Floodplain Management Review Course

Presented by Department of Water Resources
Course Goal

To review Floodplain Management topics to increase familiarity and proficiency in these subject areas.
Course Topics

<table>
<thead>
<tr>
<th>UNIT</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT I</td>
<td>Floodplain Management Concepts</td>
</tr>
<tr>
<td>UNIT II</td>
<td>Floodplain Mapping</td>
</tr>
<tr>
<td>UNIT III</td>
<td>NFIP Regulations &amp; Administrative Procedures</td>
</tr>
<tr>
<td>UNIT IV</td>
<td>Elevation Certificates</td>
</tr>
<tr>
<td>UNIT V</td>
<td>Flood Insurance</td>
</tr>
<tr>
<td>UNIT VI</td>
<td>Flood Hazard Mitigation</td>
</tr>
</tbody>
</table>
UNIT I

Floodplain Management Concepts

• Natural and Beneficial Functions
• National Flood Insurance Program
• Unified National Program
Natural & Beneficial Functions

• Flooding is a natural process.
• If the natural process is unbalanced by man-made changes, an area may receive more water than it can handle.
• Floods will flow into nearby low-lying areas or floodplains.
• Different types of floodplains are based upon the type of flooding that forms them.
Natural & Beneficial Functions

Natural resources of floodplains fall into three categories:

**Water Resources**
(flood and erosion control)

**Living Resources**
(biological resources and functions)

**Societal Resources**
(recreation, scientific knowledge, open space)
Multiple Objective Management

AKA: M-O-M

• Looks at the entire watershed affecting the flood problems
• Brings all parties’ interests to the table
• Capitalizes on the expertise of many parties
• Solve problems by linking to other community concerns – “broad thinking”
Wetland protection is sometimes separated from floodplain management...

- USACE responsible for wetland permitting: Section 404 of the Clean Water Act

- Many states have their own more restrictive wetland regulations

Photo by DWR
Flooding and Types of Floods

- Riverine
- Flash
- Coastal
- Shallow

Photo by DWR
Riverine Overbank Flooding

Flooding that occurs along a channel

Downstream channels overload with water
Flash Flooding

Flooding occurs after heavy rain in short time period

Steep slopes and narrow stream valleys most vulnerable

FEMA / Brian Hvinden
Coastal Flooding

Occurs along the coast of oceans and large lakes

Mostly caused by hurricanes and severe storms

FEMA / Dave Gatley
Shallow Flooding

Occurs in flat areas with inadequate or no defined channels

(3) Types:

• Sheet flow (Zone AO = no BFE)
• Ponding (Zone AH = w/ BFE)
• Urban drainage

Photo by DWR
Sheet Flow (Zone AO)

- Floodwater spread out in large area with uniform depth
- After intense/prolonged rainfall which rain cannot soak into ground
- Moves downhill and cover wide area

Picture from FEMA’s IS-9
Ponding (Zone AH)

- Runoff collects in depression & cannot drain, does not move or flow away
- Water will remain until it infiltrate soil, evaporate or pumped out

Picture from FEMA’s IS-9
National Flood Insurance Act of 1968

• Established the National Flood Insurance Program (NFIP)
• Created the unified national program for floodplain management
NFIP – Purpose

- Transfer costs of flood losses from taxpayers to property owners
- Provide financial aid after floods
- Guide development away from flood hazard areas
- Require new buildings be constructed in ways to minimize/prevent flood damages
NFIP – Legislative Cornerstones

1973 Flood Disaster Protection Act
   • Difficult for non-participating communities to receive federal assistance

1979 Federal Insurance Administration and NFIP transferred to FEMA
   • Funded primarily through premium income

1994 National Flood Insurance Reform Act
   • Fine tuned various aspects of the program

2004 National Flood Insurance Reform Act

2012 Biggert-Waters Flood Insurance Reform Act
   • Premium rate increases

2014 Home Flood Insurance Affordability Act
   • Surcharges required
Biggert-Waters Flood Insurance Reform Act of 2012

Key provisions of the legislation will require the NFIP:

• Raise rates to reflect true flood risk
• Make the program more financially stable
• Change how Flood Insurance Rate Map updates impact policyholders.
Biggert-Waters Flood Insurance Reform Act of 2012

Phasing in of actuarial rates for subsidized properties with a 25% rate increase for:

- Non-primary/secondary residence (beginning January 1, 2013)
- Pre-FIRM structures (beginning January 1, 2013)
- Severe Repetitive Loss properties (beginning October 1, 2013)
- Properties with past flood damage exceeds fair market value (beginning October 1, 2013)
- Commercial properties (beginning October 1, 2013)
Homeowner Flood Insurance Affordability Act 2014

• Repealed and Modified certain provisions of the Biggert-Waters Flood Insurance Reform Act of 2012.

• New surcharges are added to all policies.
  • Primary Residence Policies - $25
  • All other Policies - $250
The NFIP – How it Works

Mapping
(Construction, Insurance Policies, Loan/Financial Assistance)

Insurance
(Post-FIRM, Pre-FIRM, All Floods)

Regulations
(NFIP Criteria, Lower/Higher Rates)
The NFIP – How it Works

Mutual Agreement

• Participation for the NFIP is voluntary and based on agreement between local communities and federal government

• NFIP Federally backed flood insurance is available for communities that agree to regulate development
NFIP - Roles
UNIT I – Summary Review

Floodplain Management Concepts

• Natural and Beneficial Functions
• National Flood Insurance Program
• Unified National Program
UNIT II

Floodplain Mapping

• Base Flood
• Flood Studies
• Map Formats and Zones
• Map Changes
Base Flood

- Flood that has a 1% chance of occurrence in any given year. (AKA 100-year flood)
- National standard used by NFIP as the basis for mapping, insurance rating, and regulating new construction
Flood Insurance Study (FIS)

- Used with maps to delineate the SFHA, flood risk zones, and establish BFE
- Serve as basis for rating flood insurance, regulating floodplain development, and carrying out FPM measures
- Supports risk assessments with depth, velocity, duration data, and flood history information
Flood Insurance Study (FIS)

- Estimates flow frequencies
- Establishes flood profiles, floodways, flood zones, and floodplain boundaries for 10, 50, 100 & 500-year floods
- Establishes flood zones
Cross Section

Detailed flood studies analyze the areas through which floodwater will flow

- Cross Sections – Graphical depiction of the stream and the floodplain at a particular point along the stream
- Hydrologic and Hydraulic Study – Determines flood elevations, velocities, and floodplain widths used to make the flood maps
Flood Profiles
<table>
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<th>CROSS SECTION</th>
<th>DISTANCE (FEET)</th>
<th>WIDTH (FEET)</th>
<th>SECTION AREA (SQUARE FEET)</th>
<th>MEAN VELOCITY (FEET PER SECOND)</th>
<th>REGULATORY</th>
<th>WITHOUT FLOODWAY</th>
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1Feet above county boundary
Floodway

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.
Floodway Schematic

**Surcharge** not to exceed 1.0 foot (FEMA requirement)
Mapping – Basic Elements
Mapping – Basic Elements

- BFE Line
- Floodplain Boundary
- Coastal Barrier Symbol
- Flood Hazard Area Designation
- Zone Division Line
- BFE Label
- Cross Section Symbol
- Zone Label
- Floodway
Mapping – Basic Elements

LiMWa

- Wave height ≥ 3 feet
- Wave height 3.0–1.5 feet
- Wave height < 1.5 feet

BFE
- Flood level including wave effects
- 100-year stillwater elevation

Sea level
- Shoreline
- Sand beach
- Buildings
- Overland wind fetch

Properly elevated building
- Unelevated building constructed before community entered the NFIP

Vegetated region
- Limit of SFHA

Limit of base flooding and waves
Mapping – Basic Elements
LiMWA Example
Mapping – Basic Elements
Mapping – Basic Elements

**LEGEND**

**SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD**

- **ZONE A**: No base flood elevations determined.
- **ZONE AE**: Base flood elevations determined.
- **ZONE AH**: Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO**: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AP9**: To be protected from 100-year flood by federal flood protection system under construction; no base flood elevations determined.
- **ZONE V**: Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE**: Coastal flood with velocity hazard (wave action); base flood elevations determined.

**FLOODWAY AREAS IN ZONE AE**

**OTHER FLOOD AREAS**

- **ZONE X**: Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

**OTHER AREAS**

- **ZONE X**: Areas determined to be outside 500-year floodplain.
- **ZONE D**: Areas in which flood hazards are undetermined, but possible.

**UNDEVELOPED COASTAL BARRIERS**

- Identified 1983
- Identified 1990 or Later
- Otherwise Protected Areas: Identified 1991 or Later

**Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.**

**Base Flood Elevation Line; Elevation in Feet**

**Cross Section Line**

**River Mile**

**Elevation Reference Mark**

**0.615**

**Reference** to the National Geodetic Vertical Datum of 1929

**MAP REPOSITORY**

Refer to Repository Listing on Map Index

**EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP**

**AUGUST 19, 1988**

**EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL**

Refer to the FLOOD INSURANCE RATE MAP effective date shown on this map to determine whether actual rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 338-9320.
Mapping Formats

Flood Hazard Maps

• Definition – SFHAs, BFE, Floodways
• Old Format
• New Format

Digital FIRM – GIS layers
Flood Hazard Boundary Map

FHBMs do not have BFEs
Old Format

Flood Insurance Rate Map (FIRM)

Old FIRMs don’t have Floodways
Old Format Flood Boundary and Floodway Map (FBFM)

Old format FBFM have Floodways but no BFEs
New Format
Flood Insurance Rate Map (FIRM)

New FIRM cannot have Floodways and BFEs
Countywide

Flood Insurance Rate Map (FIRM)
Digital Flood Insurance Rate Map (DFIRM) Ortho Example

FIRM FLOOD INSURANCE RATE MAP
FLOOD COUNTY, USA AND INCORPORATED AREAS
PANEL 38 OF 40

NOTE:
- This map incorporates approximate boundaries of coastal barrier resources system units and other otherwise protected areas established under the Coastal Barrier Resources Act of 1980 (PL 96-334).
- The Map Number shown below should be used when pricing map ordnance. The Community Number shown above should be used on insurance applications for the affected community.

MAP NUMBER
9900900038 D
EFFECTIVE DATE
AUGUST 19, 1998

Federal Emergency Management Agency
Digital Flood Insurance Rate Map (DFIRM) Current Maps
Flood Zone Designations

Unnumbered Zone A  
Zones AE (A1 - A30)  
Zones AO (Sheet Flow)  
Zones AH (Ponding)  
Zone A99  
Zone AR

Zone V  
Zone VE (V1-V30)  
*Zone D  
*Shaded Zone X (B)  
*Unshaded Zone X (C)

* No mandatory purchase requirement
Only FEMA can change NFIP flood maps!!!

Request must be based upon existing real world conditions at the time of the request.
Methods of Map Change

• Restudy the map and publish new maps
• Issue a letter describing the map change
  • LOMA (natural condition)
  • LOMR (man-made condition)
  • LOMR-F (LOMR based on fill)
  • CLOMA (Conditional LOMA)
  • CLOMR (Conditional LOMR)
Types of Map Change

• Amendment – maps changed to reflect errors due to the problem of accurately locating the floodplain boundary on a topographic map

• Revision – maps changed to reflect physical changes to flood conditions
What Does a LOMA Do?

• Officially amends the FIRM
• Removes the mandatory* flood insurance purchase requirement
• May remove a property from the local regulatory requirements
• No review fee
• eLOMA – Web based application to facilitate the process

* Even with a LOMA, lender may still require purchase of flood insurance
What Does a LOMR-F Do?

• Officially amends the FIRM
• Removes the mandatory* flood insurance purchase requirement
• Existing and proposed developments MUST comply with local FPM regulations
• Review fee varies

* Even with a LOMR-F, lender may still require purchase of flood insurance
Conditional Letters of Map Change

• Do not officially change the FIRM
• FEMA will review and determine whether a map change would be approved if built as proposed
• CLOMRs involve fees
• Within 6 months of project completion, LOMR request must be submitted to FEMA
Maintaining NFIP Maps

• The community is the primary repository for NFIP maps
• Old and revised maps have historical significance and should be kept
• To obtain maps:

Contact the FEMA Map Service Center
http://msc.fema.gov or 1-877-336-2627
Current FEMA Mapping Tool Format

- FIRMette
- Google Earth – Stay Dry
- National Flood Hazard Layer
UNIT II – Summary Review

Floodplain Mapping

• Base Flood
• Flood Studies
• Map Formats and Zones
• Map Changes
Mapping Exercise
UNIT III

NFIP Regulations and Administrative Procedures

- NFIP Regulations
- 44CFR 60.3 Requirements
- Ordinance Administration
- Substantial Damage / Improvement
Community Participation

- Community must adopt and enforce FPM regulations that meet or exceed the minimum NFIP standards and requirements (in accordance with 44 CFR 60.3)

- Over 21,000 communities in the U.S. and approximately 98% of California communities participate in the NFIP
Non-Participating Communities

- NFIP flood insurance will **not** be available
- No federal grants/loans for development (in SFHA)
- Limited disaster assistance
- Loans are available from federally insured/regulated lending institutions but must:
  - Notify the applicants of the flood hazard
  - No NFIP insurance or disaster relief is available
NFIP Regulations (44CFR 60.3)

60.3 a
No map/data

60.3 b
FHBM
(A zones)

60.3 c
BFEs
(AE zones)

60.3 d
BFEs and floodway
(AE zones)

60.3 e
Coastal with BFEs & floodway
(V & VE zones)
44CFR 60.3 Requirements

• A permit is required for all development in the SFHA shown on the FIRM

• Development is any man-made change to real estate including:
  - Structures
  - Dredging
  - Grading
  - Excavating
  - Storage (equipment & materials)
  - Mining
  - Filling
  - Paving
  - Drilling
Paragraph 44CFR 60.3(a)

No Map

• Ensure all necessary permits are obtained
• **All** development reviewed by community official to be “reasonably safe” from flooding
Additional Considerations 60.3(a)(2)

• Environmental Protection Measures
• Federal Regulations:
  – National Environmental Policy Act
  – EO 11988
  – Clean Water Act (Section 404)
  – Endangered Species Act
  – Sewage Disposal System regulations
  – Hazard Materials Facilities site restrictions
  – EO 13690
Paragraph 44CFR 60.3(b)

Approximate Zone A only

- Permits required in Zone A
- Obtain, review, and reasonably utilize BFE and floodway data
- BFE data required for developments
  > 50 lots or 5 acres, whichever is less
- If BFEs or floodways are available follow the appropriate regulations
Paragraph 44CFR 60.3(c)

BFEs but no Floodways or V Zones

- Lowest floor at or above BFE
- Keep records of low floor elevations
- Manufactured home rules
- Areas beneath the lowest floor
- Openings, vents

- AO Zone Rules
- Recreational Vehicles
- Drainage paths in AO and AH
- CLOMR for BFEs of more than 1 foot
Paragraph 44CFR 60.3(c)

Opening (venting) requirements:
• Certificate from a professional engineer/architect

OR

• Minimum of 2, base no higher than 1’ above grade, and a net area of not <1 square inch for every square foot of enclosed area, and covering must allow auto-entry / exit of flood waters

Recreational Vehicles:
• Onsite fewer than 180 consecutive days and
• Fully licensed and ready for highway use

or

• Meet the permit requirements of 60.3(b)(1) and (c)(6)
Paragraph 44CFR 60.3(d)

BFEs and Floodways but no V Zones

• Select and adopt a regulatory floodway
• Prohibit encroachments
Paragraph 44CFR 60.3(e)
Zones Communities with V Zones

- Bottom of the lowest horizontal structural member at or above BFE
- No fill for structural support
- No obstructions below the BFE
- V Zone Engineer Certification
- Mobile homes & Recreational Vehicles
- New construction landward of high tide
- Mangroves and dunes

<table>
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<th>60.3 a</th>
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<tr>
<td>60.3 b</td>
<td>FHBM (A zones)</td>
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<tr>
<td>60.3 c</td>
<td>BFEs (AE zones)</td>
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<td>60.3 d</td>
<td>BFEs and floodway (AE zones)</td>
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<tr>
<td>60.3 e</td>
<td>Coastal with BFEs &amp; floodway (V &amp; VE zones)</td>
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</table>
Paragraph 44CFR 60.3

*C2.a and C2.c are the blanks on the Elevation Certificate for the Lowest Floor Elevation*
Tell me something about . . .

- RVs
- Lowest floor in V Zones vs. A Zones
- AO with no depth shown
- Development in Approximate A Zones
- Pre-FIRM Manufactured Home Parks
- Riverine with no floodway
- Enclosure openings
Ordinance Administration

Ordinance must be:

- Legally enforceable
- Applied uniformly throughout the community
- Take precedence over less restrictive requirements
Duties of the Administration

- Understanding the regulations
- Ensure permits are obtained
- Coordination with other offices, departments, & programs
- Inspections
- Correct violations & enforcement actions
- Updating the ordinance & record keeping
Ensure Permits Are Obtained

*Inspections* – most effective way to ensure compliance

*Enforcement* – Ensure all development in the floodplain has a permit and is built according to the approved plans in compliance with regulations
Ensure Permits Are Obtained

• Needed for all changes to floodplains
• Ensure permit system has wide range of coverage
• Ensure that all federal and state permits are obtained
• If compliant with regulations, issue a permit
• If not compliant, deny the permit
Certification Required

Floodproofing Certificate supports the NFIP requirements that nonresidential buildings may be designed to be watertight or substantially impermeable to floodwaters.

• For insurance - floodproofed elevation must be at least one foot above the BFE.
• Must obtain and maintain a registered professional engineer’s certification that the building is properly floodproofed.
Certification Required

• **No-Rise Certification** documents that a project in the floodway or floodplain where the floodway has not been mapped-will not cause an increase in flood heights. Must be supported by engineering analysis and technical data.

• **V-Zones** require that buildings in coastal high hazard areas are engineered to resist wind and water impacts simultaneously.
Correct Violations & Enforce Actions

• **Voluntary Compliance** – educate property owner on how complying with the ordinance is to their best interest

• **Administrative Steps** – Notice of violation, stop work order, no Certificate of Occupancy
Correct Violations & Enforce Actions

- Violations and Penalties – Fines, Recordation, Injunction, Court
- Section 1316 – FEMA denial of flood insurance to a property that is in violation of State or local floodplain management regulations
Record Keeping

There is no statute of limitations!!!

- **Permit File** (NFIP Requirement)
- **Elevation Certificates** official record for new and substantially improved buildings
  - LOMR (man-made condition)
  - Documents compliance with regulations and supports insurance rating
  - CRS communities must use FEMA Elevation Certificate (Form 86-0-33)
  - Current effective Elevation Certificate
What is a Variance?

• A grant of relief from the regulations
• Can result in increased risk and expensive insurance premiums
• Local decision based upon NFIP, state and local requirements
• Follow general principals of zoning related to property- not personal issues
• Compliance with regulations would be “exceptional hardship”
Guidelines for Granting Variances

- Unique to the property
- Pertains to land, not owners or structure
- Good and Sufficient Cause
- Hardship
- Does not create threats to public safety
- Must not defraud or victimize the public
- Allows only minimum deviation necessary
- Flood Insurance Rates cannot be waived
Variance Denial Positive Benefits

Variance Granted
Did not elevate
$12,850/year

Variance Denied
Elevated to BFE
$1,414/year
Wet Floodproofing

• Variance must be obtained
• Use limited to parking or storage
• Required openings for entry and exit of water
• Flood resistant materials below BFE
• Utilities dry floodproofed or elevated and building must be anchored to resist flotation, collapse, and lateral movement
Substantial Improvement & Substantial Damage

Photo by DWR
“Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the “start of construction” of the improvement. This term includes structures which have incurred “substantial damage”, regardless of the actual repair work performed.
Substantial Improvement: 44CFR

“Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50% of the market value of the structure before the damage occurred.”
Costs Included

- Structural items and major building components
- Interior finish elements
- Utility and service equipment
- Market value of all labor and materials

For more detailed information please see FEMA P-758 at http://www.fema.gov/library/viewRecord.do?id=4160
Costs Excluded

- Existing and pre-identified
- Design and permit costs
- Clean-up
- Contents
- Outside improvements

For more detailed information please see FEMA P-758
http://www.fema.gov/library/viewRecord.do?id=4160
Special Situations

- **Exempt costs** should not be included in determining improvement / repair costs
- **Historic structures** are exempt from SI requirements **IF:**
  - Bona-fide “historic”
  - Integrates all possible flood damage reduction measures
  - Project maintains status of structure
- **Code violations**
UNIT III – Summary Review

NFIP Regulations and Administrative Procedures

• NFIP Regulations
• 44CFR 60.3 Requirements
• Ordinance Administration
• Substantial Damage / Improvement
UNIT IV

Elevation Certificate (EC)

[Image of Elevation Certificate (EC) by FEMA]
Elevation Certificates

• Provides elevation information to ensure compliance
• Determines proper insurance premiums
• Supports map change requests (LOMA, LOMR-F)
Elevation Certificates

• The NFIP requires communities to obtain lowest floor elevation information for newly constructed and substantially improved/damaged buildings in the SFHA.

• The community must maintain the as-build Elevation Certificate as a formal record of compliance.
Elevation Certificates

• Required for rating post-FIRM buildings in AE, AO, AH, A (with BFE), VE, V (with BFE) and AR zones

• Not required for pre-FIRM buildings, but can be an option if using post-FIRM insurance rating

• Elevation Certificate certifies building elevations, but does **NOT** waive the flood insurance purchase requirement
Elevation Certificates

- Collect property, map and community information (A, B, E, G)
- Provide building description (A)
- Certify the building elevation data and professional expertise (C, D, F)
- Must be used by CRS communities
Building Diagrams

DIAGRAM 1A
All slab-on-grade single- and multiple-floor buildings (other than split-level) and high-rise buildings, either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor is at or above ground level (grade) on at least 1 side.*

- C2.a
- C2.f–h (determined by existing grade)
- NEXT HIGHER FLOOR
- BOTTOM FLOOR
- GRADE

DIAGRAM 1B
All raised-slab-on-grade or slab-on-stem-wall-with-fill single- and multiple-floor buildings (other than split-level), either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor is at or above ground level (grade) on at least 1 side.*

- C2.a
- C2.f–h (determined by existing grade)
- NEXT HIGHER FLOOR
- BOTTOM FLOOR
- GRADE
Building Diagrams

**DIAGRAM 2A**
All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.

Distinguishing Feature – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.*

```
C2.a
GRADE
```

```
C2.f–h  (determined by existing grade)
```

```
C2.b
```

```
NEXT HIGHER FLOOR
```

```
BOTTOM FLOOR BASEMENT
```

**DIAGRAM 2B**
All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.

Distinguishing Feature – The bottom floor (basement or underground garage) is below ground level (grade) on all sides; most of the height of the walls is below ground level on all sides; and the door and area of egress are also below ground level on all sides.*

```
C2.a
GRADE
```

```
C2.f–h  (determined by existing grade)
```

```
C2.b
```

```
NEXT HIGHER FLOOR
```

```
BOTTOM FLOOR BASEMENT
```

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*Note: These diagrams illustrate the criteria for determining the flood risk of buildings with basements or underground garages.
Building Diagrams

**DIAGRAM 3**

All split-level buildings that are slab-on-grade, either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor (excluding garage) is at or above ground level (grade) on at least 1 side.*
Building Diagrams

**DIAGRAM 4**

All split-level buildings (other than slab-on-grade), either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.*

---

*Note: Diagram showing the distinction between different floor levels and the grade.
All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.

Distingushing Feature – For all zones, the area below the elevated floor is open, with no obstruction to flow of floodwaters (open lattice work and/or insect screening is permissible).
Building Diagrams

DIAGRAM 6

All buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure below the elevated floor.

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.

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Department of Water Resources | National Flood Insurance Program | UNIT IV
Building Diagrams

**DIAGRAM 7**

All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least 1 side is at or above grade. The principal use of this building is located in the elevated floors of the building.

**Distinguishing Feature** – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.

![Diagram](image-url)
Building Diagrams

DIAGRAM 8
All buildings elevated on a crawlspace with the floor of the crawlspace at or above grade on at least 1 side, with or without an attached garage.

Distinguishing Feature – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawlspace is with or without openings** present in the walls of the crawlspace. Indicate information about crawlspace size and openings in Section A – Property Information.

[Diagram of a building with labeled parts C2.a, C2.b, C2.f, C2.g, A8.b–c, and A8.a, indicating the crawlspace and the grade outside.]
Building Diagrams

DIAGRAM 9
All buildings (other than split-level) elevated on a sub-grade crawl space, with or without attached garage.

Distinguishing Feature – The bottom (crawl space) floor is below ground level (grade) on all sides.* (If the distance from the crawl space floor to the top of the next higher floor is more than 5 feet, or the crawl space floor is more than 2 feet below the grade [LAG] on all sides, use Diagram 2A or 2B.)

[Diagram showing labeled points C2.a, C2.b, C2.f, C2.g, A8.b–c, A8.a, Grade, Next Higher Floor, Subgrade Crawl Space, Openings*]
Elevation Certificates

FEMA

NATIONAL FLOOD INSURANCE PROGRAM

ELEVATION CERTIFICATE

AND

INSTRUCTIONS

2015 EDITION
Elevation Certificates

The Elevation Certificate can be found at:
https://www.fema.gov/media-library/assets/documents/160

The Floodproofing Certificate can be found at:
Elevation Certificate Exercise
UNIT IV – Summary Review

Elevation Certificates
UNIT V

Flood Insurance

- Mandatory Purchase
- Coverage / Limitations
- Rating Buildings
- Increased Cost of Compliance (ICC)
- Community Rating System
Mandatory Purchase Requirement

• Applies to buying, repairing, constructing or improving private and publicly owned buildings
• Secured mortgage loans from lenders regulated or insured by Federal agencies
• Lender determines if property is in SFHA
• Lender discretion if building is not in SFHA
Coverage

30-Day Waiting Period Applies unless:

- Policy bought while making, increasing, extending or renewing loan
- In coordination with certain map changes current effective Elevation Certificate
Coverage

• Obtained from local insurance agents
• Agents can sell “direct” policies through FEMA or Write Your Own (WYO) through companies that work with and agree to FEMA requirements and rates
• Dwelling, General Property and Residential Condo Association are standard flood insurance policy types
Coverage

Preferred Risk Policy is a lower-cost option for properties in moderate-to-low risk areas with combinations of building and contents protection.

- Must be in B, C or X Zone on effective date of policy
- Regular Program communities
- Limited loss history
Limitations

Insurance coverage limitations:

• In areas below the lowest elevated floor depending on the flood zone and date of construction

• In basements regardless of zone or date of construction
Limitations

• **Basement** is any area of a building (including sunken room or portion of) with a floor subgrade (below ground level) on all sides.

• No Coverage for:
  – Wallpaper
  – Carpeting
  – Similar Finishings
  – Contents
Limitations

Basements
Limitations

Crawlspaces
Limitations

Elevated building on full story
Limitations

Elevated building with enclosure
Rating Buildings

Flood insurance and NFIP regulations are designed to reinforce each other in the area of rating buildings

• Enforcement of state & local regulations affects property owners’ rates
Rating Buildings

**Pre-FIRM**
- Built prior to community’s initial FIRMs/flood maps.
- May have greater flood risk

**Post-FIRM**
- Built after initial FIRM
- Reduced risk of flooding and damage if compliant with state and local floodplain regulations
Rating Pre-FIRM Buildings

Pre-FIRM rates are “subsidized” by premium income from Post-FIRM SFHA, B, C and X zone policy-holders.

• Rating based on building type and FIRM zone, not elevation
• Can use the Post-FIRM rates if the building is elevated above the BFE
  (Elevation Certificate required)
Post-FIRM rates are actuarial-based on building’s risk of flooding:

- If BFE is available, rating is based on elevation of lowest floor in relation to the BFE.
- If no BFE, rates are based on overall loss experience and expected damage for all buildings within that zone.
Rating Buildings

• Post-FIRM buildings in Zones VE and V1-30, with no obstructions below elevated floor, have higher rates than AE and A1-30 Zones due to greater risk from wave impacts.

• V Zone buildings with enclosures greater than or equal to 300 sq ft will have higher insurance rates.
Rating Buildings

“Insurable” Building:

• “Walled and Roofed” – Contains two or more rigid walls and roof is fully secured
• “Manufactured home” – Transportable building that can be used w/ or w/o permanent foundation
• “Principally above ground” – More than 51% of its actual cash value (including machinery and equipment) above ground
Rating Buildings

Three important facts:

• Contents coverage is a separate policy
• Single peril policy for direct physical damage; pays just replacement cost or Actual Cash Value of actual damage up to policy limit
• Not guaranteed replacement, never pays more than policy limit!
Rating Buildings

“Submit-to-Rate” requires detailed underwriting analysis for buildings with peculiarities in their exposure to flooding:

- Lwest floor ≥ 2 feet below BFE
- Below grade crawlspace
- Enclosure below BFE
Coastal Barriers Resources System (CBRS)

- Buildings located within CBRS or Otherwise Protected Areas (OPA) cannot purchase flood insurance if structure was built or substantially improved on or after a specified date.

* Flood insurance can be written in OPAs for new structures supporting conservation uses.
Increased Cost of Compliance (ICC)

• Increased Cost of Compliance (ICC): coverage helps pay for the increased costs to comply with floodplain ordinance after a flood, when the building has been declared substantially or repetitively damaged.

• ICC Coverage can be applied to FRED: Floodproofing, Relocation, Elevation, Demolition up to $30,000
Community Rating System (CRS)

Voluntary NFIP program that recognize and encourage communities to go beyond NFIP minimum requirements in their local floodplain management activities

• Communities in full compliance can apply
• CRS uses a class rating system which entitles residents in SFHAs to premium reductions
Benefits of (CRS)

- Reduced flood insurance rates
- More risk awareness & education
- Improved public safety
- Better floodplain management
- CRS training and technical assistance
- Receive recognition from national evaluation program
CRS Activities 5 Categories

**Public Information (300 series)**
Advise about flood hazard, insurance, reducing damage

**Mapping and Regulations (400 series)**
Increased protection to new development

**Flood Damage Reduction (500 series)**
Areas in which existing development is at risk

**Warning and Response (600 series)**
Preparing for and responding to a flood due to natural causes

**Community Classification (700 series)**
Credit points for each activity undergo final adjustment
New CRS Coordinator’s Manual can be found at:

http://www.fema.gov/library/viewRecord.do?id=2434
UNIT V – Summary Review

Flood Insurance

• Mandatory Purchase
• Coverage / Limitations
• Ratings Buildings
• Increased Cost of Compliance (ICC)
• Community Rating System
UNIT VI

Flood Hazard Mitigation

• Disaster Operations
• Recovery to Reduce Risk
• Mitigation Planning
• Mitigation Assistance Programs
Disaster Operations

Disaster organizations are organized around four major areas:

• Prepare
• Respond
• Recover
• Mitigate
Disaster Operations

Permit process expedited if clean up & emergency repairs are limited to:

• Removal & disposal of damaged items
• Hosing, scrubbing, or cleaning damage
• Covering holes to prevent further damage
• Making building safe to enter (removing sagging ceilings, shoring-up foundations)
Recovery to Reduce Risk

Enforcement Responsibilities:

• Inspections of all flood properties
• Post your determination on each building
• Follow-up to make sure recovery is compliant
Mitigation Measures

- Prevention
- Property Protection
- Protection of Natural Resources
- Emergency Services
Mitigation Measures

Prevention

Photo by DWR
Mitigation Measures

Property Prevention

Photo by DWR
Mitigation Measures

Natural Resource Prevention

Photo by DWR
Mitigation Measures

Emergency Services

Photo by FEMA/ Win Henderson
Mitigation Planning

A process to identify risk and vulnerabilities and then develop long term strategies for protecting people and property.

• **Disaster Mitigation Act of 2000** requires communities to have a mitigation plan to qualify for some of the FEMA mitigation grants
Mitigation Planning

Key Elements:

- Public Involvement
- Risk Assessment
- Mitigation Strategy

Photo by DWR
FEMA Mitigation Grant Programs

Hazard Mitigation Grant Program (HMGP):

• Requires Federal Disaster Declaration
• State and communities must have FEMA approved mitigation plan
• Funding is sliding scale formula dependent on State Mitigation Plan; usually 75% federal 25% nonfederal monies
• Elevation, acquisition (demolition or relocation), retrofitting and minor flood control are eligible projects
FEMA Mitigation Grant Programs

Flood Mitigation Assist. Program (FMA):

• Applies to NFIP insured structures

• **Planning grants** support risk assessment and development of mitigation plans

• **Project grants** implement elevation, demolition, relocation or acquisition activities

• **Technical assistance grants** for states and communities to develop FMA applications and implement projects
FEMA Mitigation Grant Programs

Pre-Disaster Mitigation Program (PDM):

• Nationally competitive program for States and communities
• Must have FEMA approved mitigation plan
• Activities must be cost effective
• Eligible projects include elevation, localized flood control for critical facilities, relocation, stormwater mgmt. projects, retrofitting, vegetation restoration, voluntary acquisition
FEMA Mitigation Grant Programs

Repetitive Flood Claims Program (RFC):

• Targets insured repetitive loss properties
• Acquisition, structure demolition, and relocation with deed restriction for open space are considered
• Grants can be 100% federally funded if State or community cannot meet the cost-share requirements of the FMA program
• Priority goes to acquisitions that equal most savings for National Flood Insurance Fund
Severe Repetitive Loss Program (SRL): Residential properties with severe repeat loss history:

- Four or more claims that:
  - each exceed $5,000 with at least two in a 10-year period
  - OR
  - 2 or more claims that cumulatively exceed the value of the building

-- OR --

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FEMA Mitigation Grant Programs
UNIT VI – Summary Review

Flood Hazard Mitigation

• Disaster Operations
• Recovery to Reduce Risk
• Mitigation Planning
• Mitigation Assistance Programs
Course Summary Review

UNIT I  Floodplain Management Concepts
UNIT II Floodplain Mapping
UNIT III NFIP Regulations & Administrative Procedures
Unit Summary Review

UNIT IV  Elevation Certificates
UNIT V   Flood Insurance
UNIT VI  Flood Hazard Mitigation
Why Become a Certified Floodplain Manager?

• Confidence in professional knowledge
• Professional/Public recognition
• Job advancement potential
• Motivation for continued education
• Personal satisfaction
Who Benefits from having Certified Floodplain Managers in their community?

- Citizens
- Flood Insurance Policy Holders
- Emergency Responders
- Tax Payers
- Policy Makers
- Community Members
Disclaimer

Attending this course is not a guarantee for passing the Certified Floodplain Manager Exam – you should study and prepare in addition to reviewing course content.

Review material for the Certified Floodplain Managers Exam can be found on the Association of State Floodplain Managers (ASFPM) website at [www.floods.org](http://www.floods.org) on the Certification menu look for the "Certified Floodplain Managers Exam Preparation Guide"
Questions?