



# ***Elmhurst Levee Certification***

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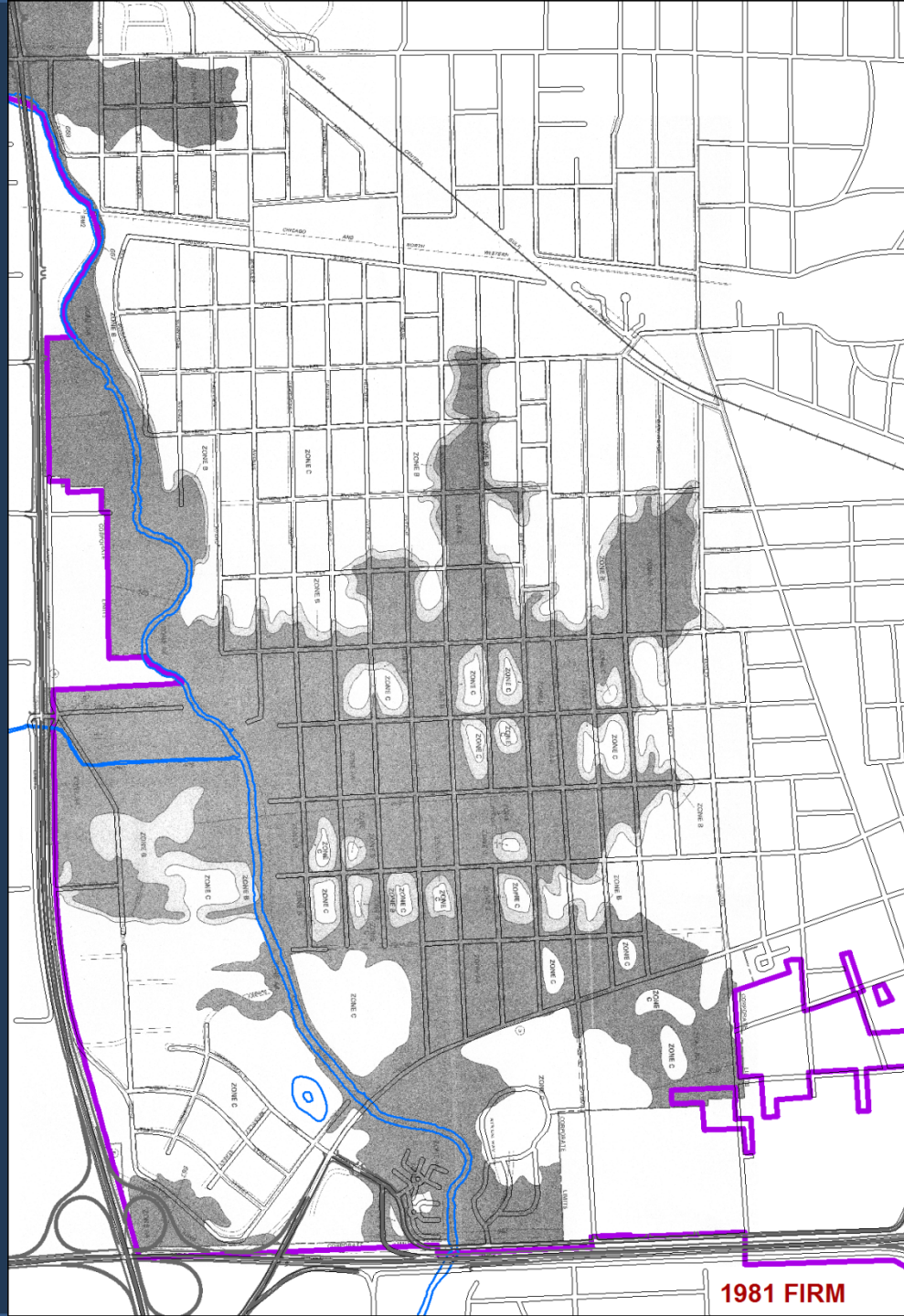






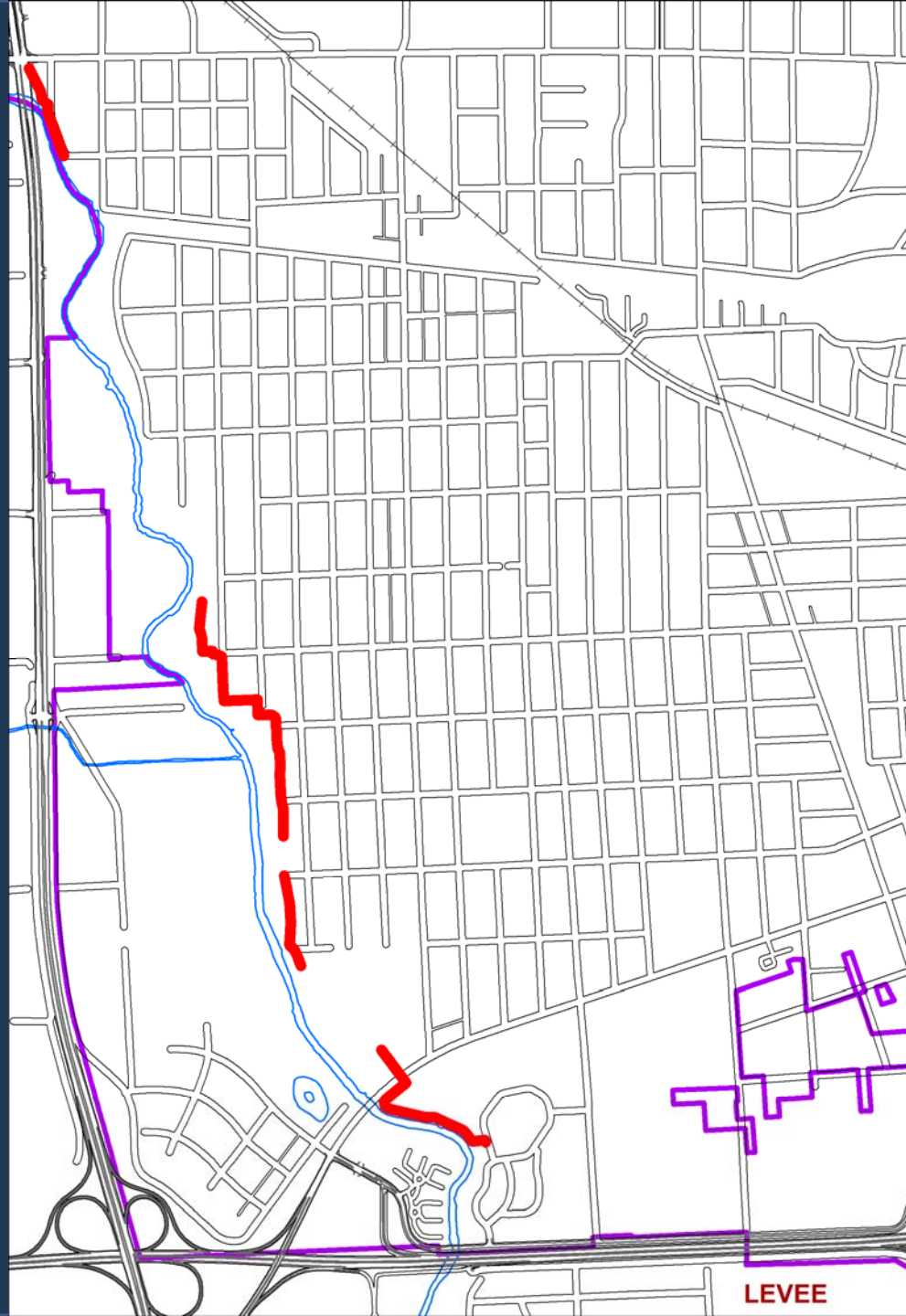






1981 FIRM

















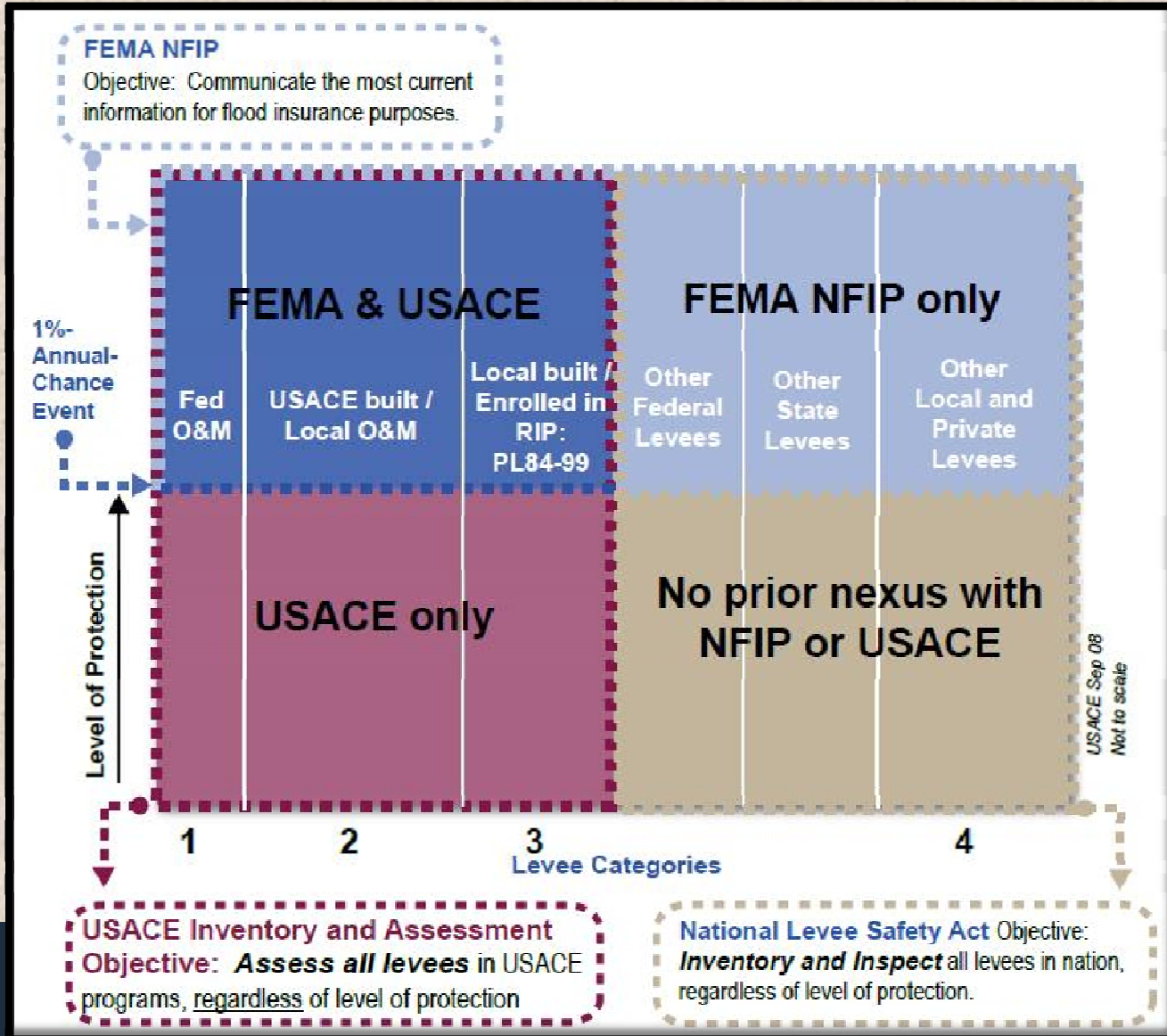


# Elmhurst Levee Certification

## Levee System Responsibility

# Universe of Levees

Source: "Draft: Recommendations for a National Levee Safety Program", January 15, 2009





# ***Elmhurst Levee Certification***

## ***Levee System Responsibility***

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- Not all levees designed/maintained to USACE Standards
  - Levees first built to protect agricultural areas
  - Other levee systems have been built to protect urban areas by various federal, state, local entities
- On the FEMA FIRM panels as providing protection
  - Levee met criteria of 44 CFR 65.10 / LOMR





# ***Elmhurst Levee Certification***

## ***Levee System Responsibility***

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- **USACE-built levees**
  - Regular inspections
- **Community-built levees**
  - Have not required documentation of inspections



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# *Elmhurst Levee Certification*

## *Levee System Responsibility*

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- **Levee Certification**
  - Documentation of levee conditions, based on NFIP's 44 CFR 65.10 with some USACE guidance.
  - Why important to show that levee still meets criteria?



# *Elmhurst Levee Certification*

## *Levee System Responsibility*

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- No levee system provides full protection from all flood events
  - Levee systems are designed to provide a specific level of protection, and larger events can cause them to be overtopped or fail



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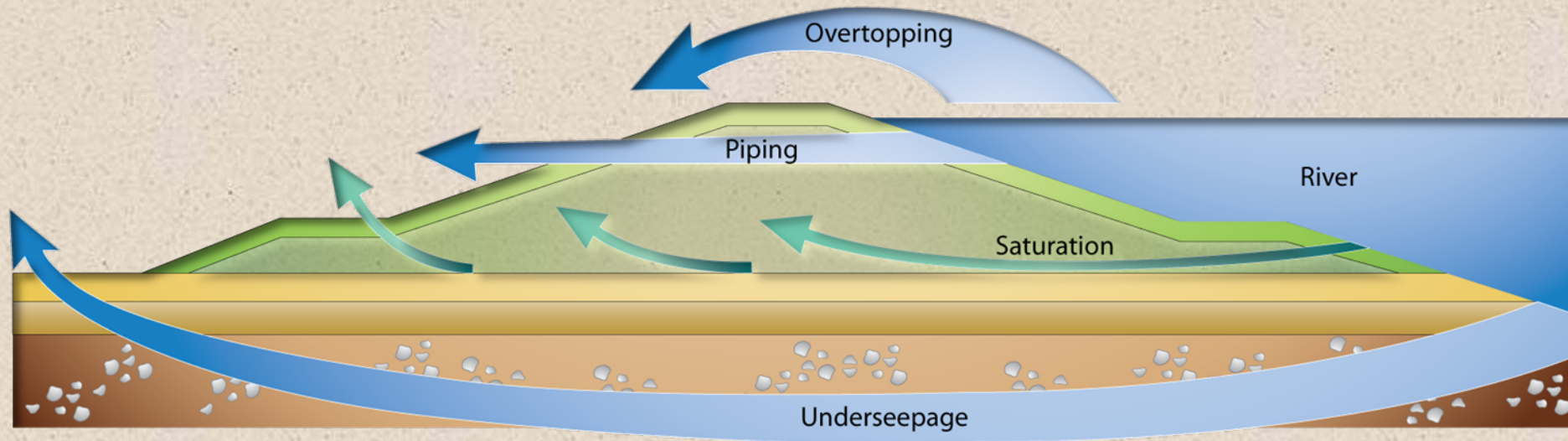


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## *Levee System Responsibility*



Potential Levee Failure Scenarios

Source: FEMA



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# *Elmhurst Levee Certification*

## *Levee System Responsibility*

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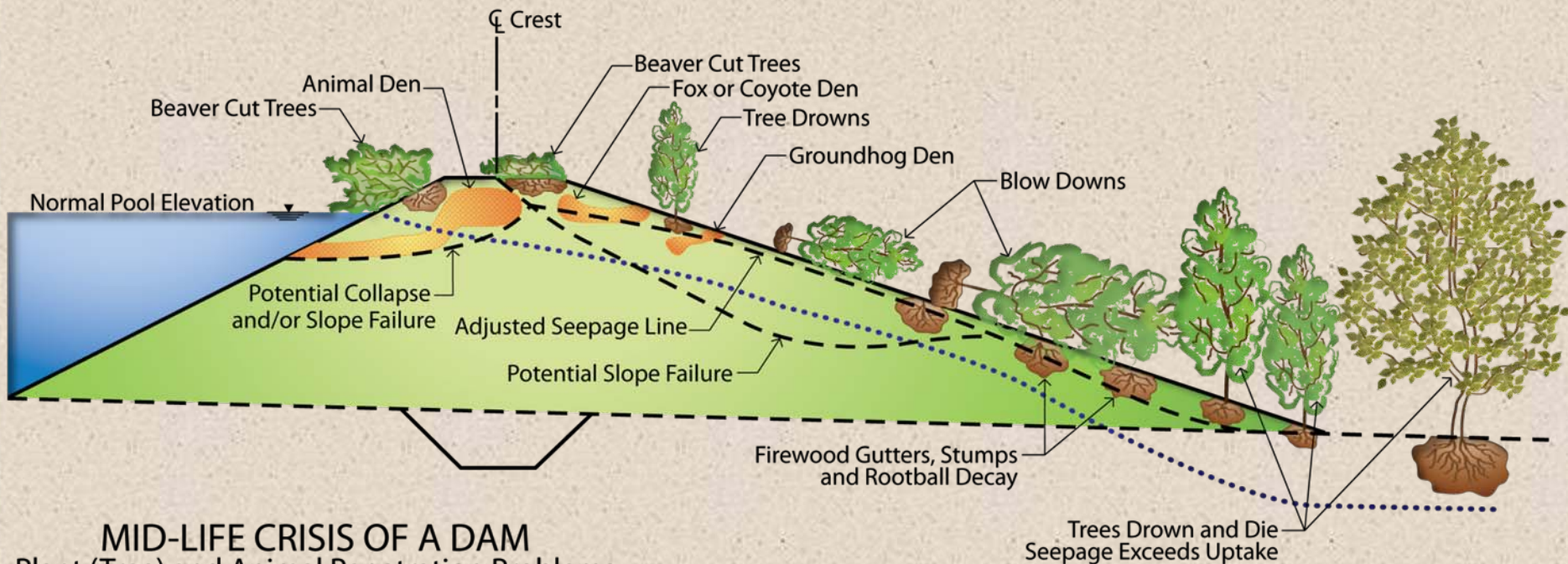
- Levee systems decay and deteriorate over time
  - Regular maintenance and periodic upgrades are needed
  - Maintenance can become a serious challenge as levee system gets older
  - When levee systems do fail, they often fail catastrophically





# Elmhurst Levee Certification

## Levee System Responsibility



### MID-LIFE CRISIS OF A DAM Plant (Tree) and Animal Penetration Problems

Source: "Technical Manual for Dam Owners, Impacts of Plants on Earthen Dams",  
FEMA Publication 534, September 2005



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# *Elmhurst Levee Certification*

## *Levee Certification Responsibilities*

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- How to get a levee certified?
  - FEMA does not examine or analyze structures for condition or performance assessment
  - Levee owners provide data and documentation to show levee system meets NFIP design, operations, and maintenance criteria





# *Elmhurst Levee Certification*

## *Levee Certification Responsibilities*

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- A levee system can be certified if evidence shows that the system meets regulatory standards to provide protection from the base flood
  - Typically a statement by a licensed professional engineer or federal agency responsible for levee system design
- FEMA will “accredit” levee systems that have been certified





# *Elmhurst Levee Certification*

## *Levee Certification Responsibilities*

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- If levee system cannot be certified, FEMA will not accredit the system, or will de-accredit a system that had previously been shown to meet NFIP criteria
  - These systems will not be depicted on DFIRMs as providing a 1-percent-annual-chance level of protection





# ***Elmhurst Levee Certification***

## ***Levee Certification Responsibilities***

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- **Uncertified/unaccredited levee systems**
  - FEMA will remap the levee-impacted areas landward of these systems as high-risk areas called Special Flood Hazard Areas (SFHAs)
  - Flood insurance is required in SFHAs for any mortgage that is federally backed, regulated, or insured





# ***Elmhurst Levee Certification***

## ***Levee Certification Essentials***

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- How does the Levee Certification Process Begin?
  - FEMA Procedure Memorandum No. 43 – Guidelines for Identifying Provisionally Accredited Levees (PALs)



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# *Elmhurst Levee Certification*

## *Levee Certification Essentials*

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- **PALs**
  - PAL designation for levee systems that are reasonably expected to continue to provide 1% annual chance flood protection
  - PAL designation allows the map release and review process to proceed while data and documentation are being gathered
  - For communities that are unable to provide full and prompt documentation of levee status





# *Elmhurst Levee Certification*

## *Levee Certification Essentials*

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- PALs (continued)
  - Levee owners will have up to 24 months to obtain and submit necessary data and documentation
  - A note clarifying the provisional nature of the PAL designation and the Zone X area will be provided on the DFIRM
  - Elmhurst Levee is currently a PAL





# ***Elmhurst Levee Certification***

## ***Levee Certification Essentials***

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- **FEMA Certification Criteria**
  - 44 CFR 65.10 (NFIP Regulations)



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# ***Elmhurst Levee Certification***

## ***Challenges***

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- Understanding what guidance is out there, and what should be followed
  - FEMA/NFIP
    - Delegated to technical consultant
  - USACE



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# ***Elmhurst Levee Certification***

## ***Challenges***

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- PAL 2-year timeframe may be difficult to meet, if significant maintenance and documentation deficiencies exist
  - The clock starts on the PAL when the letter is signed by the community
  - As-built plans
  - Maintenance documentation

# *Elmhurst Levee Certification*

## *Challenges*

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- Variable interpretations of FEMA requirements may cause confusion/delays
  - Tie into “high ground”
  - Freeboard “taper” requirement
  - Vegetation-Free Zone dimensions
    - USACE ETL 1110-2-571: No woody vegetation 15-ft either side from the toe of the slope & 8-ft vertical clearance.
    - Easements / Area appurtenant to levee
    - What’s growing roots?





# ***Elmhurst Levee Certification***

## ***Challenges***

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- Other Issues
  - Utility relocation
  - Vegetation characteristics (turf grass vs. native grasses)
  - Certification Validity Period



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# ***Elmhurst Levee Certification***

## ***Challenges***

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- **Public Outreach**
  - Animal relocation and filling of burrows
  - Vegetation removal may conflict with residents desire for screening



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# ***Elmhurst Levee Certification***

## ***Levee Certification Essentials***

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- **Design Criteria – 65.10(b)(1)**
  - **Freeboard**
    - 3 ft minimum unless variance and 2 ft minimum
    - At Structures +1 ft
    - At U/S end +0.5 ft



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# Elmhurst Levee Certification

## Levee Certification Essentials

- Design Criteria – 65.10(b)(2)
  - Closures



Ok



Maintenance Needed



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# ***Elmhurst Levee Certification***

## ***Levee Certification Essentials***

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- **Design Criteria – 65.10(b)(3)&(4)**
  - **Embankment Protection**
    - Demonstrate through engineering analysis that anticipated erosion will not result in failure of embankment or foundation
  - **Embankment and Foundation Stability (includes floodwalls)**
    - Evaluate expected seepage during base flood



# ***Elmhurst Levee Certification***

## ***Levee Certification Essentials***

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- **Design Criteria – 65.10(b)(5)&(6)**
  - **Settlement**
    - Assess potential and magnitude of future losses of freeboard due to settlement
  - **Interior Drainage**
    - Evacuating flood waters from behind the levee



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# ***Elmhurst Levee Certification***

## ***Levee Certification Essentials***

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- Operation Plans Criteria – 65.10(c) & Maintenance Plans Criteria – 65.10(d)
  - Formal, officially adopted flood warning system & plan
    - Closures
    - Interior Drainage Systems
    - Maintenance Responsibilities



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## ***Levee Certification Essentials***

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- Submittal to FEMA – 65.10(e)
  - Data submitted to support levee system compliance with structural requirements must be certified by a registered professional
  - Certified as-built plans must also be submitted



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- Questions?



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