# Guidance for Flood Risk Analysis and Mapping

## MT-1 Technical Guidance

December 2020


FEMA

Requirements for the Federal Emergency Management Agency (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) Program are specified separately by statute, regulation, or FEMA policy (primarily the Standards for Flood Risk Analysis and Mapping). This document provides guidance to support the requirements and recommends approaches for effective and efficient implementation. The guidance, context, and other information in this document is not required unless it is codified separately in the aforementioned statute, regulation, or policy. Alternate approaches that comply with all requirements are acceptable.

For more information, please visit the FEMA Guidelines and Standards for Flood Risk Analysis and Mapping webpage (www.fema.gov/flood-maps/guidance-partners/guidelines-standards). Copies of the Standards for Flood Risk Analysis and Mapping policy, related guidance, technical references, and other information about the guidelines and standards development process are all available here. You can also search directly by document title at www.fema.gov/multimedia-library.

# Table of Revisions

The following summary of changes details revisions to this document subsequent to its most recent version in November 2019.

| Affected Section or Subsection | Date | Description |
|---|---|---|
| Section 4.2 | December 2020 | Additional guidance for determining Base Flood Elevations (BFEs) from products generated from 2-D models. References to evaluation lines added for 2-D based floodways. |

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# 1.0 Introduction

The purpose of this document is to explain how the Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA) makes determinations or provides comments regarding the flood hazard zone for a lot, a portion of a lot, or an existing or proposed structure. The lot, portion of lot, or structure is considered the subject of the determination (subject).

The regulations governing the processing of these determinations and comments are presented in the Code of Federal Regulations (CFR), Title 44, Chapter I, Parts 65 and 70, available online through the Federal Government's e-CFR site.

Many terms associated with the MT-1 process have specific definitions related to the National Flood Insurance Program (NFIP) and the MT-1 application process. These key terms can be found in the Glossary (Section 6.0).

# 2.0 Overview of the MT-1 Process

Through the MT-1 process, a property owner or authorized representative may request a property-specific determination or comment regarding the flood hazard designation for as-built or proposed development. MT-1 determinations amend the community's effective Flood Insurance Rate Map (FIRM) by clarifying whether the subject is within the Special Flood Hazard Area (SFHA). MT-1 comments provide feedback on whether proposed development, if completed exactly as proposed, would be within the effective SFHA upon completion of the project. During the review, FEMA considers the horizontal location of the subject on its community's effective FIRM and allows for detailed property elevation data to be submitted and compared to the calculated Base Flood Elevation (BFE). All requests are processed on a first come first served basis upon receipt of all data required for the review.

## 2.1. Determining Eligibility for the MT-1 Process

The MT-1 process can only be completed using a community's effective FIRM and Flood Insurance Study (FIS) report (see FEMA Policy 204-078-1 Standard ID (SID) 218), and it does not result in physical changes to an effective FIRM. If the subject of a request has either caused or been affected by significant SFHA changes or BFE changes, the Letter of Map Revision (MT-2) process may need to be completed first to allow due process and for the changes to be officially incorporated into the effective FIRM. Application forms for the MT-2 process can be found on the FEMA website at www.fema.gov/mt-2-application-forms-and-instructions.

The MT-1 process shall not be used for requests involving:

- Changes to BFEs or SFHA boundaries including:
    - Creation of ponds or basins, including the creation of interconnected ponds that significantly modify the mapped drainage as shown on the effective FIRM.
    - Relocation or elimination of a channel or other drainage/watercourse as shown on the effective FIRM.

    - Elimination of a mapped SFHA, or portion thereof, that results in a disconnected SFHA with no apparent conveyance for the drainage as shown on the effective FIRM.
- Appeals to flood information shown on either a preliminary FIRM or the current effective FIRM. Appeals should be submitted through the local community who will review the request and, if acceptable, will forward the request to the FEMA Regional office.
- Changes to the boundary delineations for a regulatory floodway or any development in the regulatory floodway that may cause a change (increase or decrease) to the B F E or boundaries of the regulatory floodway, including compensatory storage, excavation, new ponds, drainage improvements, and the placement of any fill material.
    - The review or acceptance of a No-Rise or No-Impact Certification is outside of the scope of the MT-1 process.
    - As per CFR 44 65.3, any physical change that may cause an increase or decrease in a base flood elevation.
    - Requests of this type must be reviewed under the MT-2 process.
- Channelization projects, bridge/culvert replacement projects, other flood control improvements, or any manmade changes intended to provide flood protection.
- Changes to a Coastal High Hazard Area (CHHA), such as attempting to change an SFHA designation from Zone V to Zone A.
- Fill placement in a CHHA.
- Property and/or structures in alluvial fan flood hazard areas.
- New technical data or mapping errors that warrant a revision to the effective FIRM and FIS report.
- Review of any CLOMR-F or LOMR-F for an existing or proposed landfill site.

An MT-1 applicant should work closely with their local community, specifically the designated floodplain administrator or manager, to determine whether the MT-1 process is appropriate for review of specific projects. An MT-1 request is not a permit and should not be used to attempt to bypass the local permitting process and all other necessary federal, state and local reviews and approvals.

## 2.2. Types of MT-1 Requests

Two types of MT-1 requests may result in a Letter of Map Change (LOMC) *determination* document; two may result in a *comment* document.

### 2.2.1. Determinations

- Letter of Map Amendment (LOMA): a request for a determination from FEMA for a lot or existing structure that has NOT been elevated by fill (natural grade).
- Letter of Map Revision based on Fill (LOMR-F): a request for a determination from FEMA for a lot or existing structure that HAS been elevated by fill.

Some MT-1 determinations are not the result of specific requests but are types of unique LOMA determinations that FEMA can issue. A Letter of Map Revision Floodway (LOMR-FW) is issued when the subject has been inadvertently mapped within a regulatory floodway. The subject of a LOMR-FW determination must be located on natural ground (no fill), with either the Low Lot Elevation (LLE) for a lot or portion of a lot or the Lowest Adjacent Grade (LAG) elevation for a structure at or above the BFE. A LOMR-FW response will be processed for a subject within an effective regulatory floodway if the fill was placed in an SFHA prior to the first identification of the regulatory floodway. However, if the fill was placed in a regulatory floodway designated on a preliminary FIRM after the issuance of the Letter of Final Determination (LFD), that request will be subject to special review procedures and may be determined to be a potential violation of 44 CFR 60.3(d)(3).

A Letter of Map Revision V Zone (LOMR-VZ) is issued when the subject has been inadvertently mapped within a CHHA (V zone). The subject of a LOMR-VZ must be located on natural ground (no fill), with either the LLE (for a lot or portion of a lot) or the LAG elevation for a structure at or above the BFE.

### 2.2.2. Comments

- Conditional Letter of Map Amendment (CLOMA**):** a request for a conditional determination (comment) from FEMA for a proposed structure that will NOT be elevated by fill (natural grade). Requests require both a proposed Lowest Adjacent Grade and a certified location for the proposed structure. Note: Requests for FEMA's comment on existing land will be processed as an as-built determination (LOMA) for either the entire recorded property or a portion of the legally recorded property if a metes and bounds description and map are submitted (see Sections 3.4 and 4.8 for more details on requests based on a metes and bounds description and map).
- Conditional Letter of Map Revision based on Fill **(**CLOMR-F): a request for a conditional determination (comment) from FEMA for a lot or proposed structure that WILL be elevated by fill.

Conditional LOMCs are subject to the same standards as LOMCs for as-built conditions (LOMAs or LOMR-Fs) except:

- Because Conditional LOMCs are based on proposed construction, as-built information is not required.
- The Conditional comment documents that are issued do not amend the effective NFIP map.
- Conditional LOMR-Fs (CLOMR-Fs) must demonstrate to FEMA their compliance with the Endangered Species Act. (Refer to Section 3.3).

Please see FEMA Policy 204-078-1 SID 215.

### 2.2.3. Requests for Single vs. Multiple Subjects

MT-1 requests may be made for single or multiple structures, lots, or portions of property. Only submittals for coincident properties will be treated as one case. If they are not coincident, each property will be processed as a separate case and will be subject to the necessary data requirements, including any applicable review fee. To be considered coincident, properties

must be adjacent to one another, contained within the same deed or plat map, and affected by the same flooding source. Requests for property or a portion of property affecting more than one existing *or proposed* lot or parcel of land will be treated as a multiple-lot case and subject to any applicable multiple-lot review fee.

## 2.3. How to Apply

MT-1 requests may be initiated either by submitting an online request or by mailing the appropriate application form(s) and supporting documentation.

### 2.3.1. Applications and Forms

- The MT-1 Application, which may be used for all types of MT-1 requests, can be found online at www.fema.gov/mt-1-application-forms-instructions.
    - Form 1 – Property Information Form
    - Form 2 – Elevation Form
    - Form 3 – Community Acknowledgment Form
    - Form 4 – Payment Information Form
- The MT-EZ Application, found online at www.fema.gov/mt-ez-form-instructions, may be used for a single residential lot or structure; it cannot be used for conditional requests, requests submitted by developers, requests involving multiple structures or lots, property located within the regulatory floodway, or requests involving the placement of fill.
    - Section A – Property Information Form
    - Section B – Elevation Information Form

### 2.3.2. Online Requests

- The Online LOMC tool**,** at hazards.fema.gov/femaportal/onlinelomc/signin, generates the equivalent of a Property Information Form. All other forms (MT-1 or MT-EZ, as appropriate) and required data must be uploaded with the application.
- The electronic LOMA (eLOMA) tool was designed specifically to allow registered Licensed or Certified Professionals to generate a determination. More information about eLOMA is available on FEMAs Mapping Information Platform at hazards.fema.gov.

## 2.4. Determination and Comment Outcomes

An MT-1 review will result in one of the following outcomes: removal, non-removal, or out as shown. Additionally, some requests may result in an Informational or No Change Response Letter that explains why the review could not be completed.

**Removal**

- For determination documents, a removal outcome indicates that the SFHA designation has been removed from the subject of the determination. Removal determination documents normally do not list the calculated BFE used for the determination.

- For comment documents, a removal outcome indicates that if the as-built development is completed as described before the effective FIRM is revised, the subject of the determination will not be within the SFHA.

**Non-Removal**

- For determination documents, a non-removal outcome indicates that the subject of the determination remains within the SFHA.
- For comment documents, a non-removal outcome indicates that if the as-built development is completed as described before the effective FIRM is revised, the subject of the determination will remain within the SFHA.

**Out as Shown**

- For determination documents, an out-as-shown outcome indicates that the subject of the determination is not mapped within the SFHA on the effective FIRM.
- Out-as-shown comment documents are not normally issued for a conditional out-as-shown request (CLOMA-OAS). Rather, the requester is usually asked to provide a metes and bounds description and map for the property, or a portion of the property, containing the area of the proposed structure(s), and the request is processed as a LOMA.

**Informational Response Letters**

- Due to the nature of the request, it must be processed as a CLOMR or LOMR.
- The subject of the determination is in Zone D, an area of possible but undetermined flood hazards.
- The community has not signed the required Community Acknowledgement Form, a requirement for a CLOMR-F, LOMR-F, or LOMR-FW.
- The subject of the determination is within a CHHA designated Zone V, with no established BFE.
- The subject of determination is in a CHHA and in an area subject to erosion.
- A LOMR-FW, LOMR-F, or CLOMR-F cannot be processed because the community does not participate in the NFIP.
- The request is for a CLOMR-F or LOMR-F for the area of a proposed or existing landfill site. Landfill sites normally have large amounts of fill, no insurable buildings, and are subject to multiple other federal, state, and local review and permitting.

**No Change Response Letters**

- An existing determination for the subject is still valid.
- The subject is currently included as valid on a revalidation letter for the community.

### 2.4.1. Special Wording in MT-1 Determination and Comment Documents

Standard wording options known as “Additional Considerations” can be added to a determination or comment document. These options do not in any way make or modify a determination or comment in the Outcome section of the document. The wording options are included to clarify

special situations pertaining to the community, to cite the data used in the determination, or to provide additional information on specific conditions pertaining to the property or a portion of the property.

In addition to providing any standard wording that may apply to a request, the Additional Consideration section may be used when the legal property description is continued or when the determination document table is continued:

- *Legal Property Description (Continued)* is used when the legal property description is too long to fit on Page 1. This is normally required for metes and bounds requests, which can have lengthy descriptions. The legal property description is continued on the following page(s) of the document.
- *Determination table (Continued)* is used when there is more than one subject of determination for the request. The determination table is continued on the following page(s) of the document.

# 3.0 MT-1 Supporting Data Requirements

Specific application forms are required to initiate an MT-1 request, and additional data must be submitted to complete the application. While the items listed in this section fulfill the requirements for most MT-1 requests, other data may be required to provide clarity before the review can be completed. Extensions for additional time to submit the required data are not normally approved and applications are processed on a first come first served basis from the time all of the required data is received. More information regarding the application forms and the data required for an MT-1 request can be found on the web at www.fema.gov/change-flood-zone-designation-online-letter-map-change.

Please note that an exhaustive review of each MT-1 request is not performed until all required data items have been received for review. Because of this, a subsequent data request may be required once initial requested additional data items have been received and reviewed. Subsequent data requests are normally due to new information provided, or additional clarity regarding a request, that is contained in the data received following an additional data request.

## 3.1. General Data Requirements

One set of data is required for all MT-1 requests. In general, the required data provides five essential pieces of information:

1. Requester information, with a signed/dated request.
   - MT-1 Property Information Form (Form 1).
   - MT-EZ Property Information Form (Section A).
   - Completed Online LOMC or eLOMA request (signature not needed).
2. Recorded legal document that includes a description of the property.
   - Recorded property deed; all pages must be submitted.
   - Recorded master condominium deed for requests involving condominiums.

- Recorded plat map
- Must include a recordation date and legible recording information, such as Book/Volume and page numbers and/or Document/Instrument number.
- Usually obtained from the County/Parish Clerk or Recorder/Register of Deeds office for the community.

3. Subject(s) of the determination (structure, lot, or portion of property).
   - Provided on Property Information Form.
   - Entered into the Online LOMC or eLOMA portals.

     Note: If a request is submitted for an entire legally recorded property or a portion of property, but the request includes only the elevations for a structure, a determination/comment will be evaluated for only the structure.
4. Map and address information sufficient to accurately and efficiently verify the location of the property and any structure(s) on the property.
   - Tax Assessor's Map
   - Certified plat of survey or other suitable structure location map.
   - Certified survey of structure location for proposed structures.
   - Must show at least one street intersection that is also shown on the FIRM.
   - Must have a north arrow and scale for reference.
5. Certified elevation information
   - Needed for most determinations/comments
   - Please note that if a change is made to elevations previously submitted to FEMA all changes must be accompanied by a clear explanation for the change(s) and must be certified by a licensed professional eligible to collect and certify elevation information within his/her State.

## 3.2. Elevation Data Requirements

All MT-1 requests require elevation information for the subject EXCEPT requests where the subject is entirely and clearly shown outside of the SFHA on the effective FIRM. All elevation information submitted to support an MT-1 request must be certified by a licensed professional eligible to collect and certify elevation information within his/her State, usually a Professional Engineer or Licensed Land Surveyor. If there is any uncertainty regarding eligibility, the State licensing board should be contacted for verification.

In lieu of field surveyed elevation data, it may be possible to make use of available LiDAR data. Please see Section 5.0 for additional details on the use of LiDAR data.

Elevation data requirements may include the following items:

- Elevation Form (Form 2, MT-1 Application)
- MT-EZ Application Form (Section B)
  - Can only be used for an existing single residential lot or structure.

- Elevation Certificate
    - Can only be used for a single structure, existing or proposed.
- Certified Topographic Survey Map
    - May be required when the elevation data on a form does not provide enough detail to complete the review.
- Certified Grading Plan
    - Normally required when fill is being placed on a property in the vicinity of the floodway or in the vicinity of a CHHA.

The following list includes additional considerations related to elevation data requirements:

- Elevation data must be provided to an accuracy of one-tenth of a foot.
- With the exception of Puerto Rico, all elevation information should be submitted in feet; for Puerto Rico, the elevation information should be submitted in meters.
- Elevation information must specify a vertical datum; if the datum is neither National Geodetic Vertical Datum of 1929 (NGVD 29) nor North American Vertical Datum of 1988 (NAVD 88), a conversion to NGVD 29 or NAVD 88 must be provided.
- A United States Geological Survey (USGS) quadrangle map does not provide enough detail to be acceptable as elevation information for MT-1 processing; it may not be accepted in lieu of surveyed and certified elevation information.
- Please note that if a change is made to elevations previously submitted to FEMA all changes must be accompanied by a clear explanation for the change(s) and must be certified by a licensed professional eligible to collect and certify elevation information within his/her State.

## 3.3. Compliance Data Requirements

MT-1 reviews are completed with the understanding that the subject of the determination or comment adheres to the Federal minimum requirements listed in Title 44 of the CFR.

One of these requirements is that the low floor of any new construction or substantial improvement to a residential structure shown within the SFHA must have the lowest floor (*including basement*) elevated to or above the BFE. Non-residential structures being built or substantially improved must have the lowest floor elevated to or above the BFE OR be floodproofed to or above the BFE. For additional information please see 44 CFR 60.3(c)(2) and 60.3(c)(3).

A LOMR- F, CLOMR-F, or LOMR-FW will not be issued if the requester does not provide a fully completed, signed, and dated Community Acknowledgement Form. This form is completed by the local community official responsible for floodplain management, usually known as the Floodplain Administrator. A LOMR-F, CLOMR-F, or LOMR-FW cannot be processed in a non-participating community since no one within the community is authorized to sign the Community Acknowledgement Form.

Many States and local communities incorporate higher standards as part of their floodplain management regulations, which provide additional protection from local flood hazards or protect

from floods greater than the base flood used to map the SFHAs on the effective FIRM. FEMA encourages these higher standards, which provide additional protection for property and lives, so if a property is in or near an SFHA, it is recommended that the property owner consult the local community before considering any new development or a substantial improvement to an existing structure.

To demonstrate compliance with NFIP requirements, the following forms or data may be required before a review can be completed:

- Community Acknowledgement Form (Form 3; MT-1 Application)
    - Completion of a Community Acknowledgement Form by the community official responsible for floodplain management (or designee) is done at the discretion of the local community. An MT-1 applicant should work closely with their local community to determine whether the MT-1 process is appropriate for review of specific projects. An MT-1 request is not a permit and should not be used to attempt to bypass the local permitting process and all other necessary federal, state and local reviews and approvals. For any needed technical assistance, community officials should contact their NFIP State Coordinator and/or the FEMA Regional office.
    - Part A must be completed for conditional or as-built requests based on fill; it confirms that the fill placement meets or will meet (for proposed fill) all related development requirements.
    - Part B must be completed when the subject encroaches the regulatory floodway on the effective FIRM; it confirms that no fill has been or will be placed within the regulatory floodway and that all related development requirements have been met.
    - A community's comments must not retract or modify the standard wording included on the form.
    - For requests involving existing fill, the form must be dated after the date of fill placement.
    - When fill has been or will be placed on part of a property shown within the effective regulatory floodway, both sections of the form must be completed.
- Endangered Species Act (ESA) Compliance Documentation
    - Applicants must provide documentation which demonstrates that ESA compliance has been achieved prior to the review of any CLOMR-F request. For CLOMA, LOMA, and LOMR-F requests involving floodplain activities that have occurred already, private individuals and local and State jurisdictions are required to comply with the ESA requirement independently of FEMA's process.
    - Additional information about ESA and meeting the CLOMR-F requirements can be found in the guidance document titled, Documentation of Endangered Species Act Compliance for Conditional Letters of Map Change available on the web at www.fema.gov/media-library/assets/documents/34953.
- State Approval Letter
    - Although uncommon, a letter from the State is sometimes required before FEMA will issue an MT-1 determination.

- When such a letter is needed, the case usually involves a subject within the regulatory floodway on the effective FIRM.

## 3.4. Other Data Requirements

### Application Fee and Payment Information Form

- Fees are required to process CLOMA, CLOMR-F, and LOMR-F requests.
  - Checks or money orders should be addressed to the National Flood Insurance Program.
  - The current fee schedule for MT-1 requests is available online at www.fema.gov/flood-map-related-fees.
  - A multiple-lot fee will be assessed for property or a portion of property affecting more than one existing *or proposed* lot or parcel of land.
  - FEMA will not reimburse an applicant for costs associated with obtaining the data necessary for reviewing a request.
  - Fees may not be waived for resubmissions of completed requests unless the new request is received within 90 days of the date of the determination document or comment document or the new request is for a redetermination or reissuance based on a change to the effective FIRM.
  - Fees are reassessed for resubmissions if requested data is not received within 90 days of the date of the request in the original MT-1 case (see FEMA Policy 204-078-1 SID 217).
  - Fees are reassessed for resubmissions if the subject of the request has changed. This may include but is not limited to; additional fill being placed, metes and bounds changes for a portion of property, change from property to a portion of property, change from property to a structure request, etc.

### Flood Elevation Supporting Data

- Data may be requested when the subject is in a Zone A SFHA, which does not have established BFEs. An applicant is required to research whether a 1-percent-annual-chance flood elevation is already available for their property by contacting Federal, State, or local agencies, and to submit whatever data can be located.
  - If the data does not exist, the applicant may submit a letter to this effect, and the best available data will be used to calculate a 1-percent-annual-chance flood elevation for the subject during the MT-1 review.
- If the subject is larger than 5 acres or includes more than 50 lots, the applicant must provide certified 1-percent-annual-chance flood elevations and supporting backup data.
- More details on the requirements for Zone A areas can be found in Section 4.6.

### Certified Metes and Bounds Description and Map

- Required when the subject is a portion of a legally defined property; displays and describes the area submitted for review.

- Both the description and the map must be certified by a licensed professional eligible to collect and certify survey information.
- More detail on metes and bounds requests is available in Section 4.8.

**Site Survey Showing Property Boundary and Structure Location(s)**

- Required when multiple structures are located on a property.
- Must show the property boundary and the location of each structure on the property.
- Each structure must be labeled with a unique identifier, such as residence, garage, shed, building 1, building 2, etc.
- Must be certified by a licensed professional eligible to collect and certify survey information.

**Condominium Building Processing Details**

Condominium buildings have several special MT-1 processing requirements:

- A recorded master condominium deed is required. A recorded deed for an individual condominium unit is not acceptable.
- If a building is deeded as a condominium, a determination/comment will not be processed for individual condominium units, only for the entire building (inclusive of all units). Therefore, a LAG is required for the entire building, not just for an individual unit.

## 3.5. Common Issues with Submitted Data

The following issues (not an exhaustive list) are some of the more common problems found with the data submitted for MT-1 applications:

- Not all of the necessary forms/documents are submitted.
- Forms are not fully completed or are not signed/dated/certified.
- Confusion about definitions used by the NFIP, especially concerning:
    - Lowest Adjacent Grade (LAG)
    - Lowest Lot Elevation (LLE)
    - Lowest Floor Elevation (LFE)
    - Fill
- Submitted elevations for an as-built request are not based on finished conditions.
- Recordation data on the deed or plat is missing or illegible.
- The plat, tax map, or other submitted mapping is insufficient to definitively identify the subject or accurately locate the parcel on the FIRM.
- The effective (current) FIRM panel including use of a LOMR that may have revised the FIRM, is not used when locating the property on the FIRM/FIRMette.
- Issues with portion of property requests as described by metes and bounds:
    - Required map and accompanying description not submitted or do not match.
    - Required map and accompanying description not certified.

- Commencement point is not a legally defined/recorded point.
- Bearings and distances are not shown on the accompanying map.
- Metes and bounds area contains portions of existing or proposed buildings and/or existing or proposed drainage.
- Metes and bounds area is not an enclosed portion of property.
- Metes and bounds removal will create a disconnect in the SFHA.
- Metes and bounds is submitted with the intent of removing only the SFHA shown on the FIRM.
- Metes and bounds is submitted as an exception (an area intended to remain in the SFHA).
- Metes and bounds area attempts to redefine the SFHA boundary.
- Metes and bounds area is not for a buildable portion of property.
- A buffer in the vertical elevation between the LLE for the metes and bounds area and the corresponding BFE is recommended to avoid having to revise the metes and bounds portion of property or receiving a non-removal.
- For a portion of property with a range of BFEs, multiple LLEs may need to be surveyed for comparison to multiple BFEs. This is usually a requirement for large areas or a flooding source with rapidly changing BFEs.
- Metes and bounds description is not submitted in digital format.

- The request is not within the scope of the MT-1 LOMC process. See Section 2.1.

**Table 1: Required Forms and Minimum Data Required by Letter**

| Forms[1] | CLOMA | CLOMR-F | LOMA | LOMR-F | LOMR-FW[2] | LOMR-VZ[3] |
|---|---|---|---|---|---|---|
| Property Information Form | Required | Required | Required | Required | Required | Required |
| Elevation Data[4] | Required[4] | Required[4] | Required[4] | Required[4] | Required[4] | Required[4] |
| Elevation Form (continuation)[5] | Some requests | Some requests | Some requests | Some requests | Some requests | Some requests |
| Community Acknowledgement Form-Part A – Fill | Not Required | Required | Not Required | Required | Not Required | Not Required |
| Community Acknowledgement Form-Part B - Floodway | Not Required | Not Required | Some requests | Some requests | Required | Not Required |
| Payment Information Form and Fee[6] | Required[6] | Required[6] | Not Required | Required[6] | Not Required | Not Required |
| **Additional Data** | **CLOMA** | **CLOMR-F** | **LOMA** | **LOMR-F** | **LOMR-FW[4]** | **LOMR-VZ[5]** |
| Recorded Deed OR Recorded Plat | Not Required | Not Required | Required | Required | Required | Required |
| Tax Map[7] | Required | Required | Required | Required | Required | Required |
| Annotated FIRM | Required | Required | Required | Required | Required | Required |
| ESA Compliance | Not Required | Required | Not Required | Not Required | Not Required | Not Required |

[1] The forms listed in this table are referenced to the MT-1 application forms package. Online submittals and submittals eligible to use the MT-EZ forms need similar information.

[2] The LOMR-FW letter type is not a standard request type, but it has specific data requirements.

[3] The LOMR-VZ letter type is not a standard request type, but it has specific data requirements.

[4] Either the Elevation Form, MT-EZ Section B, OR the Elevation Certificate is required unless the subject is clearly and entirely outside of the SFHA. Each Elevation Certificate can only be used for one proposed or existing structure.

[5] The Elevation Form with continuation pages can be used for multiple properties or multiple structures.

[6] For a specific fee amount, see www.fema.gov/flood-map-related-fees.

[7] A tax map or other suitable map is needed to accurately show the location of the property.

## 4.0 Basis of MT-1 Determinations and Comments

MT-1 determinations are based on a comparison of the effective flood hazard data to both the horizontal location and vertical elevation of the subject(s). Review procedures vary based on the type of flood hazard that affects the subject. There may also be variations based on specific characteristics of the subject.

When a **structure** encroaches the SFHA, the determination or comment is based on a comparison of the effective (regulatory) BFE or 1-percent-annual-chance water-surface elevation to the elevation of the **LAG to the structure**. When a BFE is available in the Flood Insurance Study (FIS), backup hydrologic and hydraulic modeling is not researched to attempt to verify the BFE determined from the FIRM or other FIS information. Additionally, new modeling submitted for a flooding source with a BFE available in the effective FIS, will not be reviewed as a part of the MT-1 review process. These requests are more appropriate as an MT-2 CLOMR or LOMR submittal.

The LAG is defined as the elevation of the lowest point of ground touching a structure; it must include:

- Structural supports for a building, such as piers, posts or columns
- An attached garage
- Supports for an attached deck
- The bottom of a loading dock (see Section 4.10)
- Attached stairs including exterior basement stairs (see Section 4.10)
- The bottom of window wells (see Section 4.10)
- Any accessory or additional building attached by a breezeway, pedestrian bridge, covered entryway, etc. In the picture, the LAG should be inclusive of both buildings due to the breezeway attaching both buildings.

The LAG must be certified by a licensed professional eligible to certify vertical elevation data and must be provided on the appropriate application form. All elevations must have a vertical datum specified and, if applicable, the elevations must have a conversion to either NAVD 88 or NGVD 29. If the LAG for a structure is at or above the corresponding BFE, the structure may be eligible to be removed from the SFHA.

The Elevation Certificate instructions provide additional information, as well as figures on where the LAG should be taken for various structure types. The Elevation Certificate can be found at www.fema.gov/media-library/assets/documents/160?id=1383. Additional information on the appropriate location to take a LAG is also available in Section 4.10, Intervening High Ground Considerations.

Figure 1 and Figure 2 show examples of an appropriate LAG for a structure.

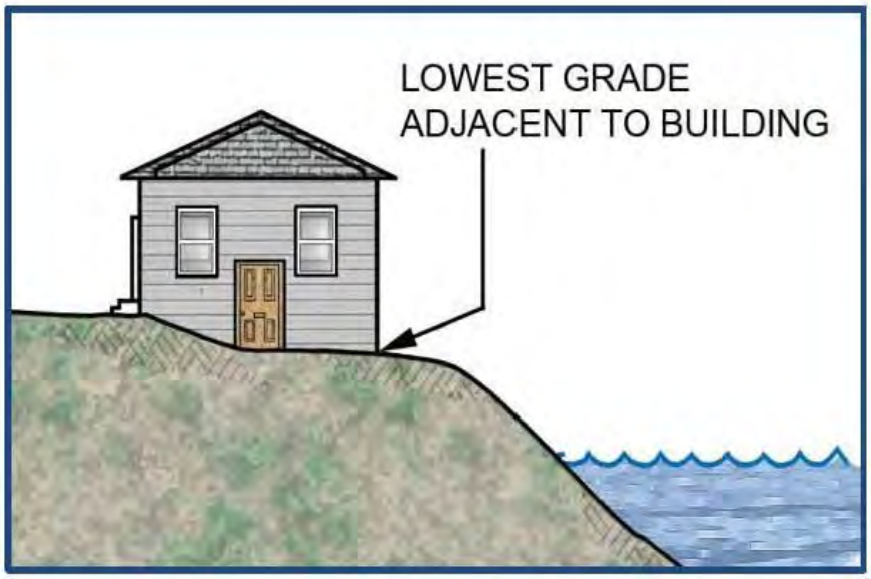



Figure 1: LAG - Lowest Ground Touching a Structure


Figure 2: LAG - Structure with Attached Deck

When a **lot (property)** encroaches the SFHA, the determination or comment is based on a comparison of the effective BFE or 1-percent-annual-chance water-surface elevation to the **lowest lot elevation (LLE)**.

For an entire property, the LLE is defined as the lowest ground elevation on the legally recorded property (recorded deed or plat). To remove an entire property from the SFHA, the LLE must be at or above the corresponding BFE, and the property to be removed shall not include any watercourse or drainage, including either permanent or intermittent water. If a property includes a watercourse, it may be possible to remove a portion of the property by defining the area of the property that is at or above the BFE and that excludes the area(s) of water (see Figure  and Figure ).

The LLE may need to include the bottom of an in-ground swimming pool. In some situations, natural intervening high ground may protect this LLE (bottom of the pool) by providing protection from the adjacent BFE. See Section 4.10 for more information on the use of natural intervening high ground believed to provide protection of a LAG or LLE that is below the adjacent BFE.


**Figure 3: LAG - Structure with Attached Deck**

The LLE must be provided on the Elevation Form and certified by a licensed professional eligible to certify vertical elevation data. If the LLE is at or above the corresponding BFE, the property may be eligible for removal from the SFHA.

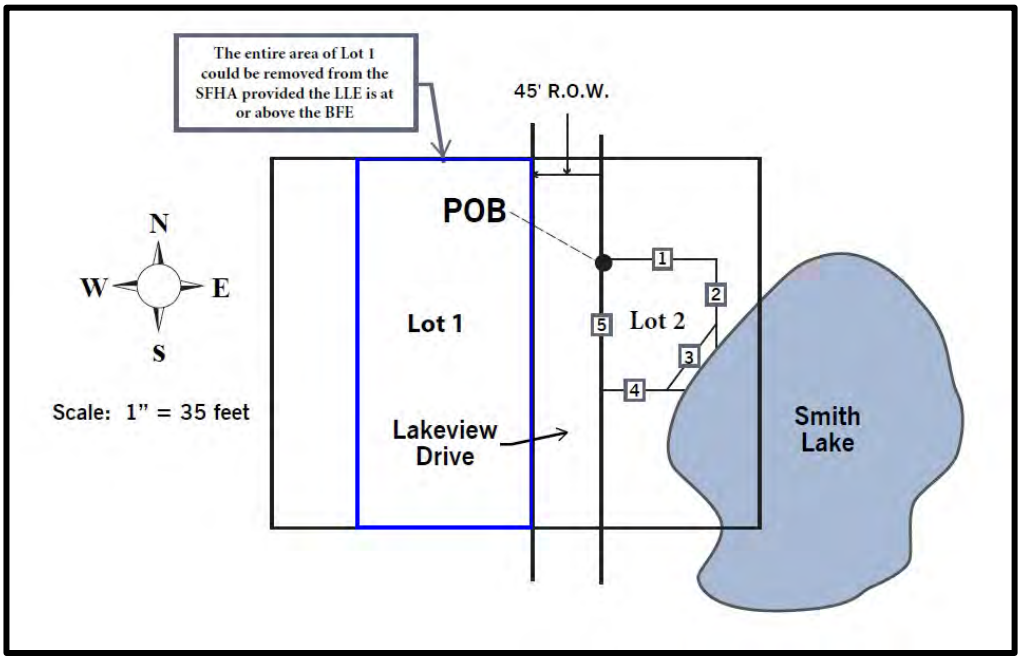



Figure 4: Entire Property - Lot 1 - No Watercourse

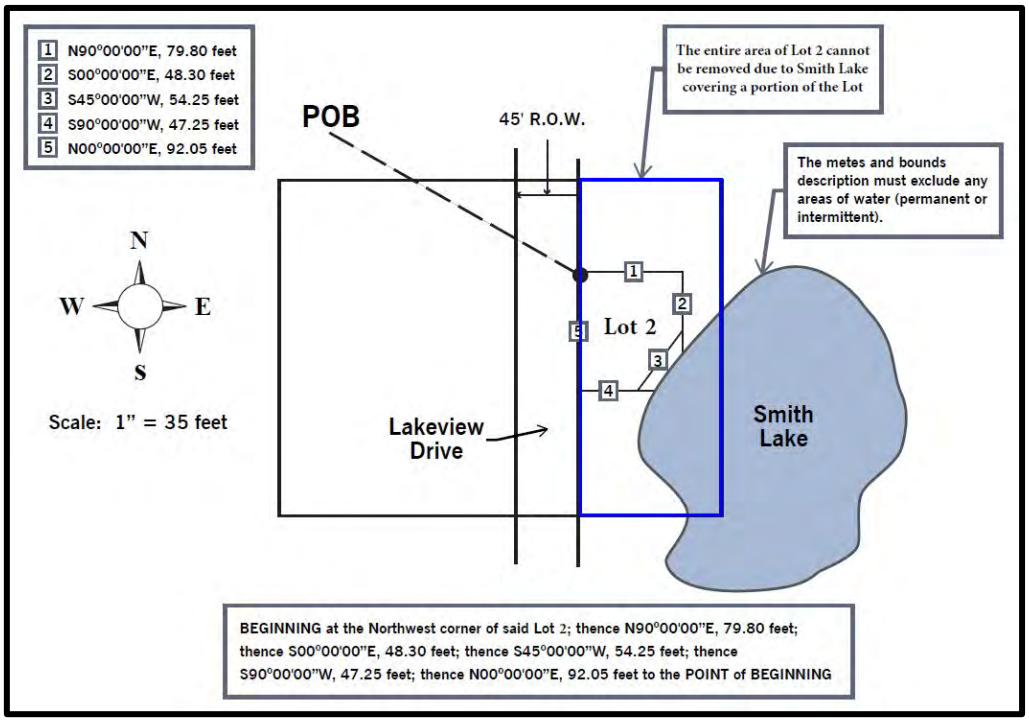



**Figure 5: Portion of Property – Lot 2 – With Watercourse**

When a **portion of property** encroaches the SFHA, the determination or comment is based on a comparison of the effective BFE or 1-percent-annual-chance water-surface elevation to the **lowest lot elevation within the described portion of property**.

To have a portion of a property reviewed for removal from the SFHA, the application data must include both a written description and a map, certified by a licensed professional, defining the portion of property to be considered for removal from the SFHA. The description defining the portion of property is known as a metes and bounds description. It must describe a closed area and be referenced to a legally defined point.

The LLE for the metes and bounds area (portion of property) must be provided on the Elevation Form and certified by a licensed professional eligible to certify vertical elevation data. If the LLE is at or above the corresponding BFE, the portion of property may be eligible for removal from the SFHA.

Some requests may require the submittal of multiple LLEs for a metes and bounds area. This usually applies to a metes and bounds area that is large enough for the BFE to change across the property, or to an area where the BFE of the flooding source changes rapidly due to the steep gradient of the stream profile. For most MT-1 requests, the BFE is calculated to the tenth of a foot (100.0 feet, 100.1 feet, etc.), so the BFE may not need to change very much for the submitted LLE to be below the upstream BFE. By submitting multiple LLEs throughout the metes and bounds area and along the flooding source, the corresponding BFE at that location can be used for comparison to determine if the portion of property is eligible for removal from the SFHA using a range of BFEs.

More information on the data needed for review of a portion of property (metes and bounds request) is in Section 4.8.

**MT-1 Determinations and Comments vs. Community Compliance Reviews**

The structure elevations used to complete an MT-1 review are not the same structure elevations that are used to determine whether a building is compliant with minimum NFIP regulations.

Compliance reviews may compare the elevation of the top of a structure's bottom floor to the BFE or 1-percent-annual-chance flood elevation; MT-1 reviews compare the lowest adjacent grade elevation to the BFE or 1-percent-annual-chance flood elevation. The SFHA designation cannot be removed from a compliant structure built within the SFHA if the lowest adjacent grade to the structure is lower than the BFE (1-percent-annual-chance flood elevation).

**MT-1 Determinations and Comments vs. Actuarial Flood Insurance Rating**

The structure elevations used to complete an MT-1 review are not the same structure elevations used to rate a flood insurance policy. When building elevations are used to calculate an actuarial flood insurance rate, the structure's lowest floor elevation is compared to the BFE or 1-percent-annual-chance flood elevation; MT-1 reviews compare the lowest adjacent grade elevation to the BFE or 1-percent-annual-chance flood elevation.

## 4.1. Locating the Subject on the Effective FIRM

During an MT-1 review, the subject must be accurately located on the effective FIRM in order to answer the following questions:

- Is the subject within the SFHA, or is there a clear separation between the subject and the SFHA boundaries, demonstrating the subject is outside of the mapped SFHA?
- If the subject is within the SFHA, what is the flooding source and type of flood hazard affecting the property?

After determining the flooding source and type of flood hazard for subject(s) within SFHAs that have BFEs developed, a subject-specific BFE must be calculated using the FIRM and FIS report. For Zone A areas that do not have established BFEs, the best available data will be used to calculate a 1-percent-annual-chance water-surface elevation for the subject(s).

If a subject is located in more than one flood zone, as mapped on the effective FIRM, the more hazardous zone is used in making a determination. For example, if the subject is in both Zone AE and Zone VE, Zone VE will be used in the determination since it represents the higher hazard. Similarly, if the subject is affected by both a Zone AE (EL 10 Feet) and a Zone AH (EL 9 Feet), Zone AE (EL 10 Feet) will be used in the determination, since the higher BFE makes this the higher hazard. Additionally, if a Zone AO and Zone AE affect a subject the Zone with the higher BFE will be used since this normally represents the higher hazard. An exception would be a Zone AO defining an alluvial fan flood hazard area since the MT-1 process cannot be used to issue a determination or comment for a subject in an alluvial fan flood hazard area.

This procedure for subjects in more than one flood zone is consistent with the NFIP procedures for flood insurance rating.

## 4.2. Riverine SFHA Methodology

This section covers the specific methodology used to review properties affected by riverine flood hazards. Within a riverine SFHA, the 1-percent-annual-chance flood elevation will be calculated at the **most upstream point** where the subject of the determination intersects the SFHA on the effective FIRM.

### Using the FIS Report to Determine a BFE

To make a definitive determination for a subject, an accurate BFE must be determined using the FIRM along with additional resources within the FIS report. The appropriate resources to use will depend on the hydraulic model type (1-D or 2-D) used to generate the mapping output. These resources may include a Floodway Data Table, a Stream Profile, a Summary of Stillwater Elevations Table, and where a 2-D model was used, an FIS grid insert. The level of detail used to map the SFHA will determine whether any of these products exist, and a quick review of the FIS report table of contents confirms whether any of them are available. Table 2 shows the most common data in the FIS report that may be available for use in determining a specific BFE for the subject.

**Table 2: Data Used to Determine a Riverine BFE**

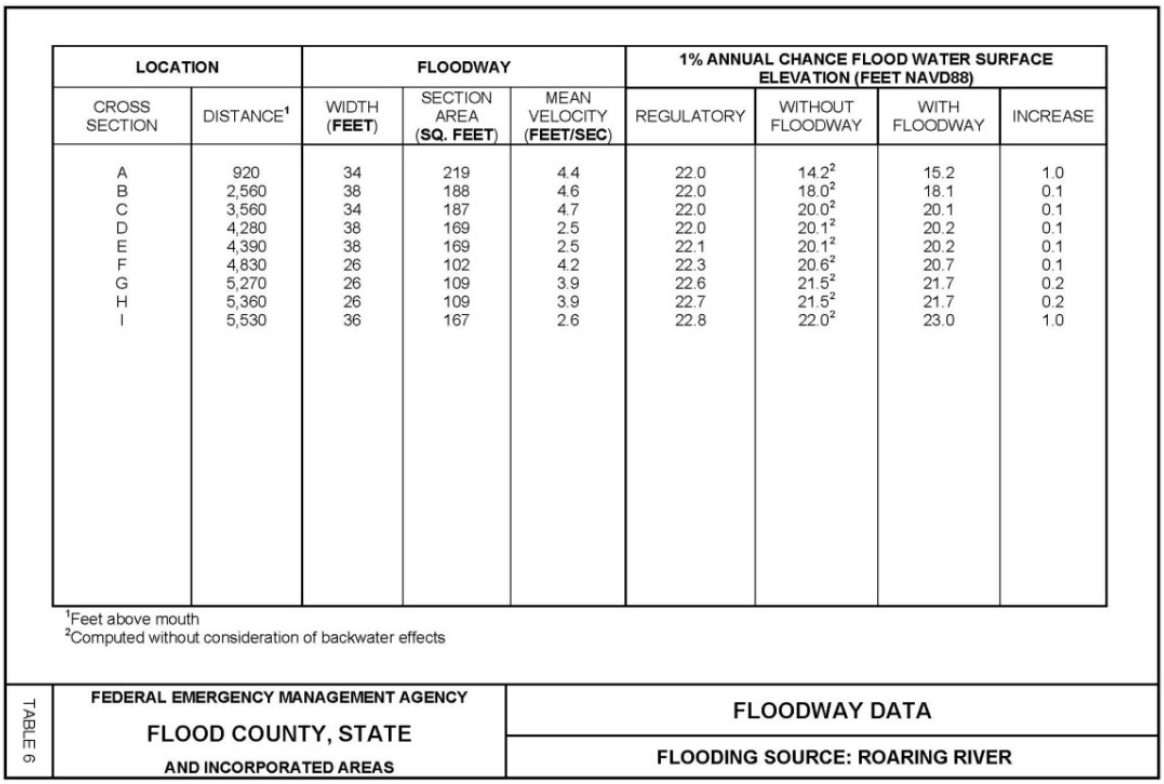
| Type of Hazard | Zone | Data Element | Location - Description |
|---|---|---|---|
| Riverine | AE or A1-A30 | Floodway Data Table (FWDT) | FIS report - The FWDT is produced for riverine flooding sources with a regulatory floodway. At each mapped cross section or evaluation line, the BFE is listed to the tenth of a foot (Figure 6). |
| Riverine | AE or A1-A30 | Stream Profile | FIS report - Stream Profiles produced for detailed study streams can be used to obtain a BFE for any point along the stream and are more accurate than the whole-foot BFEs shown on the FIRM. BFEs along the stream profile may only be applicable on or in the immediate vicinity of the profile baseline used to generate the stream profile. Where a 2-D model was used, and evaluation lines are shown on the FIRM, the user should reference the mapped evaluation lines and BFE lines to determine the applicable BFE. BFEs generated based on a 2-D model are contoured from the water surface elevation grid output from the model, and therefore are the best representation of the water surface across the floodplain width. |

| Type of Hazard | Zone | Data Element | Location - Description |
|---|---|---|---|
| Riverine | AE or A1-A30 | FIS Grid Insert | FIS report – FIS Grid Inserts are used when contoured BFE lines on the FIRM are not adequate to determine a BFE. This occurs in steep areas and areas with complex hydraulics. To provide additional detail, an FIS Grid Insert may be included within the Stream Profile section of the FIS report. |

**Floodway Data Table**

The FWDT lists specific information for each mapped cross section or evaluation line shown on the FIRM (BC, BD, and BE are cross sections shown in Figure 6 ). The elevations listed at each cross section or evaluation line are accurate to the tenth of a foot and represent some of the best riverine elevation data within the FIS report. However, the following limitations relate to obtaining and using FWDT elevation information:

- A FWDT is usually only available for streams with a regulatory floodway, meaning that FWDTs are not available for all riverine flooding sources studied by detailed methodology (with BFEs).
- The elevations listed at each cross section or evaluation line are normally applicable only if a subject of determination is located directly on a mapped cross section or evaluation line. If a subject is upstream or downstream of a cross section or evaluation line, additional information should be used to obtain the specific BFE applicable to the subject. In areas where a 1-D hydraulic analysis was used to generate results (and cross sections are displayed on the FIRM) the stream profile should be used to determine the applicable BFE. Where a 2-D hydraulic analysis was used to generate results (and evaluation lines are displayed on the FIRM) the mapped evaluation lines and BFE lines should be used to determine the applicable BFE.



| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 920 | 34 | 219 | 4.4 | 22.0 | 14.2[2] | 15.2 | 1.0 |
| B | 2,560 | 38 | 188 | 4.6 | 22.0 | 18.0[2] | 18.1 | 0.1 |
| C | 3,560 | 34 | 187 | 4.7 | 22.0 | 20.0[2] | 20.1 | 0.1 |
| D | 4,280 | 38 | 169 | 2.5 | 22.0 | 20.1[2] | 20.2 | 0.1 |
| E | 4,390 | 38 | 169 | 2.5 | 22.1 | 20.1[2] | 20.2 | 0.1 |
| F | 4,830 | 26 | 102 | 4.2 | 22.3 | 20.6[2] | 20.7 | 0.1 |
| G | 5,270 | 26 | 109 | 3.9 | 22.6 | 21.5[2] | 21.7 | 0.2 |
| H | 5,360 | 26 | 109 | 3.9 | 22.7 | 21.5[2] | 21.7 | 0.2 |
| I | 5,530 | 36 | 167 | 2.6 | 22.8 | 22.0[2] | 23.0 | 1.0 |

[1]Feet above mouth
[2]Computed without consideration of backwater effects

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOOD COUNTY, STATE

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: ROARING RIVER

**Figure 6: Example of Floodway Data Table from FIS Report**

### Flood Profile

As the name indicates, a Stream Profile (Figure 7) provides a graph showing the flood elevations in profile view along a riverine flooding source. The FIS report profiles contain information for at least the base (1-percent-annual-chance or 100-year) flood. Many, but not all profiles, also contain a stream profile for the 10-percent (10-year), 2-percent (50-year), and 0.2- percent (500-year) flood elevations.

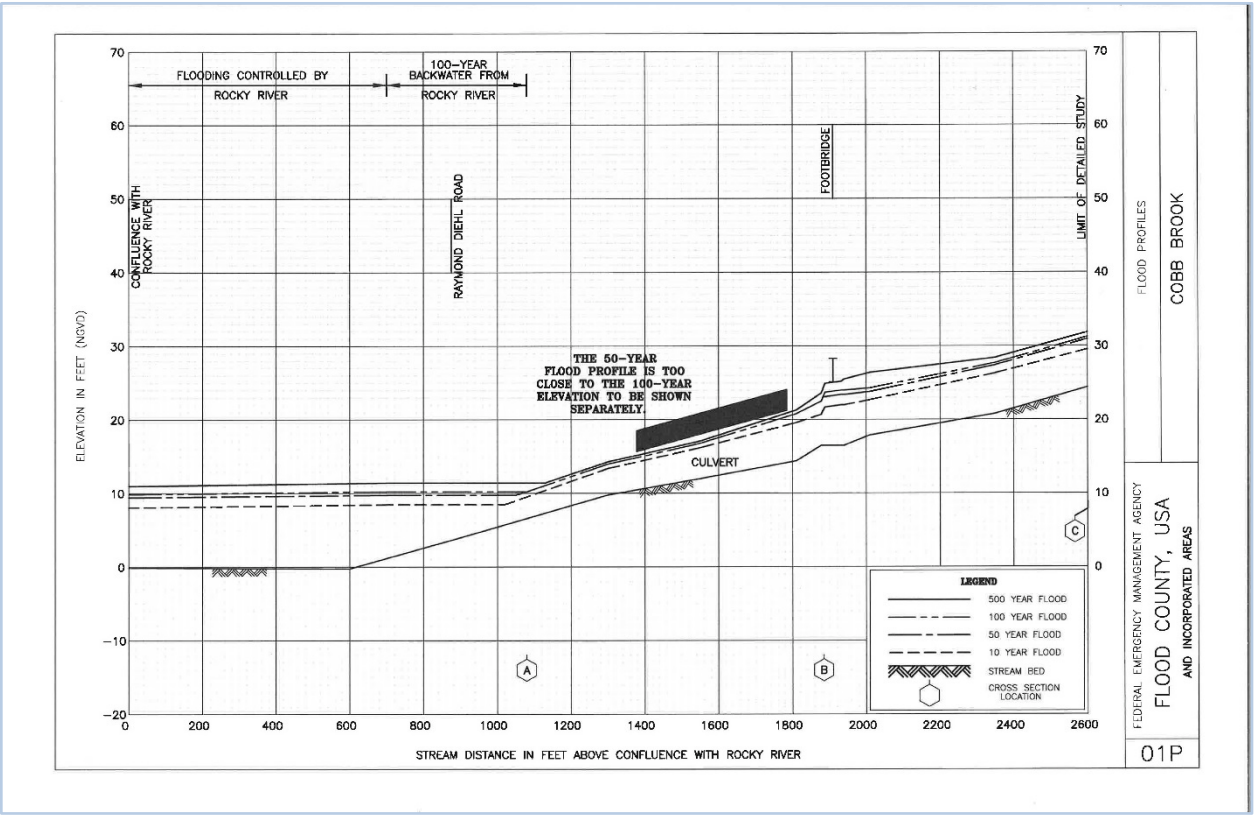



**Figure 7: Example of Stream Profile from FIS Report**

The stream profile is the product used to determine an accurate BFE at any point along a riverine flooding source when a 1-D hydraulic analysis was used to produce the regulatory stream profile. Where a 2-D hydraulic analysis was used, the stream profile should only be used when the subject location falls in the immediate vicinity of the profile baseline. In all other cases either evaluation lines and BFE lines on the FIRM should be used, or an FIS Grid Insert (where available). Procedures for determining BFEs from these sources are described in subsections below. Several steps are followed to obtain a BFE using the stream profile:

Step 1 - The location of the subject of determination (subject) on the FIRM is used to measure from the upstream edge of the subject to a feature shown on both the FIRM and the profile. The measurement is usually taken along the centerline of the flooding source. The known point can be a cross section, road crossing, dam, etc. In Figure , the measurement is taken from Cross Section BD to the subject.

Step 2 - Using the measured distance, the same horizontal distance is located downstream of Cross Section BD on the stream profile. Each profile has a horizontal scale shown at the bottom of the profile. It is critical to use the correct scale when making this measurement on the profile.

Step 3 - Once the subject is accurately located on the stream profile, the BFE can be determined using the profile line for the 1-percent (100-year) flood elevation. Using the vertical scale shown on the profile (normally 5, 10, or 20 feet per inch), read the BFE for the property from the profile. Again, use of the correct vertical scale is critical in obtaining

an accurate BFE at the subject. Also, it is important to make note of the correct vertical datum from the FIRM and profile for comparison of the BFE to elevations for the subject (LAG, LLE, etc.). In this example, the vertical datum is NAVD 88.

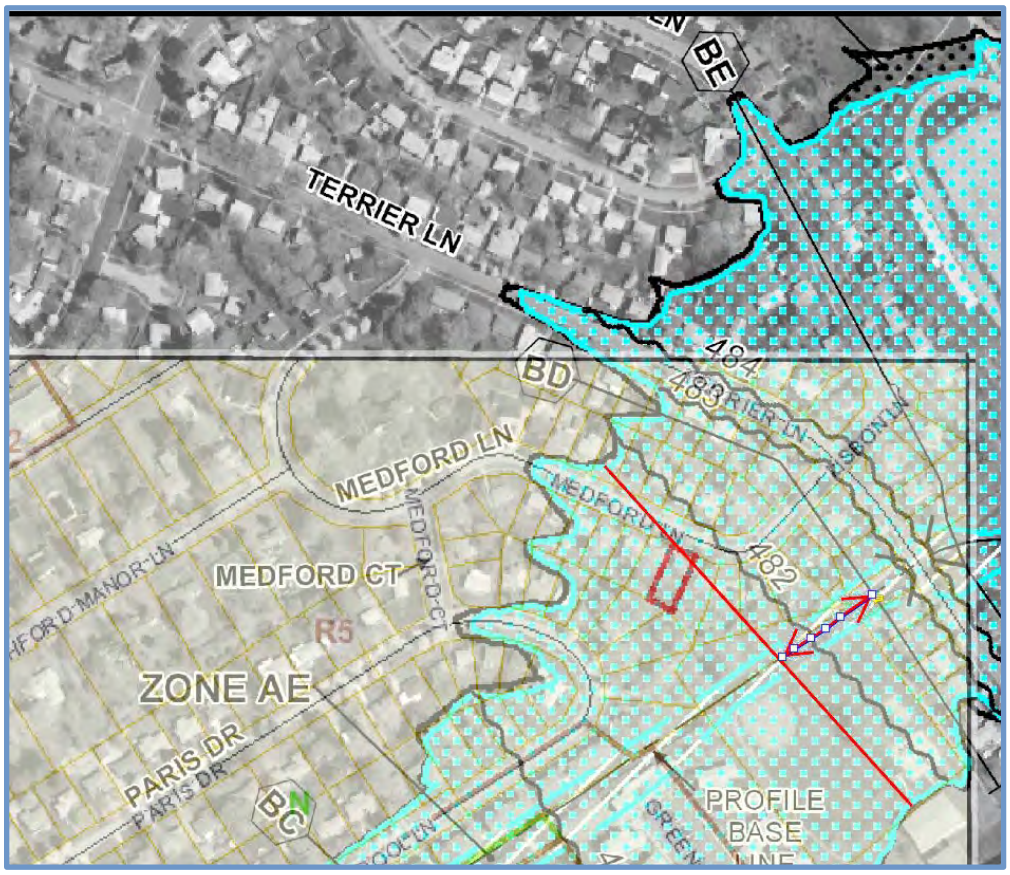



**Figure 8: Measuring to Subject from a Cross Section (Not to Scale)**

Example of Using a Stream Profile to Obtain a BFE (Figure 8 and Figure 9):

1. The FIRM scale for this example is 1" = 500 feet (not to scale in Figure 8), and the measurement shown in Figure 8 is 106 feet from Cross Section BD to the subject.

2. The horizontal scale of the profile (Figure 9) is 1" = 0.2 miles or 1,056 feet per inch. 106'/1056' = 0.10" = 1 horizontal block, which each represent one tenth of an inch.

At the subject location, 106 feet downstream of Cross Section BD, the BFE read from the profile at the 1-percent profile line is 482.0 feet (NAVD 88).

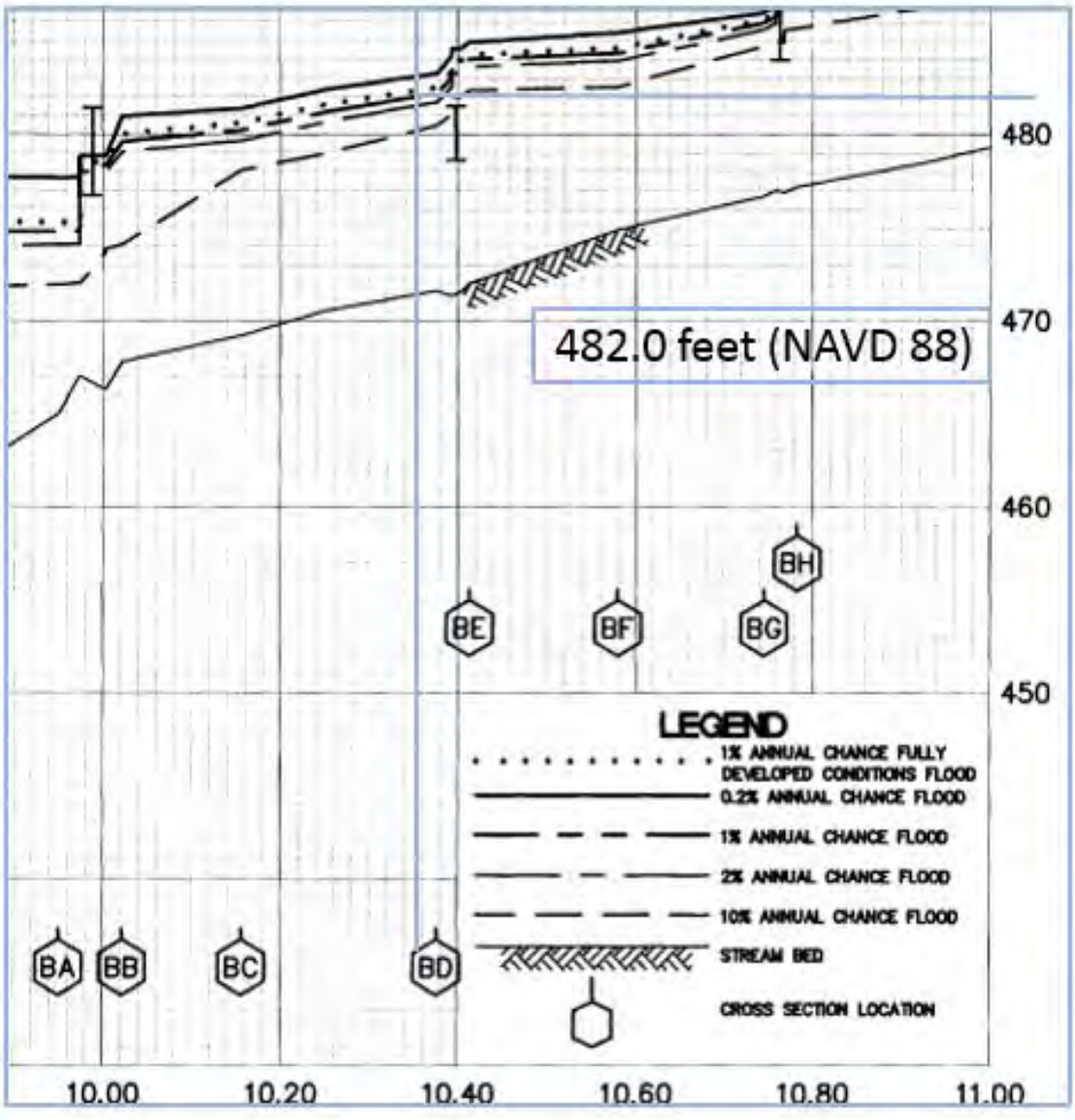



Figure 9: Portion of Stream Profile Used to Obtain BFE

**BFE Lines and Evaluation Lines**

If a subject location is within an SFHA with BFEs shown on the FIRM but there is no stream profile for the flooding source in the FIS report, the FIRM may need to be used to interpolate between two BFEs. For mapped products based on a 1-D hydraulic analyses, interpolating between BFEs will generate a less detailed BFE for the subject. If necessary, the following steps are followed when calculating a BFE using only the FIRM:

- Select the closest upstream and downstream BFEs to the subject from the FIRM.
- Select the upstream point of the flooding affecting the subject along the flooding source.
- Assuming a constant slope in the flow between the two BFEs, make a mathematical calculation for the BFE at the subject using the following formula:

$$X = E_1+((E_2-E_1)*(D_2/D_1))$$

Where:

X = the BFE at the upstream edge of the subject

E1 = the whole-foot BFE downstream of the subject

E2 = the whole-foot BFE upstream of the subject

D1 = Distance between E1 and E2, measured along the flooding source

D2 = Distance from subject to E1 (downstream BFE), measured along the flooding source

Using numbers where $E_1$=100.0'; $E_2$=105.0'; $D_1$=500.0'; and $D_2$=100.0' the calculated BFE is:

X = 100.0+((105.0-100.0)*(100.0/500.0)) = 100.0+(5.0*0.2) = 100.0+1.0 =**101.0 feet**

For 2D models, the profile baseline should not be used as the distances D1 and D2. Instead, the distances should be measured along the shortest straight line between the nearest BFEs, as show in the figure below. Point A is 62 foot upstream of BFE 2278 and 110 foot downstream of BFE 2282. The elevation of Point A is determined by:

BFE= E1+(E2-E1) * (DS Distance)/(Total Distance)

Or

BFE=2278+(2282-2278) * 62/(62+110)=2279.4 ft


**Figure 10: Measuring a Subject between BFEs in overbank areas when the floodplain is derived from 2-D models.**

### FIS Grid Inserts

If a subject location is within an SFHA with BFEs shown on the FIRM, but there is not sufficient detail available on the FIRM panel to interpolate an elevation from the mapped BFEs, a FIS Grid Insert should be available in the FIS Report. Figure 11 below shows an example of an FIS Grid Insert. The display will show modeled BFE at all nodes or cells within an area mapped using a 2-D hydraulic analysis. Depending on the hydraulic model used, the grid display may be rectangular (as in the example in Figure or irregular).

To determine the appropriate BFE from a FIS Grid Insert, the user should first determine where the subject falls relative to the BFEs at each node or cell. If a subject location falls directly on a node or cell, that BFE should be used. If a subject falls on a direct line between two reported nodes or cells, those two values should be used to determine an average BFE. Finally, if a subject location falls between several nodes, a composite average should be determined. Examples of these three situations are illustrated on Figure 11.

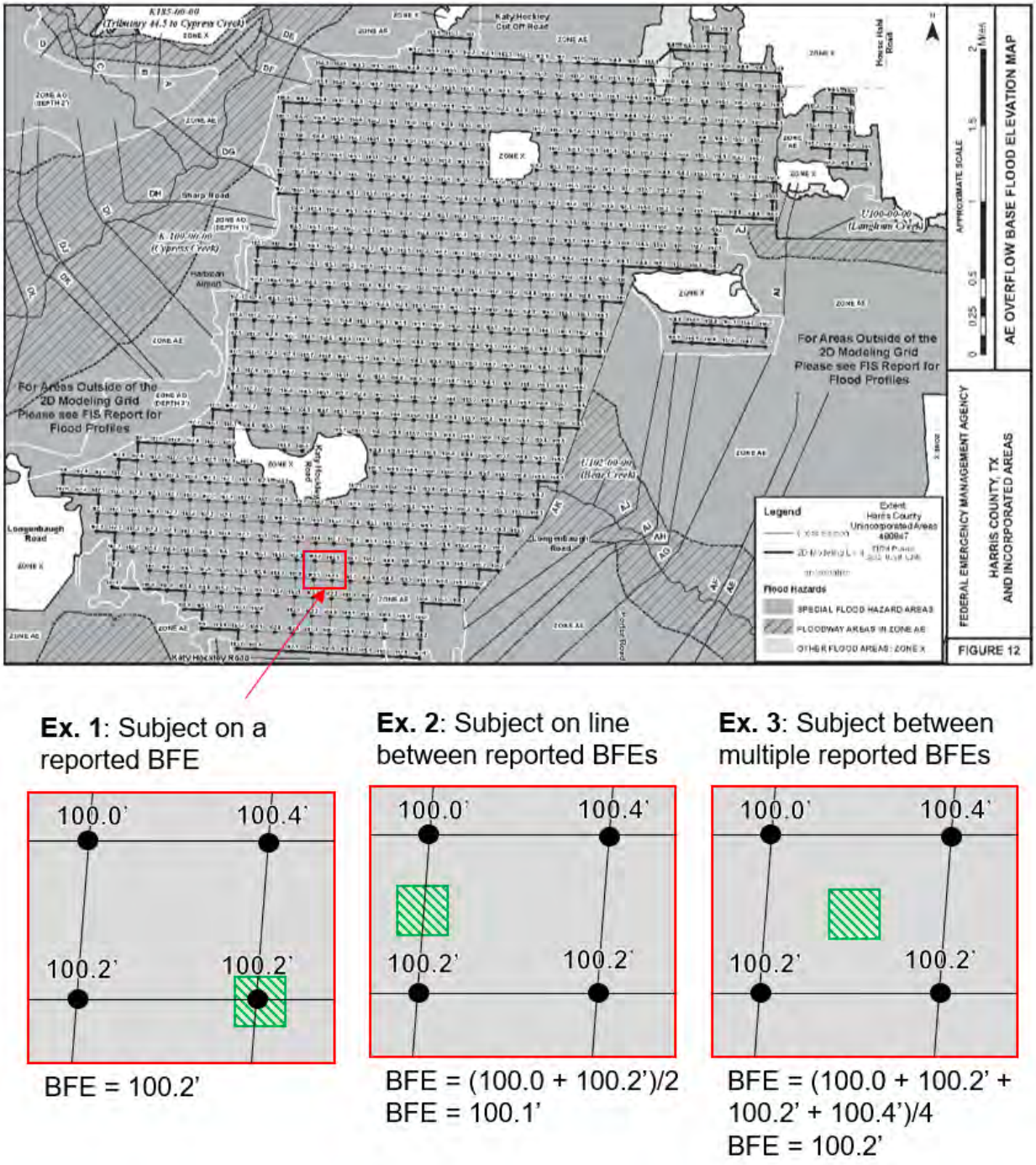



**Figure 11: Example of FIS Grid Insert and Calculations to Determine a BFE**

For some requests, a BFE is determined at multiple locations along the flooding source to ensure a correct determination. If the review determines that multiple BFE locations are required, additional elevation information for the subject may be needed to compare to the location of each BFE. The most common reason for obtaining multiple BFE calculations is that the subject results in a non-removal when the highest BFE affecting the subject is compared to the lowest elevation of the subject. By using multiple points for comparison to the BFE, the

outcome of the determination may change. This situation most frequently occurs for the following situations:

- A rapidly changing BFE (steep profile).
- A large property parallel to the flow of the flooding source.
- A large portion of property parallel to the flow of the flooding source.
- A large building parallel to the flow of the flooding source.

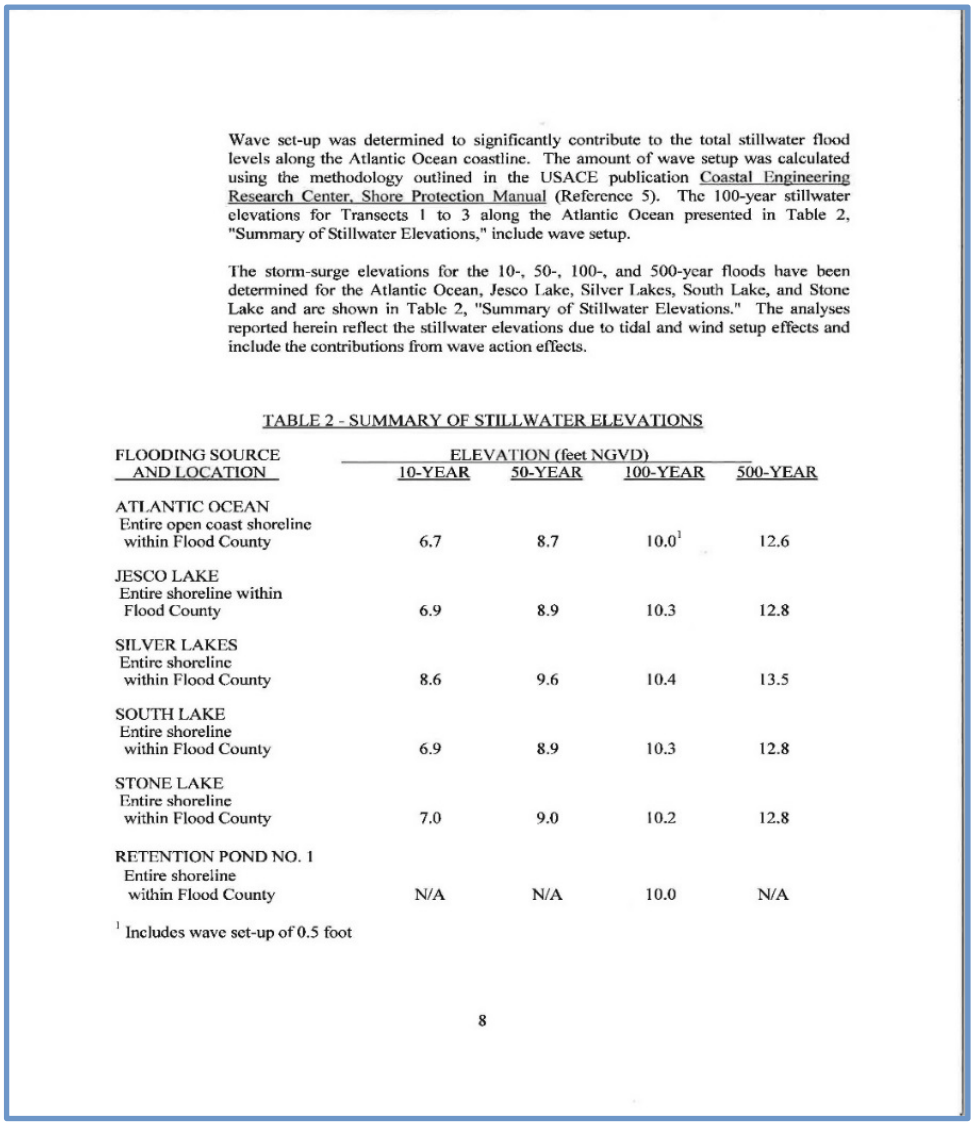
## 4.3. Lacustrine and Ponding Area SFHA Methodology

This section covers the methodology used to review properties affected by flooding effects from lakes (lacustrine) and Zone AH SFHAs.

Lacustrine and ponding area SFHAs are normally labeled on the FIRM as Zone AH (EL XX Feet) or Zone AE (EL XX Feet), where XX represents the static BFE for that SFHA. When the whole-foot number from the FIRM does not provide a definitive determination, the FIS report is researched to determine if a Summary of Stillwater Elevations table contains a more detailed BFE. The name of the flooding source shown on the FIRM is used to locate the correct elevation in the table. If a Summary of Stillwater Elevations table does not exist, or if the flooding source is not listed in the table, then the whole-foot BFE from the FIRM is used. Figure 12 shows an example of a Summary of Stillwater Elevations table.

**Table 3: Data Used to Determine a Lacustrine or Ponding Area BFE**

| Type of Hazard | Zone | Data Element | Location - Description |
|---|---|---|---|
| Lacustrine | AE or A1-A30 | Summary of Stillwater Elevations Table | FIS report - A Summary of Stillwater Elevations table contains elevations at different flood frequencies for an SFHA with a static elevation. While the FIRM normally shows a whole-foot elevation, such as Zone AE (EL 10 Feet), the table normally has elevations to a tenth of a foot (Figure 11). |
| Lacustrine | AE or A1-A30 | FIRM | FIRM - Use the elevation from the FIRM only when no FWDT, Profile, or Summary of Stillwater Elevations table is available. |
| Ponding Area | Zone AH | Summary of Stillwater Elevations Table | FIS report - A Summary of Stillwater Elevations table contains elevations at different flood frequencies for an SFHA with a static elevation. While the FIRM normally shows a whole-foot elevation, such as Zone AH (EL 10 Feet), the table normally has elevations to a tenth of a foot (Figure 11). |
| Ponding Area | Zone AH | FIRM | FIRM - Use the elevation from FIRM only when no Summary of Stillwater Elevations table is available. |



Wave set-up was determined to significantly contribute to the total stillwater flood levels along the Atlantic Ocean coastline. The amount of wave setup was calculated using the methodology outlined in the USACE publication Coastal Engineering Research Center, Shore Protection Manual (Reference 5). The 100-year stillwater elevations for Transects 1 to 3 along the Atlantic Ocean presented in Table 2, "Summary of Stillwater Elevations," include wave setup.

The storm-surge elevations for the 10-, 50-, 100-, and 500-year floods have been determined for the Atlantic Ocean, Jesco Lake, Silver Lakes, South Lake, and Stone Lake and are shown in Table 2, "Summary of Stillwater Elevations." The analyses reported herein reflect the stillwater elevations due to tidal and wind setup effects and include the contributions from wave action effects.

TABLE 2 - SUMMARY OF STILLWATER ELEVATIONS

| FLOODING SOURCE AND LOCATION | ELEVATION (feet NGVD) 10-YEAR | 50-YEAR | 100-YEAR | 500-YEAR |
|---|---|---|---|---|
| ATLANTIC OCEAN Entire open coast shoreline within Flood County | 6.7 | 8.7 | 10.0[1] | 12.6 |
| JESCO LAKE Entire shoreline within Flood County | 6.9 | 8.9 | 10.3 | 12.8 |
| SILVER LAKES Entire shoreline within Flood County | 8.6 | 9.6 | 10.4 | 13.5 |
| SOUTH LAKE Entire shoreline within Flood County | 6.9 | 8.9 | 10.3 | 12.8 |
| STONE LAKE Entire shoreline within Flood County | 7.0 | 9.0 | 10.2 | 12.8 |
| RETENTION POND NO. 1 Entire shoreline within Flood County | N/A | N/A | 10.0 | N/A |

[1] Includes wave set-up of 0.5 foot

8

Figure 12: Example of Summary of Stillwater Elevations Table from FIS Report

## 4.4. Coastal Flood Hazard Area Methodology

This section covers the basic methodology used to review properties in an SFHA affected by coastal flood hazards: both coastal high hazard areas (V zones) and coastal AE zones.

MT-1 reviews for subjects in coastal flood hazard areas consider the BFE from the FIRM when making a determination. Please see FEMA Policy 204-078-1 SID 614.

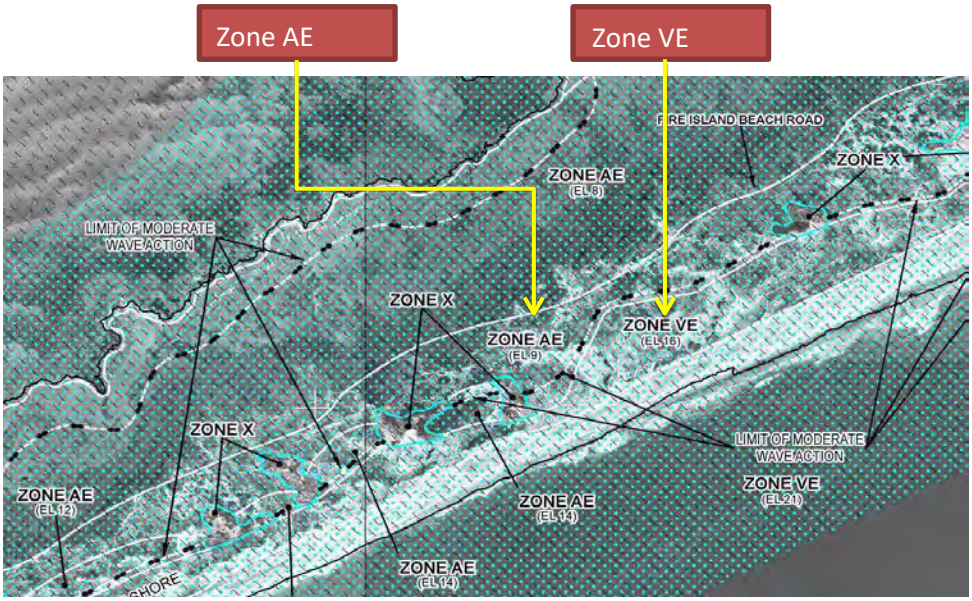



**Figure 13: Snapshot of FIRM with Coastal Zones Identified**

According to 44 CFR 60.3(e)(6), the placement of structural fill in a CHHA is prohibited. An MT-1 application cannot be processed for a request based on fill if the subject is in a CHHA. Also, any new construction or substantial improvement in a CHHA must be elevated on *pilings or columns,* as defined in 44 CFR 60.3(e)(4).

The flood zone determination for a building elevated on posts, piers, or pilings will be made by comparing the LAG to the BFE. The LAG must consider the elevation at which the piling, column, or any supporting member of the building enters the ground. If any portion of the structure, including pilings, columns, posts, or piers, is below the BFE, the building may not be removed from the SFHA.

### 4.4.1. Primary Frontal Dune (PFD) Considerations

A PFD is defined as a continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach. PFDs are subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the PFD occurs at a point where there is a distinct change from a relatively steep slope to a relatively mild slope.

No MT-1 applications for a subject of determination located seaward of the inland limit of a PFD will be processed. Determinations cannot be provided when the subject is a lot or structure either partially or entirely on a PFD. Please see FEMA Policy 204-078-1 SID 613.

### 4.4.2. Unnumbered Zone Considerations

If a property is in a Zone V SFHA with no established BFEs, a determination cannot normally be issued under the MT-1 application process. The exceptions to this rule are areas that have a preliminary study with a BFE, draft data approved by FEMA with a BFE, or submitted data

with a BFE from other Federal agencies, such as the U.S. Army Corps of Engineers (USACE). The existing or submitted data are reviewed to determine if an appropriate BFE exists that can be compared to the submitted elevation data for the subject of determination. If an appropriate BFE is available, an MT-1 application may be processed; and it will be reviewed by a coastal processing Subject Matter Expert (SME).

## 4.5. Regulatory Floodway Considerations

The regulatory floodway is defined as the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

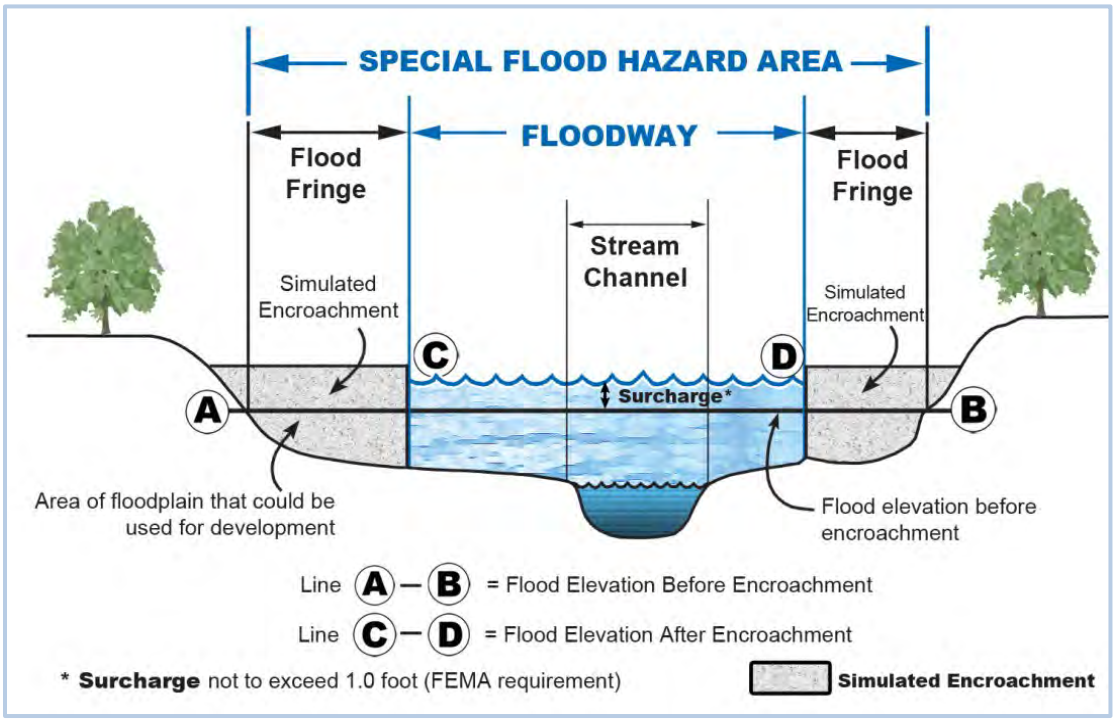



Figure 14: Regulatory Floodway Schematic

In practical terms, this means that any proposed development within the regulatory floodway, including fill, new construction, and substantial improvements, is not allowed unless it is demonstrated through hydrologic and hydraulic analysis that the proposed development would not result in an increase in flood levels (44 CFR 60.3(d)(3)). A review of this type of analysis (No-Rise/No-Impact data) is outside of the scope of the MT-1 process and must be submitted as a conditional MT-2 request. Per 44 CFR 60.3(d)(4), if an encroachment is proposed within the area of the regulatory floodway, the community must first request a conditional revision to the FIRM and floodway. This type of request is reviewed through the MT-2 process and is known as a CLOMR.

Although proposed encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway may not result in any increase

in flood levels within the community during the occurrence of the base flood discharge, as demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice, a formal review of No Rise/No Impact Certification for proposed or existing developments within regulatory floodways is not available through the MT-1 procedures. No Rise/No Impact analyses must be submitted to the FEMA Regional Office for review.

The MT-1 process can be used to review a property or structure that is inadvertently included within the regulatory floodway. There are some limitations, but the following situations qualify for review if the community is in agreement and signs Part B of the Community Acknowledgement Form:

- A lot or portion of lot on natural ground (no fill) with the lowest property elevation at or above the BFE.
- A structure on natural ground (no fill) with the LAG at or above the BFE.
- A structure built prior to the initial identification of the regulatory floodway, with the LAG at or above the BFE.
- A small portion of the regulatory floodway, when the review determines there is no need for a more comprehensive floodway revision (MT-2 CLOMR or LOMR request determined by FEMA to not be required).

If a subject qualifies as an inadvertent inclusion in the floodway, Part B of the Community Acknowledgement Form is required. This form must be completed, signed and dated by the community official responsible for floodplain management.

## 4.6. Zone A (Basic Engineering) Considerations

A SFHA is defined as the area subject to inundation by the base flood, and a Zone A SFHA is usually determined using basic engineering methodologies. Because no detailed hydraulic analyses have been performed, no BFEs or flood depths are shown on the FIRM.

MT-1 requests regarding subjects in Zone A can be reviewed, but since no BFEs are shown on the FIRM, a 1-percent-annual-chance flood elevation must be obtained by using the best available data for the area. The best available data is usually one of the following:

- A submitted hydrologic and hydraulic analysis completed for the area by a licensed professional eligible to calculate and certify hydraulic calculations.
- A calculation of the 1-percent-annual-chance flood elevation completed by another Federal agency, or from an acceptable State or local agency.
- An in-house calculation of the 1-percent-annual-chance flood elevation by FEMA.
- Limited detail analysis, available with many new FEMA flood studies, that contains cross sections along the flooding source with 1-percent-annual-chance flood elevations.
- Preliminary or draft data with BFE calculations for the area. The use of draft data is acceptable, since no BFE has been established for the Zone A SFHA.

When the request meets specific criteria, FEMA will develop a 1-percent-annual-chance flood elevation for the subject of determination. There are two criteria:

- The property must not be larger than 5 acres OR include more than 50 lots. For a property of that size, calculating the 1-percent-annual-chance flood elevation should be part of the development process.
- MT-1 applicants must research the possibility that Federal, State, and local agencies have already calculated a 1-percent-annual-chance flood elevation for the area.

FEMA may require local survey data such as the following to complete the calculation of the 1-percent-annual-chance flood elevation:

- A surveyed cross section or cross sections at the property.
- Culvert or bridge data for a culvert/bridge in the vicinity of the property. These data could include invert elevations, top-of-road elevations, length of the culvert or bridge opening, type and size of culvert or bridge opening, etc.
- Details for a dam in the vicinity of the property.

For more information on methods for determining a BFE within a Zone A SFHA, please review the document titled Zone A Manual: Managing Floodplain Development in Zone A Areas, which is available on the FEMA website at www.fema.gov/media-library/assets/documents/7273.

## 4.7. Zone AO Considerations

A Zone AO SFHA is defined as an area subject to inundation by the base flood due to shallow flooding (usually sheet flow on sloping terrain), where average depths are between 1 and 3 feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone.

When a property is within Zone AO, there is no single approach used to determine whether the SFHA designation can be removed. The review of requests for properties in Zone AO is case specific and must consider several characteristics of the Zone AO flooding:

- The extent of the Zone AO flooding that would inundate the property.
- The direction of the sheet flow in relation to the subject of determination.
- The nature of the Zone AO area, including whether supporting data suggests that the Zone AO flooding will be conveyed by the surrounding streets.
- The projected depth of flooding in the Zone AO area, which is normally 1, 2, or 3 feet.
- Whether the flood water in this zone has a defined velocity (MT-2).

Sufficient topographic information is required to support the removal of a subject from Zone AO. Information must include relevant flow paths and demonstrate that the subject is on high ground relative to the depth of the Zone AO flooding. For many requests, the topographic survey will need to extend beyond the property's boundary to definitively show that the subject will not be inundated by the depth of the base flood. As with all other elevation data, the topographic

information must be certified by a licensed professional eligible to certify elevation information in the State.

The following three basic scenarios are considered when determining the appropriate flood elevation to compare to the LLE or LAG:

- Base flood is conveyed by the street(s).
- Base flood partially inundates the property.
- Base flood entirely inundates the property.

**SFHA Conveyed by the Street(s)**

If the surrounding slopes keep the flooding conveyed primarily by the street(s), then top-of-curb or crown-of-street elevations (whichever are higher) may be used for comparison to the LLE (property) or LAG elevation (structure). Top-of-curb/crown-of-street elevations, which must be submitted for review, should include multiple locations along the street(s) conveying the Zone AO flooding. The depth of the Zone AO flooding (usually 1.0, 2.0, or 3.0 feet) is added to the highest top-of-curb/crown-of-street elevation to obtain a BFE for comparison to the LLE/LAG. If the LLE or the LAG elevation is at or above the calculated BFE, the subject may be removed from the SFHA.

Example (Figure 15): The applicable top-of-curb elevation for this scenario is 100.0 feet. The depth of flooding is 2 feet (Zone AO (2 feet)). The BFE used for the MT-1 determination is 100.0 + 2.0 = 102.0 feet. If the LLE or LAG elevation is equal to or greater than 102.0 feet, the subject may be removed from the SFHA.

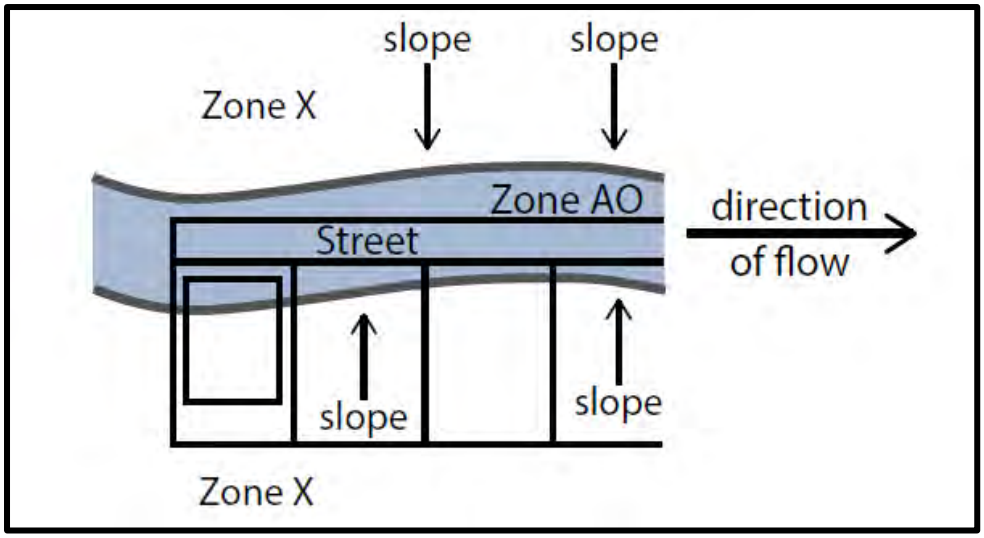



Figure 15: Zone AO SFHA Contained Primarily in Street

**Portion of Property in SFHA**

If the Zone AO flooding inundates a portion of the property, then submitted topographic information must clearly support the position that all flooding flows around and away from the subject of determination. In this scenario, the average surrounding grade within the Zone AO SFHA is compared to the elevation of the subject of determination. The depth of flooding is added to the average grade to obtain a BFE for the area. If the LLE or LAG elevation of the subject is at or above the calculated flood elevation, the subject of determination may be removed from the SFHA.

Example using average grade (Figure 16): Based on a submitted topographic survey containing 10 spot elevations for the inundated portion of the property, an average grade elevation is determined to be 100.5 feet (sum of 10 elevations/10 = 100.5'). At this property, the Zone AO flooding has a depth of 3.0 feet, so the BFE to use is: 100.5+3.0 = 103.5 feet. If the LLE or the LAG elevation is equal to or greater than 103.5 feet, the subject of determination may be removed from the SFHA.

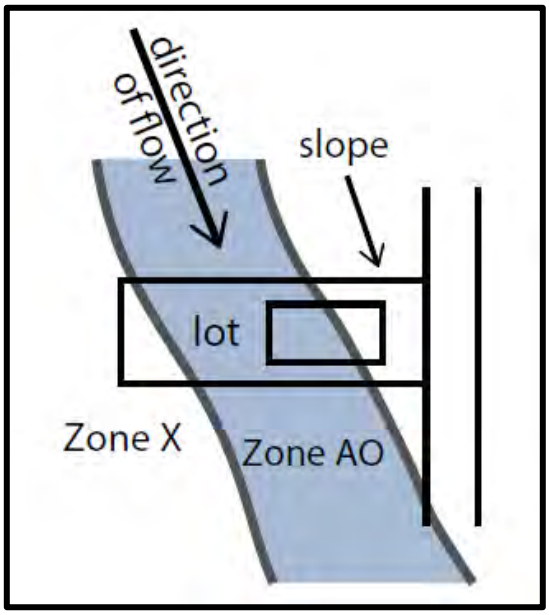



Figure 16: Portion of Property in Zone AO SFHA

**Entire Property in SFHA (see Figure 17)**

If the Zone AO flooding inundates an entire property, the submitted topographic information must clearly support the position that all flooding flows around and away from the property or structure on the property. In this scenario, if it is determined that the flooding would not be confined or conveyed by the surrounding streets, the average surrounding grade is typically used for comparison to the LLE or LAG elevation. The depth of flooding is added to the average grade to obtain a BFE for the area. If the LLE or LAG elevation is at or above the calculated flood elevation, the subject of determination may be removed from the SFHA.

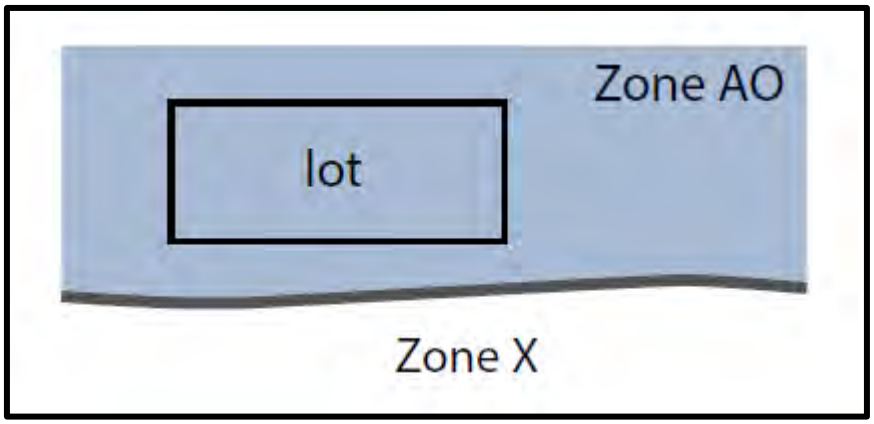



**Figure 17: Entire Property in Zone AO SFHA**

When the Zone AO flooding entirely inundates a property, it may be difficult to conclusively support the position that all flooding flows around and away from the property. Since unimproved land is not insured by NFIP flood insurance policies, it makes sense to consider requesting a determination for only the proposed or existing structure(s) on a property.

Ultimately, for a subject to be removed from a Zone AO SFHA, it must be clearly demonstrated that flood water flows around and away from the subject and the subject will not be inundated by the depth of the base flood.

If the subject of determination is in a Zone AO SFHA that meets the definition of an alluvial fan, the request must be processed as an MT-2 case (CLOMR or LOMR). Alluvial fan areas are characterized by high-velocity flows, active processes of erosion, sediment transport and deposition, and unpredictable flow paths. On the FIRM, these areas are usually shown as Zone AO with a depth and a velocity. If a subject of determination is in Zone AO with a velocity shown on the FIRM, an MT-1 application may not be processed for that location.

**Zone AO and Highest Adjacent Grade Considerations**

In some circumstances, the Highest Adjacent Grade (HAG) elevation will be used in the MT-1 review to determine if the low-floor elevation of a structure is adequately elevated above the depth of flooding specified for the Zone AO area. The HAG is defined as the highest natural elevation of the ground surface prior to construction that is adjacent to the foundation of a structure. The HAG may be available from the Elevation Certificate for the structure or could be determined from a certified grading plan including a pre-construction topographic survey for the property.

Per 44 CFR 60.3(c)(7), all new construction and substantial improvements of residential structures in Zone AO must elevate the lowest floor (including basement) above the HAG, at least as high as the depth specified in feet on the FIRM. Similarly, 44 CFR 60.3(c)(8) requires non-residential structures either to be elevated or to be completely floodproofed above the HAG, at least as high as the depth specified in feet on the FIRM.

An MT-1 determination will not be issued if this requirement is not met by new construction or after the substantial improvement of an existing structure.

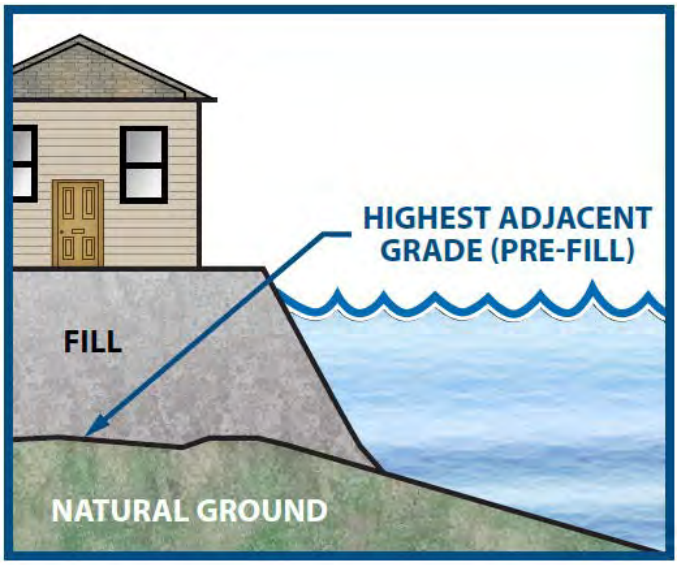



Figure 18: HAG for a Structure

## 4.8. Metes and Bounds Considerations (Portion of Property)

An MT-1 submittal with the intent of removing a portion of a legally recorded property from the SFHA is known as a metes and bounds request. The required data for a metes and bounds submittal must include:

- A metes and bounds description containing all bearings and distances for a single enclosed area. If the request includes multiple metes and bounds areas, a description for each enclosed area must be included.
- A metes and bounds map showing the area and containing all bearings and distances for the enclosed area.
- Certification of the metes and bounds description and the metes and bounds map. The certification must be completed by a licensed professional eligible to certify survey data.
- The applicable review fee. A multiple-lot fee will be assessed for a portion of property affecting more than one existing *or proposed* lot or parcel of land.

A good rule to follow when defining an area for removal from the SFHA is to provide an elevation buffer between the LLE for the metes and bounds area and the corresponding BFE. By providing a buffer, a FEMA review is less likely to result in a non-removal determination simply because of a slight difference in the calculation of the BFE. For example, if the BFE is determined to be 100.0 feet, a good rule is to define the metes and bounds area so the LLE of that area is no less than 100.5 feet or even at 101.0 feet, providing a 1-foot buffer. This can avoid portions of the defined area from being below the BFE, which could result in the need to revise the description and accompanying map.

Some requests may require multiple LLEs to be submitted for a metes and bounds area. This usually applies to a metes and bounds area that is large enough for the BFE to change across the property, or an area where the BFE of the flooding source changes rapidly due to the steep

gradient of the stream profile. For most MT-1 requests, the BFE is calculated to the tenth of a foot (100.0 feet, 100.1 feet, etc.) so the BFE may not need to change very much for the submitted low-property elevation to be below the upstream BFE. By submitting multiple LLEs along the flooding source, the corresponding BFE at that location can be used for comparison, to determine if the portion of property is eligible for removal from the SFHA using a range of BFEs.

As with all elevation information submitted for an MT-1 application, the elevation(s) submitted for the metes and bounds area must be calculated to a tenth of a foot and must be certified by a licensed professional eligible to certify elevation information.

To avoid an additional data request for a revision to the metes and bounds description and accompanying map, keep in mind the following requirements for the described area:

- It should be for the buildable portion of a property.
- It should not be submitted with the intent of removing only the SFHA area shown on the FIRM or with the intent of redefining the SFHA boundary shown on the FIRM.
- It cannot define an area for removal that will create a disconnected SFHA.
- It cannot cut through any portion of a proposed or existing structure. It must include or exclude the entire footprint of the structure, including any attachments.
- It must define an enclosed portion of property.
- It cannot include any portions of water or waterways used to convey water. Any ditch, stream channel, pond, lake, drainage easement, or other waterway must be excluded from the metes and bounds area being submitted for removal from the SFHA.
- It cannot define an area of exception (an area to remain within the SFHA).
- It must have a legally identified point of commencement.
- Required map and accompanying description not submitted or do not match.
- Required map and accompanying description not certified.
- Bearings and distances are not shown on the accompanying map.
- It should have a buffer in the vertical elevation between the LLE for the metes and bounds area and the corresponding BFE.
- Multiple LLEs may need to be surveyed for comparison to multiple BFEs. This is usually a requirement for large areas or a flooding source with rapidly changing BFEs.
- Metes and bounds description is not submitted in digital format.

The following paragraph shows an example of an appropriate metes and bounds description for a portion of a property to be removed from the SFHA, and Figure 19 shows an appropriate metes and bounds map.

BEGINNING at the northeast corner of Lot 1, as described on the previously referenced and recorded Deed; thence S16°42'22"E, 100.00 feet; thence S33°14'40"W, 145.92 feet; thence S89°13'29"W, 156.01 feet; thence N16°42'22"W, 223.14 feet; thence 210.49 feet along a curve to the left having a radius of 542.00 feet to the POINT OF BEGINNING.

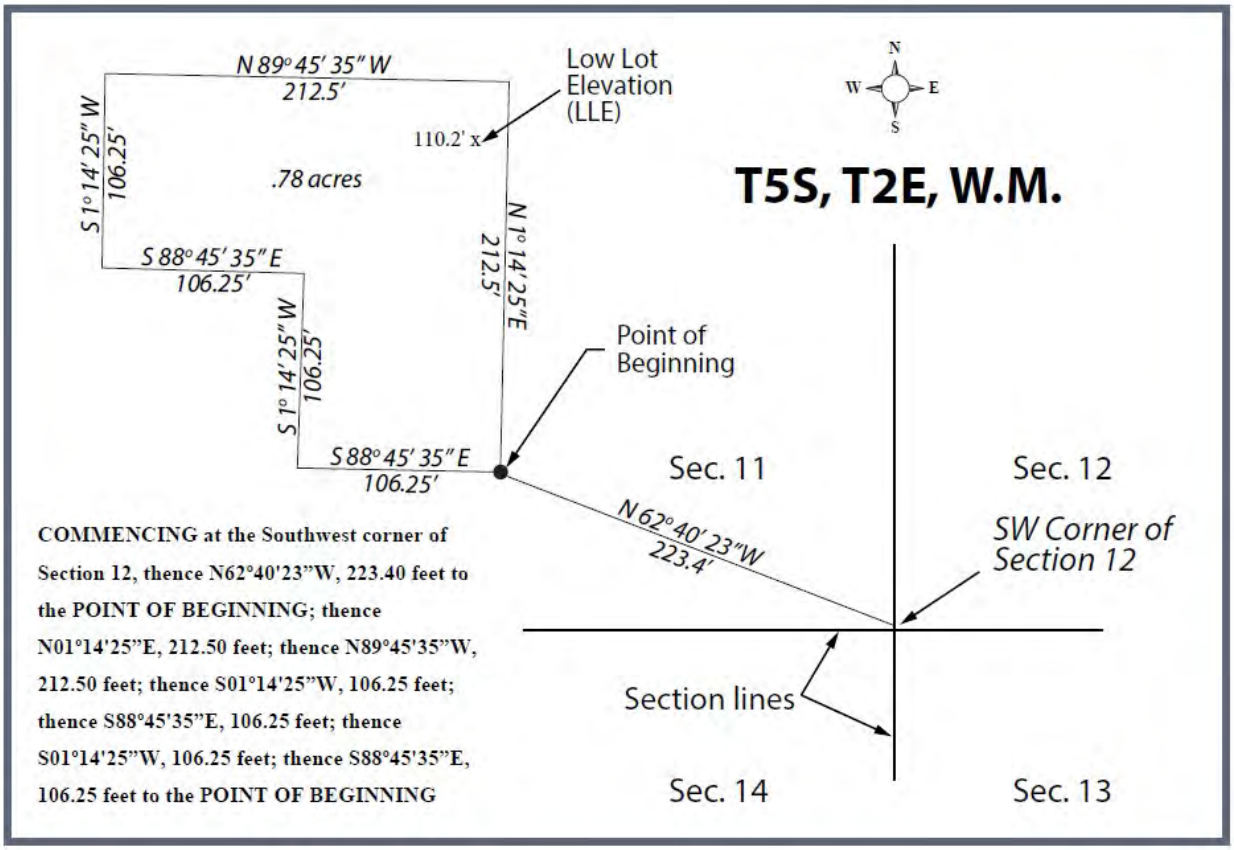



Figure 19: Example of a Metes and Bounds Description and Map

## 4.9. Amend-In Considerations

MT-1 removal determinations are based on detailed elevation information demonstrating that the subject of determination is at or above the BFE. Similarly, submitted elevation information may confirm that a subject adjacent to but outside the SFHA is actually below the corresponding BFE and would be inundated by the base flood.

Submitted elevation information for a subject clearly shown outside of the SFHA on the effective FIRM must support an Out as Shown determination. If the elevation information does not support an Out as Shown determination, an Amend-In and Deny (non-removal) determination may be issued.

Before issuing an Amend-In and Deny determination, the potential for naturally occurring intervening high ground is explored to ensure that no high ground prevents the conveyance of the base flood from the flooding source to the subject of determination. See Section 4.10 for more information on reviewing naturally occurring intervening high ground.

## 4.10. Intervening High Ground Considerations

Naturally occurring high ground can, in limited situations, provide protection from the base flood by preventing the conveyance of the base flood from the flooding source to the subject of determination. To determine that the intervening high ground provides protection from the base flood, several conditions must be met:

- The intervening high ground cannot be based on fill material or on any kind of manmade structure, such as a floodwall, berm, retaining wall, etc. It must be naturally occurring.
- Sufficient data must be submitted to show both the extent and elevation of the intervening high ground. This may require detailed topographic data and/or spot elevations extending beyond the subject property to clearly demonstrate the high ground is sufficient to prevent flood water from going around the high ground and inundating the subject.
- On the submitted form, the elevation for the subject must be the LLE or the LAG elevation—not the elevation of the intervening high ground. Certified comments must be added to the form explaining the presence of naturally occurring intervening high ground and referencing the data submitted in support of the intervening high ground.

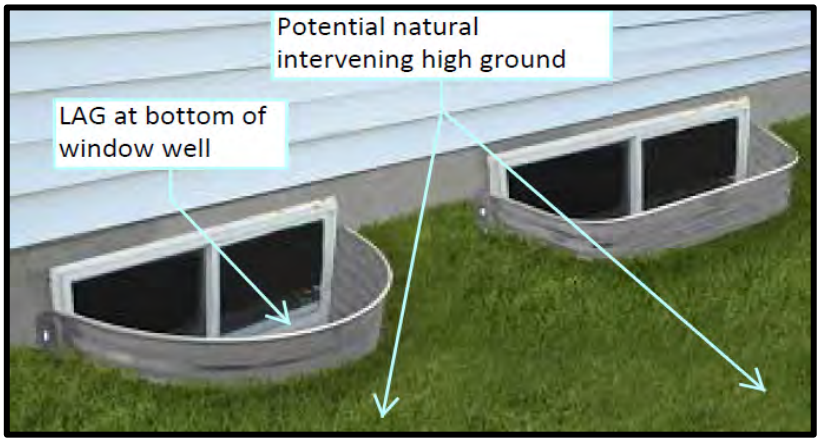



Figure 20: Use of Intervening High Ground – Window Well

For an MT-1 request, intervening high ground must be natural ground, not based on fill or structural measures, and sufficient spot elevations must be provided to demonstrate the natural intervening high ground prevents inundation of the building.


Figure 21: LAG – Exterior Basement Stairs

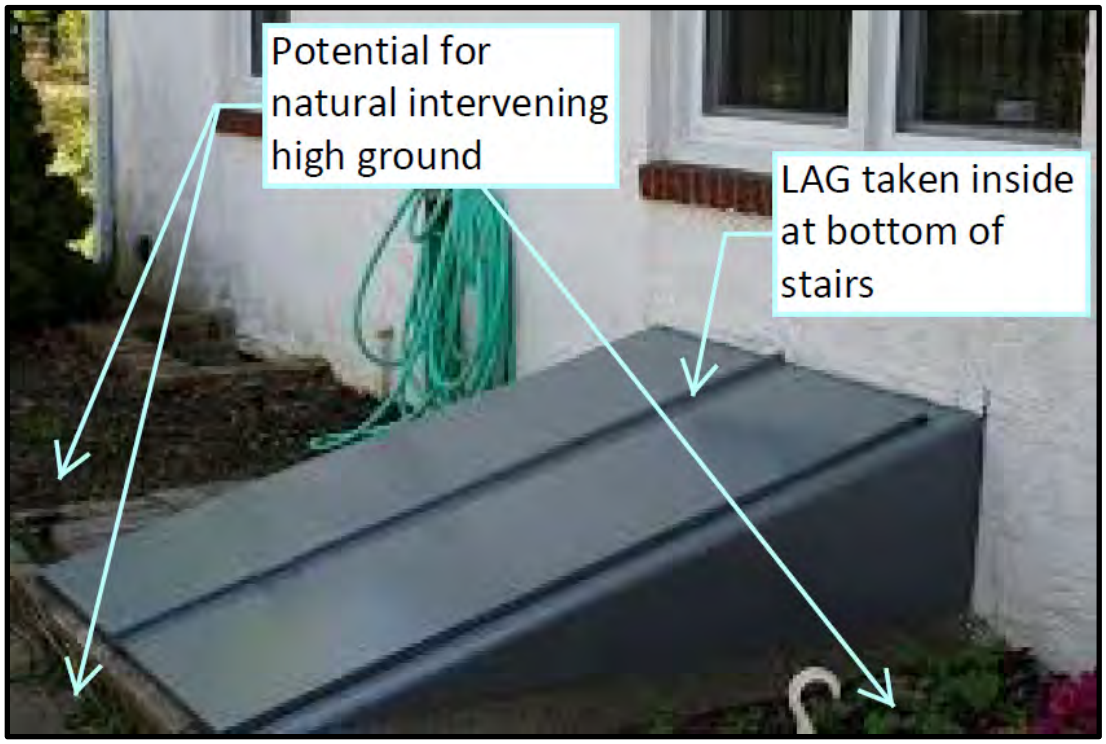



Figure 22: Use of Intervening High Ground – Covered Basement Stairs

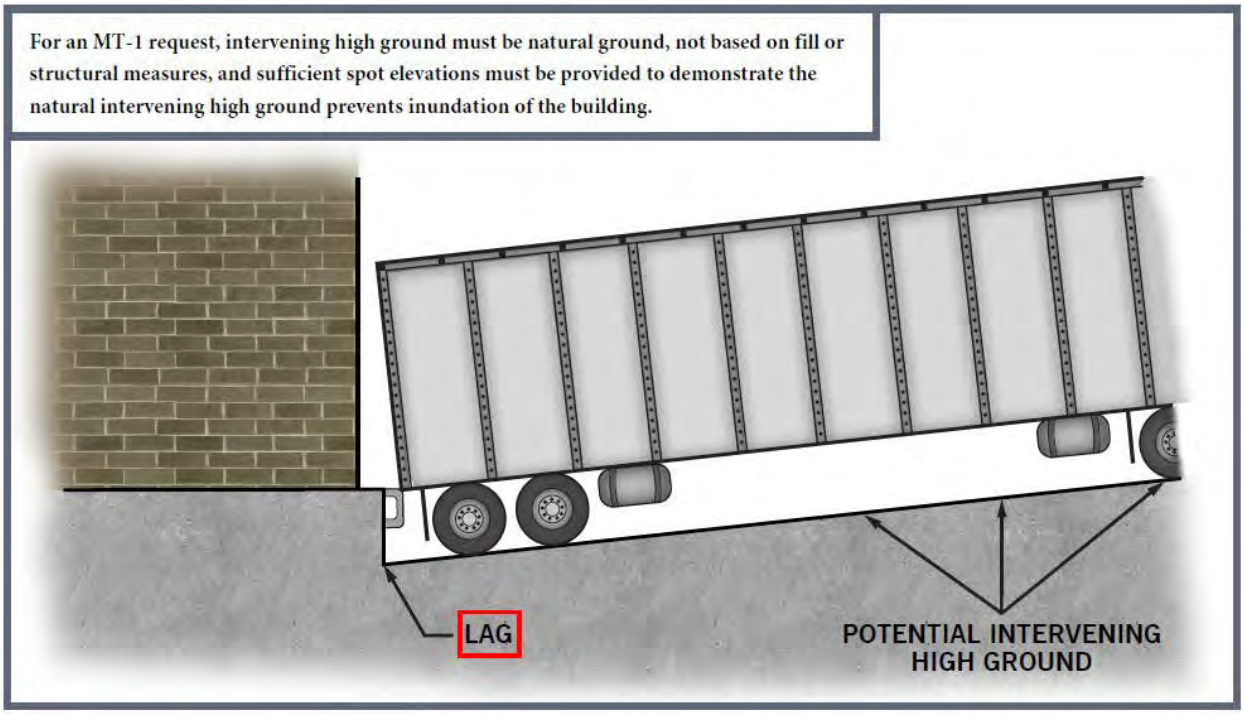



Figure 23: Use of Intervening High Ground – Loading Dock

Since the elevation submitted for a structure's LAG must sometimes be taken at the bottom of a window well, a below-grade stairwell, or a loading dock, the most common example for the use of intervening high ground is when the natural surrounding grade prevents flood water from inundating a structure by entering the top of a window well, below-grade stairwell, or loading dock.

## 4.11. Levee Related Considerations

### Seclusion

In areas with levee systems, when an updated levee analysis and mapping approach has not been completed, a new FIRM may show an area of seclusion. Seclusion mapping is one option when completing an updated levee analysis will cause a significant delay in the issuance of a new FIRM. Pending completion of the updated analysis and mapping, the area of seclusion can retain the flood hazard information from the current effective FIRM (if the seclusion FIRM has not yet been published) or retain the flood hazard information from the previous effective FIRM (if the seclusion FIRM has been published).

MT-1 determinations are issued within secluded areas. The determination is based on the flood hazard zones shown on the effective FIRM panels and the BFEs listed in the FIS report, even if updated flood hazard information is available as non-regulatory flood risk products. If the levee system is known to be accredited, special wording is inserted into the final document to underscore that within the area of seclusion the effective flood hazard information has been republished from the previous effective FIRM.

More information on seclusion mapping is available in the FEMA guidance document titled Levee, available on the web at: www.fema.gov/media-library/assets/documents/34953.

### Zone AR

An AR zone defines an SFHA that used to be designated as Zone B, C, or X due to an accredited flood control system. Zone AR defines the area that results from the decertification of a previously accredited flood protection system that is being restored to reduce the risk of the base flood. Unlike Zone A99, Zone AR has no required construction milestones; however, the flood protection system must:

- Have been previously accredited;
- No longer be eligible for accreditation;
- Currently reduce the risk from the flood having at least a 3-percent annual chance of occurring.

Mandatory flood insurance purchase requirements and floodplain management standards apply to properties in Zone AR SFHAs.

MT-1 determinations issued in Zone AR areas are based on a comparison of the LLE or LAG for the subject to the BFE for that area of Zone AR. If a property is in a dual flood zone (e.g.

AR/AE) the higher BFE will be used. That would be either the Zone AR BFE or the BFE for the previous or historic risk zone, such as Zone AE.

**Zone A99**

A Zone A99 SFHA is defined as any area currently subject to inundation by the base flood, which will ultimately have a reduced risk when an under-construction Federal flood protection system is completed. SFHAs are only designated Zone A99 after adequate progress on the construction of a protection system such as a dike, dam, or levee has been demonstrated, to consider it complete for insurance rating purposes. The criteria for adequate progress are defined in 44 CFR 61.12(b). Zone A99 can be used on a FIRM when the flood protection system has reached the specified statutory progress toward completion. No BFEs or depths are shown for Zone A99 SFHAs. Mandatory flood insurance purchase requirements and floodplain management standards apply.

For MT-1 purposes, a request for a subject in Zone A99 can be reviewed, but since no BFEs are shown on the FIRM, a BFE will be obtained by using the best available data for the area. The best available data is usually one of the following:

- A historic FIRM of the area, which will be used if the data are determined to be acceptable.
- Preliminary (draft) data, when the data development has been completed sufficiently and reviewed by both FEMA and the affected community, and a preliminary map has been issued. More information on the use of preliminary (draft) data as the best available data can be found in Bulletin 1-98, Use of Flood Insurance Study (FIS) Data as Available Data, on the FEMA website at www.fema.gov/media-library/assets/documents/7401.
- When available, information from a levee analysis can be used to determine if the subject is at or above the elevation of the natural valley analysis.

**Zone D**

Zone D is used for areas where no detailed analysis of flood hazards has been conducted, and where there are possible, but undetermined, flood hazards. Zone D is not considered an SFHA, and flood insurance is not federally required in Zone D. However, if a lender believes that property damage from flooding is possible, the lender has the prerogative of requiring flood insurance as a condition of the loan. Flood insurance is available under the NFIP for structures in Zone D.

Zone D is used primarily to map the following areas, which have a possible but uncertain risk of flooding:

- Areas associated with non-accredited levee systems with the possibility for failure.
- Areas where no detailed analysis of flood hazards has been completed.

The MT-1 process cannot be used to remove the Zone D designation from a subject. The normal response to an MT-1 request for a subject within Zone D is a letter confirming the subject is within Zone D. The letter also notes that the applicant may apply through the MT-2 process

to have the map physically revised and that all requests for map revisions must be submitted through the local community.

## 4.12. Below-Grade Parking Considerations

There are special requirements for structures with a below-grade parking garage that may allow an MT-1 LOMC to be processed.

- This process applies only to buildings in SFHAs for most flood zones beginning with A (A zones) and is not recommended for Zone AO or coastal Zone AE SFHAs.
- The building must be non-residential or meet the definition of a mixed-use building and meet all other requirements specified in FEMA Technical Bulletin 6-93, titled Below-Grade Parking Requirements.
- The building must be professionally designed, and all residential-use areas must be at or above the BFE.
- The below-grade parking area must only be used for parking, storage, and/or building access.
- The below-grade parking area (below the BFE) must be dry-floodproofed as specified in FEMA Technical Bulletin 3-93, titled Non-Residential Floodproofing-Requirements and Certification.

## 4.13. Special Considerations for Physical Changes to Increase the LAG or to Provide Flood Protection

Fill placement to elevate a buildable property or portion of property to or above the BFE is normally limited to the period prior to the construction of any improvements (buildings). Fill placed around an existing building with the intent of modifying the LAG is not recommended and may result in a potential violation of the NFIP regulations. Additionally, physical changes with the intent of providing flood protection are normally limited to the MT-2 (LOMR or CLOMR) review process.

Some additional details on physical changes:

- If a building is set back from a retaining wall used to support fill, an MT-1 review is usually possible; the LAG is usually taken at the foundation of the building (Figure 24). However, specific designs may be subject to an additional FEMA review and could determine a more appropriate location for the LAG.
- If the foundation of a building is dependent on a retaining wall for structural support of the building (on top of the wall) the LAG will usually be taken at the lowest point where the ground touches the retaining wall (Figure 25). This will normally result in a non-removal determination/comment.

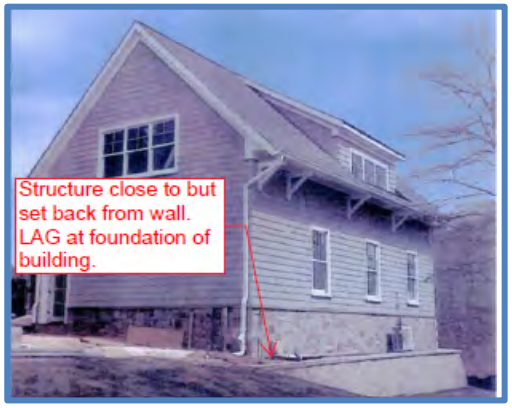



Figure 24: Set Back from Wall

- Retrofitting an existing structure to elevate the LAG might be possible with adequately placed fill material that is compacted and appropriately sloped. Most other modifications will not be acceptable to change the LAG, including a "sandwich" of fill supported entirely by a retaining wall or the placement of a curb along an existing foundation (Figure 26). Before a property owner starts any construction or modifications, including fill placement, the local official responsible for floodplain management (Floodplain Administrator or Manager) must be consulted to ensure the proposed project will meet all local and State floodplain management requirements, including any local standards that are more restrictive than the Federal minimum requirements. Additionally, the property owner should submit a conditional LOMR-F (CLOMR-F) request to FEMA for review prior to starting any modification. This may avoid costly modifications that ultimately will not be acceptable for elevating the LAG of an existing building.


Figure 25: On Top of Wall


Figure 26: Not an Acceptable Retrofit Option to Modify the LAG

## 5.0 Light Detection and Ranging (LiDAR) Letter of Map Amendment (LOMA)

LiDAR, an acronym for Light Detection and Ranging, is a remote sensing technology that is capable of efficiently creating accurate topographic data at a large scale. FEMA is going to begin accepting LOMA applications using elevations based on LiDAR data. Because this process involves a greater level of uncertainty, homeowners should be aware that the LiDAR data may not fully capture their flood risk.

For submittals using contours based on LiDAR data, FEMA will subtract one-half of the contour interval or 1 foot, whichever is greater, from the lowest contour closest to the structure or

property (but not going through it), to account for the nature of this data. For structures or properties that cannot be removed with this method, certified elevations will be required. For submittals using LiDAR point data, FEMA will subtract 2 feet from the lowest point immediately adjacent to the structure (to determine the LAG) or on the property (to determine the LLE). For structures or properties where FEMA has already been provided certified elevation data (typically in the form of an Elevation Certificate or site survey), the certified data will be used in lieu of LiDAR.

FEMA has standardized Quality Level 3 data, as defined by the USGS. Quality Level 3 was selected to help ensure that the LiDAR data is accurate without being so restrictive that most existing datasets could not be used. Where more precise data is available, it can also be used for these products. In addition, the LiDAR must be publicly available and be accessible free of charge via the Web. The owner of the data must be a Federal, State, local, or Tribal government entity.

## 5.1. Exclusions

LiDAR cannot be used for several categories of submissions:

- No requests involving fill.
- No requests involving structures that are still under construction (LiDAR would need to show that the whole property or a portion of the property was removable).
- No conditional requests.
- No requests involving subjects mapped in the regulatory floodway.
- No requests involving CHHAs (Zones V, VE, or V1-V30).
- No requests involving Zones AO, AR, or A99.
- No requests where the FIRM clearly shows the property/structure to be outside the SFHA.
- No requests involving the resolution of potential violations identified through the LOMC process.
- No requests involving physical changes to the flooding source/SFHA that require revision to the FIRM.
- No eLOMA requests.
- No requests to supersede LOMCs based on certified elevation data.

## 5.2. Exhibit Requirements for MT-1 Requesters

An applicant requesting that a LOMA determination be evaluated based on LiDAR data must submit a paper map or digital PDF exhibit that displays either: (1) an overlay of the LiDAR contours or (2) an overlay of the LiDAR points, both of which must use an aerial image of the structure/property in question.

The exhibit must contain the following data:

- Scale.
- North arrow.
- Address/Assessor's Parcel Number (APN) for structure/property in question.
- Clearly identified subject of determination. At least one street intersection visible on the exhibit, as applicable.
- Name, organization, and contact information for the map overlay creator.
- Aerial imagery that correctly represents the footprint of the structure.
- Date the LiDAR was collected.
- Source of the LiDAR data (Federal, State, community, etc.), to include the public website address.
- LiDAR accuracy information.
- Location of the data archive or metadata file (must be available for independent verification through a publicly available website or metadata).
- Vertical Datum

The following information is not required to be provided with the submitted paper map or digital PDF exhibit, but it would be helpful to the analyst reviewing the application:

- Latitude and longitude, in decimal degrees to 6 decimal places, at the center of the subject.
- Effective FIRM panel number and effective date.
- SFHA boundaries.
- Stream centerline.
- Date of aerial imagery.
- Date map overlay was made.

Please note that this exhibit can be created from multiple sources, including local and State government and Federal agencies, that have collected LiDAR and other needed data.

Where LiDAR contours are available, the exhibit must contain the following data:

- LiDAR contours illustrated in 1- or 2-foot contour intervals, with accuracy and vertical datum information.

Where LiDAR contours are not available, in lieu of the LiDAR contours noted above, the exhibit may depict the point cloud, with elevations labeled, that would be used to determine the LAG or LLE. The point density must be sufficient, and the labeled elevations need to be uniformly spaced throughout the subject property to adequately portray changes in elevations. All other exhibit requirements noted above are also required. Figure 27 is an example of this type of exhibit.

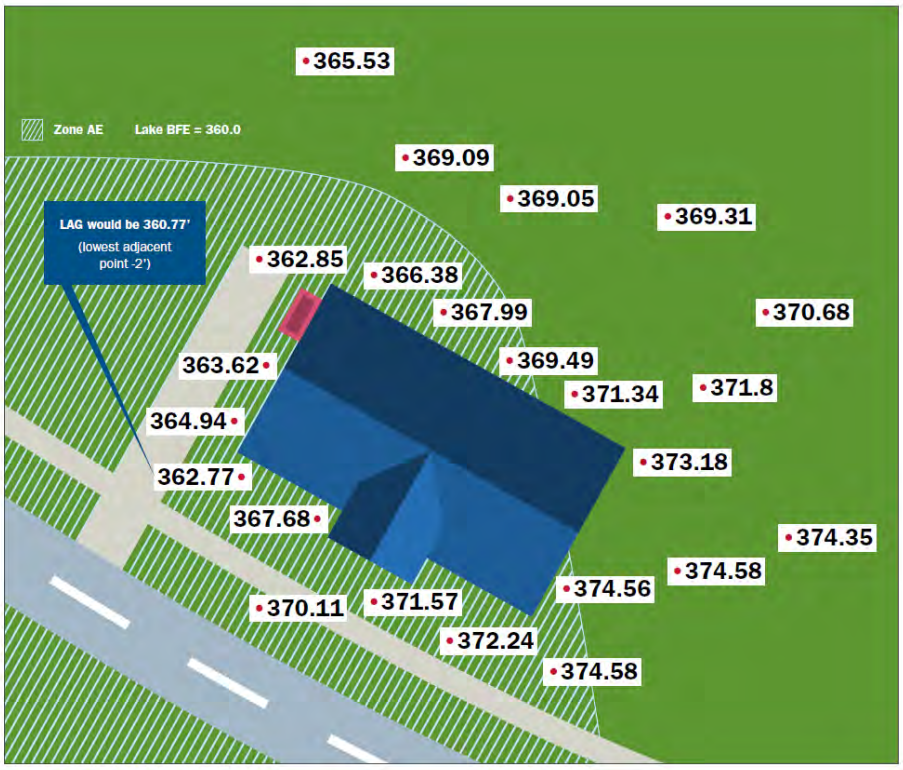



**Figure 27: Example of Point Cloud Depiction**

In addition to the exhibit, the requester must furnish all other necessary data, including the MT-1 forms, to complete the request. Exhibits can be provided for multiple lot requests, as long as the other required elements are provided for each property. Very large requests might be better handled through multiple LOMAs or the MT-2 process; when this is suspected, FEMA will decide how best to handle the change prior to issuing a determination.

If an elevation certificate is provided or has been previously provided for the subject property, the elevation certificate will be used in lieu of the LiDAR data. For determinations that have already been issued, elevation certificate data will also be required in lieu of the LiDAR data.

## 5.3. Processing Procedures

LIDAR-based submissions will be reviewed based on the following criteria:

- The LOMA analyst will review the submitted exhibit to determine the location of the structure/property in question and identify the elevation data to be assessed.
- Contour submittals: The analyst will identify the lowest contour immediately adjacent to the subject (but not going through it) and subtract one-half the contour interval or 1 foot, whichever is greater, from the lowest contour closest to the structure or property (see Figure 28) to determine the applicable LAG elevation or LLE. This elevation will be compared to the BFE.

- LiDAR point submittals: The analyst will identify the lowest point immediately adjacent to the structure or on the property and subtract 2 feet to determine the LAG or the LLE.
- If the comparison of the LAG or LLE to the BFE results in a removal and all other required data was submitted, a determination can be issued. The LAG/LLE, and possibly the BFE as well, will not be published with the determination. If additional data is required to process the request (i.e., submittal form, deed, plat), it will be requested to complete the determination.
- If the comparison of the LAG/LLE to the BFE results in a non-removal, certified elevations will be requested in addition to any other data needed for the request.

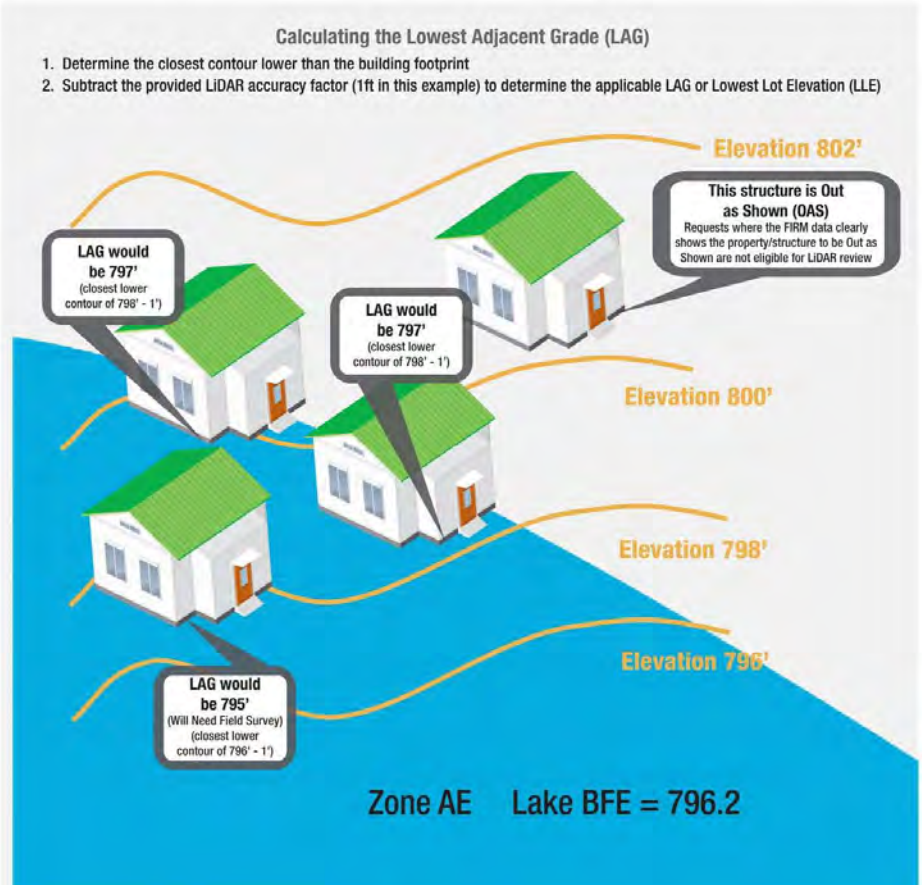



Figure 28: LAG Calculation Examples

## 5.4. BFE Development Procedures

For properties in flood zones without published BFEs, the applicant should provide any data that is available to determine the BFE. When data is not available, FEMA will determine the BFE based on the best available data. It should be noted that these BFE determinations are often conservative, and any information that is provided may assist in determining the BFE.

## 5.5. Disclaimer

All cases issued using LiDAR in lieu of certified elevations will include the following disclaimer:

> This determination is based on LiDAR topographic data showing the elevation of the subject property. The elevation data that were used are not certified by a Licensed Land Surveyor or Professional Engineer, but they meet or exceed FEMA requirements. This determination is subject to change if more detailed data becomes available.

## 5.6. Data Request Paragraphs

Use the paragraphs below when an applicant indicates the submittal is a LiDAR LOMA but did not submit a LiDAR exhibit.

> FEMA now accepts LiDAR (Light Detection and Ranging) data in lieu of certified elevations, where applicable. A LiDAR overlay meeting FEMA specifications must be prepared. Please refer to the Elevation Guidance for complete LiDAR overlay requirements. Contact your community to determine LiDAR availability and for assistance in preparing the LiDAR overlay.

If the case is not eligible for a LiDAR LOMA (i.e., it is one of the ineligible case types), use the standard paragraph for requesting certified elevations.

> The Elevation Information Form (Form 2) must be included for all requests except those in which the Flood Insurance Rate Map (FIRM) already shows the property and structure to be CLEARLY outside the SFHA. For cases in which the determination for the structure is uncertain, elevation data must be submitted to provide a definitive determination. This form must be completed by a licensed land surveyor or registered professional engineer. If an Elevation Certificate has been completed for a structure(s), it may be submitted in lieu of this form. The Elevation Certificate must be certified by a licensed land surveyor or registered professional engineer.

Use the paragraph below when submitted LiDAR data does not result in a removal because the elevation is below the BFE with or without the subtracted value.

> Upon review of the submitted LiDAR data, more detailed elevation information is needed to proceed with your request. Please submit an Elevation Information Form (Form 2), completed by a licensed land surveyor or registered professional engineer. If an Elevation Certificate has been completed for a structure, it may be submitted in lieu of this form. The Elevation Certificate must be certified by a licensed land surveyor or registered professional engineer.

## 5.7. Revalidations

LOMAs that are superseded by a map update will need to go through the revalidation process to determine whether they are still valid. If the LiDAR is still valid, the case can go through the normal revalidation process and possibly remain valid. Where new LiDAR has been used for the map update, the LOMA may be superseded or need to be redetermined.

# 6.0 Glossary

Most of the definitions listed in this section, as well as additional definitions applicable to the NFIP, can be found at 44 CFR 59.1.

**Alluvial Fan** is a sedimentary deposit located at a topographic break, such as the base of a mountain front, escarpment, or valley side, that is composed of streamflow and/or debris flow sediments and has the shape of a fan, either fully or partially extended. These characteristics can be categorized by composition, morphology, and location.

**Alluvial Fan Flooding** is flooding occurring on the surface of an alluvial fan or similar landform which originates at the apex and is characterized by high-velocity flows; active processes of erosion, sediment transport and deposition; and unpredictable flow paths. Alluvial fan flooding is depicted on a FIRM as Zone AO, with a flood depth **and** velocity.

**Amendment** is a change to an NFIP map that removes an area that was inadvertently included in the SFHA.

**Area of Shallow Flooding** is an area designated Zone AO, AH, AR/AO, AR/AH, or VO on a community's FIRM with a 1-percent or greater annual chance of flooding to an average depth of 1 to 3 feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

**Base Flood** is the flood having a 1-percent chance of being equaled or exceeded in any given year.

**Base Flood Elevation (BFE)** is the elevation of the flood having a 1-percent chance of being equaled or exceeded in any given year.

**Basement** means any area of the building having its floor subgrade (below ground level) on all sides.

**Coastal High Hazard Areas (CHHAs),** identified as Zone V or VE, are SFHAs that extend from offshore to the inland limit of a primary frontal dune along an open coast, and any other area subject to high-velocity wave action from storms or seismic sources. Typically, these are the areas where the computed wave heights for the base flood are 3 feet or more. CHHAs are subject to more stringent building requirements and different flood insurance rates than other zones shown on the FIRM, because they have a higher level of risk than other areas.

**Coastal AE Zone** is the portion of the SFHA landward of a V zone (i.e., coastal areas where wave heights are computed to be less than 3 feet), mapped as Zone A or AE on the FIRM. While the wave forces in coastal A zones are not as severe as those in V zones, the capacity for wave action to damage or destroy buildings is still present.

**Comment Document** is a conditional document issued by FEMA that makes a comment on proposed fill to be placed on a lot or portion of a lot, or on the construction of proposed structure(s). The document does not make a final flood zone determination and, to remove the

SFHA designation, it must be followed by a final determination document from FEMA once construction is complete (fill placed or structure finished). While a community may use the comment document for a proposed project as part of their permitting process, the NFIP or a lender may not use it to waive the Federal requirement for flood insurance.

**Date of Construction** is the date a structure was completed. For MT-1 application purposes, this is normally the date the final grading for a structure was completed. If an MT-1 application is for a structure, the date of construction must be provided on the application.

**Detailed Flood Zone or Flood Hazard Area** refers to a flood zone where BFEs have been established and are shown on the FIRM; the FIRM may be accompanied by an FIS report containing more detail.

**Development** means any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.

**Fill** is defined as material from any source (including the subject property) placed to raise the ground (natural grade) to or above the BFE. The common construction practice of removing unsuitable existing material (topsoil) and backfilling with select structural material is not considered the placement of fill if the practice does not alter the existing (natural grade) elevation, which is at or above the BFE. Fill that is placed before the date of the first NFIP map showing the area in an SFHA is considered natural grade.

A **Flood Hazard Boundary Map** is an official map of a community, issued by the Federal Insurance Administrator, where the boundaries of the flood, mudslide (i.e., mudflow), and related erosion areas having special hazards have been designated as Zones A, M, and/or E.

A **Flood Insurance Rate Map (FIRM)** is an official map of a county or community, on which SFHAs and other applicable risk zones are delineated.

A **Flood Insurance Study (FIS) report** is a compilation and presentation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a county or community. When a flood study is completed for the NFIP, the information and maps are assembled into an FIS report. The report contains detailed flood elevation data in flood profiles and data tables, which can be critical in determining an accurate BFE for MT-1 subjects.

**Floodplain Management** is the operation of an overall program of corrective and preventive measures for reducing flood damage, including emergency preparedness plans, flood control works, and floodplain management regulations.

**Floodplain Management Regulations** include zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a floodplain ordinance, grading ordinance and erosion control ordinance) and other applications. The term describes State or local regulations, in any combination, which provide standards for the purpose of flood damage prevention and reduction.

**Floodway** – see Regulatory Floodway.

**Flood Zone,** for the purposes of this document, refers to an identified SFHA as defined and mapped on a community's effective FIRM. Numerous flood zones can be labeled on a FIRM, including Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone D, Zone V, Zone VE, and Zones V1-V30. More information on these flood zones can be found at www.fema.gov/flood-zones.

**Highest Adjacent Grade (HAG)** means the highest natural elevation of the ground surface prior to construction and adjacent to the proposed walls of a structure.

**Letters of Map Change (LOMCs)** are documents issued by FEMA that revise or amend the flood hazard information shown on the FIRM without requiring the FIRM to be physically revised and republished. LOMCs include determinations/comments issued as part of the MT-1 or MT-2 processes.

**Light Detection and Ranging (LiDAR)** is a method for remotely collecting elevation information using an instrument that measures distance to a reflecting object by emitting timed pulses of laser light and measuring the time between emission and reception of reflected pulses. Additional information on LiDAR can be found at www.fema.gov/media-library/assets/videos/93310.

**Lowest Adjacent Grade (LAG)** is the elevation of the lowest ground touching a structure, including attached patios, stairs, window wells, loading docks, deck supports, or garages. The elevation must be provided to the nearest tenth (0.1) of a foot or meter (only meters if the FIS/FIRM is in meters).

- The LAG is only necessary when the subject is a proposed or existing structure.
- The LAG is the primary elevation used to determine whether a structure can be removed from the SFHA.
- The LAG includes any attached accessory, such as a garage attached to the main residence by a breezeway or two structures attached by a utility or pedestrian bridge. If structures are attached, the LAG needs to be the lowest ground touching the entire structure joined by any structural feature (bridge, breezeway, deck, etc.).
- The LAG includes any support for any portion of the structure and must include the ground elevation at the point where any piers, posts, or columns touch the ground. Any structure having a supporting member entirely or partially within a body of water will not be removed from the SFHA.
- The LAG must include the supports for any attached deck or stairs. When completing an Elevation Certificate, this elevation must be entered as Item C2.h).

**Lowest Lot Elevation (LLE)** is the lowest elevation of a legally recorded property or the lowest elevation of a portion of a legally recorded property as defined by a metes and bounds description. For an MT-1 application, the LLE must be accompanied by a map. The elevation must be provided to the nearest tenth (0.1) of a foot or meter (only in meters if the FIS/FIRM is in meters).

**Lowest Floor** means the lowest floor of the lowest enclosed area (including a basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area, is not considered a building's lowest floor, provided that the enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of 44 CFR 60.3.

The **Mapping Information Platform (MIP)** is a digital warehouse and production tool that provides the tools for digital flood map production. FEMA mapping partners can create, validate, store, track and update digital flood data using the MIP workflow process.

**Metes and Bounds Description** is a series of bearings and distances, referenced to a defined point and describing a closed area of property. A metes and bounds description and accompanying map must be submitted for MT-1 requests requiring a determination on a portion of a legally recorded property. The description must be accompanied by a metes and bounds map showing the area. Both the description and the map must be certified by a licensed professional eligible to certify survey data, such as a Professional Engineer or Licensed Land Surveyor.

**Metes and Bounds Map** – see Metes and Bounds Description

**The National Flood Insurance Program (NFIP)** was created by the U.S. Congress in 1968 with the goal of reducing future flood losses through the adoption of local floodplain management regulations and to provide protection for property owners against potential losses through an insurance mechanism that allows a premium to be paid for the protection of those who need it most.

**Regulatory Floodway** is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

**Special Flood Hazard Area (SFHA)** is the land in the floodplain that is subject to inundation by the flood having a 1 percent or greater chance of occurring in any given year. The area may be designated as Zone A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, or V. For purposes of this document, the term SFHA is synonymous with the phrase “area of special flood hazard.”

**Structure,** for floodplain management purposes, means a walled and roofed building, including a gas or liquid storage tank that is principally above ground, as well as a manufactured home.

**Structure,** for insurance purposes**,** means:

- A building with two or more outside rigid walls and a fully secured roof, that is affixed to a permanent site.
- A manufactured home (also known as a mobile home), which is a structure built on a permanent chassis, transported to its site in one or more sections, and affixed to a permanent foundation).

- A travel trailer without wheels, built on a chassis and affixed to a permanent foundation, that is regulated under the community's floodplain management and building ordinances or laws.
- (Structure does not mean a recreational vehicle or a park trailer or other similar vehicle, except as described in the previous bullet, or a gas or liquid storage tank).

**Subject of Determination (Subject),** for purposes of an MT-1 application, is the specific area/item for which a flood zone determination is being requested. The subject is specified by the requester and can be any of the following:

- An entire legally defined property (recorded deed or plat).
- A portion of a legally defined property, as defined by a metes and bounds description with accompanying map.
- An existing structure (construction date must be provided).
- A proposed structure (proposed date of construction must be provided).

**Pre-FIRM development** is defined as any development occurring prior to the effective date of the first FIRM for a community. This means the development occurred before the community received detailed flood hazard data and usually before the community enacted comprehensive regulations on floodplain management. Pre-FIRM development is not subject to MT-1 fees or "based on fill" requirements.

**Vertical Datum** refers to a common vertical elevation reference system. Two primary reference systems are currently used within the United States: National Geodetic Vertical Datum of 1929 (NGVD 29) and North American Vertical Datum of 1988 (NAVD 88). All elevation data submitted with an MT-1 application must be converted to the same vertical datum used for the effective FIS.

## 7.0 Existing Guidance and Resources

MT-1 Application Forms (June 2012) and Instructions (April 2017)

https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms#mt-1

MT-EZ Form (June 2012) and Instructions (April 2017)

https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-ez

Elevation Certificate and Instructions (February 2019)

www.fema.gov/media-library/assets/documents/160?id=1383

Code of Federal Regulations Title 44

https://www.ecfr.gov/cgi-bin/text-idx?SID=16b1d3053748084c6955acc3e6b24ceb&mc=true&tpl=/ecfrbrowse/Title44/44cfrv1_02.tpl#0

FEMA Policy Standards for Flood Risk Analysis and Mapping

https://www.fema.gov/media-library/assets/documents/35313

Technical Bulletins

www.fema.gov/media-library/collections/4

Higher Floodplain Management Standards – Fact Sheets https://

www.fema.gov/multimedia-library