

NFIP Essentials of Floodplain Management—Full Day Course

Student Manual

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Contents

NFIP ESSENTIALS OF FLOODPLAIN MANAGEMENT—FULL DAY COURSE.....	1
UNIT 0: STUDENT PREPARATION	11
Course Goal	12
Course Objectives	12
Course Overview	12
Prerequisites	12
Course Schedule	13
Evaluation	13
UNIT 1: COURSE INTRODUCTION	14
VISUAL 1: NFIP ESSENTIALS OF FLOODPLAIN MANAGEMENT.....	16
VISUAL 2: DISCLAIMER.....	17
VISUAL 3: UNIT 1: COURSE INTRODUCTION.....	18
VISUAL 4: UNIT 1 TOPICS	19
VISUAL 5: UNIT 1 OBJECTIVES	20
VISUAL 6: COURSE GOAL.....	21
VISUAL 7: COURSE OBJECTIVES	22
VISUAL 8: INTRODUCTIONS.....	23
VISUAL 9: COURSE AGENDA.....	24
VISUAL 10: COURSE MATERIALS.....	26
VISUAL 11: UNIT 1 SUMMARY	26
UNIT 2: INTRODUCTION TO FLOODPLAIN MANAGEMENT.....	28
VISUAL 1: UNIT 2: INTRODUCTION TO FLOODPLAIN MANAGEMENT.....	31
VISUAL 2: COURSE MAP UMBRELLA	32
VISUAL 3: UNIT 2 OBJECTIVES	33
VISUAL 4: UNIT 2 TOPICS	34
VISUAL 5: FLOODPLAINS AND THE COMMUNITY	35
VISUAL 6: WHAT DO FLOODPLAINS LOOK LIKE?	36
VISUAL 7: NATURAL AND BENEFICIAL FUNCTIONS OF FLOODPLAINS	37
VISUAL 8: FLOODPLAINS AND THE COMMUNITY OVERVIEW	38
VISUAL 9: BENEFITS OF FLOODPLAIN MANAGEMENT	39
VISUAL 10: KNOWLEDGE CHECKS 1 AND 2.....	40
VISUAL 11: NATIONAL FLOOD INSURANCE PROGRAM FRAMEWORK	41
VISUAL 12: NFIP OVERVIEW	42
VISUAL 13: HISTORY OF THE NFIP	45
VISUAL 14: NFIP FRAMEWORK	47
VISUAL 15: NFIP PARTICIPATION	48
VISUAL 16: KNOWLEDGE CHECKS 3 AND 4.....	49
VISUAL 17: DISADVANTAGES OF NON-PARTICIPATION IN THE NFIP	50
VISUAL 18: THE THREE-LEGGED STOOL.....	52
VISUAL 19: FEDERAL, STATE, AND LOCAL NFIP ROLES AND RESPONSIBILITIES	53
VISUAL 20: NFIP ROLES AND RESPONSIBILITIES.....	54

VISUAL 21:	FEDERAL ROLES (1 OF 2)	55
VISUAL 22:	FEDERAL ROLES (2 OF 2)	56
VISUAL 23:	KNOWLEDGE CHECK 5	57
VISUAL 24:	STATE ROLES	58
VISUAL 25:	COMMUNITY ASSISTANCE PROGRAM — STATE SUPPORT SERVICES ELEMENT (CAP-SSSE)	59
VISUAL 26:	NFIP LEGAL AUTHORITY.....	60
VISUAL 27:	KNOWLEDGE CHECKS 6 AND 7	61
VISUAL 28:	LOCAL ROLES.....	62
VISUAL 29:	FLOODPLAIN ADMINISTRATOR PERMITTING RESPONSIBILITIES.....	63
VISUAL 30:	FLOODPLAIN ADMINISTRATOR RESPONSIBILITIES	64
VISUAL 31:	KNOWLEDGE CHECK 8	65
VISUAL 32:	ACTIVITY 2.1: MATCHING NFIP RESPONSIBILITIES	66
VISUAL 33:	UNIT 2 SUMMARY	68
UNIT 3: RISK DETERMINATION: MAPS AND STUDIES.....		69
VISUAL 1:	UNIT 3: RISK DETERMINATION: MAPS AND STUDIES.....	70
VISUAL 2:	COURSE MAP UMBRELLA	72
VISUAL 3:	UNIT 3 OBJECTIVES.....	73
VISUAL 4:	UNIT 3 TOPICS	74
VISUAL 5:	UNDERSTANDING FLOOD MAPS AND STUDIES	75
VISUAL 6:	FORCES OF FLOODWATER.....	76
VISUAL 7:	BASE FLOOD	77
VISUAL 8:	SPECIAL FLOOD HAZARD AREA (SFHA)	78
VISUAL 9:	SFHA ZONES START WITH A OR V.....	79
VISUAL 10:	NON-COASTAL (RIVERINE) FLOOD ZONES	80
VISUAL 11:	REGULATORY FLOODWAY.....	81
VISUAL 12:	SHALLOW FLOODING ZONES.....	82
VISUAL 13:	COASTAL HIGH HAZARD AREAS	83
VISUAL 14:	OUTSIDE OF THE SFHA.....	84
VISUAL 15:	KNOWLEDGE CHECK 1	85
VISUAL 16:	KNOWLEDGE CHECK 2	86
VISUAL 17:	FIRM AND FIS COMPONENTS.....	87
VISUAL 18:	FLOOD STUDY REGULATORY PRODUCTS.....	88
VISUAL 19:	FLOOD INSURANCE STUDY (FIS).....	89
VISUAL 20:	FLOODWAY DATA TABLES	90
VISUAL 21:	FIS FLOOD PROFILE	91
VISUAL 22:	STILLWATER ELEVATION TABLE.....	92
VISUAL 23:	COASTAL TRANSECTS.....	93
VISUAL 24:	FLOOD INSURANCE RATE MAP (FIRM)	94
VISUAL 25:	FIRM PANEL ELEMENTS.....	95
VISUAL 26:	VARIOUS STYLES OF FIRMS	96
VISUAL 27:	FIRMETTE	97
VISUAL 28:	FIRM INDEX	98
VISUAL 29:	KNOWLEDGE CHECK 3	99
VISUAL 30:	KNOWLEDGE CHECK 4	100

VISUAL 31:	DETERMINING THE BFE	101
VISUAL 32:	IDENTIFY THE RISK AND DETERMINE THE BFE	102
VISUAL 33:	DETERMINING THE BFE IN RIVERINE AREAS (ZONE AE)	103
VISUAL 34:	1. DETERMINE THE PROPERTY'S LOCATION	104
VISUAL 35:	2. NOTE THE FLOODING SOURCE NAME	106
VISUAL 36:	3. DETERMINE THE DIRECTION OF FLOW	108
VISUAL 37:	4. FIND THE MOST UPSTREAM POINT OF THE PROPOSED DEVELOPMENT.....	110
VISUAL 38:	5. MEASURE ALONG THE STREAM CENTERLINE	112
VISUAL 39:	6. FIND THE BFE TO THE NEAREST 0.1 FOOT USING FIS MATERIALS	113
VISUAL 40:	INFORMATION ON AN FIS FLOOD PROFILE.....	114
VISUAL 41:	6.1 LOCATE THE PROPERTY ON THE FLOOD PROFILE	116
VISUAL 42:	6.2 FIND THE BFE TO THE NEAREST 0.1 FOOT	117
VISUAL 43:	KNOWLEDGE CHECK 5	119
VISUAL 44:	UNIQUE SITUATIONS: RIVERINE STRUCTURE ON A CROSS SECTION.....	121
VISUAL 45:	USING THE FLOODWAY DATA TABLE	122
VISUAL 46:	STEPS TO DETERMINE THE BFE IN SHALLOW FLOODING ZONES	125
VISUAL 47:	DETERMINING THE BFE IN ZONE AH.....	126
VISUAL 48:	DETERMINING THE BFE IN A ZONE AH: STILLWATER ELEVATIONS TABLE	127
VISUAL 49:	DETERMINING THE BFE IN ZONE AO.....	128
VISUAL 50:	STEPS TO DETERMINE THE BFE IN ZONE VE	129
VISUAL 51:	STEP 1. DETERMINE THE PROPERTY'S LOCATION AND STEP 2. IDENTIFY THE NEAREST COASTAL TRANSECT	130
VISUAL 52:	STEP 3. FIND THE BFE ON THE FIRM	131
VISUAL 53:	STEP 4. CHECK THE FIS COASTAL TRANSECT DATA TABLE	132
VISUAL 54:	ACTIVITY 3.1: MAPPING EXERCISE: FLOOD ZONE AND THE BFE	133
VISUAL 55:	APPROXIMATING THE BFE IN A ZONES	140
VISUAL 56:	ZONE: APPROXIMATE A ZONES	141
VISUAL 57:	HOW TO APPROXIMATE THE BFE IN A ZONES.....	142
VISUAL 58:	CONTOUR INTERPOLATION	143
VISUAL 59:	CONTOUR INTERPOLATION EXAMPLE	144
VISUAL 60:	DATA EXTRAPOLATION.....	145
VISUAL 61:	DATA EXTRAPOLATION EXAMPLE.....	146
VISUAL 62:	KNOWLEDGE CHECK 6	147
VISUAL 63:	FEMA FLOOD MAP SERVICE CENTER (MSC).....	148
VISUAL 64:	OVERVIEW OF THE FEMA MSC.....	149
VISUAL 65:	SEARCH BY ADDRESS OR SEARCH ALL PRODUCTS.....	150
VISUAL 66:	SEARCH RESULTS SCREEN	151
VISUAL 67:	SHOW ALL PRODUCTS RESULTS PAGE.....	152
VISUAL 68:	EFFECTIVE PRODUCTS: FIRM PANELS.....	154
VISUAL 69:	HOW TO MAKE A FIRMETTE	155
VISUAL 70:	FIRMETTE MAPS.....	156
VISUAL 71:	NFHL VIEWER	157
VISUAL 72:	CHANGING NFIP MAPS.....	158
VISUAL 73:	LETTER OF MAP CHANGE (LOMC) REQUESTS	159
VISUAL 74:	TYPES OF LOMCs.....	160

VISUAL 75:	LOMA	161
VISUAL 76:	LOMR	162
VISUAL 77:	LOMR-F	163
VISUAL 78:	CLOMR.....	164
VISUAL 79:	COMMUNITY ACKNOWLEDGEMENT FORM.....	165
VISUAL 80:	KNOWLEDGE CHECK 7	166
VISUAL 81:	UNIT 3 SUMMARY	167
UNIT 4: FLOODPLAIN MANAGEMENT REGULATIONS OVERVIEW		168
VISUAL 1:	UNIT 4: FLOODPLAIN MANAGEMENT REGULATIONS OVERVIEW	169
VISUAL 2:	COURSE MAP UMBRELLA	171
VISUAL 3:	UNIT 4 OBJECTIVES.....	172
VISUAL 4:	UNIT 4 TOPICS	173
VISUAL 5:	NFIP FEDERAL REGULATIONS: 44 CFR SECTION 60.3(A-E)	174
VISUAL 6:	KNOWLEDGE CHECK 1	175
VISUAL 7:	LEGAL AUTHORITIES GOVERNING FLOODPLAIN MANAGEMENT	176
VISUAL 8:	44 CODE OF FEDERAL REGULATIONS (CFR) SECTION 60.3	177
VISUAL 9:	NFIP REGULATORY STAIRCASE: 44 CFR SECTION 60.3.....	179
VISUAL 10:	NFIP DEFINITION OF DEVELOPMENT	180
VISUAL 11:	SUBSTANTIAL IMPROVEMENT (SI) AND SUBSTANTIAL DAMAGE (SD).....	181
VISUAL 12:	44 CFR 60.3(A): UNMAPPED COMMUNITIES	182
VISUAL 13:	44 CFR 60.3(A): REQUIREMENTS	183
VISUAL 14:	44 CFR 60.3(A)(3): REASONABLY SAFE FROM FLOODING	184
VISUAL 15:	44 CFR 60.3(A): REQUIREMENTS OVERVIEW.....	185
VISUAL 16:	KNOWLEDGE CHECK 2	186
VISUAL 17:	44 CFR 60.3(B): ZONE A WITHOUT BFES.....	187
VISUAL 18:	44 CFR 60.3(B) REQUIREMENTS: 50 LOTS OR 5 ACRES.....	189
VISUAL 19:	44 CFR 60.3(B) REQUIREMENTS: OBTAIN AND USE OTHER DATA.....	190
VISUAL 20:	44 CFR 60.3(B) REQUIREMENTS: MAINTAIN RECORDS OF THE LOWEST FLOOR	191
VISUAL 21:	44 CFR 60.3(B) REQUIREMENTS: WATERCOURSE ALTERATIONS.....	192
VISUAL 22:	44 CFR 60.3(B) REQUIREMENTS: MANUFACTURED HOMES.....	193
VISUAL 23:	KNOWLEDGE CHECK 3	194
VISUAL 24:	44 CFR 60.3(C): SFHAS WITH BFES.....	195
VISUAL 25:	44 CFR 60.3(C) REQUIREMENTS: ELEVATE LOWEST FLOOR.....	197
VISUAL 26:	LOWEST FLOOR ELEVATION DEFINITION	198
VISUAL 27:	44 CFR 60.3(C) REQUIREMENTS: NON-RESIDENTIAL DRY FLOODPROOFING.....	199
VISUAL 28:	44 CFR 60.3(C) REQUIREMENTS: ENCLOSURES	200
VISUAL 29:	44 CFR 60.3(C) REQUIREMENTS: FLOOD OPENINGS IN ENCLOSURES	201
VISUAL 30:	KNOWLEDGE CHECK 4	202
VISUAL 31:	44 CFR 60.3(C) REQUIREMENTS: ELEVATING MANUFACTURED HOMES	203
VISUAL 32:	44 CFR 60.3(C) REQUIREMENTS: CUMULATIVE RISE	204
VISUAL 33:	44 CFR 60.3(C) REQUIREMENTS: GRADING FOR DRAINAGE—ZONES AH AND AO.....	205
VISUAL 34:	44 CFR 60.3(C) REQUIREMENTS: RECREATIONAL VEHICLES (RVs).....	206
VISUAL 35:	KNOWLEDGE CHECK 5	207
VISUAL 36:	44 CFR 60.3(D): SFHAS WITH REGULATORY FLOODWAY	208

VISUAL 37:	44 CFR 60.3(d) REQUIREMENTS: NO FLOODWAY ENCROACHMENT	209
VISUAL 38:	44 CFR 60.3(e): COASTAL HIGH HAZARD AREAS	210
VISUAL 39:	44 CFR 60.3(e): SITE REQUIREMENTS	211
VISUAL 40:	44 CFR 60.3(e) REQUIREMENTS: FOUNDATION TYPE AND ELEVATION	212
VISUAL 41:	44 CFR 60.3(e) REQUIREMENTS: LOWEST HORIZONTAL STRUCTURAL MEMBER	213
VISUAL 42:	44 CFR 60.3(e) REQUIREMENTS: V ZONE CERTIFICATE.....	214
VISUAL 43:	44 CFR 60.3(e) REQUIREMENTS: MANUFACTURED HOMES AND RVs.....	215
VISUAL 44:	KNOWLEDGE CHECK 6	216
VISUAL 45:	ACTIVITY 4.1: IDENTIFYING NFIP REGULATIONS.....	217
VISUAL 46:	HIGHER REGULATORY STANDARDS	222
VISUAL 47:	HIGHER REGULATORY STANDARDS OVERVIEW	223
VISUAL 48:	BENEFITS OF HIGHER REGULATORY STANDARDS.....	224
VISUAL 49:	EXAMPLES OF HIGHER REGULATORY STANDARDS	225
VISUAL 50:	KNOWLEDGE CHECK 7	227
VISUAL 51:	UNIT 4 SUMMARY	228
UNIT 5: OVERSIGHT AND COMPLIANCE: THE PERMITTING PROCESS.....		229
VISUAL 1:	UNIT 5: OVERSIGHT AND COMPLIANCE: THE PERMITTING PROCESS	230
VISUAL 2:	COURSE MAP UMBRELLA	232
VISUAL 3:	UNIT 5 OBJECTIVES.....	233
VISUAL 4:	UNIT 5 TOPICS	234
VISUAL 5:	FLOODPLAIN ADMINISTRATOR RESPONSIBILITIES AND AUTHORITIES	235
VISUAL 6:	LOCAL GOVERNMENT LAND USE AUTHORITY	236
VISUAL 7:	FLOODPLAIN ADMINISTRATOR RESPONSIBILITIES (1 OF 2).....	237
VISUAL 8:	FLOODPLAIN ADMINISTRATOR RESPONSIBILITIES (2 OF 2).....	238
VISUAL 9:	KNOWLEDGE CHECK 1	239
VISUAL 10:	DEVELOPMENT PERMITTING PROCESS	240
VISUAL 11:	FLOODPLAIN REGULATIONS AND THE PERMIT PROCESS.....	241
VISUAL 12:	COMMUNITY PERMITTING PROCESS	242
VISUAL 13:	REQUIRE FLOODPLAIN PERMITS	243
VISUAL 14:	SAMPLE FLOODPLAIN DEVELOPMENT PERMIT APPLICATION	244
VISUAL 15:	DEVELOPMENT PERMIT REVIEW PROCESS	245
VISUAL 16:	PERMIT PROCESS BEST PRACTICES	246
VISUAL 17:	DEVELOPMENT PERMIT APPLICATION RESOURCES AND PROCEDURES	248
VISUAL 18:	KNOWLEDGE CHECK 2	250
VISUAL 19:	ACTIVITY 5.1: A DAY IN THE LIFE OF A FLOODPLAIN ADMINISTRATOR-PART 1.....	251
VISUAL 20:	PERMIT AND COMPLIANCE REVIEW PROCESS	253
VISUAL 21:	PERMIT REVIEW PROCESS.....	254
VISUAL 22:	REVIEWING FOR COMPLETENESS.....	255
VISUAL 23:	REVIEWING FOR COMPLETENESS: TECHNICAL DOCUMENTS	256
VISUAL 24:	REVIEWING FOR COMPLETENESS: LOCATION OR PLAT MAP AND PLAN SETS	257
VISUAL 25:	REVIEWING FOR COMPLETENESS: FEDERAL AND STATE PERMITS	258
VISUAL 26:	REVIEWING FOR COMPLETENESS: LOCAL DEPARTMENT REVIEWS	259
VISUAL 27:	REVIEWING FOR COMPLETENESS: CERTIFICATIONS	260
VISUAL 28:	KNOWLEDGE CHECK 3	261

VISUAL 29:	REVIEWING FOR COMPLIANCE	262
VISUAL 30:	REVIEWING FOR COMPLIANCE: LOCATION OF PROPOSED DEVELOPMENT (1 OF 2)	263
VISUAL 31:	REVIEWING FOR COMPLIANCE: LOCATION OF PROPOSED DEVELOPMENT (2 OF 2)	264
VISUAL 32:	REVIEWING FOR COMPLIANCE: DETERMINE THE DEVELOPMENT TYPE.....	265
VISUAL 33:	REVIEWING FOR COMPLIANCE: PERMIT AND TECHNICAL INFORMATION	266
VISUAL 34:	SI/SD STEP 1: DETERMINE COSTS OF IMPROVEMENTS AND/OR REPAIRS.....	267
VISUAL 35:	SI/SD STEP 2: DETERMINE MARKET VALUE.....	268
VISUAL 36:	SI/SD STEP 3: MAKE CALCULATION AND STEP 4: PROVIDE DETERMINATION LETTER.....	269
VISUAL 37:	CHECK THE BFE OR DEPTH	270
VISUAL 38:	CHECK THE LOWEST FLOOR ELEVATION	271
VISUAL 39:	REVIEWING SITE PLANS AND BUILDING DESIGN PLANS (1 OF 2)	272
VISUAL 40:	REVIEWING SITE PLANS AND BUILDING DESIGN PLANS (2 OF 2)	274
VISUAL 41:	TECHNICAL DOCUMENTATION.....	276
VISUAL 42:	TECHNICAL DOCUMENTATION: CERTIFIED ELEVATIONS	278
VISUAL 43:	TECHNICAL DOCUMENTATION: ELEVATION CERTIFICATES	279
VISUAL 44:	REVIEWING FOR COMPLIANCE: ELEVATION CERTIFICATES	281
VISUAL 45:	TECHNICAL DOCUMENTATION: DRY FLOODPROOFING CERTIFICATE.....	283
VISUAL 46:	ISSUE OR DENY PERMIT	285
VISUAL 47:	VARIANCES AND THE NFIP	287
VISUAL 48:	CONDUCT INSPECTIONS	289
VISUAL 49:	INSPECTIONS: IDENTIFYING FLOODPLAIN VIOLATIONS.....	291
VISUAL 50:	FEMA OVERSIGHT/CONSEQUENCES OF NONCOMPLIANCE	293
VISUAL 51:	ISSUE CERTIFICATE OF OCCUPANCY.....	295
VISUAL 52:	RECORDKEEPING PROTECTS COMMUNITY AND PROPERTY OWNERS	296
VISUAL 53:	KNOWLEDGE CHECK 4	298
VISUAL 54:	ACTIVITY 5.2: A DAY IN THE LIFE OF A FLOODPLAIN ADMINISTRATOR—PART 2	299
VISUAL 55:	POST-DISASTER PERMITTING	302
VISUAL 56:	POST-DISASTER PERMITTING AND DAMAGE ASSESSMENTS	303
VISUAL 57:	COMMUNITY POST-DISASTER PERMITTING AND DAMAGE ASSESSMENT ACTIONS	304
VISUAL 58:	FIELD WORK.....	305
VISUAL 59:	FEMA SUBSTANTIAL DAMAGE ESTIMATOR (SDE)	306
VISUAL 60:	PROVIDE DETERMINATION LETTER	307
VISUAL 61:	SI/SD STANDARD OPERATING PROCEDURES (SOPs).....	308
VISUAL 62:	DISASTER RECOVERY REFORM ACT OF 2018	309
VISUAL 63:	KNOWLEDGE CHECK 5	311
VISUAL 64:	FEMA HAZARD MITIGATION ASSISTANCE (HMA)	312
VISUAL 65:	FEMA INDIVIDUAL ASSISTANCE (IA) AND PUBLIC ASSISTANCE (PA)	315
VISUAL 66:	OTHER FUNDING FOR RECOVERY.....	316
VISUAL 67:	UNIT 5 SUMMARY	318
UNIT 6:	FLOOD INSURANCE	320
VISUAL 1:	UNIT 6: FLOOD INSURANCE	321
VISUAL 2:	COURSE MAP UMBRELLA	323
VISUAL 3:	UNIT 6 OBJECTIVES.....	324
VISUAL 4:	UNIT 6 TOPICS	325

VISUAL 5:	FLOOD INSURANCE AVAILABILITY	326
VISUAL 6:	FLOOD INSURANCE DEFINITION: FLOOD (44 CFR § 59.1).....	327
VISUAL 7:	FLOOD INSURANCE DEFINITION: STRUCTURE	328
VISUAL 8:	NFIP FLOOD INSURANCE AVAILABILITY	329
VISUAL 9:	MANDATORY PURCHASE REQUIREMENTS.....	331
VISUAL 10:	FLOOD INSURANCE MANDATORY PURCHASE REQUIREMENTS	332
VISUAL 11:	KNOWLEDGE CHECKS 1 AND 2.....	333
VISUAL 12:	FLOOD INSURANCE POLICY WAITING PERIOD	334
VISUAL 13:	FLOOD INSURANCE RATING FACTORS	335
VISUAL 14:	FLOOD INSURANCE RATING FACTORS OVERVIEW.....	336
VISUAL 15:	GEOGRAPHIC LOCATION	337
VISUAL 16:	STRUCTURAL VARIABLES	338
VISUAL 17:	FLOOD INSURANCE DISCOUNTS.....	339
VISUAL 18:	KNOWLEDGE CHECK 3	341
VISUAL 19:	FLOOD MAPS AND FLOOD INSURANCE.....	342
VISUAL 20:	ELEVATION CERTIFICATES AND FLOOD INSURANCE.....	343
VISUAL 21:	INSURANCE AND FLOODPLAIN MANAGEMENT.....	345
VISUAL 22:	FLOODPLAIN MANAGEMENT AND FLOOD INSURANCE	346
VISUAL 23:	COMPLIANCE ENFORCEMENT: SECTION 1316	347
VISUAL 24:	REPETITIVE LOSS (RL)/SEVERE REPETITIVE LOSS (SRL) PROPERTIES	348
VISUAL 25:	REPETITIVE LOSS (RL) PROPERTIES.....	349
VISUAL 26:	SEVERE REPETITIVE LOSS (SRL) PROPERTIES	350
VISUAL 27:	REPETITIVE LOSS AND SUBSTANTIAL DAMAGE (SD).....	351
VISUAL 28:	KNOWLEDGE CHECK 4	352
VISUAL 29:	INCREASED COST OF COMPLIANCE (ICC)	353
VISUAL 30:	INCREASED COST OF COMPLIANCE (ICC) COVERAGE.....	354
VISUAL 31:	ICC MITIGATION SOLUTIONS.....	355
VISUAL 32:	LOCAL FLOODPLAIN ADMINISTRATOR’S ROLE IN ICC.....	356
VISUAL 33:	KNOWLEDGE CHECK 5	357
VISUAL 34:	FLOOD INSURANCE RESOURCES	358
VISUAL 35:	UNIT 6 SUMMARY	360
UNIT 7: COURSE SUMMARY		361
VISUAL 1:	COURSE SUMMARY	362
VISUAL 2:	UNIT 7 OBJECTIVES.....	364
VISUAL 3:	UNIT 7 TOPICS	365
VISUAL 4:	SELF-REFLECTION: CONTINUED PERSONAL GROWTH	366
VISUAL 5:	RESOURCES, TRAINING, AND CONTACTS	367
VISUAL 6:	ACTIVITY 7.1: FLOODPLAIN MANAGEMENT MATCH GAME.....	369
VISUAL 7:	COURSE OBJECTIVES SUMMARY	371
VISUAL 8:	UNIT 7 SUMMARY	372
VISUAL 9:	COURSE COMPLETION	373

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Unit 0: Student Preparation

Course Goal

The goal of this course is to have participants explain the foundational roles and responsibilities of a Floodplain Administrator.

Course Objectives

Upon completion of this course, participants will be able to:

- Explain the roles and responsibilities of Federal, State, and local agencies in the NFIP.
- Describe how a Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) are used to determine the flood zone and Base Flood Elevation (BFE).
- Identify the minimum NFIP regulations applicable to floodplain management.
- Explain the Floodplain Administrator's responsibilities in providing oversight and ensuring compliance.
- Describe the basic concepts of flood insurance under the NFIP; and
- Identify additional resources, training, and contacts that support floodplain management.

Course Overview

This course provides local, State, Tribal, territorial, and Federal officials with foundational knowledge of how Floodplain Administrators and the NFIP operate in floodplain management. The course will focus on the NFIP, concepts of floodplain management, Floodplain Administrator responsibilities, flood maps and studies, ordinance administration, and the relationship between floodplain management and flood insurance.

Prerequisites

RECOMMENDED:

FEMA recommends participants take the following trainings before attending this course:

- [IS-0273: How to Read a Flood Insurance Rate Map \(FIRM\)](https://training.fema.gov/is/courseoverview.aspx?code=IS-273)
(<https://training.fema.gov/is/courseoverview.aspx?code=IS-273>)
- [IS-274: How to Use a Flood Insurance Study \(FIS\)](https://emilms.fema.gov/is_0274/curriculum/1.html)
(https://emilms.fema.gov/is_0274/curriculum/1.html)
- [IS-1100.a: Increased Cost of Compliance](https://emilms.fema.gov/is_1100a/curriculum/1.html)
(https://emilms.fema.gov/is_1100a/curriculum/1.html)

- [IS-1113: Coastal Barrier Resources Act](https://emilms.fema.gov/is_1113/curriculum/1.html)
(https://emilms.fema.gov/is_1113/curriculum/1.html)
- [IS-1119: Letters of Map Amendment \(LOMAs\) and Letters of Map Revision—Based on Fill \(LOMR-Fs\)](https://training.fema.gov/is/courseoverview.aspx?code=IS-1119)
(<https://training.fema.gov/is/courseoverview.aspx?code=IS-1119>)

Course Schedule

The course includes eight hours of instruction. Instructors will present seven units:

- Unit 1: Course Introduction
- Unit 2: Introduction to Floodplain Management
- Unit 3: Risk Determination: Maps and Studies
- Unit 4: Floodplain Management Regulations Overview
- Unit 5: Oversight and Compliance: The Permitting Process
- Unit 6: Flood Insurance
- Unit 7: Course Summary

Evaluation

Since this is a non-credited course, a course assessment is not applicable.

Unit 1: Course Introduction

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Visual 1: NFIP Essentials of Floodplain Management



Student Notes:

Welcome to the NFIP Essentials of Floodplain Management course. Over the next eight hours, this course will introduce you to the foundational concepts associated with floodplain management, Floodplain Administrator responsibilities, and the National Flood Insurance Program (NFIP).

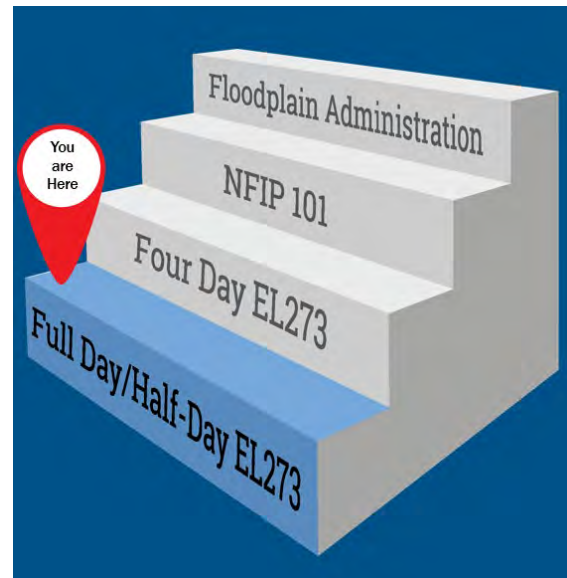
Visual 2: Disclaimer

Please Note:

This course does not adequately prepare participants to become a Floodplain Administrator.

This is a Not-for-Credit course consisting of a broad overview of floodplain management.

This course should be considered a condensed introduction to the four-day EL273 course and/or NFIP 101.



Student Notes

This course is an introduction to EL2723 and does NOT adequately prepare you to become a Floodplain Administrator. This course is a shortened, not-for-credit course that includes a broad overview of floodplain management. If you would like to become a Floodplain Administrator, you MUST take the four-day EL273 course and/or the online NFIP 101: Introduction to Floodplain Management course.

Visual 3: Unit 1: Course Introduction

Unit 1: Course Introduction



**Student
Notes**

This is Unit 1: Course Introduction.

Visual 4: Unit 1 Topics



- Unit Objectives
- Course Goal and Objectives
- Introductions
- Course Agenda
- Course Materials
- Unit Summary



Student Notes

In this unit, you will review the Unit 1 objectives, course goal, and objectives; conduct participant introductions; review the course agenda; learn about the materials necessary to complete this course; and review the unit summary.

Visual 5: Unit 1 Objectives

After completing this unit, you should be able to:

- Describe the course goal.
- Describe the course objectives.



**Student
Notes**

Before beginning this unit, we will review the learning objectives. After completing this unit, you should be able to:

- Describe the course goal.
- Describe the course objectives.

Visual 6: Course Goal

The goal of this course is to have participants explain the foundational roles and responsibilities of a Floodplain Administrator.

If you wish to learn more comprehensive information to become a Floodplain Administrator, consider additional FEMA training courses:

- E/L 0273: Managing Floodplain Development Through the National Floodplain Insurance Program (NFIP)
- NFIP 101: Introduction to Floodplain Management



Student Notes

The goal of this course is for you to explain the foundational roles and responsibilities of a Floodplain Administrator.

This is an introductory course covering a wide range of topics. This course does not adequately prepare you to become a Floodplain Administrator. If you wish to pursue additional training for floodplain management, consider taking EMI's E/L 0273: Managing Floodplain Development Through the National Floodplain Insurance Program (NFIP) classroom course and the Association of State Floodplain Managers (ASFPM) NFIP 101: Introduction to Floodplain Management online course.



Online Resource

- [NFIP 101: Introduction to Floodplain Management](https://www.floods.org/training-center/online-training/asfpm-on-demand-learning/nfip101/) (https://www.floods.org/training-center/online-training/asfpm-on-demand-learning/nfip101/).
- To take the E/L 0273 course, they will need to register with FEMA [Emergency Management Institute \(EMI\)](https://www.fema.gov/emergency-management-institute) at <https://www.firstrespondertraining.gov/frts/npccatalog?id=2079>.

Visual 7: Course Objectives

After completing this course, you should be able to:

- Explain the roles and responsibilities of Federal, State, and local agencies in the NFIP.
- Describe how a Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) are used to determine the flood zone and Base Flood Elevation (BFE).
- Identify the minimum NFIP regulations applicable to floodplain management.
- Explain the Floodplain Administrator's responsibilities in providing oversight and ensuring compliance.
- Describe the basic concepts of flood insurance under the NFIP.
- Identify additional resources, training, and contacts that support floodplain management.



Student Notes

After completing this course, you should be able to:

- Explain the roles and responsibilities of Federal, State, and local agencies in the NFIP;
- Describe how a Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) are used to determine the flood zone and Base Flood Elevation (BFE);
- Identify the minimum NFIP regulations applicable to floodplain management;
- Explain the Floodplain Administrator's responsibilities in providing oversight and ensuring compliance;
- Describe the basic concepts of flood insurance under the NFIP; and
- Identify additional resources, training, and contacts that support floodplain management.

Visual 8: Introductions

Provide your:

- Name
- Locality
- Course expectations



When asked by the instructor, provide your:

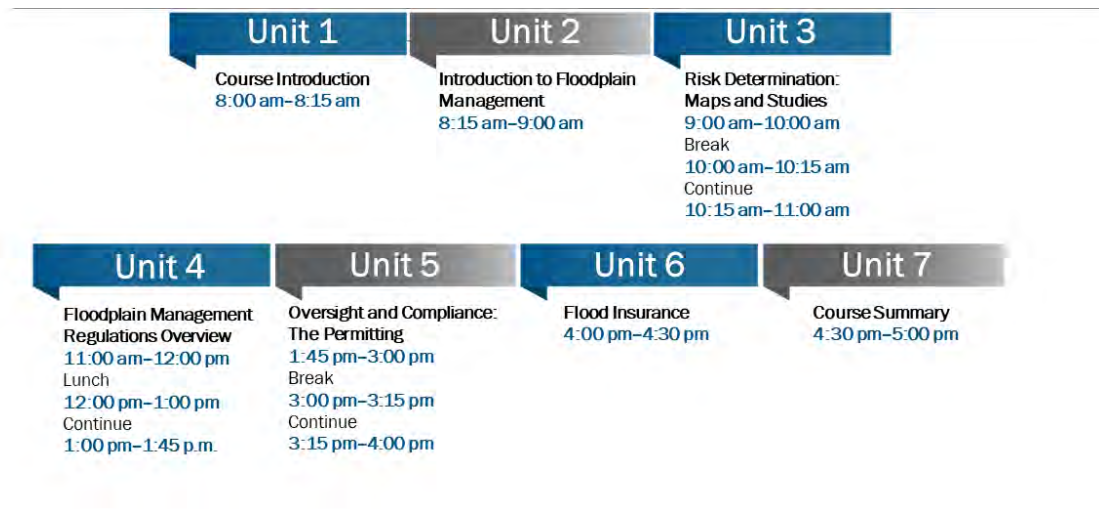


Student Notes

- Name,
- Locality, and
- Course expectations.

If time is available at the end of this course, the instructor will revisit the documented course expectations to determine if this course met your expectations.

Visual 9: Course Agenda



Student Notes

This is an 8-hour course with a 1-hour lunch break and two 15-minute intermediate breaks.

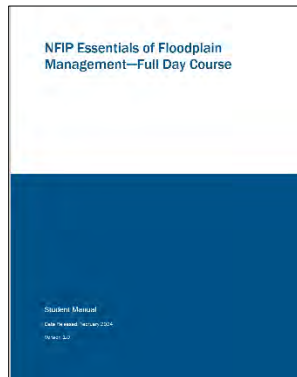
Table 1: Course Agenda provides a detailed unit schedule.

TABLE 1: COURSE AGENDA

Unit Name	Schedule
Unit 1: Course Introduction	8:00 am–8:15 am
Unit 2: Introduction to Floodplain Management	8:15 am–9:00 am
Unit 3: Risk Determination: Maps and Studies	9:00 am–10:00 am
Break	10:00 am–10:15 am
Unit 3: Risk Determination: Maps and Studies (Cont.)	10:15 am–11:00 am
Unit 4: Floodplain Management Regulations Overview	11:00 am–12:00 pm
Lunch	12:00 pm–1:00 pm
Unit 4: Floodplain Management Regulations Overview (Cont.)	1:00 pm–1:45 pm
Unit 5: Oversight and Compliance: The Permitting	1:45 pm–3:00 pm
Break	3:00 pm–3:15 pm
Unit 5: Oversight and Compliance: The Permitting (Cont.)	3:15 pm–4:00 pm
Unit 6: Flood Insurance	4:00 pm–4:30 pm
Unit 7: Course Summary	4:30 pm–5:00 pm

Visual 10: Course Materials

Student Manual



Job Aids and Other Resources



**Student
Notes**

Your Student Manual includes copies of all course visuals and key points. The handouts are provided by the instructor.

A job aid is available to help you identify the responsibilities of a Floodplain Administrator. For example, the job aid explains how to determine the BFE.

During this training, we may refer to other resources not available in the classroom but are valuable to your roles and responsibilities. For example, the online training resource that we mentioned earlier, NFIP 101: Introduction to Floodplain Management. These references are included in your Student Manual.

Take notes in your Student Manual throughout the course. Your notes may serve as valuable reference information later in your career.

Visual 11: Unit 1 Summary

After completing this unit, you are now able to:

- Describe the course goal.
- Describe the course objectives.



**Student
Notes**

You have completed Unit 1. You are now able to::

- Describe the course goal.
- Describe the course objectives.

Unit 2: Introduction to Floodplain Management

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Visual 1: Unit 2: Introduction to Floodplain Management

Unit 2: Introduction to Floodplain Management



Student Notes

Welcome to Unit 2: Introduction to Floodplain Management. The main purpose of this unit is to provide you with an overview of the NFIP and associated floodplain management activities.

Visual 2: Course Map Umbrella



Student Notes

This umbrella will serve as a guide to help you identify where you are in this course. Know the Risk, Mitigate the Risk, and Insure the Risk are the three main elements of this umbrella. For Unit 2, we will discuss Know the Risk. Some of the unit topics include floodplain management basics and an overview of the NFIP.

Know the Risk, Mitigate the Risk, and Insure the Risk will be presented frequently throughout this course.

Visual 3: Unit 2 Objectives

After completing this unit, you should be able to:

- Describe the functions of floodplains.
- Describe the general framework of the NFIP.
- Explain the roles and responsibilities of Federal, State, and local governments in the NFIP.



**Student
Notes**

After completing this unit, you should be able to:

- Describe the functions of floodplains,
- Describe the general framework of the NFIP, and
- Explain the roles and responsibilities of Federal, State, and local governments in the NFIP.

Visual 4: Unit 2 Topics



Floodplains and the Community

- Introduction to the National Flood Insurance Program (NFIP)
- NFIP Framework
- Federal, State, and Local NFIP Roles and Responsibilities
- Activity 2.1: Matching NFIP Responsibilities
- Unit Summary

Floodplain management is a community-based effort to prevent or reduce the risk of flooding, resulting in a more resilient community. Floodplain Administrators play an important role in achieving this goal, which we will discuss throughout this course. The topics in this unit include:



Student Notes

- Floodplains and the Community.
- Introduction to the National Flood Insurance Program (NFIP);
- NFIP Framework.
- Federal, State, and Local NFIP Roles and Responsibilities; and
- Activity 2.1: Matching NFIP Responsibilities.

Visual 5: Floodplains and the Community

Floodplains and the Community



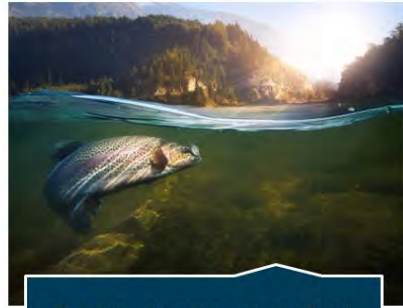
**Student
Notes**

Benefits of floodplains and their impact on humans.

Visual 6: What do Floodplains Look Like?



Areas of low-lying ground (typically adjacent to a river or coast) which are subject to flooding



Provide natural and beneficial functions

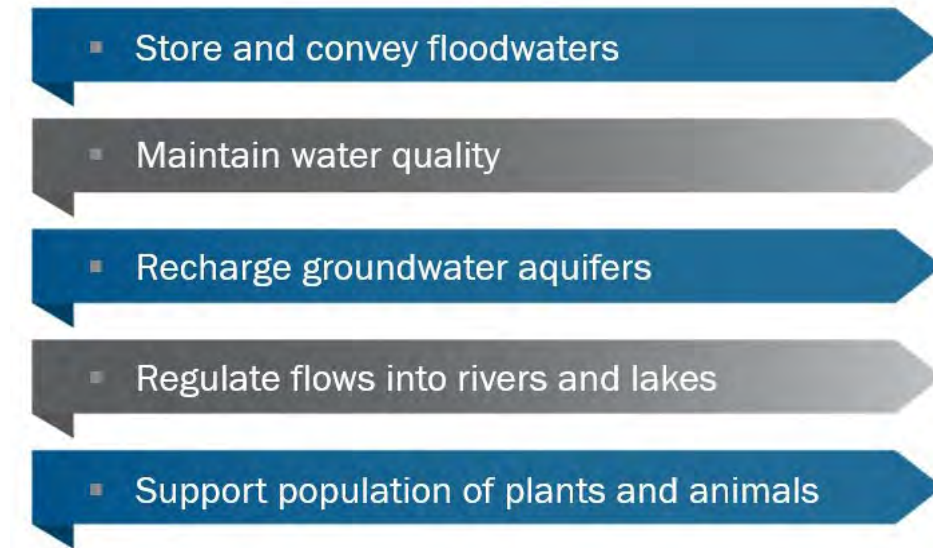


Student Notes

Anywhere it can rain, it can flood. Floodplains can be found across many different environments. They can be low-lying ground areas (typically adjacent to a river or coastline) which can flood during high-water events. Floodplains can also be found in low-lying urban areas with no direct hydrological connection to a watercourse that becomes inundated due to water and drainage build-up.

Flooding is part of the earth's natural water cycle. Flooding can be caused by rainwater, but it can also occur due to other water sources such as snow melt, ice jams, or storm surges. The forces of water are continuously changing our landscapes.

Visual 7: Natural and Beneficial Functions of Floodplains



Some of the natural and beneficial functions of floodplains include:

- Storing and conveying floodwaters to help keep them from flooding our homes, schools, hospitals, and businesses.
- Improving water quality where natural vegetation acts as a filter for runoff and overbank flows.
- Regulating the flow of water into rivers and lakes when kept open and free of development.
- Recharging groundwater aquifers, an important water resource for many communities.
- Providing habitats for plants and animals:
 - Some unique species, such as migratory birds or salmon (some of which cannot live anywhere else) find their habitat in floodplains.
- The natural functions of floodplains benefit our communities by supporting our recreational areas, cultural identity, industry, commerce, agriculture, and access to transportation.



**Student
Notes**

Visual 8: Floodplains and the Community Overview

- Floods continuously alter the landscape by either eroding or building up sediment.
- Floodplains provide access to:
 - Transportation
 - Water supply
 - Power supply
- People are drawn to bodies of water to live, work, and enjoy.
- Human development can negatively impact the floodplain.



Over time, floods have altered floodplains, which have influenced human activities. Human activities also influence and alter floodplains.



Student Notes

Floodplains, waterways, and bodies of water were historically integral to human civilization. Today bodies of water provide necessary access to transportation and are also a water and power supply.

The influx of people and industry to waterways has altered floodplains and the dynamics of flooding. The result has been increasing levels of damage and destruction from the combination of natural forces and human development.

With development comes financial investment. There is more to lose when a flood can harm people and damage property.

Visual 9: Benefits of Floodplain Management

- Reduces flood damage risk
- Increases resiliency
- Comprehensive planning can help:
 - o Maintain natural and beneficial functions.
 - o Direct development away from floodplains.
 - o Avoid new infrastructure such as roads that promote further development.
- Regulatory development requirements are important, but are not the only approaches.



Student Notes

- Floodplain management strategies can help reduce the negative impact of development in floodplains and increase resiliency. A good floodplain management program acknowledges that floodplains may also offer many benefits, as we discussed earlier. Smart development in floodplains requires comprehensive planning. This approach considers more than just how to build new houses and structures safely. Comprehensive planning helps to:
 - o Maintain the natural and beneficial functions of floodplains,
 - o Direct development away from floodplains, and
 - o Avoid new infrastructure, such as roads, that promote further development.
- Much of this course will cover the development requirements of the NFIP, which are designed to reduce flood damage risk and increase resiliency. NFIP regulations are not the only approaches to a good floodplain management program. For example, when planning for new development, stakeholders should always consider the potential for future development. For instance, approving the development of roads and sewer services may promote more residential development in that area.

Visual 10: Knowledge Checks 1 and 2

What are three beneficial functions of floodplains?

Why is a strong floodplain management program important?



Answer the questions:



**Student
Notes**

What are three beneficial functions of floodplains?

Why is a strong floodplain management program important?

Prepare to share your responses with the group.

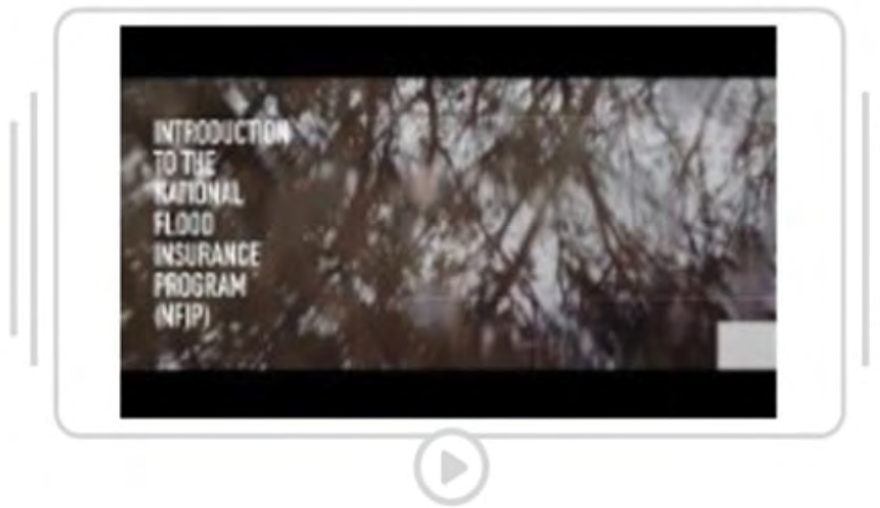
Visual 11: National Flood Insurance Program Framework



Student Notes

- General framework of the NFIP.
- The NFIP plays an integral part in supporting floodplain management activities and mitigating flood risk.

Visual 12: NFIP Overview



You are now going to watch a video [Introduction to the National Flood Insurance Program – a Customer Experience](https://www.youtube.com/watch?v=tYCh2w6Tb3o&t=7s)

(<https://www.youtube.com/watch?v=tYCh2w6Tb3o&t=7s>) that shows the impact of flooding and provides an overview of the NFIP. The NFIP plays an important role in mitigating the risks of flooding and helping property owners better understand flood risks.

Video transcript:

(somber music)

[Derek] It's a very dramatic moment when water begins to enter your house. It's certainly something I'll never forget. It rose over a three-day period to be 32 inches high.

(thunder rumbling, rain dripping)

It stayed like that for approximately five or six days. We were taking a boat into the house and checking the water level and measuring it.

[Narrator] Flooding can happen anywhere, and in Houston in 2017 it didn't just happen in high-risk areas, it happened in a lot of lower-risk areas too.

[Derek] Harvey reinforced a very key statistic. Oftentimes the homes that flood during these rain events are outside of the 100-year flood plain. So you are not safe and not immune to flooding if you're not in a 100-year or 500-year flood plain. Many of my neighbors that were outside the 500-year flood plain did not quite understand their risk of flooding.

[Narrator] When it came time to return home and clean up many in Houston didn't have the resources to recover and rebuild.

[Derek] This is your house, the place where all your children have been raised. You have to get it back. We're a middle-class community. Most of us are not in a position where we have available funding to recover from a major event. It's a tremendous financial burden.

[Narrator] In 1968 Congress created the National Flood Insurance Program, or NFIP. At the time, there weren't many affordable options for private flood insurance, especially for people living in high-risk areas. The government recognized the need for a more affordable program to help communities manage flood risk, no matter their risk level, and help reduce their risk of flooding in the



**Student
Notes**

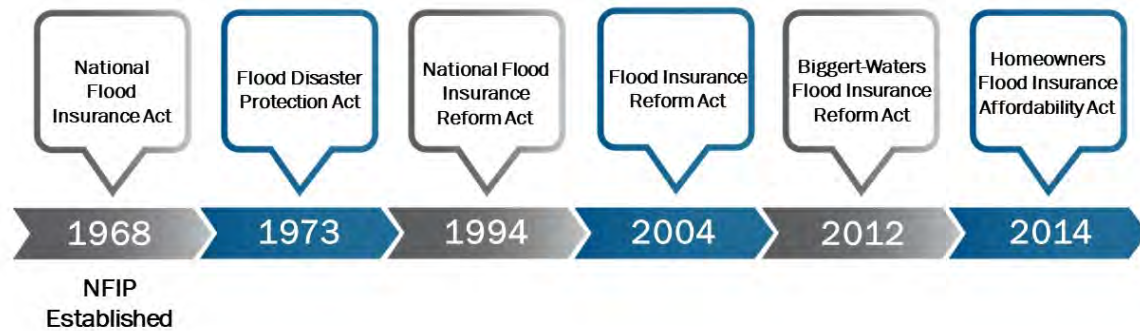
future. Today FEMA programs like the NFIP help communities and property owners better understand their flood risk and how risk can change.

Using flood-risk data and maps, communities can decide how to reduce their risk in ways that work best for them.

[Derek] The rebuilding process really starts with your engagement with flood insurance. Thank goodness we were able to count on that for our recovery. We plan to live in this house for a very long time. We love the community. Our family is here. This is our home.

[Narrator] Learn more about how the National Flood Insurance Program can help your community understand and reduce risk. Visit fema.gov/mitigation.

Visual 13: History of the NFIP



NFIP was established in 1968 with the passage of the National Flood Insurance Act. Since its inception in 1968, the NFIP has been updated and strengthened with the passage of a number of laws.

Important dates in the development of the NFIP:

- 1973: The Flood Disaster Protection Act. This act mandated that when federally regulated lenders make, increase, extend, or renew any loan for structures in a Special Flood Hazard Area, flood insurance must be purchased.
- 1994: The National Flood Insurance Reform Act. This act:
 - Reinforced the requirement to obtain and maintain flood insurance.
 - Required that lenders review the current Flood Insurance Rate Map any time an action is taken on a loan and added monetary penalties for lenders that are not following the rules.
 - 2004: The Flood Insurance Reform Act. This included several reforms, including help for repetitive loss properties (those with multiple flood claims).
- 2012: Biggert Waters Flood Insurance Reform Act. Congress sought to build a more sound financial framework for the NFIP by directing FEMA to remove historic discounts for some policyholders and to move towards actuarial (full-risk) rating. Congress also authorized and funded the national mapping program and certain rate increases. These actions ensured the fiscal soundness of the program by transitioning from subsidized rates (also known as artificially low rates) to full actuarial rates reflective of risk.
- 2014: Homeowner Flood Insurance Affordability Act (HFIAA). This act rolled back some of the changes implemented in 2012. HFIAA continued with rate increases but included limits to them. HIFFA also updated the approach to ensuring the fiscal soundness of the fund by applying an annual surcharge to all policyholders.



**Student
Notes**

Visual 14: NFIP Framework

- Voluntary program
- Federal Government maps the hazard
- Local community agrees to adopt and enforce minimum NFIP standards
- Federal Government provides flood insurance and disaster assistance



FEMA is responsible for managing and administering the NFIP and is focused on establishing a partnership with local communities to ensure the proper implementation of the NFIP. Let's examine the dynamics of this mutually beneficial partnership:



Student Notes

- The NFIP is a voluntary program that communities may choose to join, but joining is not a requirement.
- If communities choose to join the program, they are required to meet certain expectations. To support local communities, the Federal Government maps the hazards that the community uses to regulate development and understand their risk. FEMA also makes Federal flood insurance available to residents of the community.
- The local communities' role in this NFIP partnership is to adopt and enforce local floodplain management ordinances that meet or exceed Federal minimum standards. So, local communities play a significant role by adopting and enforcing the NFIP requirements.

Visual 15: NFIP Participation

- Participation is voluntary.
- Benefits:
 - o NFIP flood insurance
 - o Safer, stronger development in flood-prone areas
 - o Increased resilience in your community
 - o Eligibility for grants and loans



Participation in the NFIP is voluntary; however, it is highly encouraged because of its multiple benefits:

- NFIP flood insurance is available for residents, renters, and business owners in both high-risk and moderate-to-low-risk areas. Buildings in high-risk areas that have loans from federally regulated or insured lenders must carry flood insurance. NFIP flood insurance is only available in participating communities.
- The NFIP helps create safer and stronger development in flood-prone areas through regulations and standards. NFIP minimum regulations and higher standards protect property, save lives, and break the cycle of flood damage.
- As a result of these regulations and standards, NFIP participating communities have increased resilience. Damage to infrastructure, utilities, and property is lessened, helping government, critical facilities, and businesses to stay open or reopen more quickly following an event.
- Participating in the NFIP makes your community eligible for grant and loan support from FEMA, the Department of Housing and Urban Development (HUD), the Small Business Administration (SBA), other Federal agencies, and some State grants and loan programs for mitigation and rebuilding.



**Student
Notes**

Visual 16: Knowledge Checks 3 and 4

Who is responsible for enforcing NFIP regulations?

What are the benefits of NFIP participation?



Answer the questions:

Who is responsible for enforcing NFIP regulations?



**Student
Notes**

What are the benefits of NFIP regulation?

Prepare to share your responses with the group.

Visual 17: Disadvantages of Non-participation in the NFIP

- Inability to get federally-backed flood insurance:
 - o Difficulty obtaining mortgages in high flood risk areas
 - o Flood insurance may be available at a higher cost from private companies.
- Increased physical and financial exposure to damages and devastating flood losses
- Ineligibility for most forms of disaster assistance
 - o For insurable structures in identified flood hazard areas

Communities that do not participate in the NFIP may not understand the value of the program the value of the program. For example, some communities are hesitant to join in a program because they think it will require additional government regulations.

Communities should consider the disadvantages of not joining the NFIP. The following are some of the consequences of non-participation:

- No Federal flood insurance: Non-participation may convey the wrong message to prospective homebuyers and businesses about a commitment to local government and community service. This may result in:
 - Difficulty obtaining mortgages: Many mortgages are connected to Federal funding. In high flood-risk areas, these mortgages require the property to have flood insurance. In a non-participating community where Federally backed flood insurance is unavailable, it's much more difficult to find a loan. Private insurers may be an option, but they are not guaranteed and are typically more expensive.
 - Higher flood insurance costs: While flood insurance may be available from private sources, it may come at a higher cost than the NFIP, and coverage will vary. Additionally, if an area has suffered significant losses after an event, private insurers may pull out of the affected market. So, you can't guarantee that private insurance will always be available.
- Increased exposure: The exposure to flood losses can be both physical and financial. Proposed developments will be at greater risk if they are built to lower standards than the NFIP requires, and if they do not have NFIP flood insurance.
- Lack of certain types of disaster assistance: Non-participating communities are ineligible for certain types of Federal disaster assistance or Federal grants for insurable structures located in identified flood hazard areas. This impacts the ability to do mitigation, construction, repair, or improvements to publicly or privately owned buildings.



**Student
Notes**

Visual 18: The Three-Legged Stool

The NFIP balances three related program areas:

- Flood Hazard Identification (mapping)
- Flood Mitigation (regulations such as building codes and zoning)
- Flood Insurance (provision of federally-backed insurance for property owners in participating communities)



The NFIP is often compared to a three-legged stool. All three legs of the stool must be balanced to support a sound floodplain management program. If a leg is removed, the entire stool will stand crooked or fall.

Three related program areas that support the NFIP include:

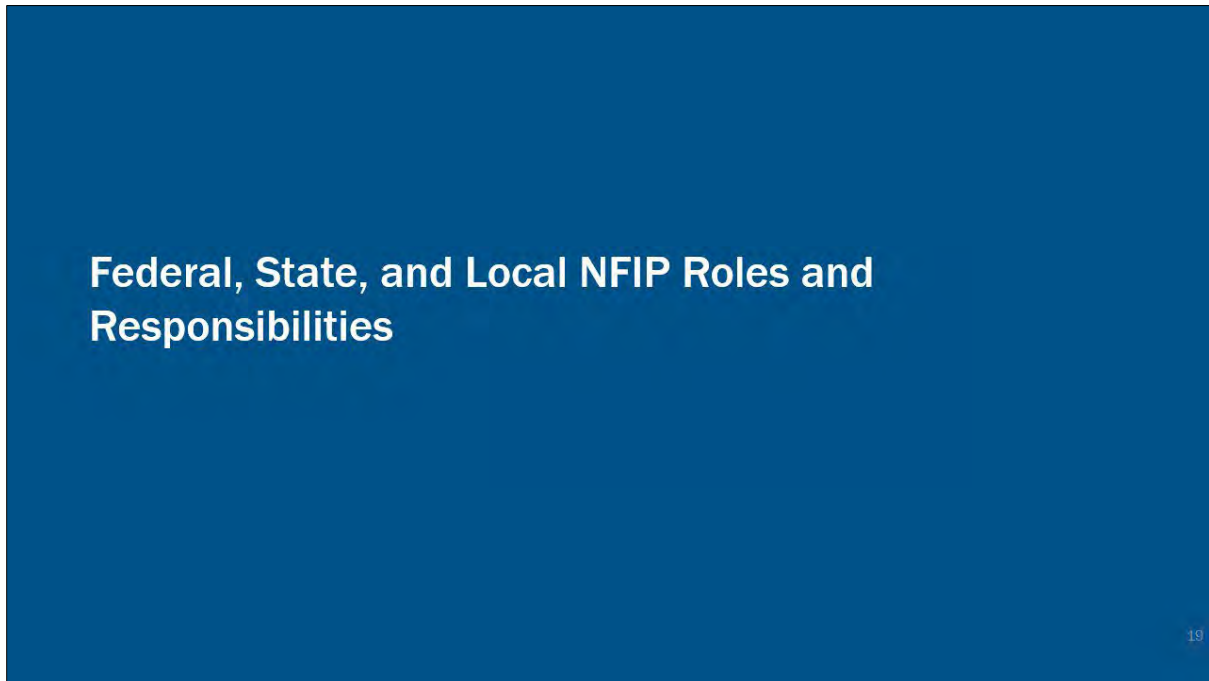
- Flood Hazard Identification: FEMA and its mapping partners help to communicate risk by using scientific methods and technical data to develop Flood Insurance Rate Maps (FIRMs) and Flood Insurance Studies (FISs). If you don't know the flood risk, how can you properly mitigate or insure against it?
- Floodplain Management: This leg refers to local floodplain management regulations, such as building codes; land use planning rules; and ordinances, that communities adopt to help reduce their flood risks. If you know your risk but don't mitigate, insurance will likely be insufficient to recovery fully from financial losses associated with the risk.
- Flood Insurance: Federally backed flood insurance is available for properties in communities that participate in the NFIP and adopt and enforce floodplain management regulations. Even if you mitigate, larger flood events may occur. Insurance can help cover the additional risk of larger flood events that are not addressed by the mitigation.



**Student
Notes**

The Federal government, States, and local communities all play a role to help support each of the three legs of the stool.

Visual 19: Federal, State, and Local NFIP Roles and Responsibilities



**Student
Notes**

Roles and responsibilities of Federal, State, and local agencies.

Visual 20: NFIP Roles and Responsibilities

- Federal
- State
- Local



Student Notes

All levels of government have a role in protecting citizens and property from flooding. As we discussed earlier, the Federal Government (more specifically, FEMA) provides oversight of NFIP. States support local NFIP communities with items such as land use authority. Local communities administer the NFIP by enforcing floodplain management standards by adopting local floodplain ordinances.

Visual 21: Federal Roles (1 of 2)

Federal Government provides:

- National program oversight
- Flood hazard maps and products
- Minimum development standards
- Federally-backed flood insurance
- Mitigation planning and technical assistance
- Federal grant funding



**Student
Notes**

FEMA provides NFIP oversight. To support local and government agencies, FEMA and its mapping partners develop and maintain flood hazard data on an ongoing basis. FEMA and the Federal Government also help State and local government agencies by:

- Establishing the minimum standards for development and construction in the floodplains;
- Providing Federal flood insurance coverage in communities that participate in the NFIP;
- Encouraging mitigation planning and providing technical guidance to local, State, territorial, and Tribal governments, as well as property owners, developers, and other NFIP constituents; and
- Administering Federal mitigation grant programs that provide funding to State, local, Tribal, and territorial governments, ensuring these communities can rebuild in a way that reduces or mitigates future disaster losses.

Visual 22: Federal Roles (2 of 2)

FEMA Regional Offices:

- Work with State NFIP coordinating agencies
- Provide technical assistance to local officials
- Answer questions from design professionals and the public
- Evaluate local floodplain management compliance



Student Notes

- FEMA has ten regional offices, each with a Mitigation Division that coordinates the NFIP with States and local communities.
- Each regional office covers between four to eight States and territories. The regional offices advise local officials on administering their ordinances.
- Regional offices are available to answer questions from design professionals and the public.
- Both FEMA and the States evaluate and document local floodplain management compliance.

Visual 23: Knowledge Check 5

How does FEMA help support the NFIP in local communities? Provide at least three examples.



Answer the question:

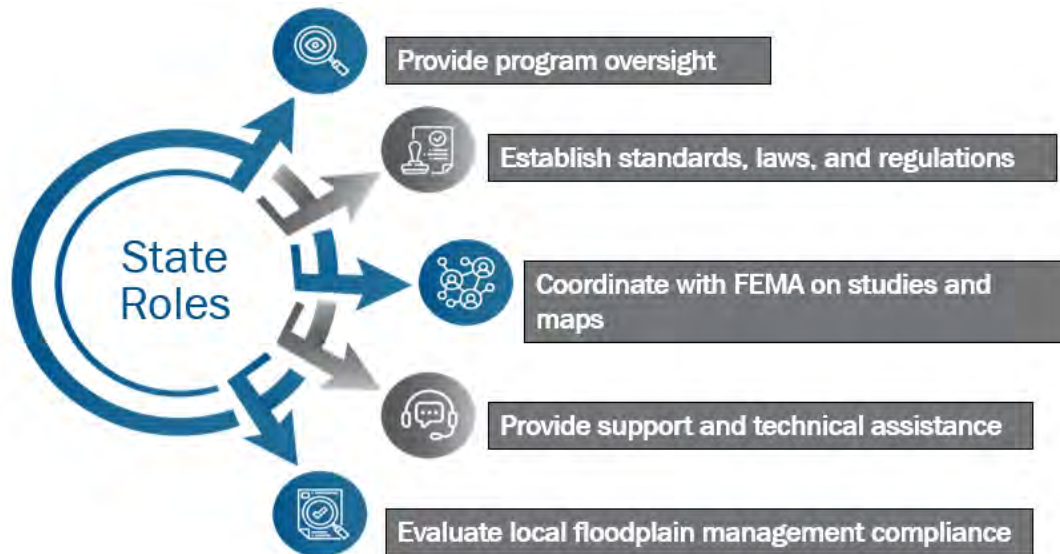


**Student
Notes**

How does FEMA help support the NFIP in local communities? Provide at least three examples.

Prepare to share your responses with the group.

Visual 24: State Roles



State government play an important role in floodplain management.

Their responsibilities include:

- Providing enabling land use authority for communities to be able to enforce NFIP regulations and to join the program. Many States also have adopted floodplain management statutes and regulations that go above and beyond FEMA's minimums through their own floodplain management programs.
- Establishing and enforcing floodplain management regulations for State-owned properties. These properties must meet minimum NFIP standards and any other higher standards. Some States also manage their own FEMA mapping projects through a cooperative agreement with FEMA. If you're not sure where your land use authority comes from, contact your State's NFIP Coordinator or FEMA Regional Office.
- State NFIP Coordinators ensure that other State agencies have policies and regulations that are compliant with the minimum NFIP standards. FEMA also works with States to provide technical assistance to communities on NFIP requirements. Finally, both States and FEMA coordinate efforts to evaluate and document local compliance with floodplain management standards.



Student Notes

Visual 25: Community Assistance Program — State Support Services Element (CAP-SSSE)

- Provides funding support to States through agreement
- CAP-SSSE goals:
 - Grow local capacity and capability to improve resiliency through floodplain management
 - Build state floodplain management capability and promote strong state inter-agency coordination and collaboration
 - Promote the benefits and drive demand for strong floodplain management development standards and insurance



FEMA regional offices and a designated State agency negotiate a CAP-SSSE agreement that specifies activities and products to be completed by a State in return for CAP-SSSE funds.

States develop and meet performance commitments that align to the achievement of the CAP-SSSE program goals.

The following are the program goals:



Student Notes

- Grow local capacity and capability to improve resiliency through floodplain management: States leverage engagements and relationships with communities to build the local ability to manage flood risk.
- Build State floodplain management capability and promote strong State inter-agency coordination and collaboration: States invest in growing their technical expertise and capacity and position the office to better serve as the State's coordination point to advance floodplain management and mitigation.
- Promote the benefits and drive demand for strong floodplain management development standards and insurance: States educate communities and the public on the values of higher standards and insurance coverage.

Visual 26: NFIP Legal Authority



Student Notes

- The local community has the authority to adopt and enforce floodplain management regulations. FEMA does not have land use authority at the local level.
- All States have statutes that grant communities the ability to establish local land use regulations to serve the health, safety, and welfare of their citizens. These State-enabling authorities allow a community to adopt floodplain management regulations required for community participation in the NFIP. However, for Tribes, this authority may vary.
- Communities will adopt floodplain management regulations based on their community hazards and needs. These regulations can be found in land use or zoning regulations, building codes, or as stand-alone ordinances.
- Your State NFIP Coordinator is always a resource if you have a question about your State's enabling statutes or unique provisions.

Visual 27: Knowledge Checks 6 and 7

Is the State or Federal Government responsible for providing enabling land use authority for communities to adopt NFIP regulations?

Who can you contact at your state if you need floodplain Management support or technical assistance?



Answer the questions:

Is the State or Federal Government responsible for providing enabling land use authority for communities to adopt NFIP regulations?



**Student
Notes**

Who can you contact at your state if you need floodplain Management support or technical assistance?

Prepare to share your responses with the group.

Visual 28: Local Roles

- Adopt a local floodplain management ordinance that meets Federal NFIP minimums (and State higher standards)
- Designate a Floodplain Administrator (FPA)
- Promote good floodplain management
- Tribal governments have unique roles in the NFIP



NFIP participating communities must do the following actions:

- Enforce floodplain management standards by adopting local floodplain ordinances. They must enforce these regulations in the mapped flood hazard areas, but they are encouraged to adopt standards higher than the NFIP minimum requirements, as applicable.
- Appoint an official with the responsibility, authority, and means to implement the commitments of the program. This person is generally called the community's Floodplain Administrator (FPA).
- Promote proactive floodplain management:
 - The Floodplain Administrator should become a trusted and knowledgeable resource who administers the program in an equitable fashion.
 - Communities also help their local citizens understand the importance of good floodplain management and what is being done to protect them.



Student Notes

Tribal governments' unique authorities, roles, and responsibilities within the NFIP are a combination of State and local community roles. Federally recognized Tribal governments have powers and NFIP roles similar to those of a State, whereas the land use authority and power of local governments are dictated by their respective States. Any Tribal government with land use authority can join the NFIP and are considered an NFIP participating community.

Visual 29: Floodplain Administrator Permitting Responsibilities

- Issue or deny permits for buildings and all floodplain development
- Inspect development to assure compliance with local regulations
- Pursue code enforcement action on non-compliant development
- Make Substantial Improvement (SI) and Substantial Damage (SD) determinations
- Maintain records in perpetuity
- Provide technical assistance to citizens



Remember, regulating floodplain development is a local responsibility. After a locality has designated a Floodplain Administrator, one of their major responsibilities is permitting. Floodplain Administrator permitting responsibilities include the following:



Student Notes

- Issue or deny permits for buildings and all floodplain development.
- Inspect development to assure compliance with local regulations.
- Pursue code enforcement action on non-compliant development.
- Make Substantial Improvement (SI) and Substantial Damage (SD) determinations.
- Maintain records in perpetuity.
- Provide technical assistance to citizens.

These responsibilities should be included in any local flood damage prevention ordinance. We will discuss more about the permitting process later in Unit 5.

Visual 30: Floodplain Administrator Responsibilities

- Be familiar with enabling statutes
- Protect human life and the community
- Assist FEMA with flood map preparation and revision
- Provide information to residents on flood hazards, map data, flood insurance, and proper development
- Communicate clearly:
 - Explaining the benefits of floodplain management is an important part of the job.
 - You will need to communicate with a wide range of people.
 - Floodplain management concepts can be difficult to explain to some audiences.

Because communities adopt floodplain management regulations based on their community hazards and needs, there can also be unique provisions or specific State requirements that apply.

Floodplain Administrators should be familiar with these requirements. Statutes that meet the NFIP minimum requirements designate the FPA with the authority to protect human life and community.

Additional Floodplain Administrator responsibilities are as follows:



Student Notes

- Assist FEMA with flood map preparation and revision so that the maps most accurately depict the community's flood risk.
- Provide information to residents on flood hazards, map data, flood insurance, and proper development.
- Understand the NFIP to clearly communicate requirements to various community stakeholders in layman's terms.
- Explain the benefits of floodplain management to a wide range of people.

Now that you are familiar with the fundamentals of floodplain management, let's assess what you have learned by completing a knowledge check and an activity.

Visual 31: Knowledge Check 8

What are the floodplain management responsibilities of Floodplain Administrators?



**Student
Notes**

Answer the question:

What are the two floodplain management responsibilities of Floodplain Administrators?

Prepare to share your responses with the group.

Visual 32: Activity 2.1: Matching NFIP Responsibilities



Review the activity instructions.

- Match the answer to the level of government.
- Prepare to share your responses.

Activity 2.1: Matching NFIP Responsibilities

Purpose:

In this activity, you will match NFIP responsibilities.

Time: 10 minutes

Materials: (Located in Student Manual)

- Figure 1 Graphic Organizer Activity 2.1: Matching NFIP Responsibilities

Activity

Instructions:

- Work individually.
- Use the graphic organizer and write the letter role and responsibility that applies to the level of government.
- Include the letter under the correct level of government. You may use the same letter for multiple government agencies.
- Prepare to share your response with the instructor.

FIGURE 1 GRAPHIC ORGANIZER ACTIVITY 2.1: MATCHING NFIP RESPONSIBILITIES**Level of Government****Roles and Responsibilities****Federal**

1. Adopt and enforce floodplain management standards that meet NFIP minimums.

State

2. Provide program oversight and technical assistance to local governments.

Local

3. Make Substantial Improvement (SI) and Substantial Damage (SD) assessments.

4. Set minimum NFIP standards.

5. Set higher standards that local communities may be required to adopt.

6. Designate a Floodplain Administrator

7. Issue or deny permits for buildings and all floodplain development.

Visual 33: Unit 2 Summary

After completing this unit, you are now able to:

- Describe the functions of floodplains.
- Describe the general framework of the NFIP.
- Explain the roles and responsibilities of Federal, State, and local governments in the NFIP.



You have completed Unit 2. You are now able to:

- Describe the functions of floodplains,
- Describe the general framework of the NFIP, and
- Explain the roles and responsibilities of Federal, State, and local governments in the NFIP.



**Student
Notes**

Remember that administering and enforcing NFIP requirements are a local responsibility; however, Federal and State partners provide support to communities in administering their programs.

Unit 3: Risk Determination: Maps and Studies

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Visual 1: Unit 3: Risk Determination: Maps and Studies

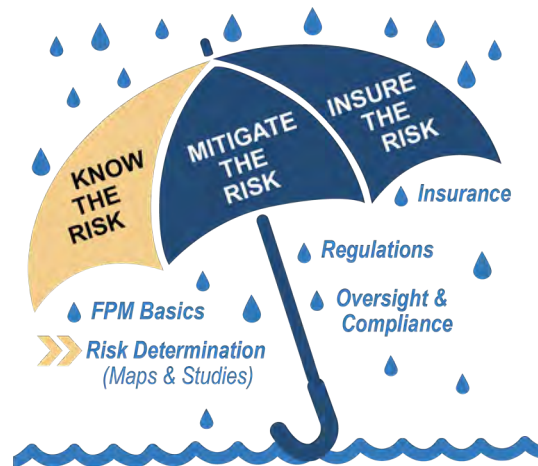
Unit 3: Risk Determination: Maps and Studies



Student Notes

Welcome to Unit 3: Risk Determination: Maps and Studies. This unit should take about 1 hour and 45 minutes to complete.

Visual 2: Course Map Umbrella



Student Notes

You are now reviewing the Know the Risk element of the NFIP umbrella. Some topics we will discuss under this part of the umbrella include determining Base Flood Elevation (BFE) and the Floodplain Administrator's responsibilities regarding map changes.

Visual 3: Unit 3 Objectives

After completing this unit, you should be able to:

- Define the impact of water forces.
- Explain the maps and flood studies Floodplain Administrators use to identify hazard information and determine the Base Flood Elevation (BFE).
- Describe the resources available on the FEMA Flood Map Service Center (MSC).



**Student
Notes**

After completing this unit, you should be able to:

- Define the impact of water forces,
- Explain the maps and flood studies Floodplain Administrators use to identify hazard information and determine Base Flood Elevation (BFE), and
- Describe the resources available on the FEMA Flood Map Service Center (MSC).

Visual 4: Unit 3 Topics



Understanding Flood Maps and Studies

- Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) Components
- Determining the BFE
- Activity 3.1: Mapping Exercise: Flood Zone and BFE
- Overview: The FEMA MSC
- Overview: Changing Maps
- Unit Summary

Topics in this unit:



Student Notes

- Understanding Flood Maps and Studies
- Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) Components
- Determining the Base Flood Elevation (BFE)
- Activity 3.1: Mapping Exercise: Flood Zone and BFE
- Overview: The FEMA MSC
- Overview: Changing Maps
- Unit Summary

Visual 5: Understanding Flood Maps and Studies

Understanding Flood Maps and Studies



**Student
Notes**

- Foundational concepts of flood maps and studies.
- Basic understanding of key terms, the various elements of a flood map, and the purpose of a Flood Insurance Study (FIS).

Visual 6: Forces of Floodwater

- Floodwaters threaten structures encroaching on the floodplain, **causing flotation, collapse, or lateral movement.**
- Flood forces can cause damage in different ways:
 - Buoyant forces: Uplift or float
 - Hydrostatic forces: Standing water
 - Hydrodynamic forces: Moving water
- Debris impacts and water damage



Review of the forces involved with flooding.

Floodwaters can exert severe forces, causing the flotation, collapse, or lateral movement of structures encroaching on the floodplain. This is what the minimum NFIP construction standards aim to prevent.



Student Notes

Flood forces can cause damage in different ways:

- Buoyant forces: Floodwaters can uplift or float a building.
- Hydrostatic forces: The force of standing water can collapse a building.
- Hydrodynamic forces: The force of moving water can push a building laterally (sideways) off its foundation.

Additionally, debris floating in floodwaters can damage structures and cause injury to individuals responding to or evacuating the flooding. Water damage to structures also occurs during a flood.

Visual 7: Base Flood

- The base flood is a flood having a 1% chance of being equaled or exceeded in any given year.
- Base Flood Elevation (BFE) is the expected water surface elevation of the base flood.
- To determine a community's risk to flood hazards, FEMA performs an engineering study to determine the extent and elevation of the 1% annual chance flood event.



Student Notes

Key terms to help you understand flood maps and studies.

A base flood is a flood having a 1% chance of being equaled or exceeded in any given year. While you may see the term “100-year flood,” this term is not preferred because it can be misleading. Having a big flood in 1 year does not mean you are safe for the next 99 years; the 1% annual chance exists every year.

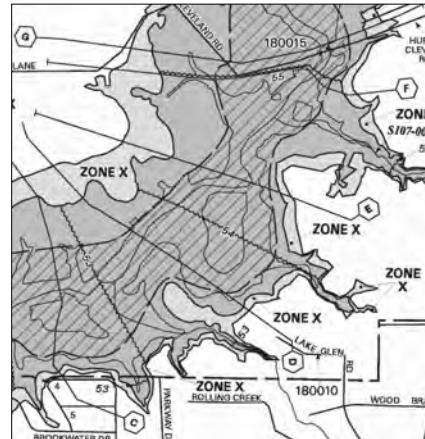
The Base Flood Elevation, or BFE, is the water surface elevation in a flood that has a 1% chance of being equaled or exceeded in any given year.

Many of the regulations you will learn on this course will reference the BFE. Particularly when referring to elevating buildings and utilities above the BFE or protecting any part of a building that is below BFE and thus subject to flooding.

To determine a community's flood hazard risks, FEMA performs an engineering study to calculate the extent (size) and depth (elevation) of the base flood event, also known as the 1% annual chance flood.

Visual 8: Special Flood Hazard Area (SFHA)

- Identified zones on the Flood Insurance Rate Map (FIRM) as being inundated by the 1% annual chance flood
- Required enforcement of floodplain standards in local ordinance applies
- Mandatory purchase of flood insurance



Student Notes

The Special Flood Hazard Area (SFHA) is the portion of the natural landscape that is predicted by a flood study to be inundated (flooded) under the base flood event.

The NFIP floodplain management regulations must be enforced in the SFHA, so the SFHA is also referred to as the regulatory floodplain. The SFHA is also where property owners with federally backed loans are required to purchase flood insurance. We will talk more about these requirements later in Unit 6: Flood Insurance.

Visual 9: SFHA Zones Start With A or V

Zones A, AE, AO, and AH

- Riverine flooding
- Shallow flooding



Zones V and VE

- Coastal flooding



**Student
Notes**

The FIRM depicts the SFHA or regulatory floodplain. The SFHA is identified by zones starting with the letter “A” or “V.”

Visual 10: Non-Coastal (Riverine) Flood Zones

- **Zone A:**
 - Areas with a 1% annual chance of flooding mapped by approximate methods
 - BFEs **not** determined
- **Zone AE:**
 - Areas with a 1% annual chance of flooding where BFEs have been determined
 - Called Zones A1-A30 on older FIRM



Riverine flooding occurs when streams and rivers exceed the capacity of their natural or constructed channels, and water overflows the banks, spilling out into adjacent low-lying, dry land.

The following riverine flood zones are the most common on a FIRM:

- **Zone A:** Areas with a 1% annual chance of flooding mapped by an approximate or non-detailed flood study. Here, the extent (or size) of the base flood is mapped, but no depths or BFEs are shown.
- **Zone AE:** Areas with a 1% annual chance of flooding where the BFEs are determined by a detailed flood study. This zone may or may not include a regulatory floodway.



Student Notes

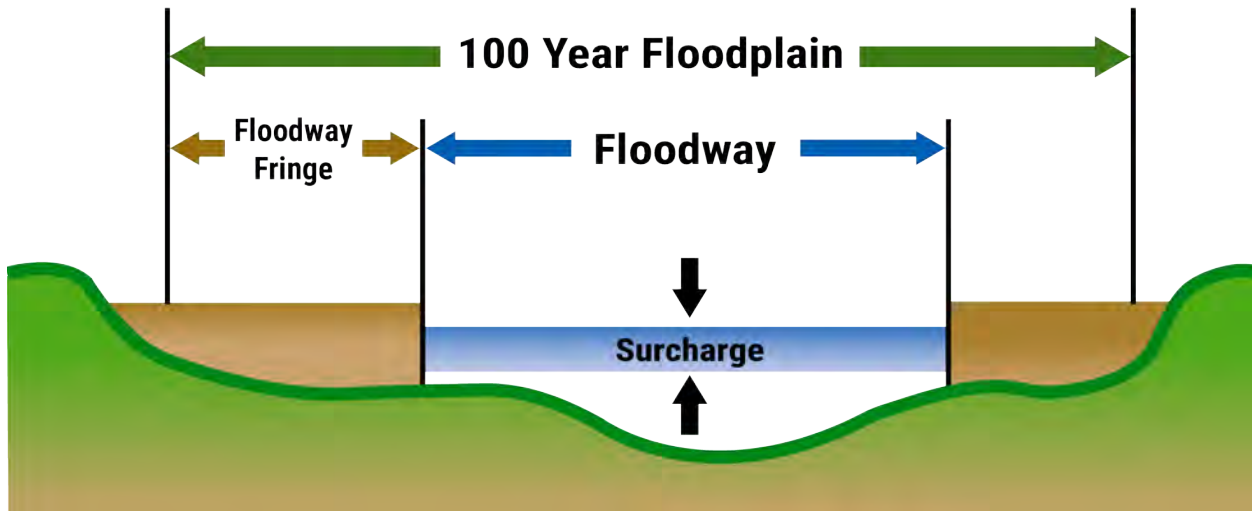
Older FIRMs used numbering (Zones A1-A30) for detailed study areas, while newer FIRMs simply use an “E” to indicate that elevations are established in these zones.

Some less common riverine flood zones include:

- **Zone A99:** This is a Federal area of flood protection that is under construction.
- **Zone AR:** This is the decertification of a previously accredited flood protection system.

Visual 11: Regulatory Floodway

- The channel of a river or other watercourse and 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.
- May be mapped in riverine AE Zones as part of a detailed flood study



Sometimes, riverine AE zones also have what is called a regulatory floodway. The NFIP defines the regulatory floodway as “the channel of a river or other watercourse and 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.”



Student Notes

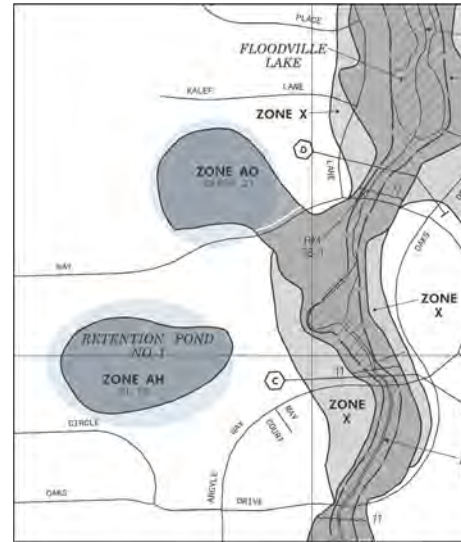
The regulatory floodway is the result of a flood modeling exercise. The model designates a portion of the floodplain that must be kept open (free of development and encroachments) to safely convey the floodwaters.

An extra level of regulatory protection applies to the mapped floodway, which you’ll learn about in Unit 4.

Once a floodway is designated within an AE zone, the remainder of the AE zone, where development and encroachments are permitted, is called the flood fringe

Visual 12: Shallow Flooding Zones

- Average flooding depths of 1–3 feet
- Velocities of 1–5 feet per second
- **Zone AO: Sheet Flow**
- **Zone AH: Ponding**



Shallow flooding zones are mapped in areas where no defined channel exists, and the ground is relatively flat. The floodwaters are shallow and are either still or are slow-moving. Average flood depths in these zones are 1–3 feet and water velocities are usually between 1 foot and 5 feet per second.



Student Notes

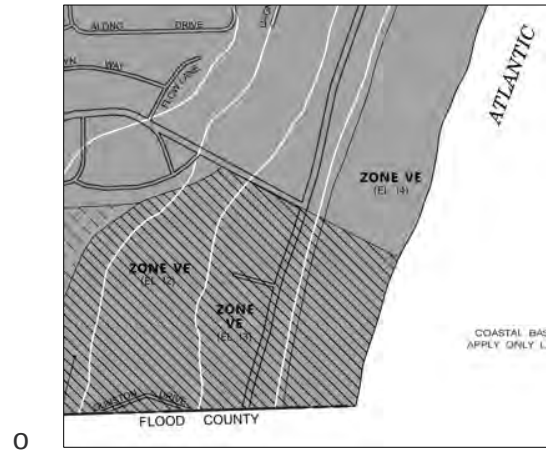
Shallow flooding zones are labeled on maps as Zones AO or AH. The "O" in AO is for overland flow, and the "H" in AH is for holding (or standing water) areas.

Zone AOs are areas inundated by the 1% annual chance flood event where the flooding is usually in the form of sheet flow or moving water over sloped terrain.

Zone AHs are areas inundated by the 1% annual chance flood event where the flooding is usually areas of ponding or standing water.

Visual 13: Coastal High Hazard Areas

- **Zone V:** BFEs not determined
- **Zone VE:** BFEs determined
 - Called Zone V1-30 on older FIRMs
- Wave heights greater than three feet
- Subject to flooding:
 - Storm surge and wave action
 - Coastal erosion



Coastal High Hazard Areas are subject to additional hazards due to wind and wave action that occur from severe storms, hurricanes, and seismic sources.

These areas are identified on FIRMs as zones with the letters V or VE. Like Zones A and AE, BFEs may or may not be determined.

Wave heights of 3 feet or higher are expected.

In addition to wave action or wave runup flooding, coastal high-hazard areas are also subject to flooding from coastal erosion.

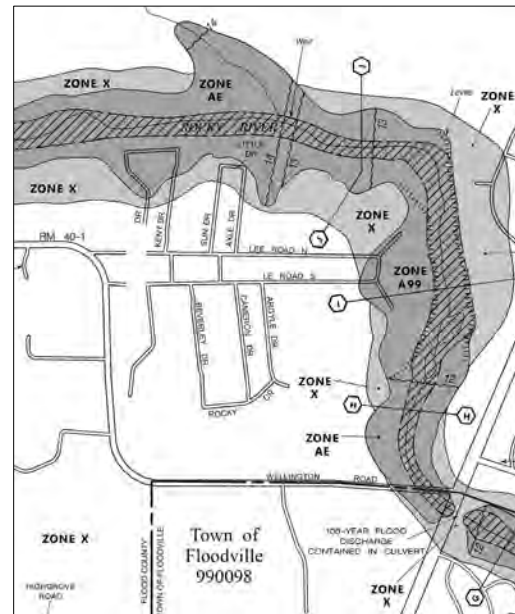
V zones appear along the Atlantic and Pacific Oceans, the Gulf of Mexico, and large lakes, such as the Great Lakes.



Student Notes

Visual 14: Outside of the SFHA

- **Zone X (shaded):** Moderate flood hazard
 - 0.2% annual chance floodplain or “500-year”
 - Called Zone B on older FIRMs
- **Zone X:** Low flood hazard
 - Called Zone C on older FIRMs
- **Zone D:** Area of undetermined risk



Zones that are outside the SFHA include X (shaded), X, and D. Minimum NFIP regulations and mandatory flood insurance purchase rules do not apply to these zones; however, building code rules or other community flood protections may still apply.

Areas of moderate flood hazard have a different shading or coloring than SFHA zones. These are called Zone X (shaded) or “Shaded X” Zones, and they represent the areas between the limits of the 1% annual chance flood and the 0.2% annual chance or 500-year flood. On older FIRMs, these were labeled Zone B.



Student Notes

The areas of minimal flood hazard, which are outside the SFHA and higher than the elevation of the 0.2% annual chance flood, are unshaded and appear white on this map. They are labeled Zone X. On older flood maps these were labeled Zone C.

Zone D areas are those of undetermined risk, with possible but undetermined flood hazards. No flood hazard analysis has been conducted in these areas.

These areas are outside the 1% annual chance of flood zones; however, this does not mean there will be zero risk of flooding.

Visual 15: Knowledge Check 1

What flood zone letter on the FIRM matches the following flood zone description?

Inland or riverine areas with a 1% annual chance of flooding, where no depths or BFEs are shown



**Student
Notes**

Answer the question:

What flood zone letter on the FIRM matches the following flood zone description?

Inland or riverine areas with a 1% annual chance of flooding, where no depths or BFEs are shown

Prepare to share your responses with the group.

Visual 16: Knowledge Check 2

What flood zone letter designation matches the following flood zone description?

Coastal areas with a 1% annual chance of flooding and additional hazards associated with wind and wave action, wave heights greater than three feet, and BFEs shown at selected intervals



Answer the question:



**Student
Notes**

What flood zone letter designation matches the following flood zone description?

Coastal areas with a 1% annual chance of flooding and additional hazards associated with wind and wave action, wave heights greater than three feet, and BFEs shown at selected intervals

Prepare to share your responses with the group.

Visual 17: FIRM and FIS Components

FIRM and FIS Components

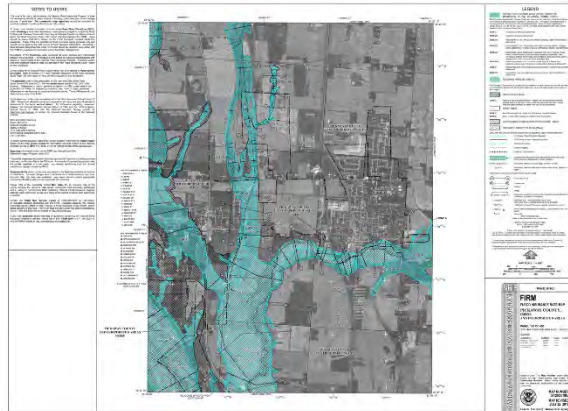


**Student
Notes**

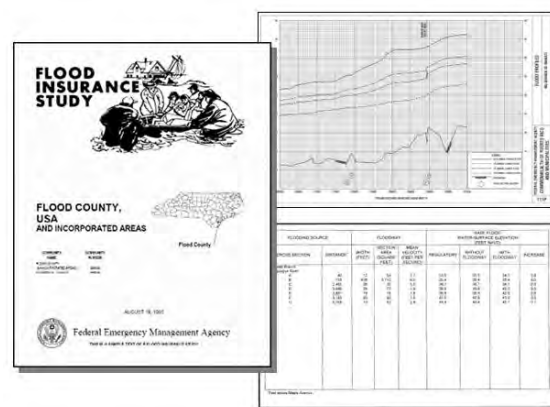
- Various components that exist in a FIRM and FIS.
- Explain how these tools are used to support floodplain management activities.

Visual 18: Flood Study Regulatory Products

FIRM



Flood Insurance Study (FIS)



The Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) are FEMA's two regulatory products that go together to support floodplain management activities.



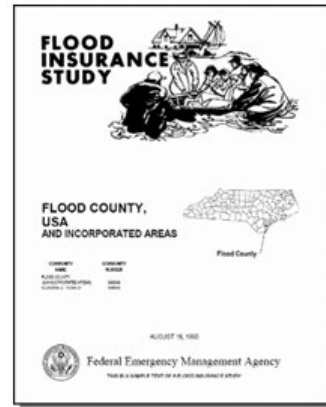
Student Notes

Floodplain Administrators and supporting partners use these two products to identify and mitigate flood risk for various situations ranging from new construction to explaining high-risk areas to administrative officials.

Communities must maintain adequate copies of their current (or effective) maps and studies and keep them updated. It's important to keep copies of old revised maps, as they provide a historical record.

Visual 19: Flood Insurance Study (FIS)

- Includes background information on the area studied
- Describes engineering methods and data used to determine the BFE
- May contain additional detailed data:
 - Floodway Data Tables
 - Flood Profiles
 - Stillwater Elevation Data Tables
 - Coastal Transect Parameters



An FIS is the source of technical data and risk information for the adoption of floodplain regulations. The FIS provides the history of flooding in the community and describes engineering methods and data used to establish BFEs.



Student Notes

The FIS also contains flood profiles and other tables with additional detailed information. Depending on the type of flood hazards studied (e.g., riverine, coastal, lakes) in an area, some or all of these data tables and flood profile graphs will be present.

Because profile graphs and tables in the FIS contain more detailed data than the FIRM displays, they are very important for Floodplain Administrators to use when determining BFEs as accurately as possible (i.e., to the nearest 0.1 foot).



Handout

Due to the detail and thoroughness involved with a study, a FIS is often a large multi-volume document.

Refer to Handout 3.1: Flood County FIS.

Use this document to follow along with the topic discussion for the FIS.

Visual 20: Floodway Data Tables

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Rocky River								
A	4,395	115	1,233	6.1	9.9	9.9	10.0	0.1
B	5,537	13	142	9.2	10.4	10.4	10.5	0.1
C	9,810	125	323	8.4	10.9	10.9	11.1	0.2
D	10,995	85	861	7.2	11.2	11.2	11.3	0.1
E	12,695	245	1,587	6.1	11.3	11.3	11.4	0.1
F	13,845	270	2,403	4.5	11.5	11.5	11.5	0.0
G	14,513	230	2,553	3.7	11.6	11.6	11.6	0.0
H	16,625	180	2,000	4.2	11.7	11.7	11.7	0.0
I	18,209	415	2,566	3.9	12.5	12.5	12.7	0.2
J	20,849	250	2,581	4.9	13.0	13.0	13.2	0.2
K	25,360	340	2,924	3.6	14.0	14.0	14.2	0.2

¹Feet above county boundary

TABLE 6	FEDERAL EMERGENCY MANAGEMENT AGENCY	FLOODWAY DATA
	FLOOD COUNTY, USA AND INCORPORATED AREAS	ROCKY RIVER

Refer to page 17 in Handout 3.1 and review the Floodway Data Table.

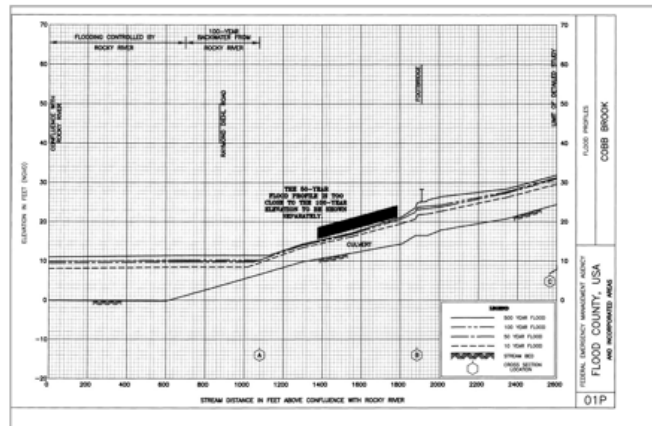


Student Notes

Floodway Data Tables present data from the hydraulic analysis for riverine studies at specific cross sections along a stream, like the width of the floodway and the elevation of the base flood.

These tables identify the distance to each cross-section from a downstream reference point, such as the mouth of the flooding source or a county boundary.

Visual 21: FIS Flood Profile



Refer to page 24 in Handout 3.1 and review the FIS Flood Profile.



Student Notes

A Flood Profile is a large, gridded graph showing detailed flood elevation data for rivers and streams.

Profile lines for the various flood recurrence intervals are shown, as are the streambed and certain bridges or culverts across the stream.

The detailed data in these profiles make them very important for floodplain managers to use when determining riverine BFEs to the nearest 0.1 foot.

Visual 22: Stillwater Elevation Table

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				



Student Notes

Refer to page 8 in Handout 3.1 and review the Stillwater Elevation Table.

For inland lakes, ponds, or reservoirs, the FIS includes Stillwater Elevation Tables that describe the BFEs. For oceans, Stillwater Elevation Tables provide elevations without waves. For each flooding source, the projected elevation of floodwaters in the absence of waves is shown for various flood frequencies.

Visual 23: Coastal Transects

Developed to calculate the heights of flooding, including wave action

TRANSECT	LOCATION	ELEVATION (feet NGVD)	
		100-YEAR STILLWATER	MAXIMUM 100-YEAR WAVE CREST ²
1	Shoreline of Flood County, approximately 1,000 feet southeast of the intersection of Tralee Road and McLaughlin Drive, extending inland approximately 5,400 feet to Old Ventures.	10.0 ¹	14.2
2	Shoreline of Flood County, between McLaughlin Drive and Flower Street, extending inland approximately 4,300 feet to Palmeri Drive.	10.0 ¹	14.2
3	Shoreline of Flood County approximately 300 feet southwest of the intersection of State Route 45 and View Way, extending inland approximately 4,700 feet to Stone Trail.	10.0 ¹	14.2

¹ Includes wave setup of 0.5 foot
² Because of map scale limitations, the maximum wave elevation may not be shown on the FIRM

Each transect was taken perpendicular to the shoreline and extended inland to a point where wave action ceased. Along each transect, wave heights and elevations were computed considering effects of changes in ground elevation, vegetation, and physical features. The stillwater elevations for the 100-year flood were used as the starting elevations for these computations. Wave heights were calculated to the nearest 0.1 foot, and wave elevations were determined at whole-foot increments along the transects. The location of the 3-foot breaking wave for determining the terminus of the V Zone (area with velocity wave action) was also computed at each transect.

Refer to page 12 in Handout 3.1 and review the Coastal Transects table.



Student Notes

For coastal studies (along the Pacific and Atlantic Oceans, in the Great Lakes, and the Great Salt Lake), coastal transect descriptions are developed to calculate the heights of flooding, including wave action.

The locations, wave crest, and stillwater elevations for these transects are described in a series of tables.

A companion Coastal Transect Parameters table provides the flood hazard zone and BFEs for each transect flooding source.

Visual 24: Flood Insurance Rate Map (FIRM)

Identifies:

- Flood zones, based on the FIS
- BFEs (rounded)
- Community names and boundaries
- Streets, geographic features, watercourse names, and other relevant labels

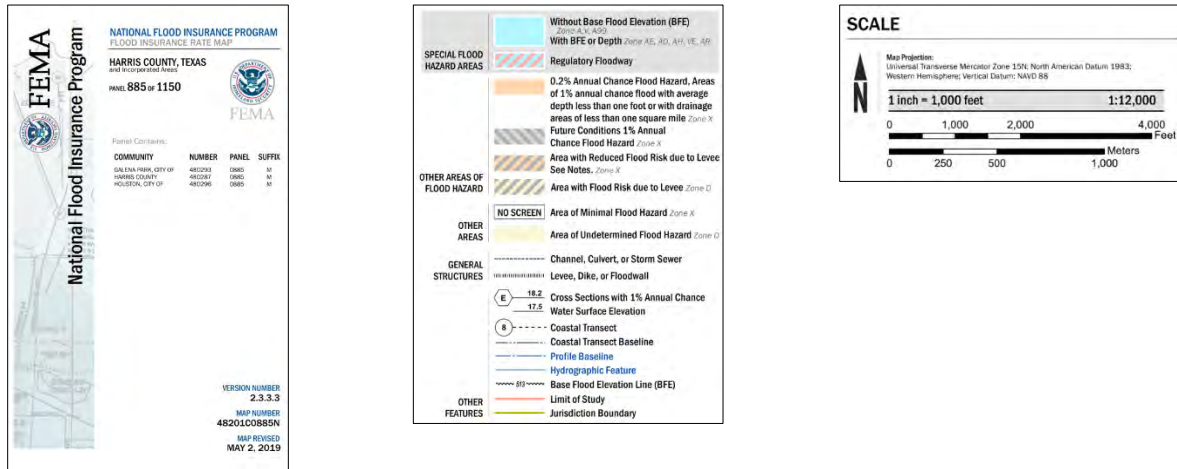


**Student
Notes**

- The FIRM identifies the SFHA and the specific flood zones applicable to that community. This information is based on the engineering analysis/flood study conducted for a given area. (i.e., county or watershed). The mapped SFHA zones beginning with A or V depicted on the FIRM are where the local floodplain regulations apply and where lenders enforce the mandatory flood insurance purchase requirement. Map panels are quite large, so only a portion of a FIRM is displayed on the screen.
- Depending on the type of flood study and the flood risks present, the FIRM may show regulatory floodplains with or without BFEs. The FIRM may include riverine areas where a regulatory floodway has been delineated. Coastal high-hazard areas may have additional information.
- Other lines and symbols are used to indicate things like the approximate BFE, riverine cross sections, and other features like roads, bridges, and culverts. Community boundary lines on the FIRM may be colored or dashed.

Visual 25: FIRM Panel Elements

Title Block, Legend, Scale Bar, and North Arrow



In addition to the map itself, the FIRM panel contains the following elements:

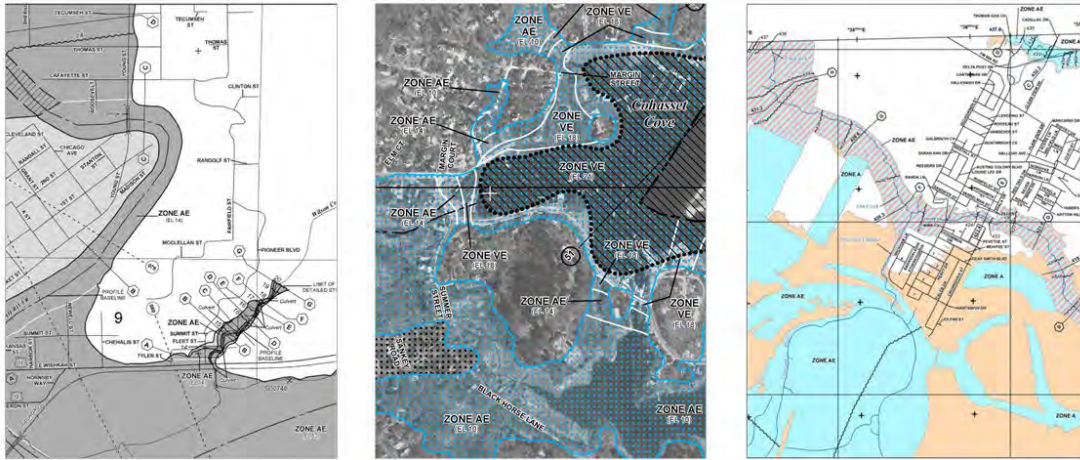


Student Notes

- The title block, which lists the title of the flood study, map panel number, effective date, and the communities shown
- The map legend, which describes the symbols and features that are displayed
- The scale bar
- The north arrow

FIRMs may also have an area that displays notes to the user, important information about how the map was created, data sources, and references.

Visual 26: Various Styles of FIRMs

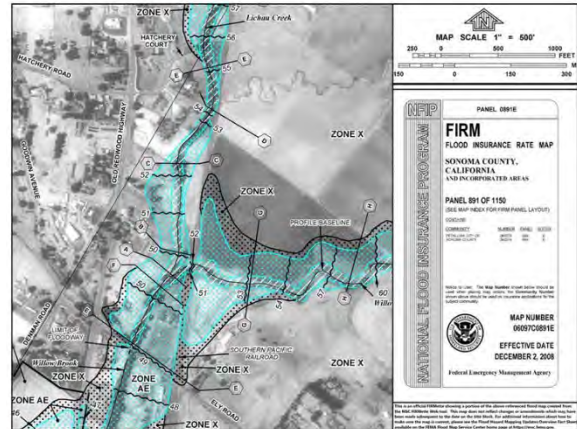


Student Notes

Review the examples of various map styles on the screen. Depending on when the map was made, the FIRM may be entirely grayscale, contain a single blue color with variations in shading, or be multi-colored. The FIRM may or may not include aerial imagery.

Visual 27: FIRMette

- An official copy of a portion of a FIRM panel
- [Generated on FEMA Flood Map Service Center \(MSC\)](https://msc.fema.gov/portal/home)
(<https://msc.fema.gov/portal/home>)



Student Notes

FIRMettes are an official copy of a portion of a FIRM panel. They show the same components as a full panel FIRM, but a full panel is too large to detail on a single screen or page.

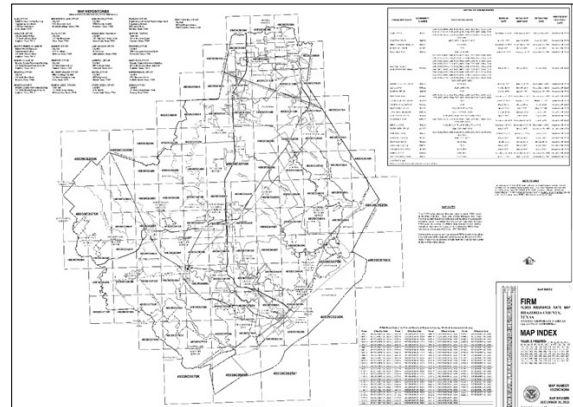


Online Resource

Floodplain Administrators can create a FIRMette online using FEMA's Map Service Center (MSC). The [FEMA MSC](https://msc.fema.gov/portal/home) is available at <https://msc.fema.gov/portal/home>.

Visual 28: FIRM Index

- A Table of Contents map:
 - Shows locations for each FIRM panel in a flood study
- Title block:
 - Title of the flood study
 - Unique map index number
 - Effective or revised date
 - List of FIRM panels in the study



Some panels may not be printed.

A FIRM index is like the table of contents for the maps—it's the high-level list of all the FIRM panels for an area (typically countywide). Each small rectangle indicates one FIRM panel, and they're labeled with their FIRM panel numbers.

Review of the title block of the map index, which includes:



**Student
Notes**

- Title of the flood study,
- Unique map index number,
- Effective or revised date, and
- List of FIRM panels in the study.

In certain instances, some panels may not be printed if there is no SFHA or if an area is outside the boundary of the flood study.

Visual 29: Knowledge Check 3

Fill in the blank for the following statement:

The FIRM panel contains four main elements:

1. Title block
2. Scale bar
3. _____
4. _____



Answer the following fill in the blank question:

The FIRM panel contains four main elements:



**Student
Notes**

- Title block
- Scale bar
- _____
- _____

Prepare to share your responses with the group.

Visual 30: Knowledge Check 4

Fill in the blank for the following statement:

The FIRM index shows locations of

_____.



**Student
Notes**

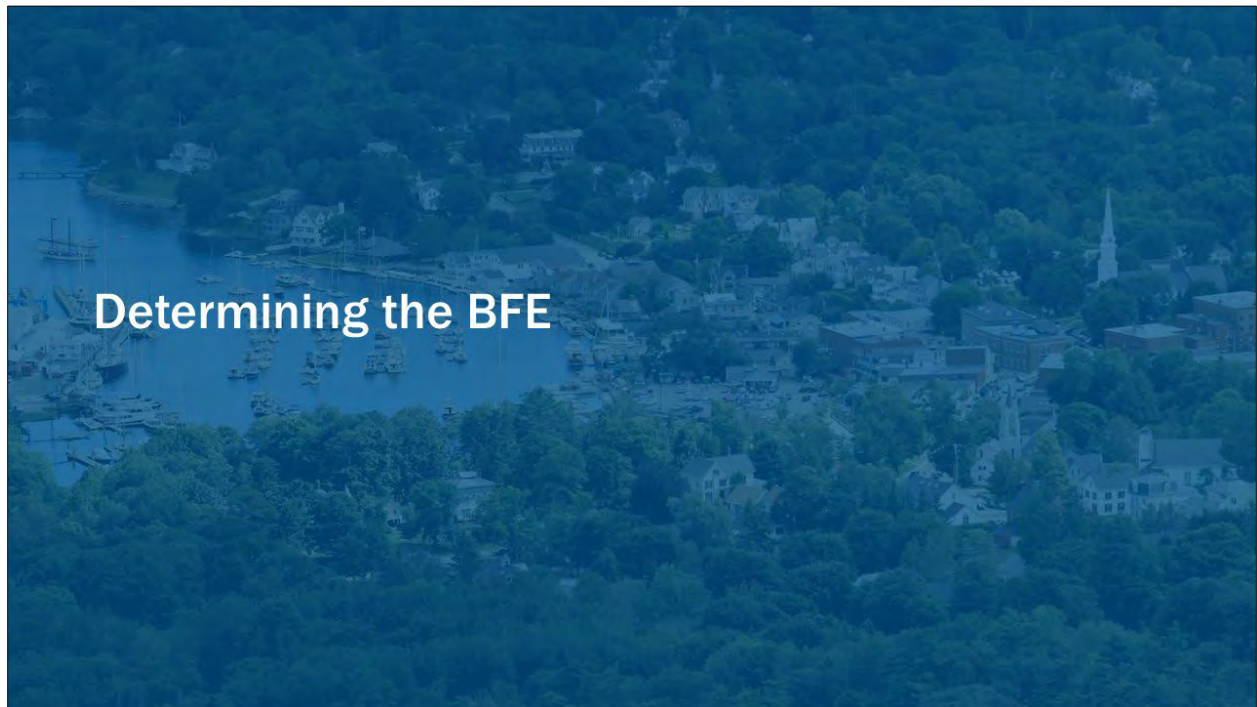
Answer the following fill in the blank:

Fill in the blank for the following statement: The FIRM index shows locations of

_____.

Prepare to share your responses with the group.

Visual 31: Determining the BFE



**Student
Notes**

Common approaches to determining the BFE.

Visual 32: Identify the Risk and Determine the BFE

- To guide permitting and development decisions, Floodplain Administrators will:
 - Locate a specific property on the FIRM.
 - Use the FIRM and FIS to determine the BFE at a specific site.
- The steps to determine the BFE depend in part on the flood zone.
 - Riverine
 - Shallow flooding
 - Coastal High Hazard Areas
 - A zones



Student Notes

To guide permitting and development decisions, Floodplain Administrators must use the FIRM and the FIS. The FIRM is used to locate a specific property in relation to the SFHA. In many cases, both the FIRM and the FIS are used together to determine the BFE at a specific site.

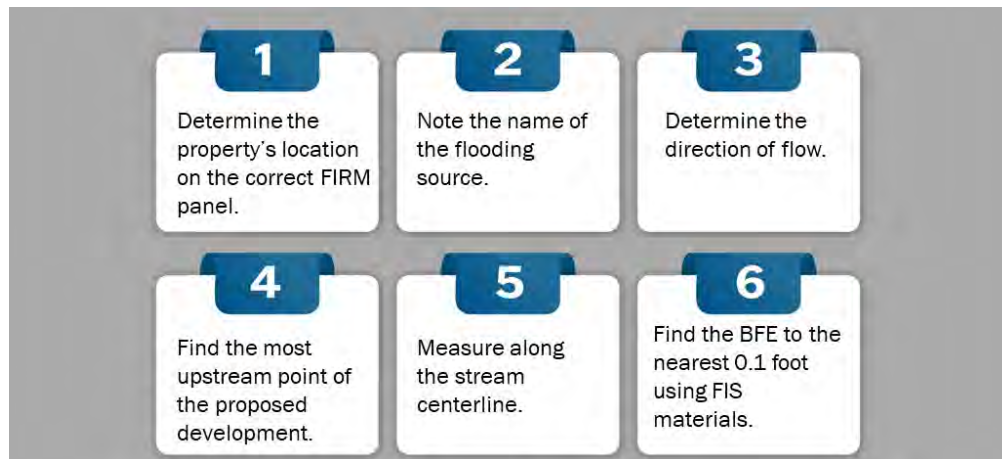
Over the next few units in this course, we will discuss the connections between:

- The mapped hazard and BFE,
- The regulations that apply (which we will discuss in Unit 4), and
- How the Floodplain Administrator checks for compliance during permitting (which we will discuss in Unit 5).

The steps to determine the BFE depend on the flood zone designation. For this unit, we will explain how to identify risk and determine the BFE for:

- Riverine areas,
- Shallow flooding areas,
- Coastal High Hazard Areas, and
- A zones.

Visual 33: Determining the BFE in Riverine Areas (Zone AE)



The following steps are necessary to determine the BFE for Riverine Areas (Zone AE):



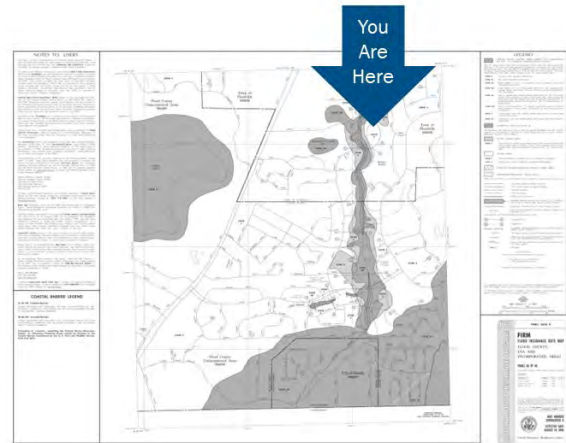
Student Notes

1. Determine the property's location on the correct FIRM panel.
2. Note the name of the flooding source.
3. Determine the direction of flow. Understanding which direction the water is flowing helps you determine upstream/downstream.
4. Find the most upstream point of the proposed development and draw a new cross section line perpendicular to the stream flow.
5. Measure along the stream centerline, from that new cross section to the nearest lettered cross section on the FIRM.
6. Find the BFE to the nearest 0.1 foot using FIS materials (i.e., data tables and Flood Profiles).

Visual 34: 1. Determine the Property's Location

Determine the Property's Location

- Find and use the correct FIRM panel.
- Confirm using the FIRM Index or the FEMA MSC address search.



See Figure 2. Firm Part 1

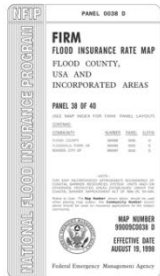
Gathering Information from the FIRM and the FIS.



Student Notes

To determine the BFE for a riverine area, first determine the property's location and the correct FIRM panel. For example, if a property is near Argyle Way and Oaks Drive in Floodville, you need to find the FIRM panel that displays that part of town.

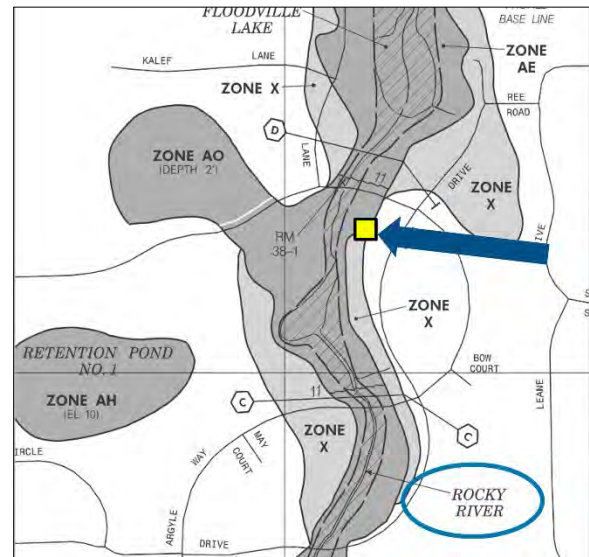
If you are not sure which FIRM panel to use, use the map index to acquire a countywide view of all the FIRM panels or, you can use the FEMA MSC to perform an address search for the correct FIRM panel (explained later in this unit).



Visual 35: 2. Note the Flooding Source Name

Note the Flooding Source Name

- Find this property is in, or partially in, the SFHA.
 - What is the applicable flood zone?
- For this property, the name of the flooding source is the **Rocky River**.



See Figure 3. FIRM Part 2

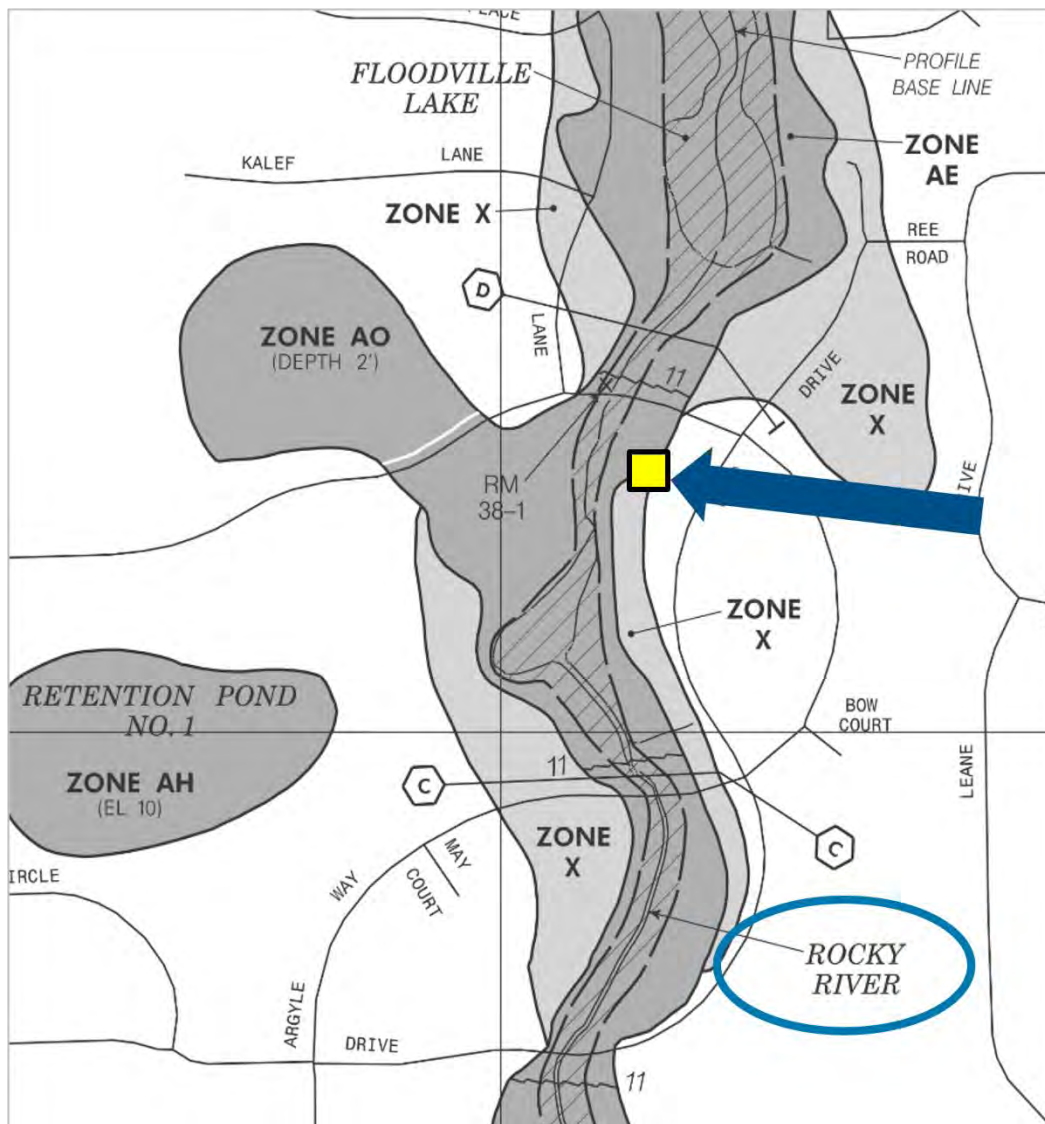
Focus on the portion of the FIRM with the example property location. The yellow box on the screen represents the exact location of the property.



Student Notes

The second step to determine the BFE for the riverine area is to note the flooding source name.

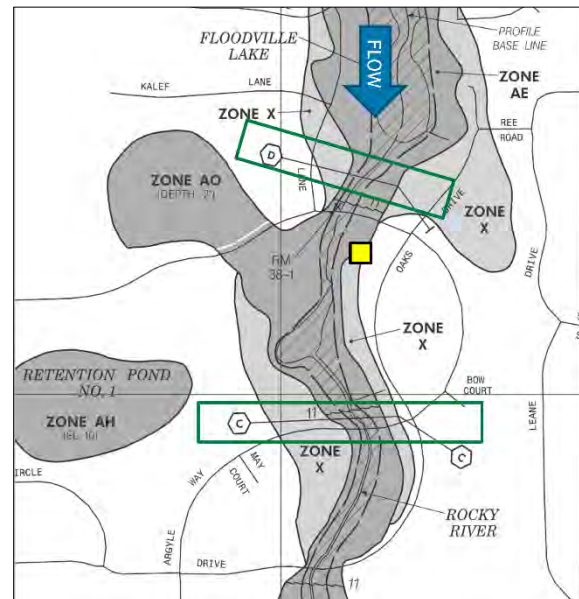
Keep in mind that riverine AE sites are typically located between lettered cross sections. So, gather some measurements of the nearby riverine cross sections, and use the flood profiles in the FIS as the source for the regulatory BFE. In this example, the flood source is labeled as Rocky River.

FIGURE 3. FIRM PART 2

Visual 36: 3. Determine the Direction of Flow

Determine the Direction of Flow

- Determine upstream and downstream.
- Upstream indicated by:
 - Higher number BFE wavy lines
 - Later letters of the alphabet
 - Stream slope on Flood Profile in FIS



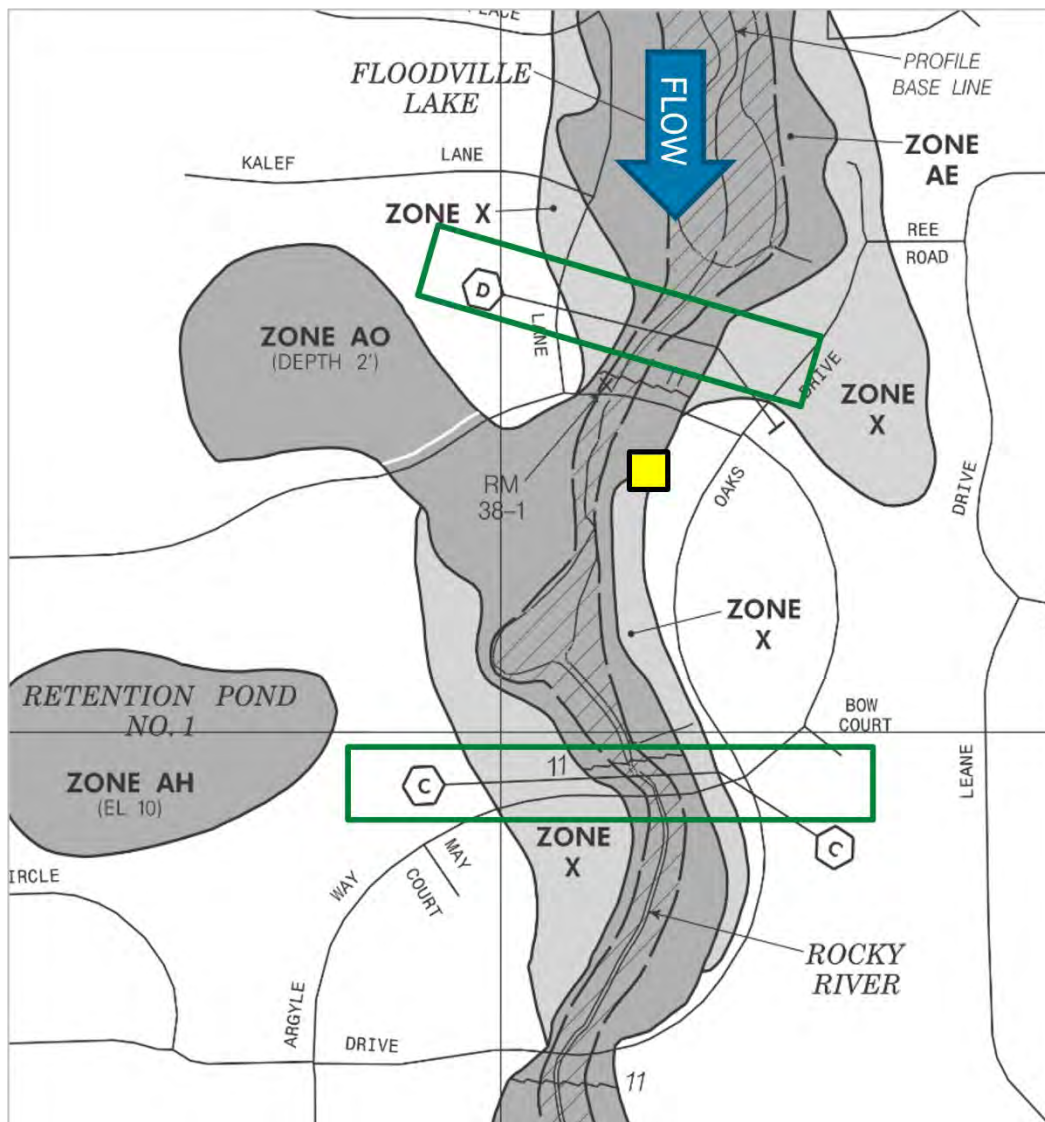
See Figure 4. FIRM Part 3

Determine the direction the Rocky River is flowing to find the property's upstream boundary. Remember that upstream is not always to the north. To determine which direction is upstream, you can:



Student Notes

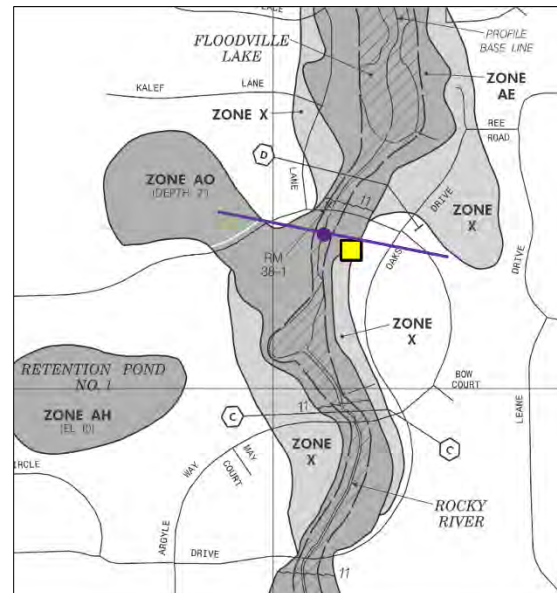
- Refer to the rounded BFE wavy lines on the FIRM. The higher numbers indicate the upstream direction.
- Refer to the order of the lettered cross sections. As you travel upstream, the labeling goes up the alphabet: A, B, C, D, and so on. Cross section A is always the most downstream point. On long rivers, the labeling after the letter Z starts over at AA.

FIGURE 4. FIRM PART 3

Visual 37: 4. Find the Most Upstream Point of the Proposed Development

Find the Most Upstream Point of the Proposed Development

- Draw a new line at that upstream point, across the flooding source.
- Draw a line perpendicular to the stream flow.



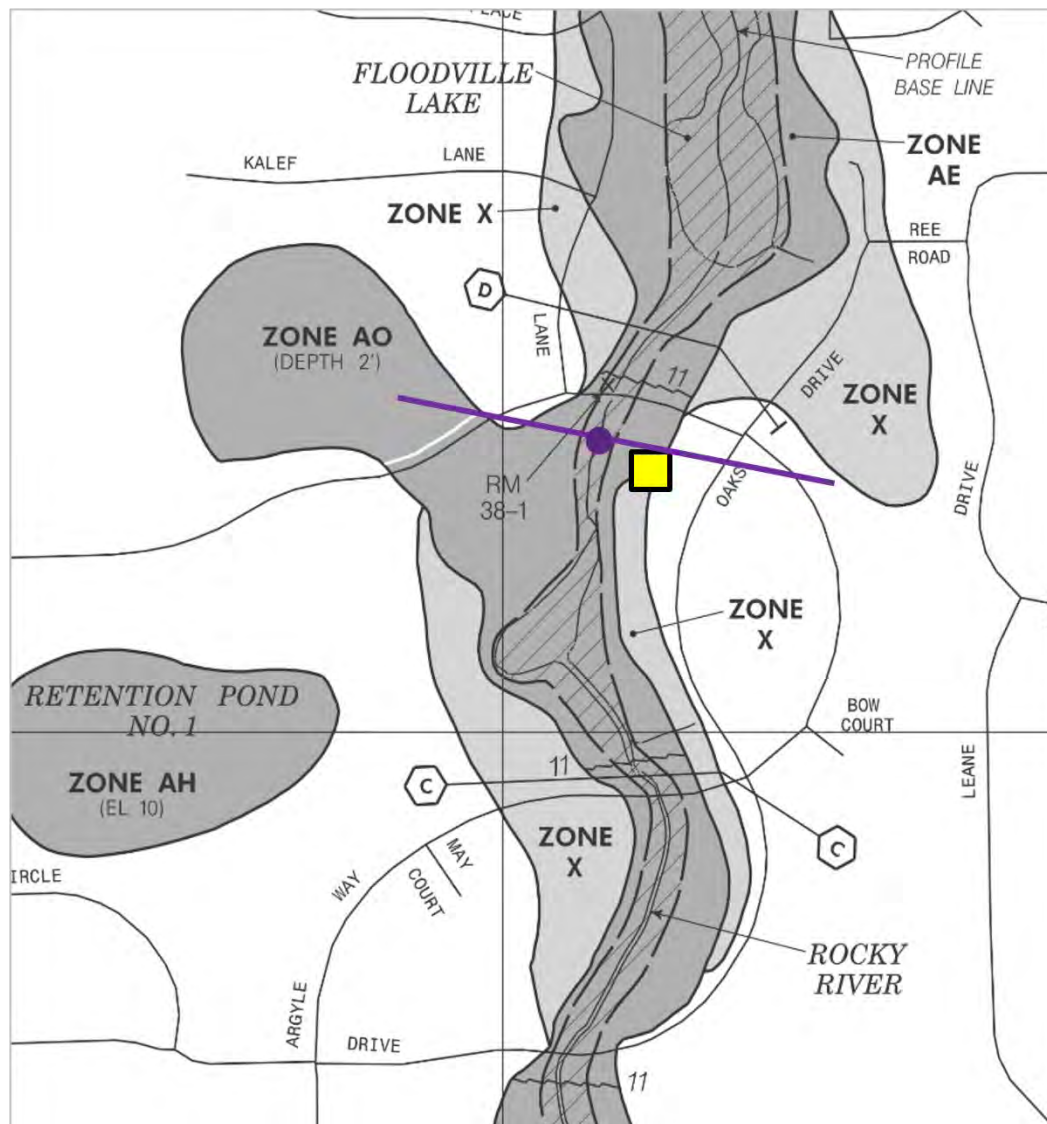
See Figure 5. FIRM Part 4



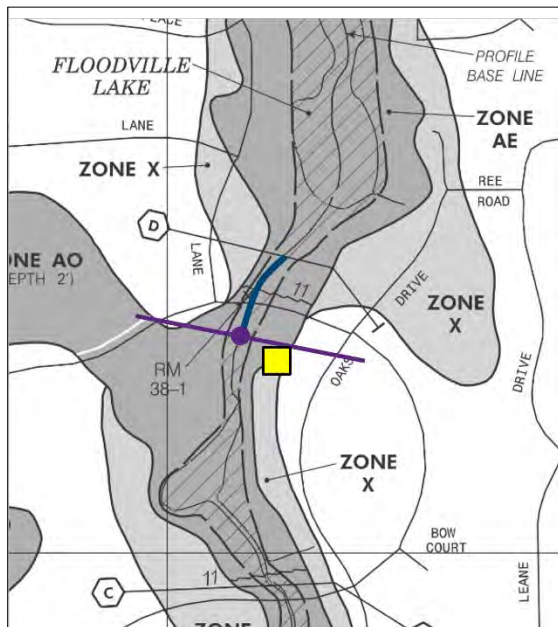
Student Notes

For riverine properties located between lettered cross sections on the FIRM, you need to determine the distance from the property's upstream point to the nearest cross section using the Flood Profiles in the FIS.

To determine the property distance, first draw a line from the upstream edge of the property across the stream, perpendicular to the stream flow. In meandering river sections, use the orientation of the nearby cross sections and estimated BFE isopleths (wavy lines) to guide you in orienting your line. Then, mark where your drawn line and the stream center line intersect.

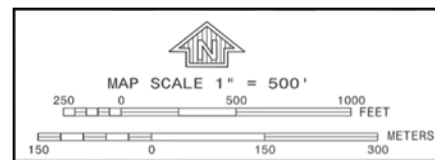
FIGURE 5. FIRM PART 4

Visual 38: 5. Measure Along the Stream Centerline



Measure Along the Stream Centerline

- Find the centerline or profile base line.
- Measure along the stream centerline (from the new cross section) to nearest lettered cross section.
- Use the scale on the FIRM Panel.



Continue with Figure 5 FIRM Part 4

Find the stream centerline, also called the thalweg. The stream centerline is shown as a thin black line inside the floodway on this map and is labeled as the Profile Base Line.

The stream centerline is shown as a thin black line inside the floodway on this map and is labeled as the Profile Base Line.



Student Notes

Using the map scale on the FIRM, measure the distance from your cross section to the nearest lettered cross section.

Note the letter, the distance between the cross section and the property, and the direction (whether the property is upstream or downstream from the cross section).

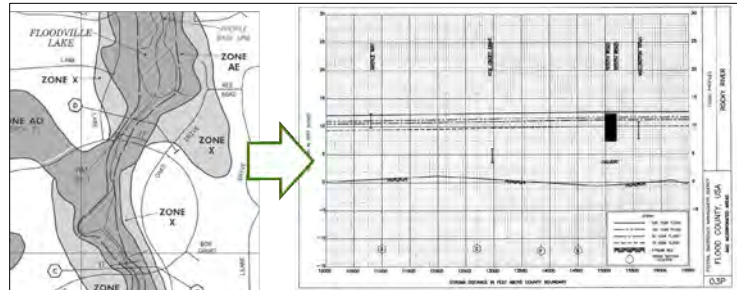
Each map has a unique scale. Use the scale on that FIRM panel to measure distance along the thalweg, which is curved and meanders like the river. Taking a straight-line measurement is incorrect.

In this scenario, the property is 300 feet downstream of Cross Section D.

Visual 39: 6. Find the BFE to the Nearest 0.1 Foot Using FIS Materials

Flood profiles in the FIS contain more detailed information for riverine AE zones.

- Obtain the correct FIS profile page
- Always check for the correct flooding source and cross sections.



When determining the BFE, it's important to check the FIS for more detailed information. For riverine AE zones, flood profiles in the FIS contain more detail than the FIRM alone.

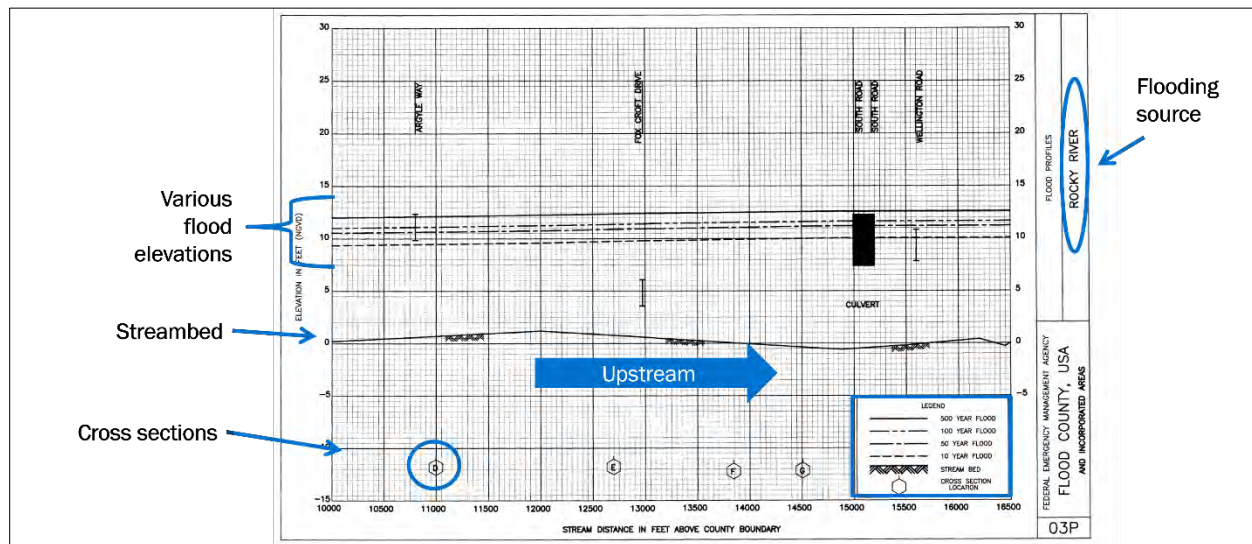


Student Notes

Note that there are typically several FIS profile pages for each flooding source studied, so you'll have to confirm you have the correct one. To confirm you have the correct FIS profile page, always check the labels to confirm that they match the correct flooding source name and cross section letters.

The letters along the bottom of the flood profile should match the letters representing the cross sections on the portion of the stream you are analyzing.

Visual 40: Information on an FIS Flood Profile



See Figure 6. FIS Flood Profile

Examine the information you will need to verify in the flood profile. We will continue to use the Rocky River Flood Profile example.

To find the flood source name in a flood profile graph, check the right side of the graph. Remember, there are many pages in FIS. To ensure you have the correct page, you will also need to ensure the letters along the bottom of the flood profile match the letters representing the cross sections on this portion of the stream. This example measures from the structure, upstream to Cross Section D. So, this would be the correct Rocky River page.

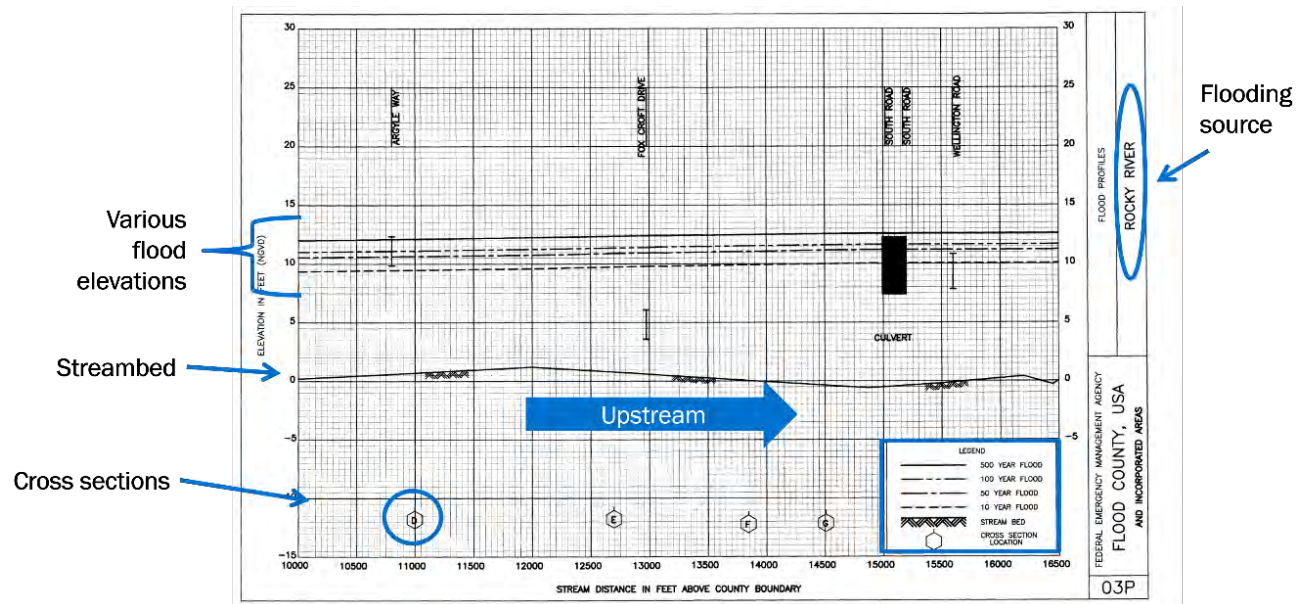


Student Notes

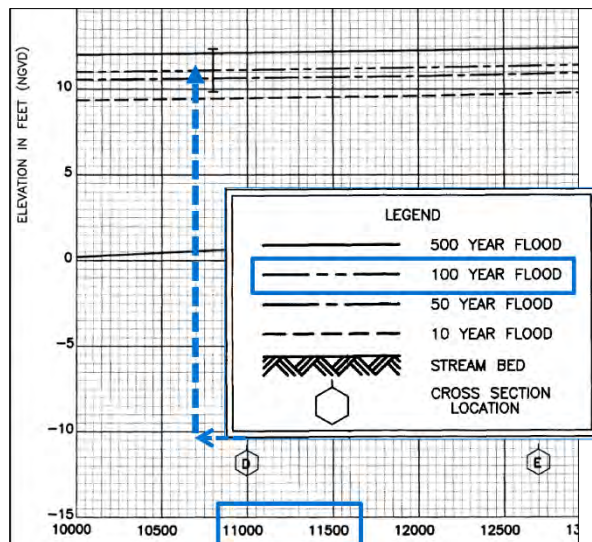
There are several flood elevation lines drawn across this flood profile, which depicts the streambed and the elevation of the floodwater for the different modeled floods. The legend lists each of these lines. The line we are interested in for determining the BFE is the 100-year flood (1% annual chance flood) line.

The bottom of the profile graph measures stream distance from a downstream point like a river confluence or county boundary line. Remember that, as with the FIRMs, the cross sections go upstream beginning with A as the most downstream point. You'll need to use this information to determine which direction to make your measurement.

FIGURE 6. FIS FLOOD PROFILE



Visual 41: 6.1 Locate the Property on the Flood Profile



Locate the Property on the Flood Profile

- Check the scale and legend.
- Each grid = 500' and square = 50"
- Structure is 300' downstream from cross section D.
 - o 300' = 6 single squares
- Draw a horizontal line 300' downstream from cross section D.
- Draw the vertical line up to the 1% annual chance (100-year) flood line.

When using the flood profile, locate the property relative to the same lettered cross section by measuring horizontally along the bottom. Use the streamline measurement from the previous step. This example structure is 300 feet downstream from cross section D.



Student Notes

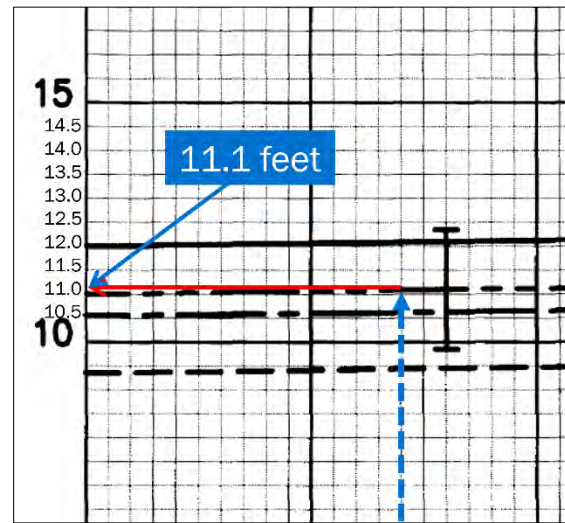
Note that each 10-grid square along the x-axis on this profile represents 500 feet of stream distance, and each individual grid square represents 50 feet or one-tenth of 500 feet. Remember to always check the scale, as the scale may be different on a different profile.

The measurement from cross section D downstream to our new cross section was 300 feet, or 6 grid squares.

Next, draw a line vertically from that point up to the profile's 1% annual chance flood line. On this profile, it's labeled as the 100-year flood. Check the legend to make sure you are using the correct 100-year or 1% annual chance flood line. There may also be lines for other flood recurrence intervals.

Visual 42: 6.2 Find the BFE to the Nearest 0.1 Foot

- Draw a horizontal line to vertical axis.
- Count squares from the nearest major division.
- Note the scale of the vertical axis.
- Determine the BFE to nearest 0.1 feet.



See Figure 7. Find the BFE Part 6

Use the close-up of the flood profile to highlight additional details.



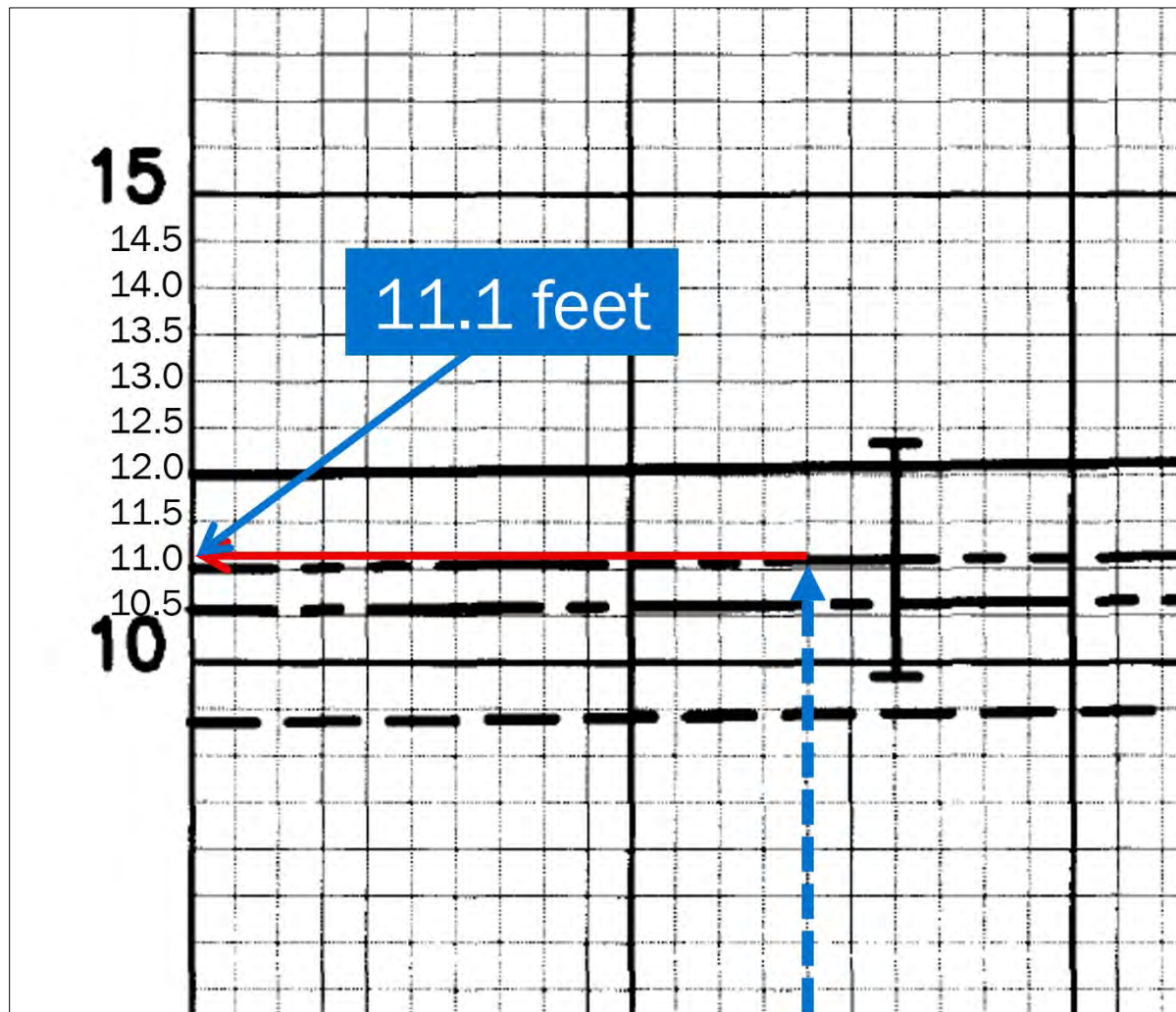
Student Notes

To determine the BFE to the nearest tenth of a foot, draw a horizontal line from where your line intersects the 1% annual chance line over to the opposite vertical axis of the profile.

Next, count the squares from the nearest major division or labeled number on the y-axis. Check the increments on the grid, as scales may vary. For example, each square may represent 1 foot, 0.5 feet, or another increment.

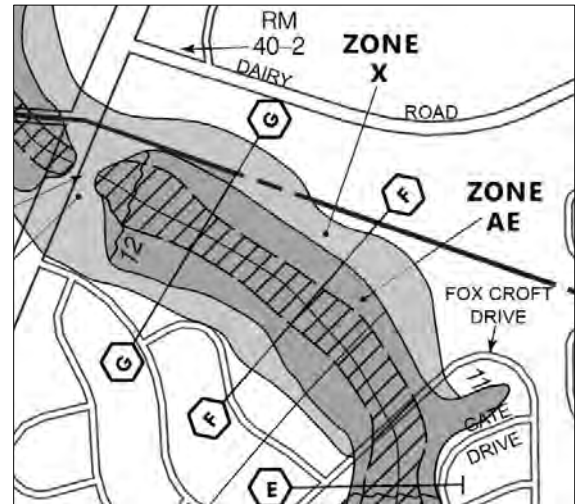
After drawing the line across the y-axis, your answer should be 11.1 feet for the BFE.

FIGURE 7. FIND THE BFE PART 6



Visual 43: Knowledge Check 5

Which direction is upstream on the map?



See Figure 8. Knowledge Check 5 Map.



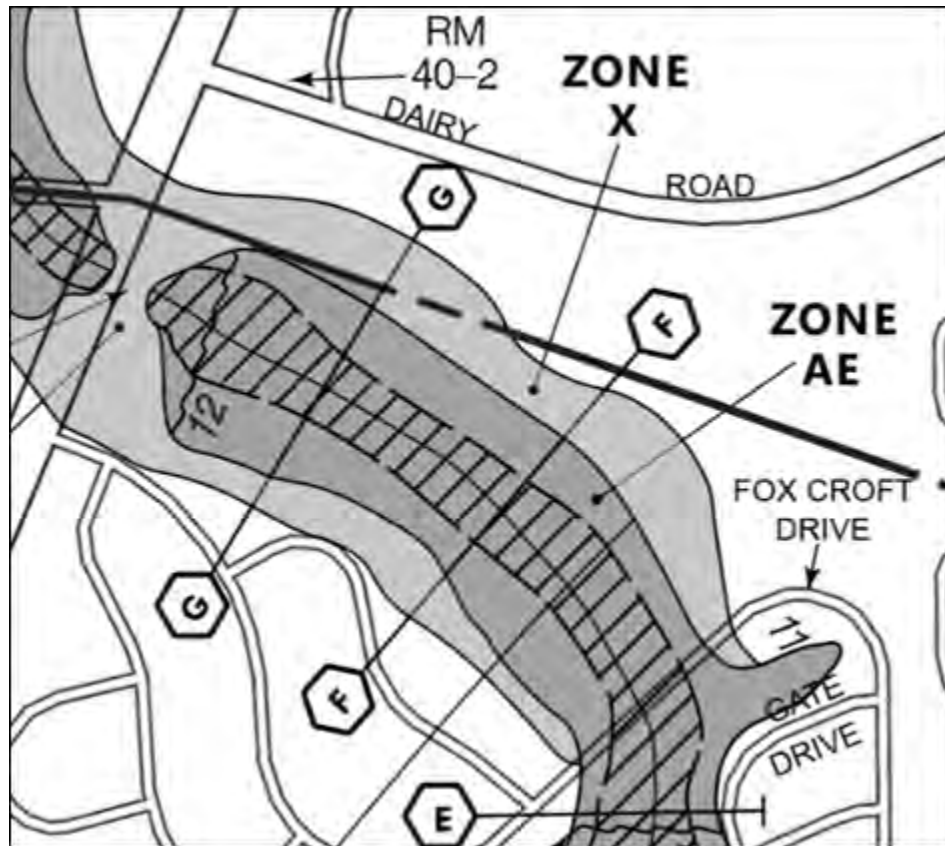
Student
Notes

Answer the question:

Which direction is upstream on the map?

Prepare to share your responses with the group.

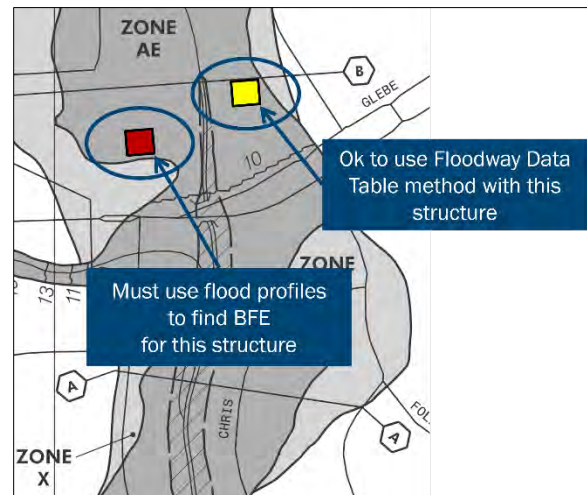
FIGURE 8. KNOWLEDGE CHECK 5 MAP



Visual 44: Unique Situations: Riverine Structure on a Cross Section

Floodway Data Table method:

Only appropriate if upstream boundary of the structure/property touches the cross section



Student Notes

Before you learn how to use the floodway data table in the FIS, you should understand this important point. The floodway data table method can only be used as the best source for the regulatory BFE for structures in special cases. To use this method, a structure's upstream boundary must be touching the lettered cross section.

This is rare, but it can happen! The northern-most structure shown here meets this criteria since it touches cross section B. But the structure just to the south is too far from cross section B for this method to be appropriate. In this case, you must use the flood profiles, like you learned in the previous subtopic.

Visual 45: Using the Floodway Data Table

BE = 10.4

at cross section B

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET MSL)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Rocky River								
A	4,305	115	1,233	8.1	9.9	9.9	10.0	0.1
B	6,507	13	142	9.2	10.4	10.4	10.6	0.1
C	10,990	85	861	7.2	11.9	11.2	11.3	0.1
D	12,895	245	1,887	5.1	11.3	11.3	11.4	0.1
E	13,845	270	2,403	4.0	11.5	11.5	11.5	0.0
F	14,513	250	2,803	3.7	11.6	11.6	11.6	0.0
G	18,845	180	3,020	4.3	11.7	11.7	11.7	0.0
H	18,200	415	2,946	3.8	12.6	12.5	12.1	0.2
I	20,148	245	2,961	4.0	13.0	13.0	13.2	0.2
J	25,380	340	2,924	3.6	14.0	14.0	14.2	0.2

¹ feet above county boundary

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOODWAY DATA

FLOOD COUNTY, USA AND INCORPORATED AREAS

ROCKY RIVER

See Figure 9. The Floodway Data Table

The Floodway Data Tables in the FIS contain data from the hydraulic analysis, specifically calculated at each floodplain cross section. The FIS for your community will likely contain many such tables, corresponding to the cross sections identified for each flooding source that has a mapped floodway.

Locate the flooding source name in the lower right corner. Check this every time you use a table in the FIS to ensure you have the right flooding source.

The first two columns identify cross sections and the distance of the given cross section from some reference point, usually the mouth of the flooding source.

**Student
Notes**

The next three columns under the floodway column provide data about the size of the floodway in width (the one-dimensional bird's-eye view), the area (the two-dimensional fish's-eye view), as well as the velocity of the floodwaters at each cross section.

The last four columns under base flood water surface elevation, you will primarily be interested in the first column, titled "Regulatory".

The Regulatory column of this table provides the BFE to the nearest tenth of a foot. The other columns depict the modeled increase in water-surface elevation when the floodplain is encroached upon.

So, at cross section B, the Regulatory BFE is 10.4 feet.

Remember, you can use this method to determine BFE only when the subject property's upstream edge is located on the cross section. For properties that are located between cross sections, you will use the flood profile like the previous example showed.

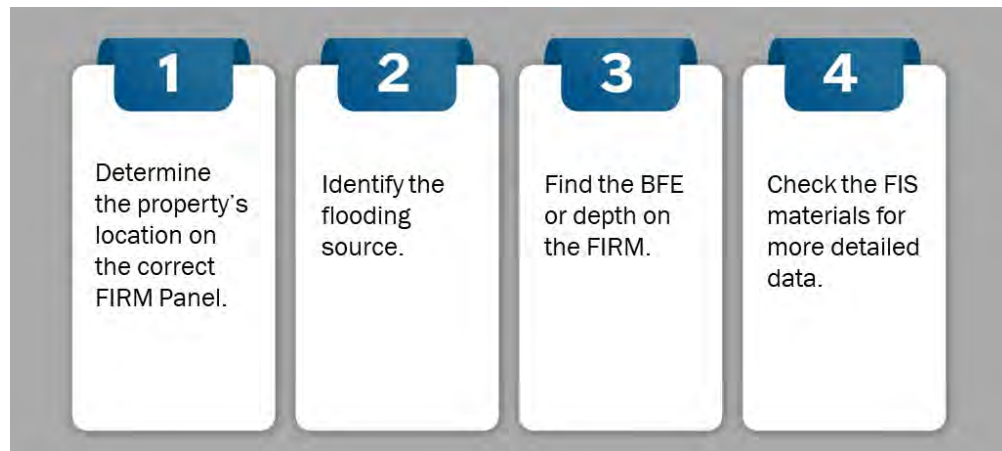
FIGURE 9. THE FLOODWAY DATA TABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Rocky River								
A	4.395	115	1,233	6.1	9.9	9.9	10.0	0.1
B	5.537	13	142	9.2	10.4	10.4	10.5	0.1
C	9.610	100	323	6.4	10.3	10.3	11.1	0.2
D	10.995	85	861	7.2	11.2	11.2	11.3	0.1
E	12.695	245	1,887	5.1	11.3	11.3	11.4	0.1
F	13.845	270	2,403	4.5	11.5	11.5	11.5	0.0
G	14.513	230	2,553	3.7	11.6	11.6	11.6	0.0
H	16.625	180	2,000	4.2	11.7	11.7	11.7	0.0
I	18.209	415	2,566	3.9	12.5	12.5	12.7	0.2
J	20.849	230	2,381	4.0	13.0	13.0	13.2	0.2
K	25.360	340	2,924	3.6	14.0	14.0	14.2	0.2

¹Feet above county boundary

TABLE 6	FEDERAL EMERGENCY MANAGEMENT AGENCY	FLOODWAY DATA
	FLOOD COUNTY, USA AND INCORPORATED AREAS	ROCKY RIVER

Visual 46: Steps to Determine the BFE in Shallow Flooding Zones



How to determine the BFE for shallow flood areas.

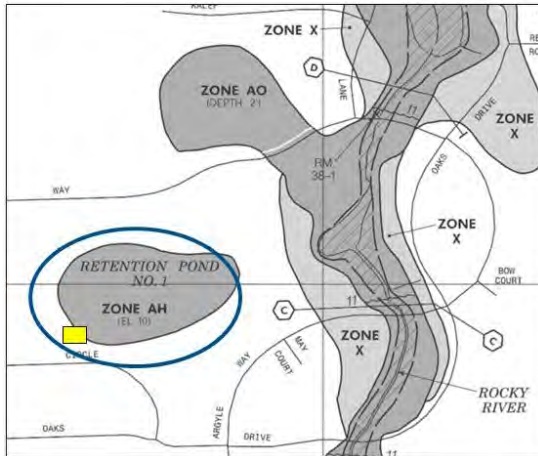
To determine the BFE in shallow flooding zones, you will need to complete the following steps:



Student Notes

- Step 1: Determine the property's location on the correct FIRM panel.
- Step 2: Identify the flooding source.
- Step 3: Find the BFE or depth on the FIRM.
 - AH = BFE
 - AO = Base Flood Depth
- Step 4: Check the FIS materials for more detailed data.

Visual 47: Determining the BFE in Zone AH



- Identify the flooding source.
 - Retention Pond 1
- Elevation on FIRM is displayed to nearest whole foot.
- Check the FIS materials for more detailed data.
 - Review the Stillwater Elevation Table.

To determine the BFE for shallow flooding areas, you will need to determine the property's location on the correct FIRM panel and identify the flooding source.



Student Notes

Examine the pond just to the west of the Rocky River. Begin by checking the map for the flood zone and the name of the flooding source. This example shows a property within an AH Zone on the FIRM.

The flooding source is labeled on the FIRM as Retention Pond Number 1. The BFE is displayed as 10 feet. Base Flood Elevations are rounded to the nearest whole foot on the map.

The Summary of Stillwater Elevations table in the FIS provides more detail on the BFE in these AH Zone areas.

Visual 48: Determining the BFE in a Zone AH: Stillwater Elevations Table

- Locate the table in the FIS.
- Find correct flooding source.
- Find 1% (100-year) flood data.
- BFE is 10.0.

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

Find the BFE.

A Summary of Stillwater Elevations Table may include information about several lakes, ponds, and other stillwater flooding sources. These areas are shown as AE or AH zones on the FIRMs, depending on the depth of flooding.



Student Notes

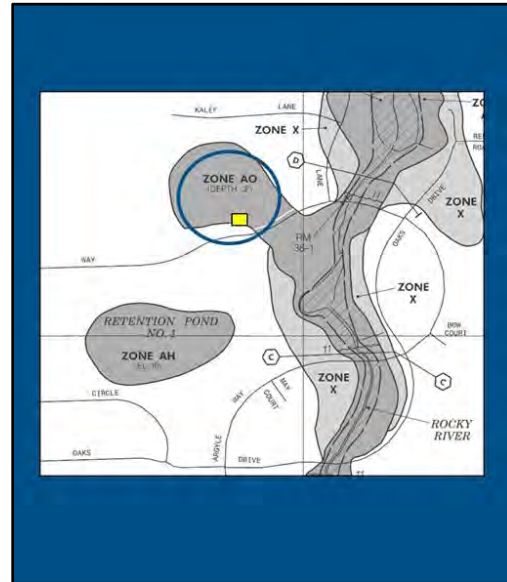
Next, find the name of the flooding source of interest. In this case, find Retention Pond Number 1.

Then, find the BFE or 1% annual chance (100-year) flood elevation column, the third column on this example table. Notice that the elevations are displayed in tenth-of-a-foot increments instead of whole-foot elevations, as they are on the maps.

In this case, the regulatory BFE for Retention Pond 1 is 10.0 feet. This is more specific than simply 10 as printed on the FIRM.

Visual 49: Determining the BFE in Zone AO

- Zone AO is unique: base flood depth, not elevation
- There is no more detail in FIS.
- Use the number on the FIRM.



Zone AO is an area of shallow flooding with average depths between one and three feet, but it represents an area where water tends to flow in large sheets over the land.

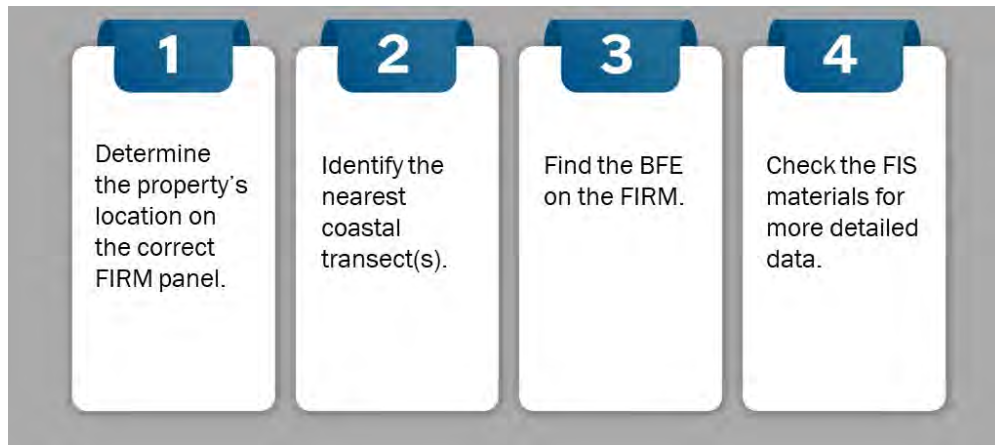


Student Notes

AO zones are unique in that the flooding is measured as a depth. The BFE is a base flood depth, not an elevation. For an AO zone, the regulatory flood depth is this depth number.

There is no detailed information about the AO zone for Flood County in the FIS, so we can read the regulatory flood depth directly from the FIRM. In this example, the depth is two feet.

Visual 50: Steps to Determine the BFE in Zone VE



How to determine the BFE for Coastal High Hazard Areas.

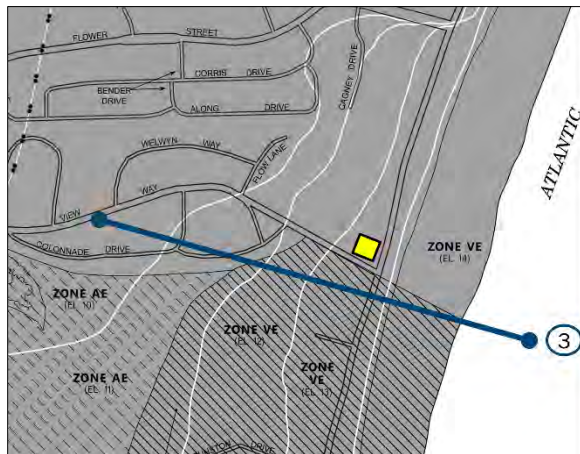
To determine the BFE in Coastal High Hazard Areas, you will need to complete the following steps:



Student Notes

- Step 1: Determine the property's location on the correct FIRM panel.
- Step 2: Identify the nearest coastal transect(s).
- Step 3: Find the BFE on the FIRM.
- Step 4: Check the FIS materials for more detailed data. Coastal Transect Data Tables may provide more specific (0.1 foot) information.

Visual 51: Step 1. Determine the Property's Location and Step 2. Identify the Nearest Coastal Transect



- Step 1. Determine the Property's Location
- Step 2. Identify the Nearest Coastal Transect
- Coastal transects:
 - Perpendicular to shoreline
 - Numbered, not lettered
 - Correlated to detailed info in the FIS

This map panel shows the Atlantic Ocean coastline with Zone VE and coastal Zone AE areas. Recall that the boundaries dividing flood zones and areas of differing BFEs are shown as solid white lines.

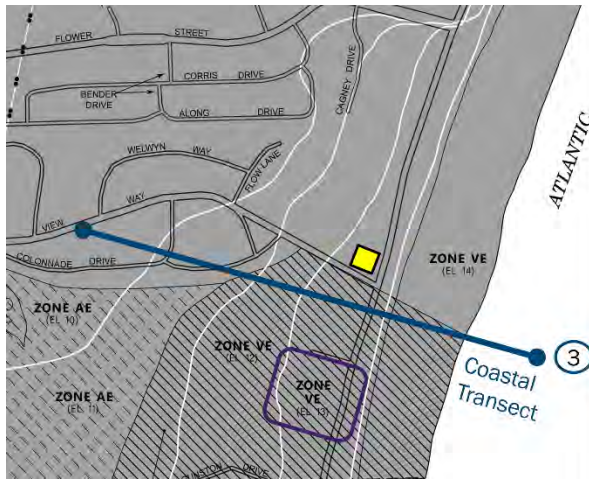


Student Notes

To identify coastal transects, search for numbered coastal transects. They are located along the coastline, oriented perpendicular to the shore, and indicate locations where wave heights are analyzed. Sometimes, the FIS contains a Transect Location map showing many transects along an entire shoreline to aid in locating the right transect number. In this case, the example property is near coastal transect number 3.

Just as the riverine cross sections mapped on the FIRM have corresponding information in the FIS, these coastal transects also have detailed corresponding information in the FIS. Some maps have the coastal transects printed on the FIRM. Some will have the locations in a Transect Location map in the FIS.

Visual 52: Step 3. Find the BFE on the FIRM



Step 3. Find the BFE on the FIRM

- o Whole foot numbers are printed on FIRM
- o Be aware of boundary lines indicating a change in flood zone or BFE.



Student Notes

In coastal areas, the whole-foot Base Flood Elevation is printed on the FIRM.

Review the example shown on the screen under each zone label. The white boundary lines on this map indicate a change in the flood zone or a change in the BFE. As the floodwaters move onshore, the BFEs become lower.

The FIRM shows this example property is in Zone VE, and the “(EL 13)” indicates the BFE is 13. This number is rounded to the nearest whole foot.

Visual 53: Step 4. Check the FIS Coastal Transect Data Table

Step 4. Check the FIS Coastal Transect Data Table

- o Identify the transect.
- o In this case, the most detailed information in the FIS confirms the same BFE as the FIRM.
- o BFE is 13 feet.

TABLE 5 - TRANSECT DATA

FLOODING SOURCE	STILL WATER ELEVATION (feet NGVD)				ZONE	BASE FLOOD ELEVATION (feet NGVD) ¹
	10-YEAR	50-YEAR	100-YEAR	500-YEAR		
ATLANTIC OCEAN						
					VE	12-14
					AE	10-12
Transect 1	6.7	8.7	10.0 ²	12.6		
Transect 2					VE	13-14
					AE	10-12
					AO	Depth 2'
Transect 3	6.7	8.7	10.0 ²	12.6	VE	12-14
					AE	10-12

¹Includes wave set-up of 0.5 foot.
²Because of map scale limitations, base flood elevations shown on the FIRM represent average elevations for the zones depicted.



Student Notes

In the FIS, Coastal Transect Data Tables contain more flood elevation data specifically calculated at each coastal transect. For each coastal flooding source, information for several coastal transects is provided. Find the BFE column, which for this example shows a range of BFEs for VE zones for Transect 3. This matches the information printed on the FIRM, showing VE zones of elevation 12, 13, and 14 feet.

Because the most detailed information that can be found in the FIS confirms the same BFE as the FIRM, you can use the number printed on the FIRM. The BFE at the location of this structure is 13 feet. In other situations, the FIS may contain information to 0.1 foot, so it is always important to check.

Visual 54: Activity 3.1: Mapping Exercise: Flood Zone and the BFE



- Form into pairs or groups.
- Review the directions.
- Identify the BFE.
- Prepare to share your responses.

Time: 25 minutes

Purpose:

In this activity, you will identify the BFE.

Materials: (Located in Student Manual)



Activity

Figure 10. Santa Barbara County FIRMette with properties 1, 2, and 3 marked on the map

Figure 11. Santa Barbara County FIS Flood Profile

Figure 12. Santa Barbara County FIS Floodway Data Table

Figure 13. Santa Barbara County FIS Coastal Transect Table

Activity type: Pairs or groups

Instructions:



Job Aid

1. Use the Santa Barbara FIRMette and the Flood Insurance Study (FIS) pages provided to determine the BFE for fictional properties 1, 2, and 3. Determine the BFE to within a tenth (0.1) of a foot, or as accurately as possible.
2. Use the Activity 3.1: Determine the BFE Job Aid to complete this activity.
3. Document your answers in BFE Findings.
4. Prepare to share your responses with the group.

ACTIVITY 3.1: DETERMINE THE BFE JOB AID

Riverine Sites:

1. First, locate the property on the FIRM.
2. Determine the name of the stream or watercourse affecting the property. Note that BFEs, shown as wavy lines crossing a stream, are rounded to the nearest foot, and cannot be used alone to get a BFE.
3. Determine the property's upstream limit for riverine BFEs. To determine which direction is "upstream," refer to the BFEs on the FIRM, where the higher numbers indicate the upstream direction, or to the stream profile on the FIS, where the slope of the channel bottom visually indicates the direction of flow. Locate the nearest lettered cross sections to the property.
4. For riverine properties located **between lettered cross sections** on the FIRM, determine the property's location relative to the stream profile on the Flood Profiles in the FIS.
5. Then, draw a line from the upstream point of the property across the stream center line, perpendicular to the stream flow. In meandering river sections, use the orientation of the nearby cross sections and estimated BFE lines to guide you in orienting your drawn line.
6. Mark a dot where your drawn line and the stream center line intersect.
7. Using the scale on the FIRM, measure the distance from your marked dot to the nearest cross section, and make a note of this distance and the letter of the cross section. Remember to measure distance along the stream centerline (which is probably curved) and not as a straight line to the cross section.
8. Using the Flood Profile, locate the property relative to that same lettered cross section by measuring horizontally along the bottom using your measurement from the previous step. Increments for distance are along the horizontal x-axis of the profile. The vertical y-axis of the profile contains the elevation information. Always check the scale and direction to locate the property upstream or downstream correctly.
9. Then, draw a line vertically from that point up to the profile's 1% annual chance flood line. Check the legend to make sure you are using the 1% line. There may also be 10%, 2%, and 0.2% lines.
10. Finally, to determine the BFE to the nearest tenth of a foot, draw a horizontal line from where your line intersects the 1% annual chance line, over to the left vertical axis of the profile. Check the increments on the grid, as scales may vary. Each square may represent 1 foot, 0.5 feet, or some other increment.
11. Or, if a riverine property's **upstream boundary is on or touching** the cross section line, use the FIS Floodway Data Table to determine the BFE to the nearest tenth of a foot. The Regulatory column in the data table provides the BFE at each lettered cross section, displayed in the rows of the data table.

Coastal Sites:

1. First, locate the property on the FIRM.

2. Determine the name of the flooding source affecting the property.
3. Coastal BFEs are calculated along transects extending from offshore to the limit of coastal flooding onshore. These coastal transects are numbered, rather than lettered.
4. Coastal BFEs may be printed on FIRMs in whole foot or 0.1-foot increments.
5. Check the FIS Coastal Transect tables to see if a more detailed BFE is provided for the nearest numbered coastal transect. If not, use the number printed on the FIRM.

Shallow Flooding Sites:

1. First, locate the property on the FIRM.
2. Determine the name of the flooding source affecting the property.
3. In AH zones, BFEs may be printed on FIRMs in whole foot or 0.1-foot increments. Check the FIS for Stillwater Elevation Tables to see if a more detailed BFE is provided for that flooding source. If not, use the number printed on the FIRM.
4. In the case of AO zones, the depth number printed on the FIRM is the regulatory Base Flood Depth.

BFE FINDINGS

Fill in BFEs here:

Property 1

Property 2

Property 3

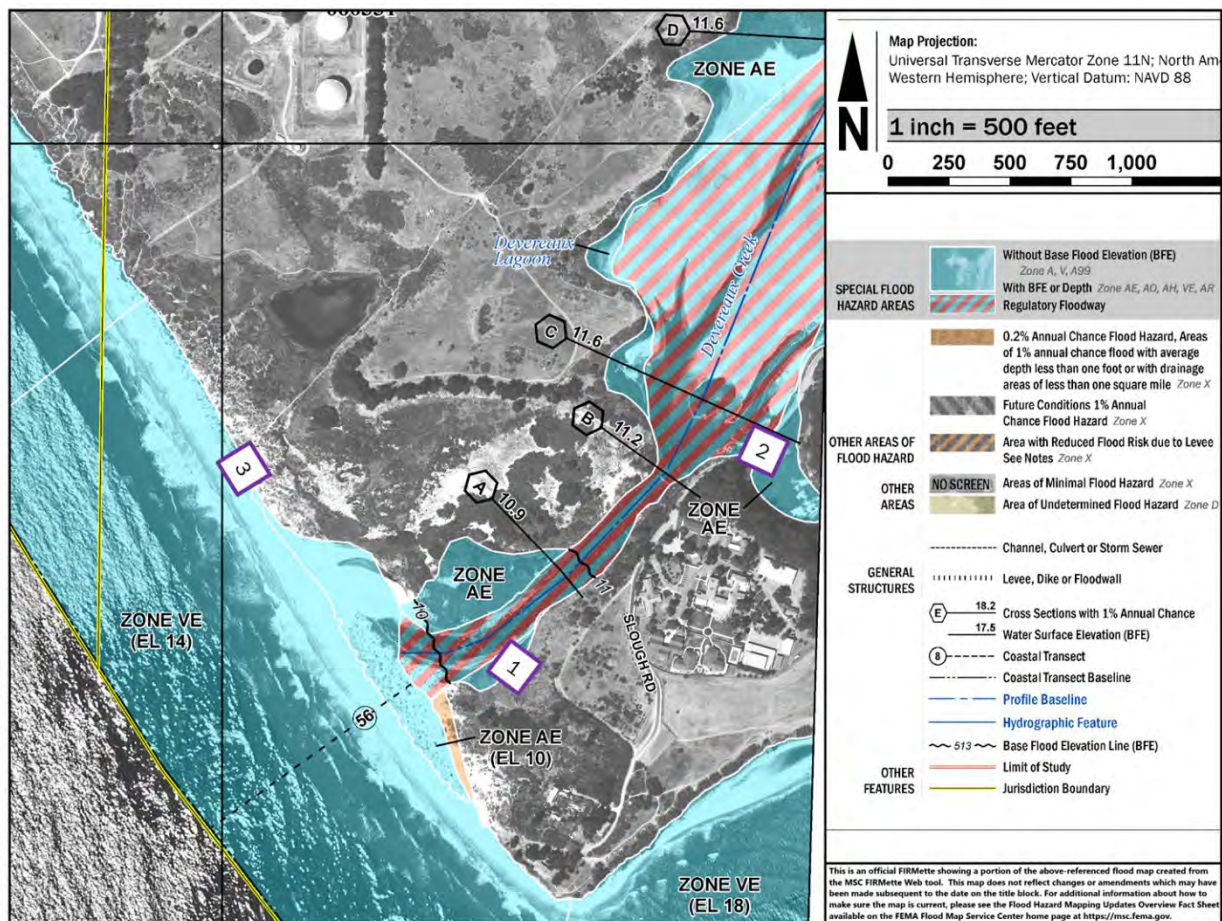
Figure 10. Santa Barbara County FIRMette

FIGURE 11: Santa Barbara County Flood Profile

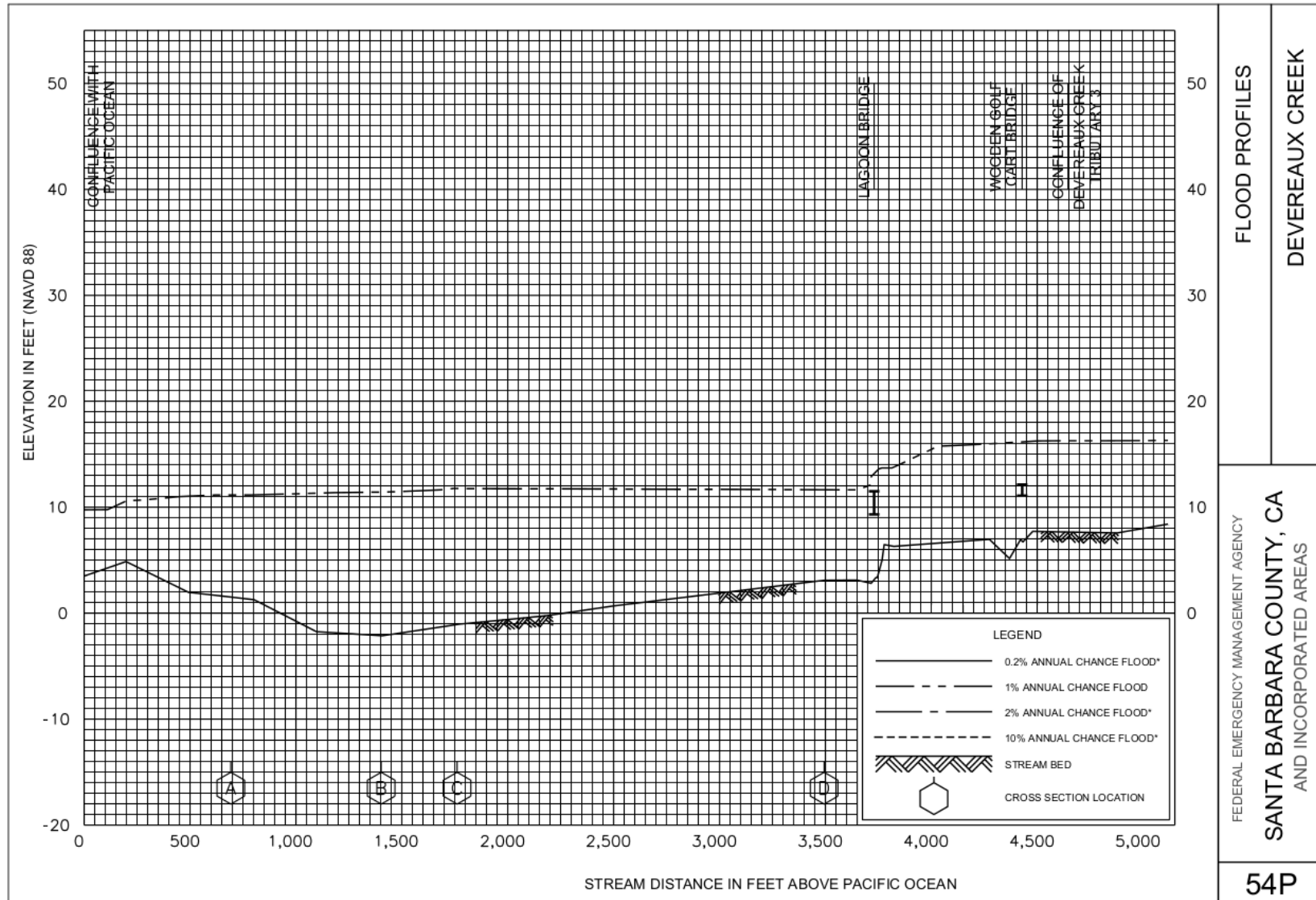


FIGURE 12: SANTA BARBARA COUNTY FIS FLOODWAY DATA TABLE

Location: Cross Section	Location: Distance	Floodway: Width (Feet)	Floodway: Section Area (Sq. Feet)	Floodway: Mean Velocity (Feet/Sec)	1% Annual Food Chance: Regulatory	1% Annual Food Chance: Without Floodway	1% Annual Food Chance: Without Floodway	1% Annual Food Chance: Increase
A	791	133	1,218	3.2	10.9	10.9	11.7	0.8
B	1,400	105	966	4.0	11.2	11.2	11.9	0.7
C	1,760	545	6,884	0.6	11.6	11.6	12.3	0.7
D	3,495	360	2,757	1.5	11.6	11.6	12.2	0.6
E	4,025	180	862	4.8	15.7	15.7	15.7	0.0
F	5,404	172	907	3.9	16.4	16.4	16.9	0.5
G	6,666	203	1,370	1.2	17.2	17.2	18.2	1.0
H	7,791	178	878	1.9	17.3	17.3	18.3	1.0
I	9,025	44	178	6.8	23.9	23.9	24.0	0.1
J	9,929	77	170	3.9	25.8	25.8	25.9	0.1
K	11,418	85	211	3.1	39.9	39.9	40.7	0.8
L	13,184	64	102	4.4	55.9	55.9	55.9	0.0
M	14,197	58	135	3.3	70.3	70.3	70.3	0.0
N	14,729	15	59	7.7	79.6	79.6	80.5	0.9
O	14,989	18	50	9.0	90.7	90.7	91.0	0.3
P	15,595	25	66	3.5	98.6	98.6	98.6	0.0

Source: FEMA

Flooding Source: Deveraux Creek

FIGURE 13. SANTA BARBARA COUNTY FIS COASTAL TRANSECT TABLE

Flood Source	Coastal Transect	(Meters, NAD83 UTM Zone 11N) X Coordinate	(Meters, NAD83 UTM Zone 11N) Y Coordinate	Total Water Level (feet NAVD88) 10% Annual Chance	Total Water Level (feet NAVD88) 4% Annual Chance	Total Water Level (feet NAVD88) 2% Annual Chance	Total Water Level (feet NAVD88) 1% Annual Chance	Total Water Level (feet NAVD88) 0.2% Annual Chance
Pacific Ocean	56	234985.5337	3812060.6747	12.5	13.0	13.4	13.8	14.7
Pacific Ocean	57	236550.8392	3811941.8810	15.7	16.7	17.5	18.3	20.2
Pacific Ocean	58	237882.8615	3811395.5344	12.4	13.0	13.6	14.2	15.6
Pacific Ocean	59	238050.1427	3811284.5647	12.4	13.0	13.5	14.0	15.3
Pacific Ocean	60	238849.9032	3811059.8307	9.8	10.0	10.2	10.4	10.8
Pacific Ocean	61	239012.9063	3811453.0222	8.5	8.7	8.7	8.8	8.9
Pacific Ocean	62	239266.7409	3812310.1032	13.5	14.2	14.8	15.4	17.0
Pacific Ocean	63	239460.7455	3812310.1032	13.0	13.7	14.3	14.9	16.5

Visual 55: Approximating the BFE in A Zones

Approximating the BFE in A Zones



**Student
Notes**

Final BFE discussion for Approximate A zones.

Visual 56: Zone: Approximate A Zones

- No BFE data published by FEMA.
- Obtain, review, reasonably utilize other best available data to regulate development.
- Federal, State, and/or local sources may include:
 - USACE
 - USGS
 - Dept. of Transportation
 - Dept. of Natural Resources
 - County Flood Control District
 - Base Level Engineering (BLE) data

Determining the BFE for Zone A is different than our previous discussions, because no BFE data is published by FEMA in these zones. They are mapped by approximate, not detailed, flood studies. In these approximate A zones, a Floodplain Administrator is required to obtain, review, and utilize other best available data to guide them in regulating development. Data may be available from other Federal, State, or local sources, including:



Student Notes

- United States Army Corps of Engineers (USACE),
- United States Geological Survey (USGS),
- Department of Transportation,
- Department of Natural Resources, and
- County Flood Control District.

There also may be Base Level Engineering (BLE) data available in newer studies where Zone A is model-backed.

Visual 57: How to Approximate the BFE in A Zones

- FEMA provides two methods for estimating BFE for floodplain management purposes:
 - Contour Interpolation
 - Data Extrapolation
- Key resource:
 - FEMA Publication 265 Managing Floodplain Development in Approximate Zone A Areas



Student Notes

There are situations in which a simplified approach for estimating the BFE is acceptable.

FEMA guidance describes two simplified methods for estimating BFE in approximate Zone As: contour interpolation and data extrapolation. Contour interpolation overlays topographic maps on the FIRM. Data extrapolation extends flood profiles beyond a detailed study area.

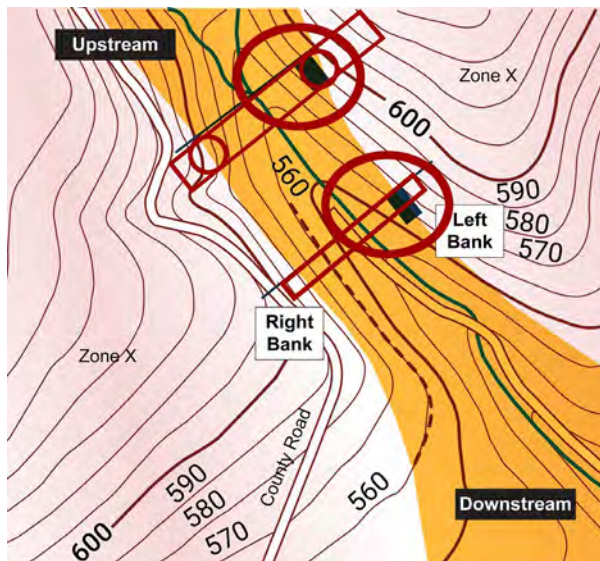


Online Resource

A valuable FEMA resource is available to help you in these situations. This resource is called [FEMA Publication 265 Managing Floodplain Development in Approximate Zone A Areas](https://www.fema.gov/sites/default/files/documents/fema_approx-zone-a-guide.pdf). It is available on FEMA's website at https://www.fema.gov/sites/default/files/documents/fema_approx-zone-a-guide.pdf

These simplified methods are appropriate for floodplain management purposes but cannot be used to support LOMA and LOMR-F applications.

Visual 58: Contour Interpolation



- Can use method if floodplain boundary and topographic map contour lines are similar
 - Overlay topographic and SFHA map
 - Check if banks are within $\frac{1}{2}$ contour interval
- Calculate BFE as: Lowest contour elevation at SFHA boundary, plus half the contour interval
 - Provides a conservative estimate of BFE



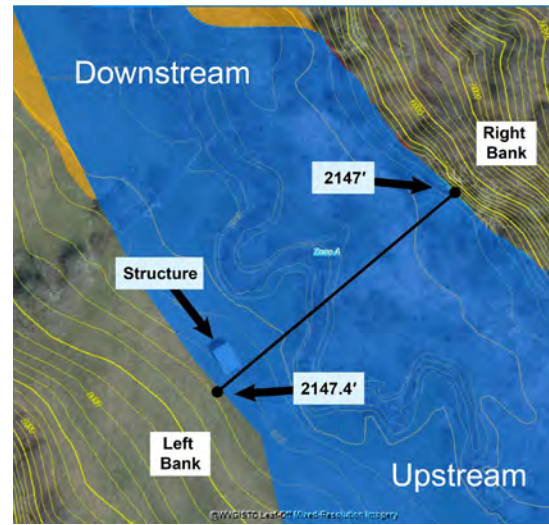
Student Notes

To use the contour interpolation method, the floodplain boundary at the site must closely match up with the contour intervals. When you overlay a contour or topo map and a map of the SFHA, the floodplain will appear relatively centered over the stream, and the boundaries on either side of the floodplain should align with contours of the same elevation. If the floodplain boundaries don't align with the contours, you cannot use this method to determine BFE.

The FEMA guidance for “similar enough” is that the water surface elevation (at that floodplain boundary) must be within one-half of the contour interval on both the right and left overbank lines. If that accuracy limit is met, calculate the BFE as the elevation of the SFHA at the lower of the left or right bank. Then, add half the contour interval as a safety factor. This provides a conservative estimate of the BFE.

Visual 59: Contour Interpolation Example

- Floodplain follows the contour lines? Yes
- Floodplain banks within $\frac{1}{2}$ interval? Yes
 - 1-foot contour intervals
 - 0.4-foot difference
- Accuracy is acceptable, determine the BFE
 - Lower water surface elevation + $\frac{1}{2}$ contour interval = BFE
- $2147.0' + 0.5' = 2147.5' \text{ BFE}$



Contour interpolation can be performed on paper maps with properly scaled topo maps laid on top or in GIS using overlapping digital layers. GIS is more common today.

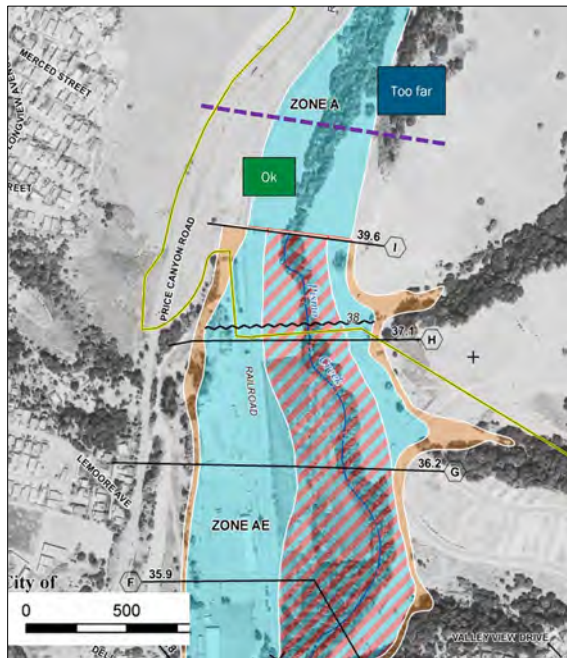


Student Notes

This example has a very detailed contour map with a contour interval of just one foot. The floodplain appears to follow the contour lines well, so it passes the first test. One side of the floodplain layer coincides exactly with the contour line representing an elevation of 2,147 feet. The other side, nearer to the structure, crosses between that contour line and the next higher one. Here, this floodplain boundary coincides with an elevation of 2,147.4 feet.

The result is within the acceptable accuracy limits of less than one-half the contour interval, so it passes the second test. To arrive at the conservatively estimated BFE, you add one-half of the original contour interval to the lower elevation number. In this example, this would be 2,147.0 feet plus 0.5 feet, or one-half of the one-foot contour shown. The total interpolated BFE for the site is 2,147.5 feet. .

Visual 60: Data Extrapolation



- Applicable in rare situations
- Can be used in Zone A sites:
 - Within 500 feet upstream of a detailed study
 - Similar slope on FIS profile
 - No hydraulic structures (bridges, culverts, dams)



Student Notes

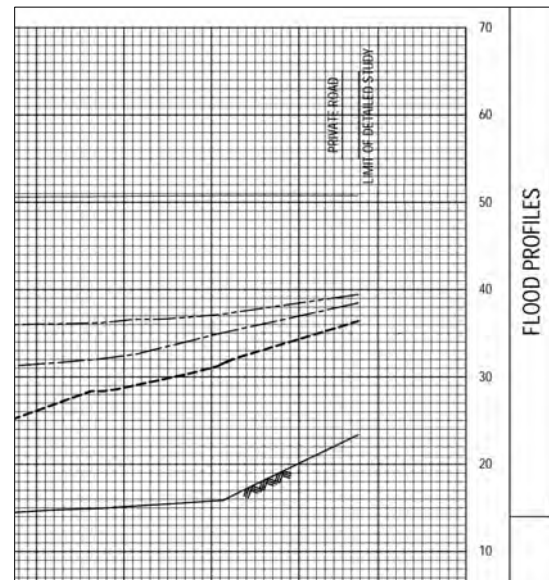
This method is rarely applicable. It can only be used in an A zone that is within 500 feet upstream of a detailed study area where there already is a 1% chance annual flood profile developed and an AE zone delineated.

Additionally, it must meet the following requirements:

- Having similar channel characteristics to the area downstream
- No backwater effects from downstream hydraulic structures such as dams or bridges

Visual 61: Data Extrapolation Example

- No hydraulic structures
- Similar slope on FIS profile
- To determine the BFE, extend 1% annual chance line from FIS profile to proposed site



The data extrapolation requirements are within 500 feet, no hydraulic structures, and having a similar slope on the FIS profile.



Student Notes

Start by extrapolating or extending the 1% chance profile line out to site distance to find the BFE. If you are performing this action on a paper FIS profile, use a ruler or other straight-edge object.

Then, align the ruler or object with the 1% chance profile line to extend it at the same constant slope.

Finally, identify where the extended 1% chance flood line intersects the vertical BFE line.

Visual 62: Knowledge Check 6

When a community has Zone A areas without elevation data, the Floodplain Administrator must obtain, review, and reasonably utilize any other _____ to regulate development.



**Student
Notes**

Answer the following fill in the blank question:

When a community has Zone A areas without elevation data, the Floodplain Administrator must obtain, review, and reasonably utilize any other _____ to regulate development.

Prepare to share your responses with the group.

Visual 63: FEMA Flood Map Service Center (MSC)

FEMA Flood Map Service Center (MSC)



**Student
Notes**

Basic steps to access and use FEMA's Flood Map Service Center (MSC).

Visual 64: Overview of the FEMA MSC

- [Official public source for flood hazard products](https://msc.fema.gov/portal/home)
(<https://msc.fema.gov/portal/home>)
- Users can:
 - Search for a community/specific location
 - Make a FIRMette
 - Download a FIRM/FIS
 - Search all products to look for old (historic)/upcoming (preliminary) maps
 - Use the National Flood Hazard Layer (NFHL) viewer

The FEMA MSC is the official public source for flood hazard information produced in support of the NFIP. Use the FEMA MSC to find your official flood map, access a range of other flood hazard products, and take advantage of tools for better understanding flood risk. At the website, you can:



Student Notes

- Search for a community or specific location,
- Make a FIRMette,
- Download a FIRM and FIS,
- Search all products to look for old (historic) or upcoming (preliminary) maps, and
- Utilize the National Flood Hazard Layer (NFHL) viewer.



Online Resource

Open a web browser on your computer (if one is available) or mobile device. Then, access the [FEMA MSC site](https://msc.fema.gov/portal/home) at <https://msc.fema.gov/portal/home>. Follow along with the instructor as they walk through the FEMA MSC.

Visual 65: Search by Address or Search All Products

FEMA Flood Map Service Center: Welcome!

Looking for a Flood Map? 

Enter an address, a place, or longitude/latitude coordinates:
Enter an address, a place, or longitude/latitude coordinates

Looking for more than just a current flood map?
 Visit [Search All Products](#) to access the full range of flood risk products for your community.

About Flood Map Service Center

The FEMA Flood Map Service Center (MSC) is the official public source for flood hazard information produced in support of the National Flood Insurance Program (NFIP). Use the MSC to find your official flood map, access a range of other flood hazard products, and take advantage of tools for better understanding flood risk.

FEMA flood maps are continually updated through a variety of processes. Effective information that you download or print from this site may change or become superseded by new maps over time. For additional information, please see the [Flood Hazard Mapping Updates Checklist and Steps](#).

[FEMA Flood Map Service Center](https://msc.fema.gov/portal/home)
 (https://msc.fema.gov/portal/home)

FEMA Flood Map Service Center: Search All Products

Choose one of the three search options below and optionally enter a posting date range.

Jurisdiction	Jurisdiction Name	Product ID
State	Jurisdiction Name or FEMA ID	Product ID
Search	By Post/Revision Number or S/N/DRC	By Flood Number, LOMR, Community



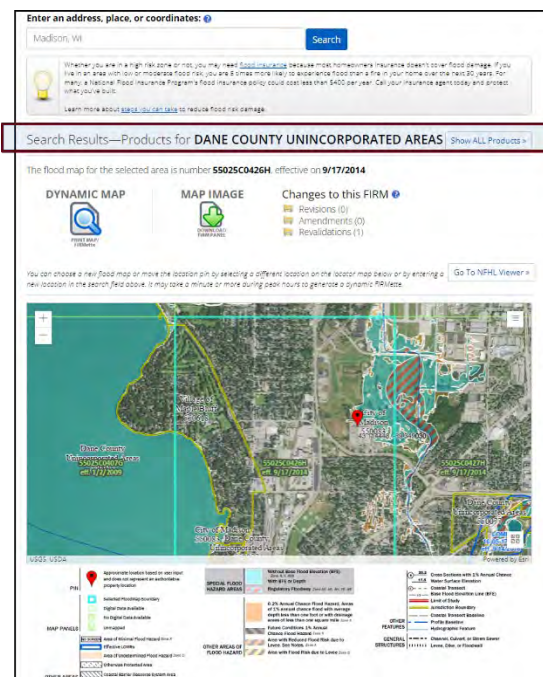
**Student
Notes**

From the main page, enter in the field at the top of the page either an address or a community name.

If you're looking for every flood hazard product for a jurisdiction or a specific FEMA product, choose the Search All Products link below the address box.

Visual 66: Search Results Screen

- Displays FIRM panel number and effective date
- Provides two printing options
 - Dynamic map
 - Map image
- Show ALL Products button
 - Get the FIS, LOMCs, other products
 - Make a FIRMette (note the FIRM # first)
- Go To NFHL Viewer button



The search results screen provides a great deal of map information, including the flood map panel number and the date that the panel became effective. You will also receive options for downloading a dynamic map or a map image.



Student Notes

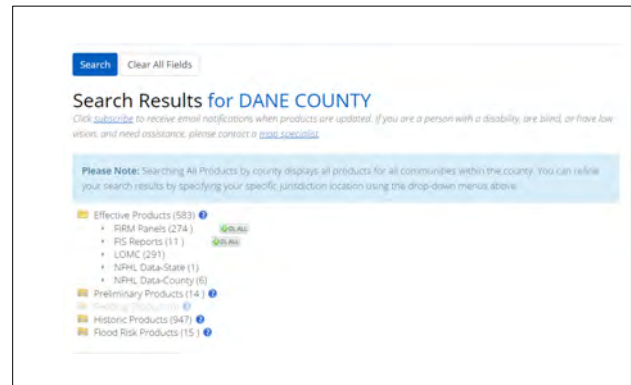
The Dynamic Map button automatically creates a FIRMette based on the center of the sample map image. You can re-center the map before clicking on the Dynamic Map icon. The FIRMette is based on the NFHL and can be printed.

The Map Image button allows you to download the entire FIRM panel to a ZIP file. This is especially useful if you need to review the same map panels frequently or need to make a large-scale printed copy.

The Show All Products button will take you to the listing of all products available for the location.

Visual 67: Show All Products Results Page

- Effective Products:
 - FIRMs
 - FIS
 - LOMCs
 - NFHL data
- Preliminary
- Pending
- Historic
- Flood Risk Products:
 - Non-regulatory



The Show All Products search results page will display effective products, as well as any preliminary, pending, and historic products available for the community or area searched.

Types of products:



**Student
Notes**

- **Effective Products:** FIRMs, FIS reports, and any effective Letters of Map Change that comprise FEMA's official flood hazard determination for a given area. They are authorized by law to be used in making flood hazard determinations under the NFIP. Note that because FIS Reports are not automatically updated by LOMRs, you will need to download items in the LOMC folder to view the most recent Flood Profiles for a LOMR area.
- **Preliminary Products:** Provide an early look at the projected risk identified by an in-progress flood hazard study. Preliminary products are not final and are presented on the MSC as the best information available at the time, subject to modification prior to final issuance.
- **Pending Products:** Released at the conclusion of a flood study and are to become effective within 180 days. Once effective, they automatically move into the effective category.
- **Historic Product:** FIRMs or FIS reports that have been superseded by a new version but are valuable references in documenting an area's prior or changing flood risk over time.
- **Flood Risk Products:** Non-regulatory products to help community officials and residents view and understand their local flood risk. Flood risk products are supplementary resources for understanding and communicating local flood risk to communities and should only be used for review and guidance purposes.

Visual 68: Effective Products: FIRM Panels

Expand

Effective Products (583)
FIRM Panels (274)

Please note: Searches often result in many map files listed under a given section. You can determine the Product ID for the individual map panel needed by looking at the Map Index file. The index map files have "IND" within the Product ID and appear at the start of the list. These index files show an overview of a jurisdiction and how it is subdivided into map panels with the Product ID for each panel shown.

Show **100** entries

Showing 101 to 200 of 274 entries

Previous 1 **2** 3 Next

Product ID	Effective Date	LOMC	Size	Download	View
55025C0355G	01/02/2009	LOMC	10MB	DL	VIEW
55025C0356H	06/16/2016	LOMC	11MB	DL	VIEW
55025C0357H	06/16/2016	LOMC	11MB	DL	VIEW
55025C0360G	01/02/2009		6MB	DL	VIEW

FIRM Panel ID Numbers

Create a FIRMette



Student Notes

Each category of product can be expanded. In this example, we've expanded the view of all Effective FIRM Panels. This screen displays the total number of FIRM panels, their product ID, effective date, an indication of any Letters of Map Change (LOMCs) present on the panel, and the file size.

There is also a file download and view button for each item. Use the view button to create a FIRMette for a panel.

Visual 69: How to Make a FIRMette

1. Select “View” to open the FIRMette Web Tool
2. Select “Create a FIRMette”
3. Follow the tool instructions
4. Select “Download” (.png or .pdf)



To create a FIRMette:

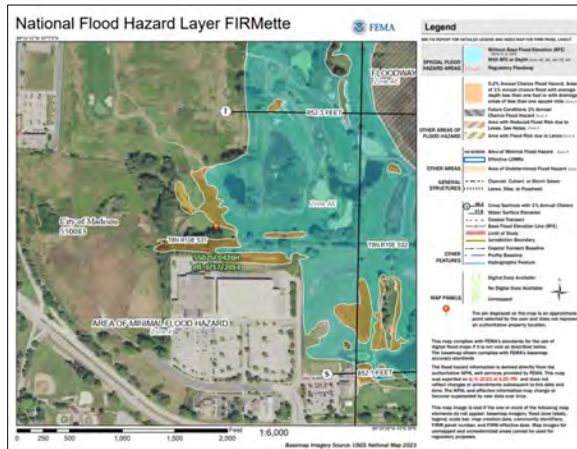


**Student
Notes**

1. Choose the FIRM panel of interest from the menu under Effective Products. Searches often result in many map files listed under a given section, so note your FIRM number or search for it on the FIRM index map. Index files have "IND" within the Product ID and appear at the start of the list.
2. Click View to open the FIRMette Web Tool. A new window will open with the FIRM Panel and the Web tool.
3. Select Create a FIRMette in the upper left corner to begin.
4. Follow the instructions in the mapper.
5. Click the Download button to save it to your computer as a PDF or a PNG image file.

Visual 70: FIRMette Maps

Dynamic Map Button: NFHL FIRMette



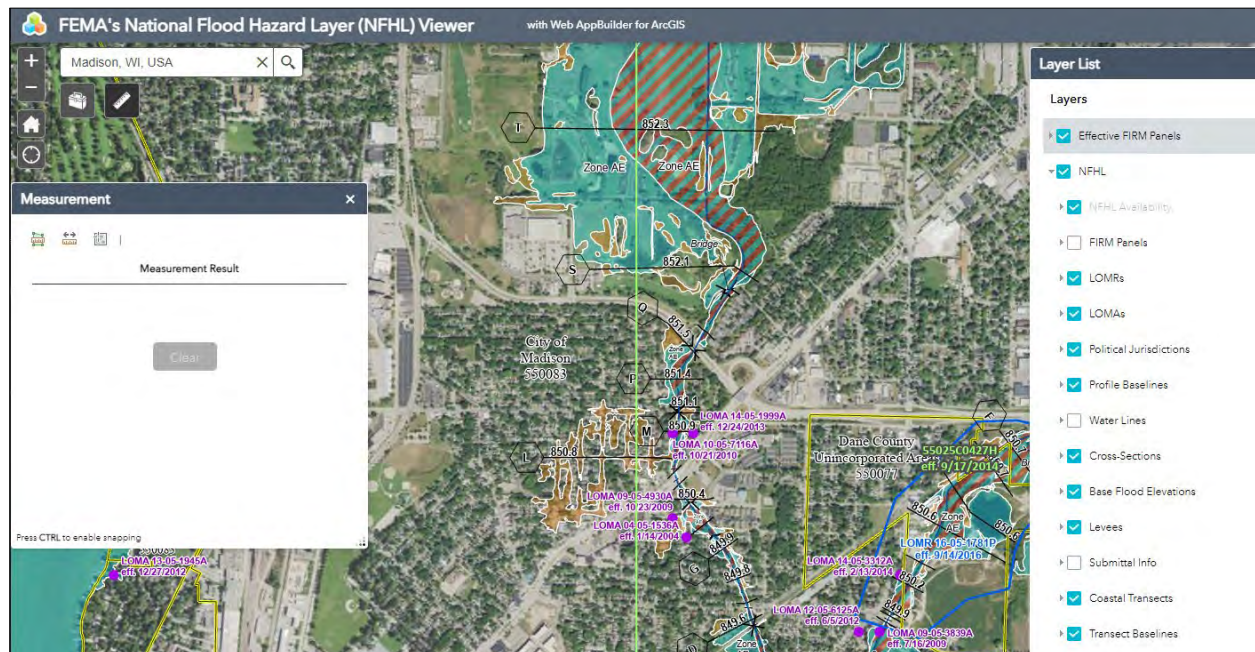
Create a FIRMette Tool: Results



Student Notes

In summary, there are two ways to get a FIRMette map: using the Dynamic Map button or using the FIRMette tool.

Visual 71: NFHL Viewer



Click the Go to NFHL Viewer button on the FEMA MSC Search Results page, which takes you to the NFHL viewer. This interactive browser viewer displays multiple layers, which can be toggled on or off as needed, as shown on the right side of the example image. Display layers include:



Student Notes

- The same map features Effective FIRMs such as cross sections, transect lines, Zones, and BFEs.
- LOMA and LOMR locations. This is often an easier way to look at where a LOMA/LOMR is located, rather than a list per panel in the FEMA MSC. Here, users can click on these Letters of Map Change to download the files directly.

The NFHL also features a measurement tool, the ruler icon in the upper left corner of the screen. This tool is very useful and helps you measure the thalweg on the AE zone.

Visual 72: Changing NFIP Maps

Changing NFIP Maps



**Student
Notes**

Importance of map changes.

Visual 73: Letter of Map Change (LOMC) Requests

- Administrative procedures to change the SFHA
- Requested by property owners, project leads, or community officials
- Issued by FEMA to amend or revise an Effective FIRM

Flood maps may change for a variety of reasons, such as changes in flood risk over time or changes in technology that make more precise mapping possible. As communities grow and development occurs, FEMA relies on new technical information to keep flood maps current.

A map update may be needed for the following reasons:

- Correct non-flood-related features, like a change in the community's corporate limits.
- Include better ground elevation data.
- Reflect changes in ground elevations in the floodplain.
- Revise flood data, like revising an existing study based on an error or more accurate data.
- Submit new flood data, such as when a flood study is prepared for a new development in an Approximate A zone.
- Reflect new development, such as a new levee or channel modification that affects the flow of the base flood. This can include new development where fill was placed and building sites were raised above BFE.

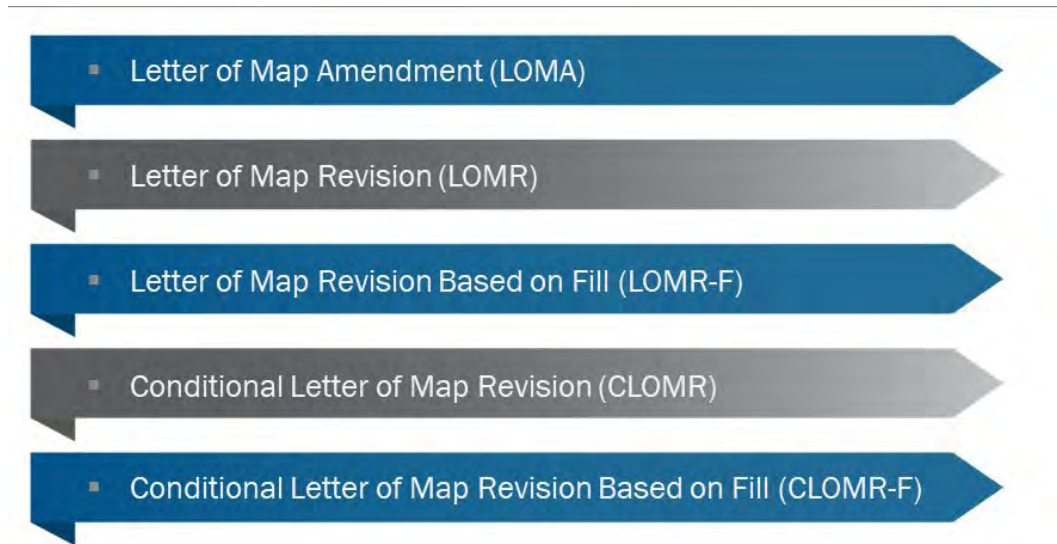
Only FEMA can officially issue a Letter of Map Change (LOMC) and change a flood designation. There are several types of Letters of Map Change, and each is assigned to one of two categories:

- Amendments
- Revisions



**Student
Notes**

Visual 74: Types of LOMCs



Student Notes

Types of letters of map changes:

- Letter of Map Amendment (LOMA)
- Letter of Map Revision (LOMR)
- Letter of Map Revision Based on Fill (LOMR-F)
- Conditional Letters of Map Revision

Visual 75: LOMA

- Official determination of a property's location and elevation, relative to the boundary of SFHA and the BFE
- For an individual structure or property
- Letter amends the FIRM; no new map is published



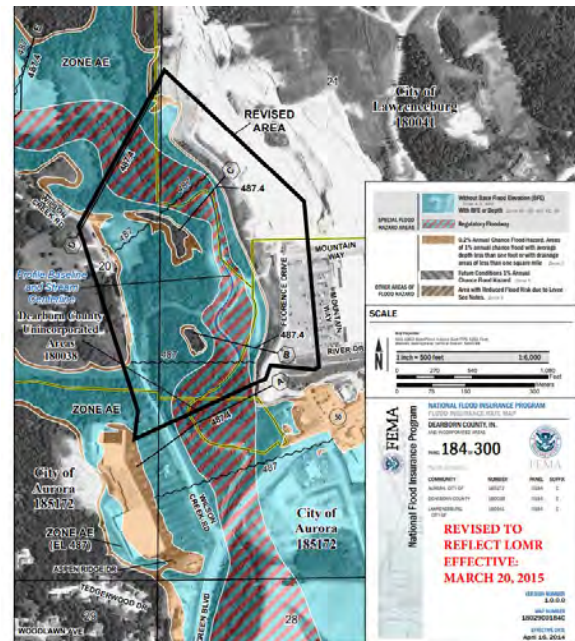
Student Notes

A Letter of Map Amendment (LOMA) is an official amendment, by letter, to an effective FIRM. A LOMA establishes a property's location in relation to the SFHA. LOMAs are usually issued because an individual structure or property has been inadvertently mapped as being in the floodplain when it is on a natural high ground (not elevated by fill) above the BFE. For example, a property owner submits an application to FEMA for a formal determination of the property's location and/or elevation relative to the SFHA.

If a comparison of the structure's lowest adjacent grade to the BFE on the map determines the structure is above the BFE, then a letter is issued removing the structure from the SFHA. No new map is published, but the letter amends the map.

Visual 76: LOMR

- Officially revises an effective FIRM
- Can include changes to:
 - SFHA boundary
 - Floodway boundary
 - BFE



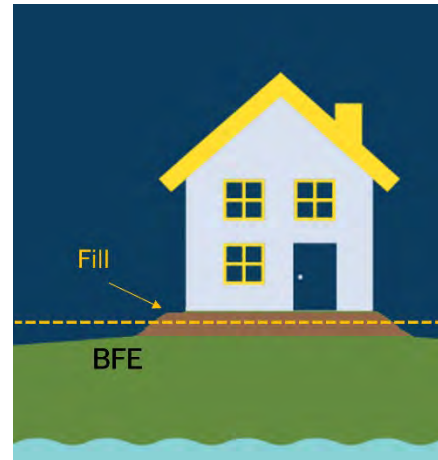
Student Notes

A Letter of Map Revision (LOMR) is FEMA's modification to an effective FIRM, officially revising (or changing) a portion of the FIRM. LOMRs are generally based on the implementation of physical measures that affect the hydrologic or hydraulic characteristics of a flooding source. The result is a modification or change to the existing SFHA boundary, regulatory floodway boundary, and/or the effective BFEs.

The LOMR is generally accompanied by an annotated copy of the affected portions of the FIRM and/or FIS report (as shown in this example). Any LOMR should be noted on the community's master flood map and filed by panel number in an accessible location.

Visual 77: LOMR-F

- A letter from FEMA stating that an existing structure or parcel of land has been **elevated by earthen fill** and would not be inundated by the base flood.
- Not permitted in the regulatory floodway



Student Notes

A Letter of Map Revision Based on Fill (LOMR-F) is a letter from FEMA stating that an existing structure or parcel of land has been **elevated by earthen fill** and would not be inundated by the base flood. Like LOMAs, LOMR-Fs are amendments, so no new map is published. A LOMR-F can only be used in locations outside the existing regulatory floodway because floodway encroachment is not permitted.

Visual 78: CLOMR

- FEMA's comment on the impact of a **proposed** project:
 - If built as proposed, would it justify a map revision?
 - If fill is involved, CLOMR-F
- Conditional. Does **not** change the effective FIRM.



Student Notes

A Conditional Letter of Map Revision (CLOMR) is FEMA's comment on the impact of a proposed project. It asks if this development was built as proposed, could a map revision by FEMA be justified and accepted? If fill is involved, a CLOMR-F is used. Remember, F stands for Fill.

Both the CLOMR and CLOMR-F are conditional. These letters do not change the effective FIRM. After a project is completed, the community must submit as-built documentation to FEMA within six months and request a LOMR or LOMR-F. This is required under 44 CFR § 65.3. The LOMR or LOMR-F officially revises the effective FIRM.

Visual 79: Community Acknowledgement Form

- Required for:
 - LOMR-F or CLOMR-F
 - LOMR when property is in the regulatory floodway
- Signed **only** by the local Floodplain Administrator:
 - Before signing, ensure local ordinance was followed, project complies with Endangered Species Act (ESA), and is reasonably safe from flooding.



Student Notes

A community acknowledgment form is required for requests involving fill (LOMR-F or CLOMR-F) and where properties are regulatory floodways.

Only the local community Floodplain Administrator can sign this community acknowledgment form. Before signing the form, they must ensure the local ordinance was followed, the project complies with the Endangered Species Act (ESA), and the structure is reasonably safe from flooding. The Floodplain Administrator should **not** sign this form if these requirements were not met.



Online Resources

Before we finish this lesson, we want to provide you with a few resources that will help you further understand map changes:

- [Change Your Flood Zone Designation](https://www.fema.gov/flood-maps/change-your-flood-zone)
(<https://www.fema.gov/flood-maps/change-your-flood-zone>)
- [The Online LOMC Training Tutorial](https://www.fema.gov/sites/default/files/2020-07/online-letter-map-change-tutorial-amendments.pdf)
(<https://www.fema.gov/sites/default/files/2020-07/online-letter-map-change-tutorial-amendments.pdf>)
- [Flood Hazard Mapping Updates](https://msc.fema.gov/msccontent/Flood_Hazard_Mapping_Updates_Overview_Fact_Sheet.pdf)
(https://msc.fema.gov/msccontent/Flood_Hazard_Mapping_Updates_Overview_Fact_Sheet.pdf)

Consider these resources as you move forward with your floodplain management activities.

Visual 80: Knowledge Check 7

What is the difference between a LOMA and a LOMR-F?

Select the best response.

- A. LOMA is a conditional determination, and LOMR-F is the final determination.
- B. LOMA is based on natural ground, and LOMR-F is based on fill.
- C. LOMA is always used for a large area, and LOMR-F is only used for a single family home.
- D. LOMA is based on artificial ground, and LOMR-F is based on fill.



**Student
Notes**

Answer the question:

What is the difference between a LOMA and a LOMR-F?

Prepare to share your response with the group.

Visual 81: Unit 3 Summary

After completing this unit, you are now able to:

- Define the impact of water forces.
- Explain the maps and flood studies Floodplain Administrators use to identify hazard information and determine Base Flood Elevations (BFE).
- Describe the resources available on the FEMA Flood Map Service Center (MSC).



You have completed Unit 3. You are now able to:



**Student
Notes**

- Define the impact of water forces,
- Explain the maps and flood studies Floodplain Administrators use to identify hazard information and determine Base Flood Elevations (BFE), and
- Describe the resources available on the FEMA Flood Map Service Center (MSC).

Unit 4: Floodplain Management Regulations Overview

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Visual 1: Unit 4: Floodplain Management Regulations Overview

Unit 4: Floodplain Management Regulations Overview



Student Notes

Welcome to Unit 4: Floodplain Management Regulations Overview. This unit should take about 1 hour and 45 minutes to complete. In Unit 2, we discussed the Federal, State, and local responsibilities for floodplain management. In this unit, we will discuss their legal authorities for floodplain management.

Visual 2: Course Map Umbrella



Student Notes

You are now reviewing the Mitigate the Risk element of the NFIP umbrella. Some topics we will discuss under this part of the umbrella include explaining the NFIP regulations that apply to floodplain management.

Visual 3: Unit 4 Objectives

After completing this unit, you should be able to:

- Identify the legal authority for community floodplain regulation.
- Identify the National Flood Insurance Program (NFIP) Federal regulations minimum standards.
- Recognize the benefits of higher floodplain management standards.



**Student
Notes**

After completing this unit, you should be able to:

- Identify the legal authority for community floodplain regulation,
- Identify the National Flood Insurance Program (NFIP) Federal regulations minimum standards, and
- Recognize the benefits of higher floodplain management standards.

Visual 4: Unit 4 Topics



- Legal Authorities for Governing Floodplain Management
- NFIP Federal Regulations: 44 CFR Section 60.3 (a-e)
- Activity 4.1: Identifying NFIP Regulations
- 44 CFR 60.1 (d): Higher Standards
- Unit Summary

The topics in this unit include:



**Student
Notes**

- Legal Authorities for Governing Floodplain Management
- NFIP Federal Regulations: 44 CFR Section 60.3(a-e)
- Activity 4.1: 60.3 Identifying NFIP Regulations
- 44 CFR 60.1(d): Higher Standards
- Unit Summary

Visual 5: NFIP Federal Regulations: 44 CFR Section 60.3(a-e)

NFIP Federal Regulations: 44 CFR Section 60.3 (a-e)

5



Student Notes

- Review some key concepts you learned about legal authorities for governing floodplains.
- Discuss 44 CFR § 60.3(a-e)

Visual 6: Knowledge Check 1

What are the legal authorities for the local, State, and Federal Governments that we discussed in Unit 2?



Answer the question:



**Student
Notes**

What are the legal authorities for the local, State, and Federal Governments that we discussed in Unit 2?

Prepare to share your responses with the group.

Visual 7: Legal Authorities Governing Floodplain Management

- Federal Government:
 - Sets minimum NFIP standards (44 CFR § 60.3)
- State Legislature:
 - Delegates local land use authority
 - Sets recommended and/or required higher standards
- Local community:
 - Adopts and enforces local ordinances and regulations
 - Responsible for permitting



Student Notes

Local, State, and Federal agencies have varying legal authorities

The Federal Government sets the minimum regulatory standards for floodplain development, found in the Code of Federal Regulations.

States legally delegate the authority for local governments to adopt regulations that meet or exceed minimum NFIP standards. These standards are designed to promote public health, safety, and general welfare. Some states may require local communities to adopt building codes or other higher standards, such as freeboard, which is a designated height above the Base Flood Elevation (BFE).

Local communities that participate in the NFIP must adopt and enforce flood damage prevention ordinances that reflect these requirements. It is the responsibility of the local community, not the responsibility of FEMA, to enforce these regulations within a local jurisdiction. FEMA is not responsible for enforcing local regulations, nor do they have the authority to issue local permits. Only the community can issue permits.

Visual 8: 44 Code of Federal Regulations (CFR) Section 60.3

- Flood zones and floodplain mapping detail determine the applicable regulations
- Standards in 44 CFR § 60.3 are cumulative
- Each regulatory step reflects more risk knowledge (more detailed mapping information).
 - Areas with less detailed maps (i.e., Zone A, no BFEs) have broader regulations.
 - Areas with more detailed maps (i.e., Zone AE, detailed BFEs and floodways) have additional, more specific regulations.



**Student
Notes**

Title 44 of the Code of Federal Regulations (CFR), Section 60.3: Floodplain Management Criteria for Floodprone Areas is the foundation for the floodplain management standards communities adopt and enforce as part of their participation in the NFIP.

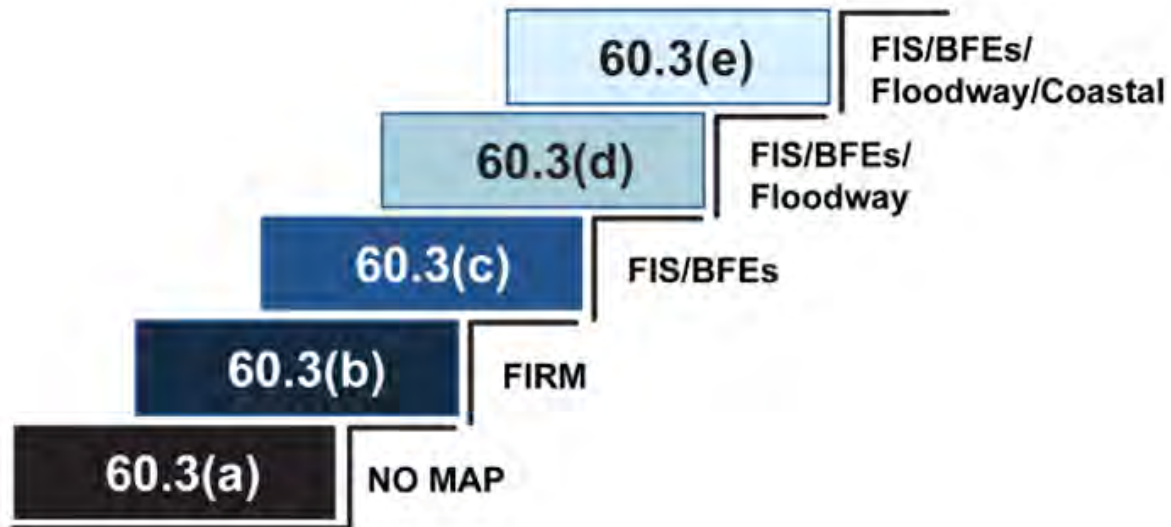
These regulations build cumulatively in increments (steps) according to the community's Flood Insurance Rate Map (FIRM) and the associated Special Flood Hazard Area (SFHA) designations. Each step adds more requirements as the available information about the risk increases.

The flood hazard map information and regulatory standards are related:

- Areas with less detailed maps (Zone A, no BFEs) have broader regulations.
- Areas with more detailed maps (Zone AE, detailed BFEs and floodways) have additional, more specific regulations.

Before we discuss the regulations in 44 CFR Section 60.3, remember that these are Federal minimums. Many States have additional, more stringent standards that communities adopt and enforce.

Visual 9: NFIP Regulatory Staircase: 44 CFR Section 60.3



This is a frequently used NFIP regulatory staircase that demonstrates the cumulative nature of 44 CFR Section 60.3(a-e). As the flood risk information (flood mapping) available increases in detail, so do the regulatory standards. FEMA hazard data (mapping) determines the minimum criteria.

Within 44 CFR, the mapping criteria are:



Student Notes

- § 60.3(a): FEMA has provided no maps.
- § 60.3(b): FEMA has provided a map with approximate A zones.
- § 60.3(c): FEMA has published a FIRM with BFEs.
- § 60.3(d): FEMA has published a FIRM with BFEs and a regulatory floodway.
- § 60.3(e): FEMA has published a FIRM that shows Coastal High Hazard Areas (V zones).

Visual 10: NFIP Definition of Development

“Any man-made 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.” (44 CFR § 59.1)

Includes:

- New structures
- Changes to existing structures
- Non-structural activities



**Student
Notes**

The term development in the context of floodplain management means much more than just new buildings. The NFIP defines development as any human-made change to improved or unimproved real estate, including but not limited to

- New construction, additions, reconstruction, and rehabilitations to existing structures in floodprone areas;
- Changes to land surface, such as mining, dredging, fill/grade, or paving;
- Storage of materials; and
- Changes to culverts, bridges, stream crossings, and bulkheads.

Visual 11: Substantial Improvement (SI) and Substantial Damage (SD)

SI	SD
“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.” ▪ Treat as new construction.	“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.” ▪ Repair of a structure that has been substantially damaged is considered SI.



Student Notes

In terms of changes to existing structures, here is another important definition. In many places, the 44 CFR 60.3 regulations mention the phrase “all new and Substantially Improved structures shall...”

Substantial Improvement (SI) is defined in 44 CFR 59.1 as, “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.”

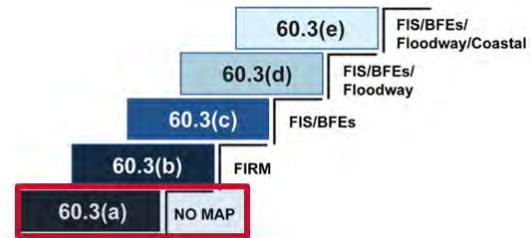
Repair of a structure that has been Substantially Damaged is considered SI.

Substantial Damage (SD) is defined as, “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.”

We’ll talk more about making these determinations during the discussion on permit reviews in Unit 5.

Visual 12: 44 CFR 60.3(a): Unmapped Communities

- Applies to NFIP communities where FEMA has no flood maps prepared
- Basis for the rest of the regulations, applicable to all communities



Student Notes

A community does not need a flood hazard map from FEMA to participate in the NFIP. 44 CFR 60.3(a). It is the first layer of regulations and is initially applicable in communities where FEMA has not produced official flood maps. Over the more than 50 years since the NFIP was created, many communities have received some level of mapping from FEMA, so this situation has become rarer.

These communities can still implement good floodplain management practices using data they've collected or maintained over the years, such as high-water marks or known areas of historic flooding.

Also remember that because of the cumulative nature of the regulations, the first paragraph of the requirements forms the basis for the rest of the regulations. Paragraph A applies to all NFIP communities.

Visual 13: 44 CFR 60.3(a): Requirements

- Requires permits for all proposed development
- Ensures all other necessary permits are obtained:
 - United States Army Corps of Engineers (USACE) 404
 - United States Fish and Wildlife Service (USFWS)
 - State water quality
- Determine if reasonably safe from flooding



Student Notes

44 CFR 60.3(a)(1) requires permits for all proposed construction or other development in the community, including the placement of manufactured homes, to determine whether such construction or other development is proposed within floodprone areas.

44 CFR 60.3(a)(2) requires the local Floodplain Administrators to also ensure that permits have been received from those governmental agencies from which approval is required by local, State, or Federal law.

For example, the United States Army Corps of Engineers (USACE) might require a 404 permit for development in a wetland. Another example is the United States Fish and Wildlife Service (USFWS), which may require incidental take permits. Your State may have some water quality permits or requirements, or the local health department may have a process and requirements for septic systems and wells.

44 CFR 60.3(a)(3) requires all permit applications to be reviewed to determine whether the proposed building sites will be reasonably safe from flooding.

Visual 14: 44 CFR 60.3(a)(3): Reasonably Safe from Flooding

All new and Substantially Improved structures must:

- Be anchored and designed to prevent flotation, collapse, or lateral movement.
- Use flood damage-resistant materials.
- Use methods and practices that minimize flood damage.
- Protect utilities from flooding.



A fundamental reason for requiring and reviewing permit applications for all development is to determine whether proposed building sites will be reasonably safe from flooding. New construction and Substantial Improvements are considered reasonably safe from flooding when they are:



Student Notes

- Designed and anchored to prevent flotation, collapse, and lateral movement. The building must adequately resist the forces of floodwater if it is to be considered reasonably safe from flooding.
- Built with materials that are resistant to floods and water damage.
- Constructed by methods and practices that minimize flood damages.
- Designed to have utilities protected from flooding. Utilities servicing all new and Substantially Improved structures need to be designed or located so that floodwaters cannot enter or accumulate within their components during a flood.

Visual 15: 44 CFR 60.3(a): Requirements Overview

- Review subdivisions and manufactured home park proposals.
 - Locate and construct public utilities/facilities to minimize and eliminate flood damage.
 - Provide adequate drainage.
- Ensure new and replacement water supply systems and sanitary sewage systems minimize or eliminate infiltration of floodwaters.
- Locate onsite waste disposal systems to avoid impairment or contamination.



Student Notes

The fourth requirement, 44 CFR 60.3(a)(4), addresses the review of subdivision and other new development proposals, including manufactured home parks. These requirements include locating and constructing public utilities in a way that eliminates flood damage. The subdivision must also provide adequate drainage of floodwaters.

The fifth requirement of 44 CFR 60.3(a) is about water systems. It requires that new and replacement water supply systems within floodprone areas be designed to minimize or eliminate infiltration of floodwaters into the systems.

The sixth requirement of 44 CFR 60.3(a) is for sewage and waste disposal systems. This requirement states that new or replacement sewage systems that minimize or eliminate the infiltration of floodwaters must be used within floodprone areas. In addition, developers should locate onsite waste disposal systems so that they are not impaired during a flood and don't cause contamination during a flood.

Visual 16: Knowledge Check 2

Which of the following are required to ensure a structure is reasonably safe from flooding? Choose all that apply.

- A. Designed and anchored to prevent flotation, collapse, or lateral movement
- B. Constructed in such a way to avoid flood damage to utilities
- C. Constructed with materials that resist flood damage
- D. Utilities servicing structures designed so floodwaters enter the components during a flood



Answer the question:



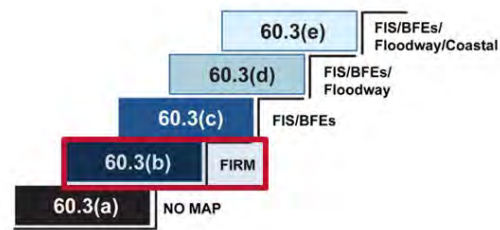
**Student
Notes**

Which of the following are required to ensure a structure is reasonably safe from flooding? Choose all that apply.

Prepare to share your responses with the group.

Visual 17: 44 CFR 60.3(b): Zone A Without BFEs

- Special Flood Hazard Area (SFHA) is defined and adopted.
- BFE is not determined.



Student Notes

44 CFR 60.3(b) is the second step on the regulatory staircase. Communities regulate at this level when the SFHA is defined and adopted, but detailed elevation information (BFEs) has not been determined. Only Approximate A zones are present. Communities with a flood map that has the SFHA defined and adopted into their floodplain management ordinance have the full authority to impose requirements and compliance with their regulations. When the maps were adopted within the community, a legal adoption process, including a public notice, occurred.

Remember that this regulatory staircase is cumulative. 44 CFR 60.3(a) regulations still apply, but only in the mapped SFHA. So, 44 CFR 60.3(b)(1) requires permits for all proposed construction in the SFHA. 44 CFR 60.3(b)(2) requires that all other applicable requirements of 44 CFR 60.3(a)(2-6) are followed. For example, the structures must be reasonably safe from flooding and all other necessary local, State, or Federal permits are obtained.

Next, we will discuss 44 CFR 60.3(b) requirements for subdivisions greater than 50 lots or 5 acres.

**Additional
Information**

These points summarize the requirements for 44 CFR 60.3(b):

- Includes the foundational 44 CFR 60.3(a) standards: Permits required; all other local/State/Federal permits have been obtained; structures should be anchored, flood-resistant materials and methods, and protected utilities
- BFE data required for subdivisions greater than 50 lots/5 acres.
- Obtain BFE and floodway data.
- Certifications required: Lowest floor elevation and dry floodproofing
- Watercourse alterations: Maintain carrying capacity and notify adjacent communities and the State Coordinating Office of alterations.
- Manufactured homes to be installed using methods that minimize flood damage.

Visual 18: 44 CFR 60.3(b) Requirements: 50 Lots or 5 Acres

All new subdivision proposals and other proposed developments (including manufactured home parks) in a Zone A, that are greater than 50 lots or 5 acres, (whichever is less), must generate and provide BFE data.



Student Notes

Requirement 44 CFR 60.3(b)(3) states that all new development proposals greater than 50 lots or 5 acres must include BFE data. This includes subdivision proposals and other proposed developments, including manufactured home parks. When subdivisions meet either of the two criteria, an engineer needs to conduct a hydrologic and hydraulic study to provide detailed BFE data to be submitted with the proposal.

Visual 19: 44 CFR 60.3(b) Requirements: Obtain and Use Other Data

Obtain, review, and reasonably utilize any BFE and floodway data available from a Federal, State, or other source.



44 CFR 60.3(b)(4) requires that for Zone A areas, communities must obtain, review, and reasonably utilize any BFE and floodway data that may be available from outside sources.

These sources include the BFE and/or floodway data from:



**Student
Notes**

- Federal, State, or local agencies;
- Subdivisions over 50 lots or 5 acres;
- Estimated methods; and
- Preliminary or draft data from FEMA that's not yet official (effective).

If you have this data, then you should consider using it for managing floodplain development.

Visual 20: 44 CFR 60.3(b) Requirements: Maintain Records of the Lowest Floor

For all new and Substantially Improved structures, when you have BFE data, obtain and maintain:

- Lowest floor elevation for all structures (including basements).
- Floodproofing elevation (for non-residential).



Student Notes

Requirement 44 CFR 60.3(b)(5) states that when using BFE information, communities must document the elevation of the lowest floor of all new or Substantially Improved structures within the SFHA. This includes the basement. In addition to the elevation of the lowest floor for dry-floodproofed non-residential buildings, the elevation to which they are floodproofed is also required.

Visual 21: 44 CFR 60.3(b) Requirements: Watercourse Alterations

- Prior to altering or relocating a watercourse, notify:
 - Adjacent communities.
 - State Coordinating Office.
- Maintain flood-carrying capacity of altered, relocated watercourse



Student Notes

Requirements for 44 CFR 60.3(b)(6) and (7) state that communities must notify adjacent communities and their State Coordinating Office prior to altering or relocating a riverine watercourse.

Additionally, the flood-carrying capacity of any altered or relocated watercourse portion must be maintained. This means that the watercourse must have the same capacity or greater after alteration. After the alteration, the flood-carrying capacity must be maintained over time.

Visual 22: 44 CFR 60.3(b) Requirements: Manufactured Homes

- Must be installed using methods and practices that minimize flood damage
- Elevate and anchor to resist flotation, collapse, or lateral movement
- Use over-the-top or frame ties to ground anchors



Student Notes

Requirements for 44 CFR 60.3(b)(8) state that all manufactured homes within Zone A must be installed using methods and practices that minimize flood damage. This means that manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement.

These methods of anchoring include, but are not limited to, the use of over-the-top or frame ties to ground anchors. This requirement is an addition to other applicable State and local anchoring requirements in place for resisting wind forces.



Online Resource

For more information on this topic, consider reviewing [FEMA Publication 85: Protecting Manufactured Homes from Floods and Other Hazards](https://www.fema.gov/sites/default/files/2020-08/fema_p85.pdf) (https://www.fema.gov/sites/default/files/2020-08/fema_p85.pdf).

Visual 23: Knowledge Check 3

What is the 60.3(b) requirement for subdivision proposals and other proposed developments?



**Student
Notes**

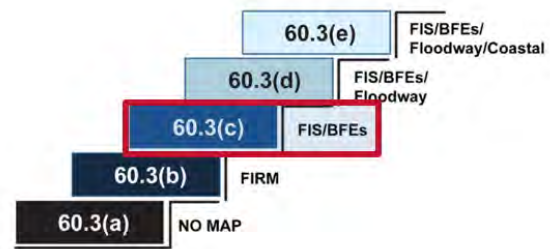
Answer the question:

What is the CFR 60.3(b) requirement for subdivision proposals and other proposed developments?

Prepare to share your responses with the group.

Visual 24: 44 CFR 60.3(c): SFHAs with BFEs

- FIRM identifies BFEs
 - Zones: AE, A1-30, AO, and AH
- No regulatory floodways
- No Coastal High-Hazard Zones



Section 44 CFR 60.3(c) is the third step on the regulatory staircase. Communities regulate this step when their FIS and FIRM identify SFHAs and BFEs, but no regulatory floodways or Coastal High Hazard Areas are delineated.

This includes regulation in:



Student Notes

- Zone AE and Zones A1-A30, where BFEs are determined;
- Zone AH, which generally indicates areas of shallow flooding from ponding, and where BFEs are determined; and,
- Zone AO, which generally indicates areas of shallow flooding from sheet flow, with the base flood depths determined.

Remember, this regulatory staircase is cumulative. 44 CFR 60.3(c)(1) requires application of 44 CFR 60.3(a)(2-6) and all of 60.3(b) standards, with 44 CFR 60.3(c)(2-14) adding additional requirements.

**Additional
Information**

These points summarize the requirements for 44 CFR 60.3(c):

- Elevate the lowest floor
- Floodproofing to BFE
- Requirements for enclosures and flood openings
- Manufactured homes elevation requirements
- Cumulative Rise must be less than one foot
- Adequate drainage in Zones AH and AO
- Recreational vehicles, temporarily onsite, fully licensed and highway ready, or elevated and anchored

Visual 25: 44 CFR 60.3(c) Requirements: Elevate Lowest Floor

- Residential structures within Zones A1-30, AE, and AH must have the lowest floor (including basement) elevated to or above the BFE.
- Non-residential structures may be elevated or dry floodproofed.
- Structures in Zone AO must elevate to or above the depth number specified on the FIRM (at least two feet, if no depth specified)



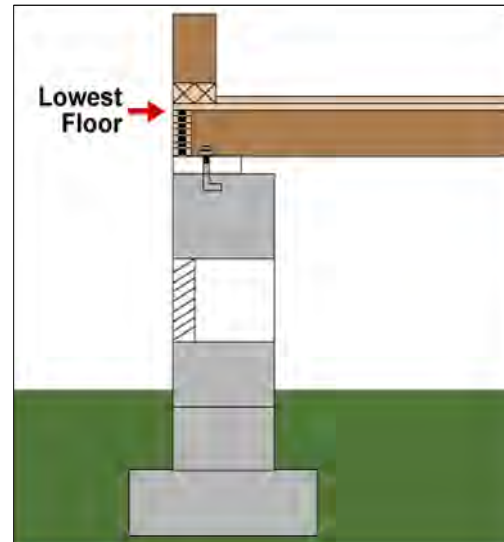
Student Notes

44 CFR 60.3(c)(2-3) requires elevating structures so that their lowest floor is at or above the BFE. This applies to all new and Substantially Improved residential structures in detailed SFHAs. It is also one of two protection methods allowed for new and Substantially Improved non-residential structures. Non-residential structures can be floodproofed instead of being elevated. You will learn about that later in this unit.

If the community has Zone AO, 44 CFR 60.3(c)(7-8) requires that the lowest floor be elevated above the Highest Adjacent Grade (HAG) to at least the depth specified on the FIRM, or to two feet if no depth has been specified on the FIRM.

Visual 26: Lowest Floor Elevation Definition

- Top of lowest floor of the lowest enclosed area (including basement)
- Doesn't include unfinished, flood-resistant enclosures with proper flood openings used solely for:
 - Parking
 - Building access
 - Storage



Student Notes

We'll continue discussing 44 CFR 60.3(c)(2-3) by defining the lowest floor elevation. It's important to know that the lowest floor elevation means the top of the lowest floor of the lowest enclosed area, including a basement if one exists. 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 such enclosure is not built to render the structure in violation of the applicable non-elevation design requirements of Sec. 60.3.

An unfinished or flood-resistant enclosure, such as a crawlspace, with proper flood openings is not considered a building's lowest floor when it is used solely for parking vehicles, building access, or storage. Utilities need to be elevated or otherwise protected if they are below the BFE.

Visual 27: 44 CFR 60.3(c) Requirements: Non-Residential Dry Floodproofing



- Designed to be watertight and resistant to flood loads
- Requires certification by an engineer or architect
- Floodplain Administrator must maintain a copy of certification for recordkeeping.

Under 44 CFR 60.3(c)(3-4), a dry floodproofed non-residential building must be designed so that the structure is:

- Watertight below the BFE,
- Resistant to hydrostatic and hydrodynamic loads, and
- Resistant to the effects of buoyancy.



Student Notes

When a new or Substantially Improved non-residential structure is intended to be floodproofed instead of elevated, an engineer or architect must sign a floodproofing certificate. The certificate asserts that the design and construction of the structure meet the accepted standards.

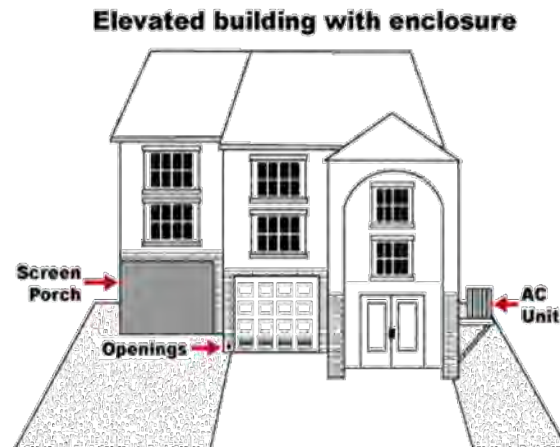
A copy of the floodproofing certificate must be maintained by the Floodplain Administrator with the rest of the permit files in perpetuity; however, dry floodproofing is not an option in V zones. We will discuss those requirements when we talk about 60.3(e).

Visual 28: 44 CFR 60.3(c) Requirements: Enclosures

Fully enclosed areas below the lowest floor must be:

- Designed to allow for the entry and exit of floodwaters
- Used only for:

P	• Parking
A	• Access
S	• Storage



Student Notes

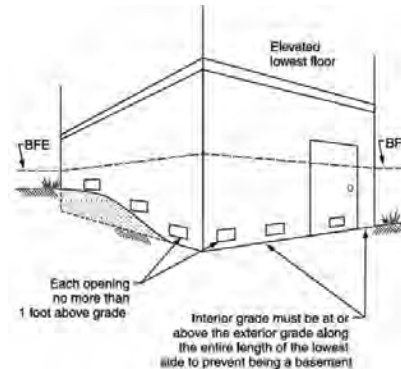
44 CFR 60.3(c)(5) requires fully enclosed areas below the lowest floor to be designed to allow for the entry and exit of floodwaters to equalize the hydrostatic flood forces on exterior walls.

The designs must meet certain minimum criteria for openings in the enclosure walls or be certified by a registered design professional.

Visual 29: 44 CFR 60.3(c) Requirements: Flood Openings in Enclosures

Passive openings to automatically equalize flood forces on exterior walls:

- At least 2 openings
- Net area: 1 inch of opening for every 1 square foot of enclosed space
- Bottom of opening no higher than 1 foot above grade
- Not be blocked or closed



Student Notes

The image on the screen is a diagram of a building with several flood openings installed in the enclosure below the lowest floor. By allowing floodwater to enter and exit the building, flood openings relieve hydrostatic and hydrodynamic loads on the building's walls during a flood. As a result, flood openings help to prevent structural collapse.

According to the 44 CFR 60.3(c)(5) requirement, there must be at least two openings with a net area of at least one square inch per square foot of enclosure.

Industry best practices recommend that vents be installed on at least two sides of each enclosed area. This reduces blockage from debris.



Best Practice

The bottom of the openings must be no higher than one foot above grade. The operation of these openings should be automatic. That is, they should require no human intervention. In addition to being no more than one foot above grade, the openings should be in the area subject to flooding,

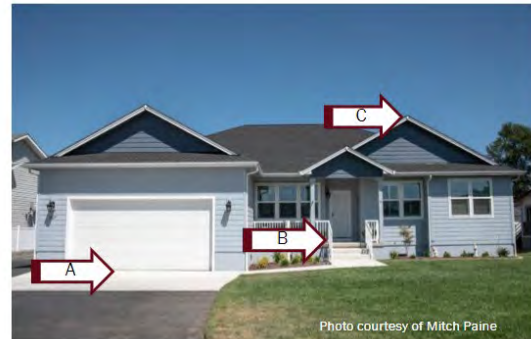
Engineered flood openings are an alternative option to passive openings. If used, they must be certified by a registered professional engineer or architect to automatically equalize hydrodynamic and hydrostatic flood forces on exterior walls.

Technical Bulletin 1: Openings in Foundation Walls and Walls of Enclosures is an excellent resource.

Visual 30: Knowledge Check 4

Scenario: This building's attached garage has sufficient flood openings for its size and is used only for parking. Also, there is no crawlspace.

Which is the Lowest Floor Elevation for this structure in an AE zone?



Read the scenario:



**Student
Notes**

- This building's attached garage has sufficient flood openings for its size and is used only for parking. Also, there is no crawlspace.

Answer the question:

- Which is the Lowest Floor Elevation for this structure in an AE zone?

Prepare to share your answer with the instructor.

Visual 31: 44 CFR 60.3(c) Requirements: Elevating Manufactured Homes

- Securely anchored to a foundation system
- Elevated on a permanent foundation:
 - At or above the BFE for most situations 44 CFR (60.3(c)(6))
 - Elevated 36 inches above grade or to BFE
 - Exception for non-flooded replacements in existing manufactured home parks 44 CFR (60.3(c)(12))



Student Notes

44 CFR 60.3(c)(6) requires new or Substantially Improved manufactured homes in Zones A1-30, AH, and AE to be elevated to or above the BFE on a permanent foundation. The manufactured home must also be anchored to the foundation system to resist flotation, collapse, or lateral movement.

This regulation applies:

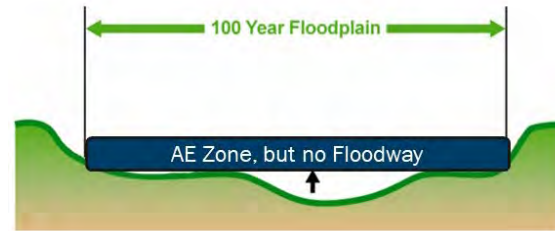
- To manufactured homes outside of a manufactured home park,
- In a new or expanded manufactured home park, and
- Where a manufactured home in a manufactured home park has suffered Substantial Damage due to a flood.

The regulation in 44 CFR 60.3(c)(12) provides an exception for existing manufactured home parks. In existing manufactured home parks, non-flooded manufactured homes may be elevated 36 inches above grade or above the BFE.

This is an NFIP minimum requirement, but many current building codes use a higher standard that requires new or replacement manufactured homes to be at or above the BFE. This requirement applies regardless of whether they are in an existing park or not.

Visual 32: 44 CFR 60.3(c) Requirements: Cumulative Rise

- In Zone AE where no floodway is developed
- No new development (including fill) is permitted if it will increase the cumulative rise more than one foot.



Student Notes

In floodplains where FEMA has provided the community with BFEs, but no floodway, 44 CFR 60.3(c)(10) states that “no new construction, Substantial Improvements, or other development, including fill, shall be permitted unless it is demonstrated that the cumulative effect of the proposed development (when combined with all other existing and anticipated development) will not increase the water surface elevation of the base flood more than one foot at any point within the community.”

This means the community must monitor for cumulative encroachment to ensure that the one-foot floodway surcharge is not exceeded. When FEMA has not established a floodway in a riverine area, you must treat the entire floodplain with more care to avoid overdeveloping areas that would convey flood flows.

Visual 33: 44 CFR 60.3(c) Requirements: Grading for Drainage—Zones AH and AO



- Requires adequate drainage paths around structures on slopes
- Guides floodwaters around and away from proposed structures
- Slopes land away from the base of proposed structures



Student Notes

44 CFR 60.3(c)(11) requires development in Zones AH and AO to have adequate drainage paths around proposed structures on slopes to guide floodwaters around and away from the proposed structures. Grading may also include by sloping the land away from the base of proposed structures in Zones AO and AH.

Visual 34: 44 CFR 60.3(c) Requirements: Recreational Vehicles (RVs)

NFIP Definition of an RV:

- Built on a single chassis
- 400 square feet or less
- Self-propelled or permanently towable by light-duty truck
- Primarily not for permanent residence

RVs Must:

- On the site for fewer than 180 consecutive days,
- Fully licensed and ready for highway use, or
- Meet elevation and anchoring requirements for manufactured homes.

RVs or motor homes are also regulated by the NFIP under 44 CFR 60.3(c)(14).

They differ from manufactured homes in that they are:

- Built on a single chassis,
- 400 square feet or smaller when measured at the largest horizontal projection,
- Designed to be self-propelled or permanently towable by a light-duty truck, and
- Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.



**Student
Notes**

Recreational vehicles are compliant when they:

- Are on the site for fewer than 180 consecutive days,
- Are fully licensed and ready for highway use, or
- Meet the permit requirements of paragraph 44 CFR 60.3(b)(1) and the elevation and anchoring requirements for manufactured homes in 44 CFR 60.3(c)(6).

It is important to know that recreational vehicles can be a challenge. Floodplain Administrators need to monitor them closely to ensure that small issues do not grow into violations.

Visual 35: Knowledge Check 5

Which of the following is not an appropriate use for an enclosure below the lowest floor?

- A. Vehicle and motorcycle parking
- B. Limited storage of garden equipment
- C. A game room with a pool table and TV
- D. Stairs to access the main living floor



**Student
Notes**

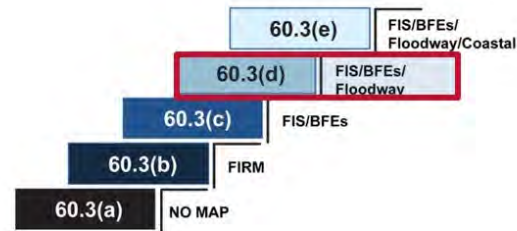
Answer the question:

- Which of the following is not an appropriate use for an enclosure below the lowest floor?

Prepare to share your responses with the group.

Visual 36: 44 CFR 60.3(d): SFHAs with Regulatory Floodway

- SFHA with BFEs and regulatory floodway(s) mapped
- No Coastal High Hazard Areas

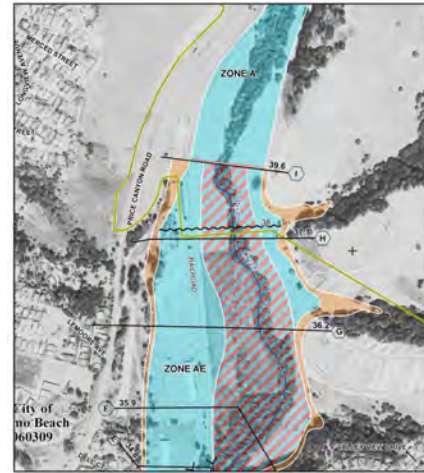
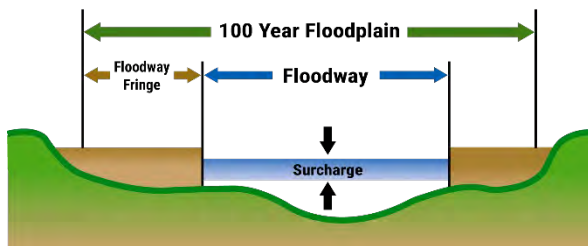


Student Notes

The next step on the regulatory staircase is 44 CFR section 60.3(d), which applies to Zone AE with BFEs and Floodways. At this level of regulation, the flood maps now delineate SFHAs, BFEs have been determined, and floodways have been mapped. Coastal High Hazards are not yet present on the FIRMs.

Visual 37: 44 CFR 60.3(d) Requirements: No Floodway Encroachment

Encroachments (e.g., buildings, roads, fill) are prohibited in floodway unless “hydrologic and hydraulic (H&H) analyses demonstrate that the proposed encroachment would not result in any increase in flood levels during the base flood discharge”



44 CFR 60.3(d)(3) prohibits encroachments within an adopted regulatory floodway unless hydrologic and hydraulic analyses demonstrate that the proposed encroachment would not result in any increase in flood levels during the base flood discharge. Encroachments may include fill, new construction, SI, and other developments.

A floodway encroachment analysis is required to demonstrate no-rise in the base flood level. This means the engineering model must show 0.00 feet of rise. Not even a tenth or a hundredth of a foot is allowed. This is often called a No-Rise analysis because it certifies that the proposed development will make no impact that will increase the BFE.



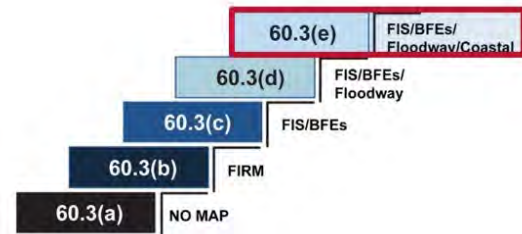
Student Notes

A No-Rise analysis must be conducted before using a permit. The No-Rise certification must be supported by technical data, signed by a registered professional engineer, and included in the submittal for the permit file. The technical data that the certification is based on should be derived from the hydrologic and hydraulic model employed to develop the floodway identified on the community's map.

It is preferable to keep development out of the floodway. Even if it is possible to build, it doesn't mean that it is safe or wise to do so. In addition, all buildings must be elevated, or otherwise protected, to the BFE. That said, some States or communities may have regulations that prohibit any new development in a floodway.

Visual 38: 44 CFR 60.3(e): Coastal High Hazard Areas

- SFHA with BFEs and Coastal High Hazard Areas mapped
- Zones VE, V1-30



Student Notes

The final step on the regulatory staircase is 44 CFR section 60.3(e), which presents the requirements for Zones VE and V1-30. Section 60.3(e) adds additional requirements for coastal high-risk floodplains.

Buildings in V zones are subject to a greater hazard than buildings built in other types of floodplains. Not only do buildings have to be elevated above the BFE, they must also be protected from the impact of waves, hurricane-force winds, and erosion.

Next, we will discuss 44 CFR 60.3(e): Site Requirements.



Additional Information

These points summarize the requirements for 44 CFR 60.3(e):

- Located landward of the mean high tide
- Foundation and elevation requirements
- Lowest horizontal member above BFE
- Breakaway walls
- V Zone Certification required
- Manufactured homes must meet the same standards as other residential structures
- Recreational vehicles must meet 44 CFR 60.3(c) requirements

Visual 39: 44 CFR 60.3(e): Site Requirements

- All new construction within Zones V1-30, VE, and V shall be located landward of the reach of the mean high tide.
- Not permitted: Human-made alteration of sand dunes and mangrove stands



Student Notes

Site requirements in 44 CFR 60.3(e)(3) state that all new construction within Zones V1-30, VE, and V are to be located landward of the reach of the mean high tide. In addition, 44 CFR 60.3(e)(7) prohibits any human-made alteration of sand dunes and mangrove stands in these zones. This requirement is in place because of the potential for increased flood damage if sand dunes and mangrove stands were altered. Mangroves, sand dunes, and other coastal features have been proven to provide significant protection against damage from coastal storms.

Visual 40: 44 CFR 60.3(e) Requirements: Foundation Type and Elevation

- Elevated on piers, posts, pilings or column foundations:
 - No solid wall foundations
 - No use of fill for structural support
- Free from obstruction:
 - Open underneath or using breakaway walls or screening
- Elevation requirement:
 - The bottom of the lowest horizontal structural member is elevated to or above the BFE

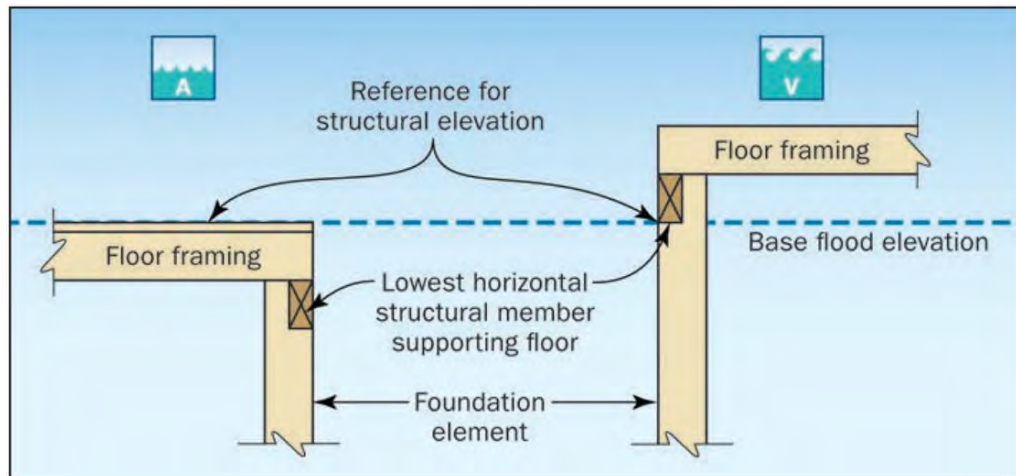


Student Notes

44 CFR 60.3(e)(4-6) pertains to elevation and both wind and water loads. Structures must be elevated on pilings and columns foundations, not solid foundation walls. Structural fill is also prohibited in V zones. Buildings must have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood lattice-work, or insect screening intended to collapse under wind and water loads.

Breakaway walls are designed to collapse from a water load less than would occur during the base flood without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. The term "free of obstruction" means that there is no enclosure below the elevated floor. Additionally, the pile or column foundation and the structure are both anchored to resist flotation, collapse, and lateral movement caused by wind and water loads acting simultaneously on all building components. Wind and water loads can push and twist a structure in different directions at the same time, adding additional stressors to a building's integrity.

Visual 41: 44 CFR 60.3(e) Requirements: Lowest Horizontal Structural Member



This diagram demonstrates together the foundation and elevation elements of V zones that we discussed in the last slide:



Student Notes

- Pier/Post construction
- Open underneath the building
- Bottom of the lowest horizontal structural member of the lowest floor (excluding pilings and columns) at or above the BFE

In Zone V areas, the lowest floor elevation for floodplain regulations is the bottom of the lowest horizontal structural member. This is the underside of the floor. This is different than in Zone As, where the lowest floor elevation for floodplain regulations is the top side of a floor.

Visual 42: 44 CFR 60.3(e) Requirements: V Zone Certificate



Engineer or architect certify:

Design
Planned methods of
construction
Meets NFIP requirements



Maintain a copy of the
certification and the
permit file



Student Notes

Requirements in 44 CFR 60.3(e)(4) state that to be compliant, a registered professional engineer or architect must certify that the design and planned methods of construction in V zones meet the NFIP requirements. It also requires that the community must maintain a copy of this V zone certification in the permit file.



Online Resource

For more information about V zones, visit FEMA's website [V-Zone Certificate](https://www.fema.gov/glossary/v-zone-certificate) at <https://www.fema.gov/glossary/v-zone-certificate>.

Visual 43: 44 CFR 60.3(e) Requirements: Manufactured Homes and RVs

Manufactured Homes	RVs
▪ Must meet the same Zone V standards as other residential structures: ○ Anchoring ○ Elevation of Lowest Horizontal Structural Member above BFE	▪ Must be: ○ On site for fewer than 180 consecutive days ○ Fully licensed and ready for highway use ○ Elevated and anchored requirements of manufactured homes

In general, 44 CFR 60.3(e)(8) requires that manufactured homes must meet the same requirements as other structures in the V Zones. This means that they must be properly anchored, and elevated so that the lowest horizontal structural member is at or above the BFE.

As with the AE zone, the regulations do allow for replacement manufactured homes in VE zones that are damaged by something other than a flood to be elevated so that the lowest horizontal structural member is at or above the BFE or 36 inches above grade.



Student Notes

44 CFR 60.3(e)(9) requires RVs in V zones to meet the same temporary or permanent placement requirements as AE zones. RVs must be:

- On the site for fewer than 180 consecutive days,
- Fully licensed and ready for highway use, or
- Elevated and anchored to the requirements of manufactured homes.

An RV is ready for highway use if it:

- Is on its wheels or jacking system,
- Is attached to the site only by quick disconnect type utilities and security devices, and
- Has no permanently attached additions.

Visual 44: Knowledge Check 6

This building has breakaway walls enclosing a parking area and is in a VE zone.

Which is the Lowest Floor Elevation for this structure?



Answer the question:



**Student
Notes**

This building has breakaway walls enclosing a parking area and is in a VE zone. Which is the Lowest Floor Elevation for this structure?

Prepare to share your response with the group.

Visual 45: Activity 4.1: Identifying NFIP Regulations



- Break into groups.
- Use the two maps provided to determine the appropriate level of regulations from the 44 CFR 60.3 staircase.
- Prepare to share your responses.

Activity 4.1: Identifying NFIP Regulations

Purpose:

In this activity, you will work in groups to identify NFIP regulations.

Time: 20 minutes

Materials: (Located in Student Manual)

- Figure 14. Activity 4.1 Map 1
- Figure 15. Activity 4.1 Map 2A
- Activity 4.1. Response Sheet: Regulatory Questions

Instructions:

Activity

- Make groups of six people.
- Use the two maps to determine the appropriate level of regulations from the 44 CFR 60.3 “staircase” that apply to fictional properties labeled 1–6 on the map.
 - Figure 14. Activity 4.1 Map 1
 - Figure 15. Activity 4.1 Map 2A
- Determine the appropriate level of regulations from the 44 CFR 60.3 “staircase” that apply to fictional properties labeled 1–6 on the map.
- Answer the additional questions for each property using the regulatory level that applies.
 - Activity 4.1. Response Sheet: Regulatory Questions
- Prepare to share your responses with the group.

FIGURE 14. ACTIVITY 4.1—MAP 1

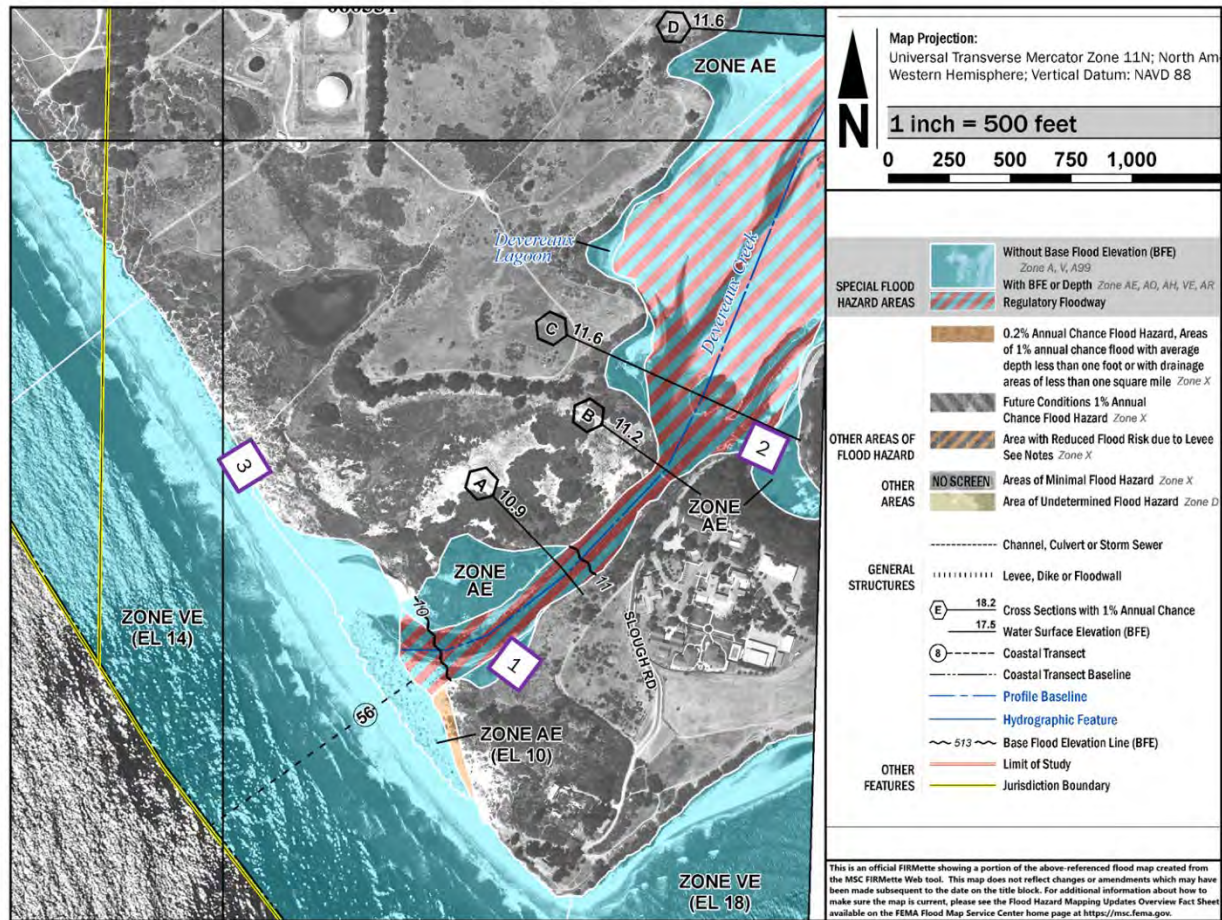


FIGURE 15. ACTIVITY 4.1—MAP 2A

ACTIVITY 4.1. RESPONSE SHEET: REGULATORY QUESTIONS**Map 1: Location 1**

- A. Which 44 CFR regulation applies?
- B. What is the distinguishing feature of the flood map at this site?
- C. Are encroachments allowed at this location?

Map 1: Location 2

- A. Which 44 CFR regulation applies?
- B. This structure cannot encroach into the floodway unless _____ demonstrate that the proposed encroachment would not result in any increase in flood levels during the base flood discharge.
- C. Who must certify the document identified in step b?

Map 1: Location 3

- A. Which 44 CFR regulation applies?
- B. A proposed structure in this location must have the _____ elevated to or above the BFE.
- C. The space below the lowest floor at this location must either be _____ or constructed with non-supporting breakaway walls, or lattice work or screening intended to collapse under wind and water loads.

Map 2A: Location 4

- A. Which 44 CFR regulation applies?

- B. The _____ (including the basement) must be elevated to or above the BFE.
- C. Fully enclosed areas below the lowest floor must be used only for:

Map 2A: Location 5:

- A. Which 44 CFR regulation applies?
- B. What information is lacking in this structure that is present for all the other structures in this activity?
- C. What must the Floodplain Administrator do regarding data in this zone?
- D. If the proposed project is a 12-acre subdivision, what will the developer be required to provide or do? Why?

Map 2A: Location 6

- A. Which 44 CFR regulation applies?
- B. In this zone, the structure's lowest floor must be elevated to or above the _____ specified on the FIRM (at least two feet if not specified)?
- C. If the proposed structure at this location has an enclosure below the lowest floor, there must be at least two openings with a net area of _____ per square foot of enclosure.

Visual 46: Higher Regulatory Standards

Higher Regulatory Standards



**Student
Notes**

Benefits of higher floodplain management standards.

Visual 47: Higher Regulatory Standards Overview

- 44 CFR 60.1(d) states that any community may exceed the minimum criteria by adopting more comprehensive floodplain management regulations.
- Adopted higher standards take precedence over NFIP minimums.
- There are many benefits of going above and beyond the minimum requirements.



Student Notes

Under 44 CFR 60.1(d), communities can adopt more comprehensive floodplain regulations utilizing standards that exceed the minimum NFIP criteria in 44 CFR 60.3. For example, States and communities that rely on the International Building Code (IBC) or residential code have higher standards.

Any more restrictive floodplain management regulations take precedence. Once adopted, those higher regulatory standards (often just referred to as “higher standards”) become the minimum standards. As such a community must apply and enforce any adopted higher standards to maintain their participation in the NFIP (maintain compliance). There are many benefits of going above and beyond the minimum standards.

Visual 48: Benefits of Higher Regulatory Standards

- Reduces or eliminates flood damage
- Provides safer floodplain development
- Creates a more resilient community
- Allows flexibility for State and local priorities
- Encourages comprehensive floodplain management
- Increases the potential for flood insurance cost



Higher standards provide several benefits and additional protection for lives and property from flood damage. These benefits include the following:



**Student
Notes**

- Reducing or eliminating flood damage
- Providing safer floodplain development
- Creating a more resilient community
- Allowing flexibility for State and local priorities
- Encouraging comprehensive floodplain management
- Increasing the potential flood insurance cost benefits

Visual 49: Examples of Higher Regulatory Standards

- Freeboard:
 - Additional feet of elevation above the BFE
- Regulating outside the SFHA
- Compensatory storage
- More restrictive thresholds for SI and SD:
 - Lower than 50%
 - Cumulative calculations

One of the most common higher standards is freeboard, which is an additional amount of height (typically measured in feet) above the BFE. Freeboard is used as a factor of safety when determining how high to elevate a building's lowest floor. Building "higher and drier" helps keep people and property safer from flooding.

Some communities regulate floodplain development in areas that are not in an SHFA on the Flood Insurance Rate Map (FIRM) but are known by the community to have flood hazards. Examples include applying floodplain standards to Shaded X areas and applying floodplain standards to areas the community has studied on their own (e.g., sea level rise, which does not appear on regulatory maps from FEMA, but may be studied separately by a community).



Student Notes

Some communities apply higher regulatory standards for compensatory storage. These communities require developers to create flood storage commensurate with the fill they put into the high-risk floodplain. This requirement can help to reduce the impact fill has on the flood risk in an area by adding more floodplain storage for future flooding events.

Another higher standard that can have a significant impact is adopting a lower threshold for Substantial Damage and Substantial Improvement. This means that a structure needs to be mitigated before hitting the 50% threshold outlined in the minimum NFIP requirements.

Cumulative Substantial Improvement is another higher standard. A community applying Cumulative Substantial Improvement will add each improvement over a set amount of time so that even incremental improvements can add up to the 50% threshold. These improvements will trigger the Substantial Improvement rules earlier.

Visual 50: Knowledge Check 7

Why is freeboard an effective higher regulatory standard?

- A. It keeps people and property safe from flooding by building “higher and drier.”
- B. It is cheaper to implement.
- C. It requires building below the BFE.
- D. It recommends building outside the floodplain.



**Student
Notes**

Answer the question:

Why is freeboard an effective higher regulatory standard?

Prepare to share your response with the group.

Visual 51: Unit 4 Summary

After completing this unit, you are now able to:

- Identify the legal authority for community floodplain regulation.
- Identify the National Flood Insurance Program (NFIP) Federal regulations minimum standards.
- Recognize the benefits of higher floodplain management standards.



**Student
Notes**

You have completed Unit 4. You are now able to:

- Identify the legal authority for community floodplain regulation.
- Identify the National Flood Insurance Program (NFIP) Federal regulations minimum standards.
- Recognize the benefits of higher floodplain management standards.

Unit 5: Oversight and Compliance: The Permitting Process

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Visual 1: Unit 5: Oversight and Compliance: The Permitting Process

Unit 5: Oversight and Compliance: The Permitting Process



Student Notes

Welcome to Unit 5: Oversight and Compliance: The Permitting Process.

The main purpose of this unit is to provide you with an overview of the Floodplain Administrator's responsibilities in providing oversight and ensuring compliance.

Visual 2: Course Map Umbrella



Student Notes

You are now reviewing the Mitigate the Risk element of the NFIP umbrella. The topics we will discuss under this part of the umbrella include oversight and compliance and pre- and post-event activities.

Visual 3: Unit 5 Objectives

After completing this unit, you should be able to:

- Explain the Floodplain Administrator's roles, responsibilities, and oversight and compliance authority.
- Identify the permit development process steps.
- Explain the permitting review steps.
- Describe the Floodplain Administrator's post-event operations responsibilities.



After completing this unit, you should be able to:



**Student
Notes**

- Explain the Floodplain Administrator's roles, responsibilities and oversight and compliance authority;
- Identify the permit development process steps;
- Explain the permitting review process; and
- Describe the Floodplain Administrator's post-event operations responsibilities.

Visual 4: Unit 5 Topics



- Floodplain Administrator Responsibilities and Authorities
- Development Permitting Process
- Activity 5.1: A Day in the Life of a Floodplain Administrator—Part 1
- Permit Review Steps
- Activity 5.1: A Day in the Life of a Floodplain Administrator—Part 2
- Post-Disaster Permitting and Mitigation and Recovery Funding
- Unit Summary

The topics for this unit are:



**Student
Notes**

- Floodplain Administrator Responsibilities and Authorities
- Development Permitting Process
- Activity 5.1: A Day in the Life of a Floodplain Administrator—Part 1
- Permit Review Steps
- Activity 5.1: A Day in the Life of a Floodplain Administrator—Part 2
- Post-Disaster Permitting and Mitigation and Recovery Funding
- Unit Summary

Visual 5: Floodplain Administrator Responsibilities and Authorities

Floodplain Administrator Responsibilities and Authorities



**Student
Notes**

Overview of the various responsibilities and authorities of the Floodplain Administrator.

Visual 6: Local Government Land Use Authority

- Statutory authorization: States, territories, or Tribal governments grant local communities the right to enact regulations to reduce flood losses.
- Regulations promote public health, safety, and general welfare.
- Authority includes the duty and authority to administer and enforce these regulations.
- **Local community is responsible for enforcing its own regulations within its jurisdiction.**



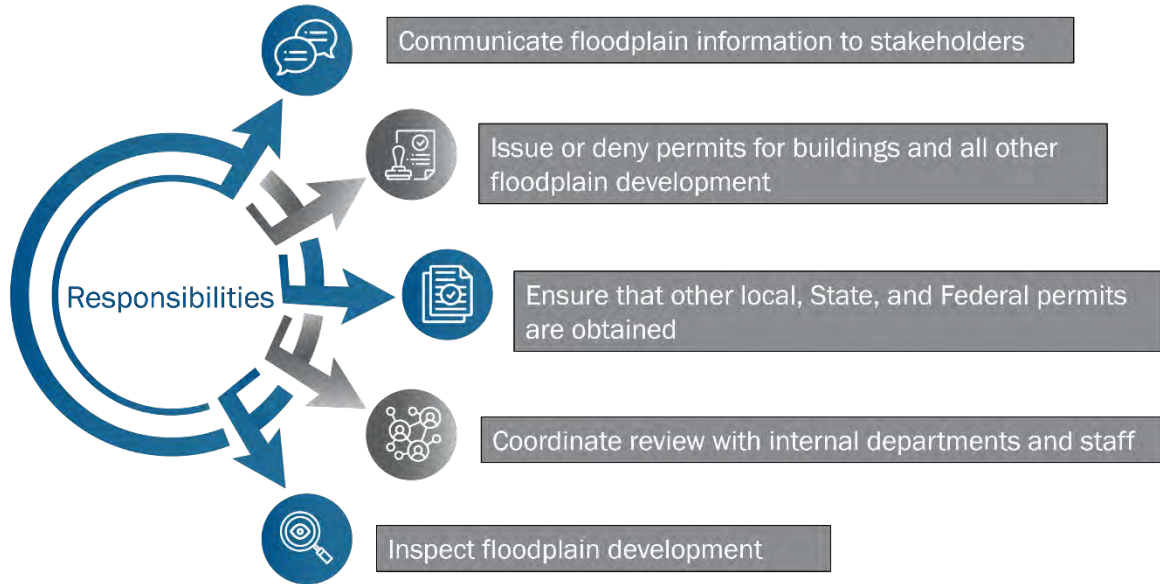
Student Notes

In most States or commonwealths, the land use authority is passed to local governments from a specific State law or set of laws. In territories, insular areas, and Tribal communities, the authority to enact floodplain regulations comes from these entities.

The purpose of granting land use authority is to protect or promote the health, safety, and general welfare of the citizens.

To participate in the NFIP, a community must adopt and enforce the floodplain regulations we discussed in the previous unit. It is the community's duty, not FEMA's, to enforce the requirements of their ordinance in their jurisdiction.

Visual 7: Floodplain Administrator Responsibilities (1 of 2)



To maintain compliance with the NFIP, your community will need to enforce its adopted floodplain management ordinance and regulate development. As the designated responsible official, to effectively regulate development the Floodplain Administrator will need to do the following:



Student Notes

- Communicate floodplain information to stakeholders.
- Review and process floodplain development permits for buildings and all other floodplain development. Permit applications should either be issued if they are compliant or denied if they are incomplete/out of compliance.
- Ensure that the applicant obtains other local, State, and Federal permits.
- Coordinate review with internal departments and staff as necessary.
- Inspect floodplain development.

Visual 8: Floodplain Administrator Responsibilities (2 of 2)



Additional Floodplain Administrator permitting responsibilities include the following:



Student Notes

- Investigating complaints and following the enforcement procedures for violations.
- Providing support and technical expertise for both the appeals and variances processes.
- Maintaining records in perpetuity.
- Providing training and guidance to community elected officials and staff on floodplain management concepts and requirements.

Visual 9: Knowledge Check 1

What are three responsibilities of a Floodplain Administrator?



**Student
Notes**

Answer the question:

What are three responsibilities of a Floodplain Administrator?

Prepare to share your response with the group.

Visual 10: Development Permitting Process

Development Permitting Process



**Student
Notes**

Regulations that govern floodplain permits.

Visual 11: Floodplain Regulations and the Permit Process



Ordinances provide the requirements for Special Flood Hazard Area (SFHA) development.

Communities create permitting procedures to administer the requirements.



NFIP standards require permits for all floodplain development.

Permitting procedures follow flood damage prevention ordinance

Maintain records and information.



Please note that specific processes or administrative pathways may vary by jurisdiction.

Community floodplain regulations and ordinances provide the framework for permitting development in the floodplain.

Since the local community has the authority to administer their NFIP program, there can be many ways that a community regulates this development.



Student Notes

NFIP minimum standards require that permits be obtained for all floodplain development, that communities ensure their ordinance is followed, and that the community maintains certain records and information.

It's up to the local community to determine how to meet these requirements in a way that works best for them. Not every community is the same. Specific permit processes or pathways may vary. For example, a community may issue a standalone permit or several integrated permits.

In Unit 4, we discussed the requirements for obtaining permits for all development in the floodplain. In this unit, we'll discuss the steps to ensure that the Floodplain Administrator obtains permits and ensures compliance for floodplain development.

Visual 12: Community Permitting Process

- Ensures all development within the SFHA is reviewed for compliance with the community's flood damage protection ordinance
- Includes all:
 - Structural development (homes, businesses, accessory buildings, etc.)
 - Non-structural development (fill, grading, excavation, decks, etc.)



Student Notes

- NFIP participating communities are required to establish permitting processes that ensure all development within the Special Flood Hazard Area (SFHA) is reviewed for compliance with the community's flood damage prevention ordinance.
- Floodplain development encompasses more than traditional residential and non-residential construction.
- Recall the definition of Development from Unit 4. Since the NFIP broadly defines development, as a rule, anything that alters the natural topography of the floodplain needs a permit review.
- Structural development includes homes, businesses, accessory structures, etc.
- Non-structural development includes things like fill/grade work, excavation, decks, etc.

Visual 13: Require Floodplain Permits

- Inside the SFHA, a permit is required for all development:
 - May be a standalone permit
 - May be additional portion of building permit or others like fill/grade permit
- Collect fees according to your procedures and ordinance.



Student Notes

If the development is inside the SFHA, then a permit is required. The Floodplain Administrator must have the owner/developer fill out a Floodplain Development Permit application and collect any fees required by your ordinance and standard procedures. The Floodplain Development Permit application and associated fees are in addition to the standard building permit application.

Visual 14: Sample Floodplain Development Permit Application

The image displays three sample pages of the Floodplain Development Permit Application form. The first page is the cover sheet, titled 'Floodplain Development Permit' with a subtitle 'Cover Sheet & Conditions'. It includes fields for 'Permit No.' and 'Date'. The second page is the 'Owner Information' and 'Contractor/Developer Information' section, featuring numbered sections for 'Owner Information' and 'Contractor/Developer Information'. The third page is the 'Floodplain Development Permit Checklist', titled 'THIS PAGE TO BE COMPLETED BY FLOODPLAIN ADMINISTRATOR', and lists various items to be checked, including 'Floodplain Development Permit Checklist', 'Floodplain Development Permit Checklist', and 'Floodplain Development Permit Checklist'.



Refer to Handout 5.1: Sample Floodplain Development Permit Application.

This is a sample Floodplain Development Permit Application developed by FEMA Region 8. This Floodplain Development Permit Application is easy to use. It uses clear, concise language and was designed to be intuitive and easily populated.



Here are some of the highlights of this form:

- Clear numbering and sections that clearly identify who should be filling out the form
- Terms and conditions associated with the permit
- Checklist of required documents to be submitted with the application
- Checkboxes to clearly identify the status of the permit application (approved, approved with conditions, denied, or variance granted)

Visual 15: Development Permit Review Process



High-level steps involved in the permit process.

This process may vary for any incomplete applications, noncompliance, appeals, variances, or violations.

The permit process steps:

- A. An applicant prepares an application and submits it to the community.
- B. The application is then checked for completeness. If the application is incomplete, it's returned to the applicant with an explanation of missing or incomplete elements that the applicant must remedy.
- C. Once the application is complete, it's reviewed for technical compliance. The reviewer checks that the application meets the ordinance requirements. If there are any technical issues with the permit, the application is returned to the applicant with an explanation of the issues with the permit.
- D. Once the application is complete and includes the technical information required, the application is reviewed and either a permit is denied and returned to the applicant, or it is approved and issued.
- E. Once the permit is issued, the applicant can move forward with developing the proposed project.
- F. After the construction has started, the Floodplain Administrator will conduct inspections and collect the required data.
- G. When the project is complete and has met all floodplain management standards, a certificate of occupancy may be issued to compliant, complete projects.



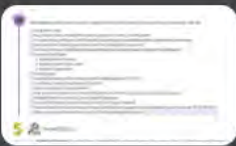
**Student
Notes**

Floodplain permitting is mostly focused on making sure that the technical elements of meeting your community's ordinance are there, so we will spend most of our time focusing on checking for completeness and compliance.

Visual 16: Permit Process Best Practices



Provide education and outreach materials.



Develop a permit application form.



Establish an inter-office review process.



Offer consultation.

While there are a lot of steps involved with this process, there are several actions that a local community can take to help the process operate more smoothly. Consider these best practices if you are responsible for reviewing a permit application:



**Student
Notes**

- **Provide education and outreach materials:** You should have materials that explain the floodplain development requirements in layman's terms for the developer. This will help ensure that the applicant has what they need to be fully informed before submitting their applications. These resources can include a brochure, quick guide desk reference, routine training, or even social media posts.
- **Develop an adequate permit application form:** This form should be clear and direct. It should contain all the technical information the community will need to review and issue the permit. A good permit application can act like a checklist for the regulatory items we discussed in Unit 4 that development is required to be built on. This includes plans, BFE, lowest floor elevation, cost estimates, and any engineering or surveying certificate requirements.
- **Establish an interoffice review process:** You should have a documented process that outlines who reviews, what they review for, and in what order. There should be a designated Floodplain Administrator who has the authority to enforce the provisions of your ordinance. In addition to the Floodplain Administrator, other offices such as health, building, electrical, or emergency services may also need to be included in the process.
- **Offer consultation:** Providing applicants with the opportunity to discuss their projects and for relevant community departments to provide their feedback will help to reduce any potential errors or incomplete submittals.

Visual 17: Development Permit Application Resources and Procedures

References and resources:

- State Floodplain Management Office
- FEMA NFIP Technical Bulletins (TBs) and Building Sciences publications
- Flood insurance resources
- Permitting office resources

It's much easier to provide guidance to an applicant in advance, than to correct problems later.



**Student
Notes**

There are resources available that can help you and your applicants with the permit application process:

- **State Floodplain Management Office:** Your State NFIP Coordinator's office may be able to provide guidance on developing or improving your permit forms and review processes. They may also have a sample development permit that you can adapt to use in your community.
- **Technical Bulletins and Building Science publications:** FEMA has technical bulletins and Building Science publications that describe the ways to meet many of the standard floodplain development requirements. You can review these to become more familiar with development standards and to be able to reference specific bulletins to applicants. As we discussed in Unit 4, [FEMA TBs](https://www.fema.gov/emergency-managers/risk-management/building-science/national-flood-insurance-technical-bulletins) are available at <https://www.fema.gov/emergency-managers/risk-management/building-science/national-flood-insurance-technical-bulletins>.
- **Flood insurance resources:** FEMA has resources for your office to reference and to provide to the public to help them better understand how to develop their projects in ways that reduce the costs of flood insurance.
- **Local permitting office:** Your local office should maintain its repository of information, including the resources we've just talked about and documents produced by your community. These can include links to flood maps and NFIP technical materials, a formal community review process checklist, a clear floodplain development form, office hours, and contact information.

The more guidance and resources you can provide to applicants in advance, the more effective your review process will be. Sometimes a suggested tweak can make it compliant, reduce risk, and potentially save the applicant money on flood insurance.

Visual 18: Knowledge Check 2

What are some best practices local communities can apply for permit reviews?



**Student
Notes**

Answer the question:

What are some best practices local communities can apply for permit reviews?

Prepare to share your response with the group.

Visual 19: Activity 5.1: A Day in the Life of a Floodplain Administrator-Part 1



- Break into groups.
- Write in your Student Manual where the listed Floodplain Administrator responsibility or permit process is located in Handout 5.1.
- Prepare to share your responses.

Activity 5.1: A Day in the Life of a Floodplain Administrator-Part 1

Purpose:

The purpose of this activity is for participants to identify the Floodplain Administrator's permitting roles and responsibilities.

Time: 15 minutes

Materials:

Handout 5.1: Sample Floodplain Development Permit Application (Provided by Instructor)

Activity

Activity 5.1: Response Sheet: Floodplain Administrator Responsibility or Permit Process (Located in Student Manual)

Instructions:

- Divide into groups of three people per group.
- Acquire "Handout 5.1: Sample Floodplain Development Permit Application".
- Write in "Activity 5.1: Response Sheet: Floodplain Administrator Responsibility or Permit Process" where the listed Floodplain Administrator responsibility or permit process is located in Handout 5.1.
- Prepare to share your responses with the group.

ACTIVITY 5.1 RESPONSE SHEET: FLOOD ADMINISTRATOR RESPONSIBILITY OR PERMIT PROCESS

Where can the following floodplain administrator responsibilities be found in Handout 5.1: Sample Floodplain Development Permit Application?

- A. Communicate floodplain information to stakeholders
- B. Require permits for all floodplain development
- C. Enforce SI requirements
- D. Issue or deny permits

Visual 20: Permit and Compliance Review Process

Permit and Compliance Review Process



**Student
Notes**

Core steps of the permit process: checking the application for completeness and technical compliance.

Visual 21: Permit Review Process



Review for Completeness

- What type of development is it?
- Where is it located?
- What rules apply?



Review for Compliance

- Does the proposed development meet the local flood damage prevention ordinance requirements?



Student Notes

To determine if the permit application is complete, you need to know what kind of documents will be required. You will need to review what kind of development is being proposed and where in the SFHA the proposed development is located.

For example, a permit application for a fence will require less documentation than a large subdivision. A project in the floodway will require a no-rise analysis, which is not required in other flood zones.

Then, you can review for compliance. In this step, you will check if the proposed development meets the requirements of the local flood damage prevention ordinance.

Visual 22: Reviewing for Completeness

- Permit forms, completed and signed
- Technical documents
- Copies of all applicable Federal and State permits
- Local department reviews
- Certifications



The application package should contain all the permit forms, plans, blueprints, and technical documentation required for you to review the proposed project for regulatory compliance.



Student Notes

If the application package is incomplete, the review can't move forward. The applicant should be advised of missing documents and reminded that the review will not start until they are submitted.

The permit forms should be filled out completely and signed. If the application is incomplete, it's returned to the applicant with an explanation of missing or incomplete elements that the applicant must remedy. There will be other documents that the applicant should submit with the application.

Visual 23: Reviewing for Completeness: Technical Documents

Confirm the inclusion of:

- Location or plat map:
 - Existing and proposed conditions
 - All dimensions and elevations
- Plan sets:
 - Based on drawings and pre-development survey
- Evidence of notification of the adjacent communities and FEMA, if altering watercourse
- Other technical documentation, if applicable



**Student
Notes**

- A location or plat map of the site should be attached to every development permit application form. Plans of the proposed development that show existing and proposed conditions and all appropriate dimensions and elevations should also be included.
- The Floodplain Administrator may require one extra set of plans to meet the recordkeeping requirements as outlined later in this session.
- If altering a watercourse, the applicant should submit evidence of notification to the adjacent communities and FEMA.
- Inform the applicant of the need for any other technical documentation, such as an Elevation Certificate and the need to hire a surveyor.
- Other documentation and certifications could include floodway encroachment analysis and no-rise certification, if applicable.

Visual 24: Reviewing for Completeness: Location or Plat Map and Plan Sets

Check for:

- Topographic information
- Flood zones
- Boundaries
- Base Flood Elevations (when applicable)
- Detail of all existing and proposed work



When reviewing the submitted documents, the Floodplain Administrator will want to check that the maps and site plans have the following:

- Topographic information such as elevation contours
- Flood zone boundaries (floodway and flood fringe) shown with source
- Base Flood Elevations
- Elevation datum indicated
- Locations of any earthen fill and proposed fill placement



**Student
Notes**

The Floodplain Administrator must also ensure that the application includes all details of existing and proposed work. Be careful of plans where not all proposed development is shown on the site.

Visual 25: Reviewing for Completeness: Federal and State Permits

Federal Permits:

- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- Environmental Protection Agency
- U.S. Coast Guard

State Permits:

- Dept. of Natural Resources
- Dept. of Environmental Protection
- Dept. of Public Health
- Dept. of Transportation
- Other departments



Student Notes

Floodplain Administrators are required to ensure that all other necessary permits have been obtained by the permit applicant; however, it is not the Floodplain Administrator's job to obtain the permit for them.

Depending on the type of development occurring, Federal permits may be required from the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Environmental Protection Agency, or the U.S. Coast Guard.

State permits may be required from State agencies such as those that oversee natural resources, environmental protection, public health, or transportation. Other State or local permits may be required, such as those from regional planning commissions.

Failure to obtain all the required permits is a common mistake. Note that some applicants may assume that a State or Federal permit means that they don't need a permit from the community as well. This is a common misconception you should be prepared to communicate about.

Visual 26: Reviewing for Completeness: Local Department Reviews



Establish and follow inter-office review process.



Check for review from other required departments.



Ensure the departments provided their required approvals.

The final two things to check for in the development permit application are that the appropriate local department reviews have occurred, and all required certifications are provided. While reviewing a development permit application, the Floodplain Administrator may need to coordinate the review with other departments, including:



Student Notes

- The building department,
- The zoning department,
- The engineer's office, and
- The health department, for well or septic system approval.

For local department reviews, check that the inter-office review process is followed, and all other required departmental reviews have occurred. If any required approvals are missing, send it to the appropriate department.

If any required approvals are missing, send it to the appropriate department.

Visual 27: Reviewing for Completeness: Certifications

Floodproofing Certificate

No-rise

V-Zone Certificate

Elevation Certificate

Signatures and seals

The final thing to check for in the completeness review is that the application includes the required certifications.

The type of certificate will depend on the flood zone and type of development. For example, non-residential structures may require a Floodproofing Certificate. If the property is in the floodway, a no-rise analysis will be required.



Student Notes

V-zone certifications may be required for development in coastal zones. These documents must not only be provided, but they should also be completed and include the surveyor or engineer's seal and signature. We'll discuss these certifications in more detail later in this unit.

Elevation Certificates can be used to collect the Base Flood Elevation (BFE) and structure elevation data.

The documents must include the professional's seal and signature when required.

Once the completeness check shows that all required documentation has been provided, you can move on to checking for technical compliance.

Visual 28: Knowledge Check 3

What must a Floodplain Administrator check to determine if a development permit application is complete?



Answer the question:



**Student
Notes**

What must a Floodplain Administrator check to determine if a development permit application is complete?

Prepare to share your responses with the group.

Visual 29: Reviewing for Compliance

Review the location.

Determine the development type.

Review the permit and technical documentation.

- Substantial Improvement (SI)/Substantial Damage (SD) determination
- Check the Base Flood Elevation (BFE)
- Check the lowest floor elevation

When conducting a review of a development permit application, the Floodplain Administrator will do the following actions:

- Review the location: Is the development inside or outside of the SFHA? If so, what flood zone? Is it in the floodway?
- Determine the development type: Is this residential or non-residential construction? Is the development structural or non-structural?
- Confirm the BFE or base flood depth: What is the BFE at the site of the proposed development?
- Review the Lowest Floor Elevation: This is the elevation that the lowest floor of living space in a structure is required to be at. The lowest floor should be at or above the Base Flood Elevation.
- Check the Substantial Improvement (SI)/Substantial Damage (SD) determination(s): A cost estimate should be included for any remodels, renovations, additions, etc.
- Review all technical documentation: All required additional documents should be reviewed. This may include elevations signed and sealed by a registered professional engineer or surveyor, no-rise analyses, and V-zone certificates.



Student Notes

Visual 30: Reviewing for Compliance: Location of Proposed Development (1 of 2)

- Is the proposed development in the SFHA where the floodplain ordinance applies?
- Use the Flood Insurance Rate Map (FIRM) and locate the proposed development and the regulatory floodplain.
- What flood zone or zones present? This informs what rules apply.
 - SFHA? Floodway? Coastal Area? Alluvial Fan?
 - Even if a **portion** of a proposed structure is in the SFHA, the floodplain ordinance applies to the whole structure.

To determine if the development permit application is compliant, start by locating the development site on the community's floodplain map.

The Floodplain Administrator will need to identify the flood zone(s) of the proposed project location using the Flood Insurance Rate Map (FIRM).



Student Notes

Some of the fundamental questions to ask when reviewing permits are:

- Is the project in the SFHA?
- If so, is it in a floodway where additional no-rise requirements apply? Is it in a coastal zone where additional building standards apply?

If any part of the development is in the floodplain, the ordinance applies to the whole structure. If the property is across two zones, the most restrictive zone must be used.

Visual 31: Reviewing for Compliance: Location of Proposed Development (2 of 2)

- Examine the site information: property lines, streets, watercourses, existing and proposed structures, topographic information, and floodway and floodplain boundaries
- Compare the flood data with the Flood Insurance Study (FIS) and FIRM.
- Identify the regulations that apply based on the zone or zones, including if the site is in the floodway.
- Note areas where the plan is unclear or shows incorrect flood data.
- Be careful of plans where not all proposed development is shown on the site.



Student Notes

In determining the location of proposed development, a Floodplain Administrator will need to:

- Examine the site information in detail for the location of property lines, streets, watercourses, existing and proposed structures, topographic information, and floodway and floodplain boundaries;
- Compare the flood data with the Flood Insurance Study (FIS) and FIRM;
- Identify the regulations that apply to the site based on the zone or zones and whether the site is in the floodway; and
- Note areas where the plan is unclear or where flood-related delineations are not consistent with (FIS).

Be careful of plans where not all proposed development is shown on the site.

Visual 32: Reviewing for Compliance: Determine the Development Type

Structural Development Examples

- Residential
- Non-residential
- Manufactured homes
- Subdivisions
- Agricultural buildings
- Detached garages

Non-structural Development Examples

- Fill/grade
- Excavation
- Decks
- Fences
- Recreational vehicles (RVs)
- Storage of materials

After determining the location of the development, the Floodplain Administrator must determine the development type. The development type will determine what documentation is required for review.

Examples of structural development include:

- Residential,
- Non-residential,
- Manufactured homes,
- Subdivisions,
- Agricultural buildings, and
- Detached garages.

Examples of non-structural development include:

- Fill/Grade,
- Excavation,
- Decks,
- Fences,
- Recreational vehicles (RVs), and
- Storage of materials.

After determining the development type, the Floodplain Administrator will review the permit and supporting technical documentation for compliance.



**Student
Notes**

Visual 33: Reviewing for Compliance: Permit and Technical Information

- Proposed changes to existing structures in the SFHA must be assessed for SI or repair of SD:
 - Vertical or lateral additions
 - Rehabilitation or remodeling (exterior and/or interior)
 - Restoration, reconstruction, or repair of damage from any origin
- A structure that is Substantially Improved or has been Substantially Damaged must meet standards for new construction.

Administration of the SI/SD requirements is an important local permitting responsibility. In many communities, some buildings existed before the flood maps were made and the high-risk zones were known.

These buildings were not built to the same flood safety standards as today. Buildings that are repaired, improved, or replaced must meet current code requirements.

When there are proposed changes to existing structures in the SFHA, they must be assessed for Substantial Improvement or repair of Substantial Damage. This includes:

- Vertical or lateral additions,
- Rehabilitation or remodeling (both exterior and/or interior), and
- Restoration, reconstruction, or repair of damage from any origin.



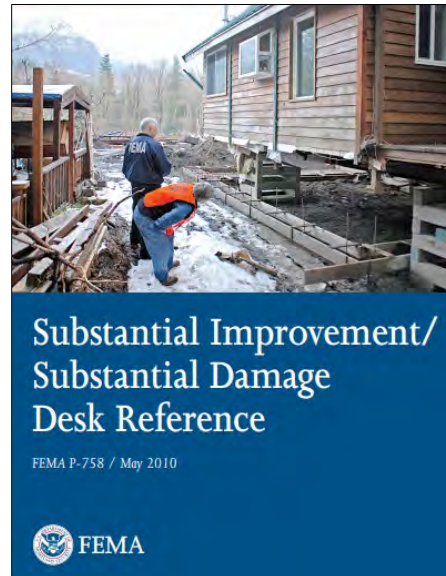
Student Notes

Recall from previous units that the NFIP provides definitions for both SI and SD in 44 CFR § 59.1:

- SI is defined as, “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.”
- SD is defined as, “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.” Repair of a structure that has been Substantially Damaged is considered a Substantial Improvement. If a structure has been declared SI or SD, it must meet the standards for new construction.

Visual 34: SI/SD Step 1: Determine Costs of Improvements and/or Repairs

- Applicant should provide the full cost of the work for all items directly associated with the structure:
 - Interior and exterior elements
 - Labor and overhead
 - The value of discounted or donated materials and labor must be calculated and included.
- Certain costs can be excluded from the calculation.
- Refer to the SI/SD Desk Reference.



The first step in making SI/SD determinations is to determine the costs of improvements and/or repairs required. To determine the cost of work, the applicant will need to provide estimates for the work involved on all items directly associated with the structure:



Student Notes

- All interior and exterior work, including structural elements, interior finishes, and utility and service equipment
- Demolition and construction debris disposal
- Labor and overhead
- The value of discounted or donated materials and labor



Online Resource

[Refer to the SI/SD Desk Reference](https://www.fema.gov/sites/default/files/documents/fema_nfip_substantial-improvement-substantial-damage-desk-reference.pdf)

(https://www.fema.gov/sites/default/files/documents/fema_nfip_substantial-improvement-substantial-damage-desk-reference.pdf) for a detailed list of the costs that should be included and excluded.

Visual 35: SI/SD Step 2: Determine Market Value

- Price that a seller can expect to receive from a buyer in a fair and open negotiation
- Meets NFIP requirements:
 - Requirement One: Value of the structure only, excluding land value and improvements
 - Requirement Two: Value based on the structure's **pre-damage or pre-improvement condition**
- Sources:
 - Professional appraisal
 - Adjusted assessment or actual cash value
 - Calculations from FEMA Substantial Damage Estimator (SDE)

After determining the cost of the work, you must determine the market value of the structure. Market value is the price that a seller can expect to receive for the structure from a buyer in a fair and open negotiation.

For the purposes of NFIP SI/SD determinations, the market value:

- Is based on the structure only. It should not include land values or other improvements.
- Must be based on the pre-damage or pre-improvement condition of the structure.

There are several sources for obtaining the market value of a structure:

- A professional appraisal
- The adjusted assessment or actual cash value
- Calculations made by the FEMA Substantial Damage Estimator (SDE)



**Student
Notes**

Visual 36: SI/SD Step 3: Make Calculation and Step 4: Provide Determination Letter

- Is it equal to or greater than the 50% threshold?

$$\frac{\text{Cost of Work (Improvement or Repairs)}}{\text{Market Value of Building}} \geq 50\%$$

- If yes, improvement or repair work must meet standards for **new construction**.
- Provide an official determination letter to the applicant.
- Template letters are available in the FEMA SI/SD Desk Reference P-758.



Student Notes

After determining the cost of work and the market value of the structure, the Floodplain Administrator can make the SI/SD calculation.

To determine the value, the cost of work is divided by the market value of the structure. If the ratio is greater than 50%, then it is considered SI or SD.

If it is considered SI or SD, the work that is done to improve or repair the structure must meet the development standards for new construction.

A letter with this determination must be sent to the applicant. Template letters are available in the FEMA SI/SD Desk Reference P-758.

Visual 37: Check the BFE or Depth

- Use both the FIRM and FIS.
- Determine the BFE to the nearest 0.1 foot wherever possible.
- In Approximate A zones:
 - Obtain/review/reasonably utilize other BFE sources.
 - For certain development types (subdivisions ≥ 50 lots or ≥ 5 acres), the applicant must conduct an analysis and generate a BFE as part of the permit application.

The next step in the permit review process after checking for SI and SD is to get the BFE or depth. Any new construction will need to be built with the lowest floor above the BFE.

To determine the BFE, you'll need both the FIRM and the FIS. It's important that the BFE is as precise as possible. BFEs obtained from the FIRM are often rounded to whole numbers. BFEs from the FIS should be written to the nearest tenth of a foot.



Student Notes

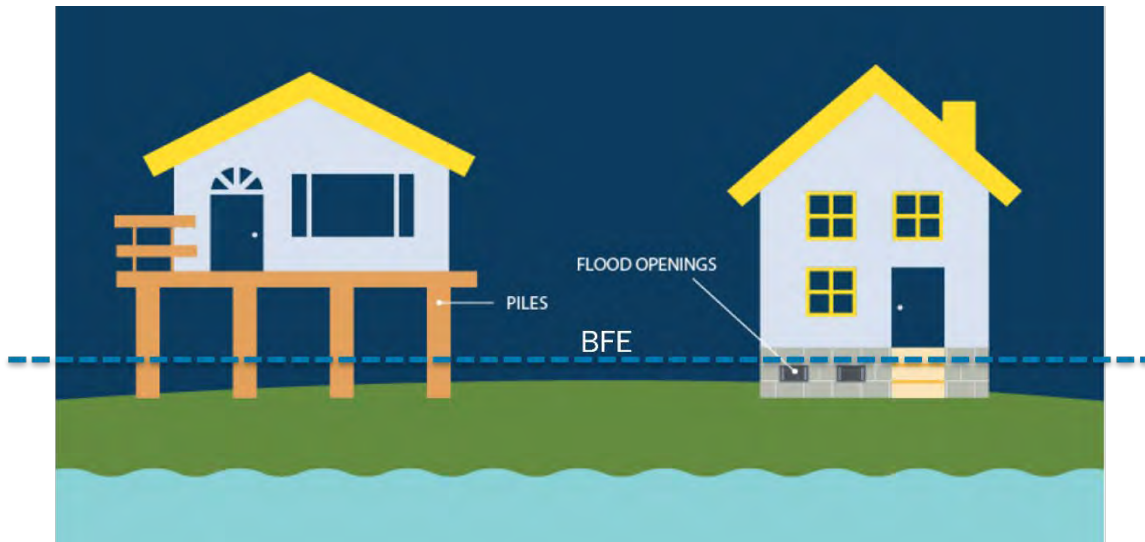
If the existing structure is considered SI or SD, the lowest floor will need to be built to BFE. If it's not considered SI/SD, the entire structure does not need to be built to BFE; however, the additions to the building may need to be built in compliance with current flood ordinance requirements.

In Approximate A zones where BFEs have not been developed:

- Obtain, review, and reasonably utilize other BFE sources.
- For subdivisions greater than 50 lots or 5 acres, the ordinance requires the applicant to conduct a detailed study to generate the BFE as part of the permit application.

Visual 38: Check the Lowest Floor Elevation

Review plans to verify the building's lowest floor elevation (LFE) is at or above the BFE.



Review the construction plans to make sure that the lowest floor of the building is built to, or above, the BFE.

Some communities and newer building codes require the lowest floor to be built one or two feet above the BFE. This higher standard is called freeboard.

Elevating the building's lowest floor above the BFE can be done through various methods:



Student Notes

- Elevating on piers, posts, columns
- Elevating on solid walls
- Elevating on properly compacted fill
- Floodproofing (only for non-residential)

Some methods are not appropriate for all building types or in all flood zones. For instance, no structural fill or solid wall foundations are permitted in V zones, and dry floodproofing is not allowed for residential structures.

If the proposed development does not comply with floodplain regulations, deny the permit.

Visual 39: Reviewing Site Plans and Building Design Plans (1 of 2)

- Note areas where the site and/or building plans:
 - Are unclear
 - Conflicts with the permit application
 - Flood-related delineations inconsistent with FIS
- Ensure all proposed development is shown
- Assess elevation data



**Student
Notes**

Once the BFE and lowest floor elevation are determined, the Floodplain Administrator needs to check the site plans and building design plans. This involves the following:

- Examining the site information in detail for the location of property lines, streets, watercourses, existing and proposed structures, topographic information, and floodway and floodplain boundaries
- Noting areas where the plan is unclear or where flood-related delineations are not consistent with FIS
- Be careful with plans where not all proposed development is shown on the site. Without a full and clear picture of what is proposed, you cannot accurately assess if it is in compliance with the floodplain regulations.

The Floodplain Administrator will also need to assess the elevation data in the application. This includes:

- Topographic contour lines,
- Spot elevations on the site plan, and
- BFE and lowest floor elevations on the building design plans or the permit application form.

Document any deficiencies in the elevation data on the plans and ask the applicant for clarification. The applicant should correct inaccurate data and supply any missing data.

Remember that the current FIRM, including any effective Letter of Map Revision (LOMR), should be the basis of the review. Be sure to note whether a Conditional Letter of Map Revision (CLOMR) or other map change process is needed.

Visual 40: Reviewing Site Plans and Building Design Plans (2 of 2)



Review for compliance:

- Grading and drainage
- Structure and foundation type
- Existing and proposed structures and proposed LFE
- Floodplain and floodway boundaries
- Lower-level enclosures and their uses
- Elevations of various floors and utilities
- Materials below the BFE
- Coastal Barrier Resource System and Otherwise Protected Area boundaries

**Student
Notes**

In the review of permit and technical documentation, review any building design plans for:

- Grading and drainage;
- Structure and foundation type;
- Existing and proposed structures and infrastructure;
- Flood zones, BFEs, and proposed lowest floors;
- Floodplain and floodway boundaries;
- Lower-level enclosures and their uses;
- Elevations of various floors and utilities;
- Materials below the BFE; and
- Coastal Barrier Resource System and Otherwise Protected Areas boundaries and associated designation dates.

If building plans conflict with or are inconsistent with applicable regulations, the Floodplain Administrator must require the applicant to make structural adjustments to the plans.

Once the Floodplain Administrator reviews the site plans and building design plans, they must then review other technical documentation for compliance.

Varies based on the development type:

- [illegible]

In addition to the site and building design plans, the Floodplain Administrator will need to check other technical documentation.

Recall that the Floodplain Administrator must verify that the document is complete and has the appropriate signatures and seals.

During the review of a development application permit for compliance, the Floodplain Administrator will need to review these forms in more detail.

Performing this step ensures the information in the application indicates that the structure is compliant with local regulations. Technical documentation requirements will depend on the proposed development type.

Some examples of technical documentation include:

- **Elevation Certificate:** Provides the BFE and structure elevation data. We will talk about Elevation Certificates later in this unit.
- **A No-Rise Certification for floodway encroachment (for development in the floodway):** A floodway analysis that results in an engineer's certification that the development will cause no rise, along with the associated engineering analysis, is required. This is commonly called a No-Rise Certification for short. These must be signed by a licensed engineer. The document must indicate no rise, meaning zero, not even 0.01 or 0.001ft, of rise.
- **Floodproofing certificates:** Required for any non-residential structure that will be floodproofed instead of elevated. There are a limited number of communities that have FEMA exemptions for floodproofed residential basements. Those would also require a floodproofing certificate.
- **Engineered flood openings:** If engineered flood openings are to be used, a copy of the Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service must be attached that shows the rated area of the openings. The document must show that the openings allow for one square inch of net area flow for every square foot of enclosed space in the structure.
- **V zone construction/breakaway walls:** Construction in V zones requires special certification. If breakaway walls are used to enclose areas below the building that exceed a design-safe loading resistance of 20 pounds per square foot, the walls must be certified by a registered professional engineer or architect.



**Student
Notes**

Visual 42: Technical Documentation: Certified Elevations

Structure elevations are required to be certified by a registered engineer, surveyor, or architect.

An Elevation Certificate:

- Provides consistent methodology to certify elevation information
- Documents a structure's compliance with regulations
- Maintains records
- Provides flood and building elevation data
- Is required for communities in the Community Rating System (CRS)

If you recall from Unit 4, the community's permit file must have an official record that shows that new buildings and Substantial Improvements in all SFHAs are properly elevated. Certain elevation information is also supposed to be certified by a registered engineer or architect. The elevation information is needed to show compliance with the flood damage prevention ordinance.



Student Notes

Minimum NFIP requirements do not have any requirements with regards to the type of form that these elevations should be documented on. Many communities chose to require the Elevation Certificate to document these elevations. The Elevation Certificate is a FEMA form that provides communities with the required elevation information to use in conjunction with the permitting process.

Elevation Certificates are not required, but they are strongly recommended because the information on the form is required. Elevation Certificates provide consistency and uniformity for communities that use them and are an important part of your requirements to maintain records for floodplain development.

They can be used for LOMA and LOMR-F applications. They are also required for communities that are participating in the Community Rating System (CRS).

Visual 43: Technical Documentation: Elevation Certificates

- When Elevation Certificates are required, it is important to identify community staff members who will collect and review the Elevation Certificates.
- Can be collected:
 - o Before construction
 - o During construction
 - o Finished (as-built) construction



Communities that choose to use an Elevation Certificate can require a single Elevation Certificate after construction has been completed to document as-built conditions and comply with the permit requirements. Alternatively, communities can require two additional Elevation Certificates before construction to document pre-construction conditions and during construction (after the foundation and lowest floor is in place, but before the vertical walls are constructed).

In the case of a pre-construction Elevation Certificate, the certificate can tell the story of what building is being proposed, like:

- The type of building,
- Where it is to be located,
- The type of foundation that is proposed,
- Information about flood vents and openings, and
- The proposed elevation of the structure's lowest floor and other elevations.
- This Elevation Certificate should be collected when the permit application and supporting materials are submitted and before ground has been broken.
- During construction, the Elevation Certificate should be submitted and reviewed after the lowest floor has been placed. This ensures that it is above BFE before construction of the structure is complete, as it is cheaper to change things at this stage than after construction is completed.
- After construction, a final Elevation Certificate can certify that the structure as-built conforms to the permit requirements. If your community is only collecting one set of elevation certificates, it should be the final as-built Elevation Certificate.



**Student
Notes**

Visual 44: Reviewing for Compliance: Elevation Certificates

- Always verify that all data on the Elevation Certificate is accurate.
 - Data must match the finished structure.
 - “N/A” is marked in all non-applicable data fields.
- Verify the data indicates a compliant building.
- Confirm the Elevation Certificate is signed and dated correctly.

Check for clear photographs.

ELEVATION CERTIFICATE	
IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19	
BUILDING PHOTOGRAPHS	
See Instructions for Item A5.	
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.:	FOR INSURANCE COMPANY USE
City:	Policy Number:
State:	Community NAIC Number:
ZIP Code:	
Instructions: Insert below at least two and when possible four photographs showing each side of the building (for example, may only be able to take front and back pictures of townhouses/machouses). Identify all photographs with the date taken and "Front View," "Rear View," "Right Side View," or "Left Side View." Photographs must show the foundation. When flood openings are present, include at least one close-up photograph of representative flood openings or vents, as indicated in Sections A8 and A9.	
	
Photo One	
Photo One Caption: Clear Photo One	
	
Photo Two	
Photo Two Caption: Clear Photo Two	
FEMA Form FF-208-PV-02-102 (formerly 089-0-23) (10/22)	
Page 7 of 10	

**Student
Notes**

You should always review an Elevation Certificate for compliance before accepting it as part of the permit file or using it to prove compliance for a Certificate of Occupancy. Complete the following tasks for your review:

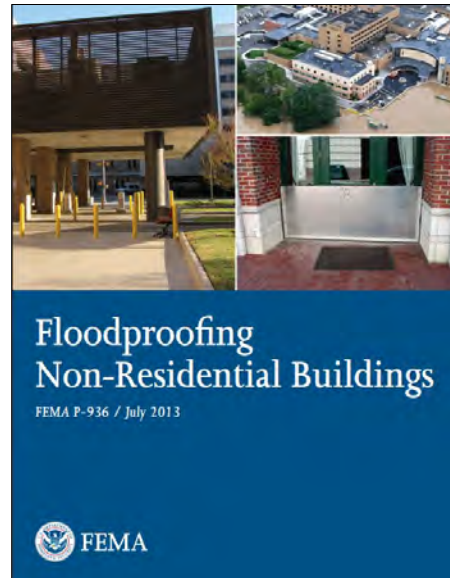
- Verify all Elevation Certificate data in the field for accuracy. The data on the post-construction Elevation Certificate must match the actual finished structure.
- Make sure “N/A” is marked in all non-applicable data fields. Leaving fields blank can cause confusion in the future.
- Most importantly, verify that the data provided indicates the building is compliant with the floodplain regulations. For example, is the lowest floor above the BFE?
- Make sure that the certifier’s seal, signature, and date are in the correct places on the form.
- Ensure that building photographs clearly display the sides of the building and any measured elements like utilities or attached decks.

Some common Elevation Certificate errors include:

- N/A not included (leaving blanks or entering 0 incorrectly),
- Incorrect BFE (often because the person reads it off the FIRM instead of using the more accurate FIS number),
- Incorrect building diagram,
- Not providing elevation of machinery or equipment, and
- Elevations not based on finished (as-built) construction.

Visual 45: Technical Documentation: Dry Floodproofing Certificate

- May dry floodproof non-residential buildings to BFE instead of elevating:
 - Designed to be substantially impermeable to floodwaters
 - Uses special sealants, components, equipment, etc.
 - Not allowed in V zones
- A registered engineer prepares design plans and must sign and seal a floodproofing certificate.
 - Local official must maintain a copy.



Another certificate that may be required for development is a Dry Floodproofing Certificate. Nonresidential buildings in non-coastal areas may be dry floodproofed to the BFE instead of elevated to the BFE.

They must “together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;” (44 CFR 60.3(c)).



Student Notes

This engineering performance standard of watertight can be met using various approaches, including specially designed sealing doors or windows, various components or equipment, sump pumps, and more. Many detailed examples are provided in FEMA guidance documents like P-936. This approach is not permitted in V zones.

Plans for a floodproofed non-residential building must be prepared by a registered engineer who must sign and seal a floodproofing certificate, confirming that dry floodproofing measures are designed in accordance with ASCE 24 (engineering consensus standard). The local official must obtain a complete and correct “as-built” Floodproofing Certificate before issuing a certificate of occupancy.



Online
Resource

For more about dry floodproofing, please consult these resources:

- [Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings \(NFIP TB-3\)](https://www.fema.gov/sites/default/files/documents/fema_technical-bulletin-3_1-2021.pdf)
(https://www.fema.gov/sites/default/files/documents/fema_technical-bulletin-3_1-2021.pdf)
- [Floodproofing Non-Residential Buildings \(FEMA P-936\)](https://www.fema.gov/sites/default/files/2020-07/fema_p-936_floodproofing_non-residential_buildings_110618pdf.pdf)
(https://www.fema.gov/sites/default/files/2020-07/fema_p-936_floodproofing_non-residential_buildings_110618pdf.pdf)

Visual 46: Issue or Deny Permit

Issue Permit

- Only if in full compliance
- Permit Issued = start of construction date
- Monitor to ensure construction starts promptly

Deny Permit

- If **not** in compliance
- If denied, the applicant can:
 - Withdraw the application
 - Redesign to bring into compliance
 - Appeal to the board of appeals
 - Request a variance

Once the application review is complete, a decision must be made to issue or deny the permit based on the compliance information provided.

If the proposed development is compliant with the ordinance and the application is complete, issue the permit. The permit allows the applicant to proceed with development based on the information they've presented. The day the permit is issued becomes the start of construction date. Monitor the site to be sure that construction begins promptly. Most communities require construction to begin within 180 days.

Alternatively, if the proposed development is not in compliance with regulations, you must deny the permit. Disclose the reasons for denying an application in writing. This tells the applicant what areas are noncompliant, so that if they wish to resubmit the application, appropriate corrections can be made.



Student Notes

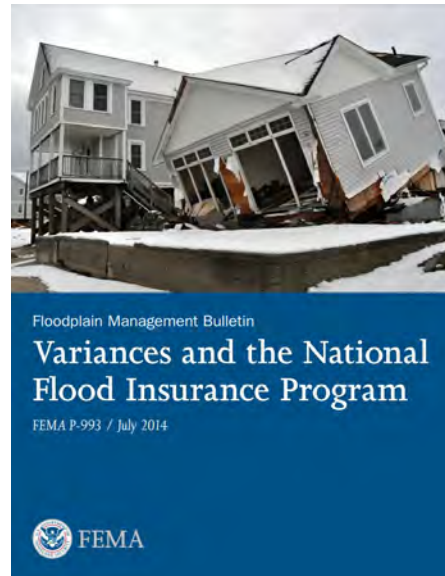
If the applicant is unhappy with the decision, they can:

- **Withdraw the application:** This pulls their application from the process. Typically, the applicant will need to re-apply and start the process over if they later decide they want to pursue the same project.
- **Redesign the project to bring it into compliance:** The applicant will need to make the required changes that the community has requested for the project to be compliant.
- **Appeal to the Board of Appeals:** Your flood damage prevention ordinance should have a process for referring these disagreements to a Board of Appeals which will interpret the ordinance and settle the dispute.
- **Request a variance to the regulations:** This gives the applicant a way to seek permission to vary from the letter of the rules because of a special situation.

Your floodplain regulations should include variance and appeals procedures.

Visual 47: Variances and the NFIP

- Defined as “a grant of relief by a community from the terms of a floodplain management regulation”
- Can be granted when minimum NFIP standards can’t be met because of special circumstances
 - Many specific criteria for when a variance is allowable
- **Should be rare!**
- Does not change flood insurance requirements



Applicants whose permits are denied because their project does not meet the requirements may try to apply for a variance from the requirements.

Floodplain variances are defined by the NFIP as the grant of relief by a community from the terms of one or more of your floodplain management regulations.

Under the regulations in 44 CFR 60.6, variances can be granted when the minimum NFIP standards can't be met because of special circumstances pertaining to the site (and not to the person applying for a variance). The reconstruction, rehabilitation, or restoration of designated historic structures is one such example.

For a variance to occur, the community must determine:

- That there is good and sufficient cause to issue the variance.
- That exceptional hardship would exist by denying the variance. Things that are not exceptional hardship reasons are if it would be too expensive or inconvenient to comply with the rules.
- That the variance will not result in additional threats to public safety, extraordinary public expense, fraud, or victimization of the public.
- That the variance must be the minimum action necessary to avoid relief.

Because variances create increased risk to life and property, relief from flood elevation and other requirements should be rare. A community must decide if the hardship claimed by the applicant outweighs the long-term risk, the community's liability, and whether granting a variance will jeopardize the community's participation in the NFIP.

Any variances that are granted will not relieve the property owner of any mandatory flood insurance purchase requirements. Variance applicants should also understand that a variance may save money in the short term; however, it may result in higher costs over the long term as a result of higher insurance premiums or, if uninsured, flood losses.



Student Notes



Online Resource

[Access the Variances and the National Flood Insurance Program FEMA P-993](https://www.fema.gov/sites/default/files/2020-08/FEMA_P-993_FPM-Bulletin_Variance.pdf) (https://www.fema.gov/sites/default/files/2020-08/FEMA_P-993_FPM-Bulletin_Variance.pdf) for more information.

Visual 48: Conduct Inspections

- Step One: Pre-construction site inspection:
 - Check for correct location and no encroachment.
- Step Two: During construction inspection:
 - Check the Lowest Floor Elevation vs the BFE.
- Step Three: Finished construction inspection:
 - Check that as-built matches approved plans.
 - Verify all compliance elements in place.
 - Complete before issuing a certificate of occupancy.



Once a permit has been approved, inspections should occur throughout the development process. Inspections ensure the project is being built according to the plans and compliance.

Depending on the development type, inspections may be conducted once or several times. For buildings, at least three inspections are strongly recommended.

Pre-construction site inspection:

- This inspection should occur when the site is staked out to compare the plans to the physical layout of the property. If you require a pre-construction Elevation Certificate, you will want to have that on hand at this inspection.
- Check that the location is correct and there's no encroachment into flood zones that weren't already identified in the plans and approved for permitting.



**Student
Notes**

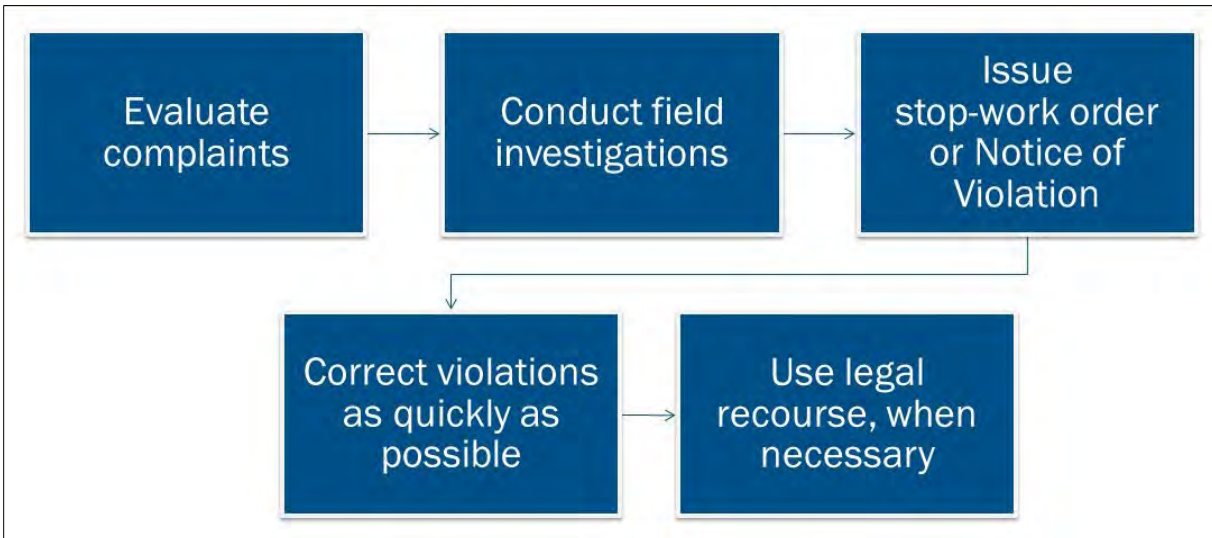
During construction inspection:

- It should occur after the foundation and lowest floor is constructed but before the vertical walls are in place, when the foundation height can be changed without major difficulty.
- Check that the Lowest Floor Elevation is at or above the BFE. You collect the “during construction” (second) elevation certificate after the lowest floor has been placed to verify that the floor has been constructed above BFE.

Finished construction inspection:

- The last inspection occurs after all construction has been completed, including the installation of accessory items or utilities servicing the building.
- Collect and review the final construction Elevation Certificate to use during this inspection. Check that the “as built” matches approved plans.
- Verify all compliance elements are in place.
- Conduct this inspection before issuing a certificate of occupancy or completion to indicate the project is finished.

Visual 49: Inspections: Identifying Floodplain Violations



Inspections may uncover noncompliant development and other floodplain violations. To address violations in your community, it is necessary to:

- Evaluate complaints,
- Conduct field investigations to determine if a violation is in fact occurring,
- Issue a stop-work order or Notice of Violation to initiate your administrative code enforcement, and
- Use legal recourse, when necessary.



**Student
Notes**

Local floodplain management law or ordinance should contain clear language and process to address violations. Field inspections are crucial to identify violations and correct them as quickly as possible.

A final Elevation Certificate should be obtained to help determine compliance. Always coordinate with the community's attorneys. Violation enforcement options can include:

- Administrative orders,
- Fines or injunctions,
- Imprisonment, and
- Section 1316 from FEMA.

Visual 50: FEMA Oversight/Consequences of Noncompliance

- Compliance issues usually found through:
 - Community compliance audit process
 - LOMC applications
 - Complaints from the public
- NFIP sanctions:
 - CRS rating retrograde to Class 10 (i.e., loss of flood insurance discounts)
 - Probation: An additional \$50 surcharge is added on new/renewed policies
 - Suspension: Community cannot purchase NFIP policies and prohibited from receiving Federal disaster assistance

**Student
Notes**

Just as a community must hold developers responsible for complying with local floodplain requirements, FEMA must hold participating communities responsible for enforcing their local floodplain requirements.

For communities that fail to enforce their ordinance or make efforts to correct violations, FEMA may take certain enforcement steps.

Community compliance issues may be found through compliance audits, LOMC applications, complaints from the public, or other means.

FEMA will provide the community time and assistance to correct non-compliant development and improve its procedures; however, if a community remains noncompliant after receiving technical assistance, various enforcement actions from FEMA can follow.

If the community is participating in the CRS program, they may be retrograded to Class 10. This means that individual policy holders will no longer receive discounts on their NFIP insurance.

If the community is placed on probation, an additional \$50 surcharge is added to every new or renewed flood insurance policy in the community, and local and congressional elected officials are notified. The probationary period lasts at least until all program deficiencies have been corrected and violations have been remedied to the maximum extent possible. If the community does not fix their program deficiencies, they will be suspended.

In some cases, communities will be suspended without going through the probationary period. This is most common when communities fail to adopt their new FIRMS before they go effective. When a community is suspended, no NFIP insurance policies are available, and the community is prohibited from receiving Federal disaster assistance

Visual 51: Issue Certificate of Occupancy

- Coordinate with other building code requirements.
- Consider establishing a policy concerning “renewable” (1-year) occupancy permits.
- File with all records related to the project.



Student Notes

A Certificate of Occupancy is a tool that many communities use to signify a project is complete. In communities with adopted building codes, this may sometimes be called a Certificate of Compliance, where more appropriate.

If your community requires a final Elevation Certificate after construction is complete, it's recommended to wait until you've received that document before issuing a Certificate of Occupancy or Compliance. File the Certificate of Occupancy or compliance with all records related to the project.

Visual 52: Recordkeeping Protects Community and Property Owners

- Maintain permit records in perpetuity.
- Includes:
 - Permit application
 - SI/SD information
 - Inspection records
 - Certifications
 - Appeal and/or variance findings
 - Correspondence
 - Any related LOMCs



This is the last step in the permit process. The community is required to maintain records in perpetuity (forever), to demonstrate compliance with their floodplain management regulations.

Keeping records protects the community and the property owner. It can provide proof that a structure has been built in compliance, or that changes have occurred to the structure that were not permitted by the community.

An ideal record file includes:

- The permit application, which describes the project's address and type of development;
- SI and SD cost estimations and determinations, if applicable;
- Your inspection records from when you conducted inspections during the building process;
- Certifications, such as the Elevation Certificate or other documentation of the lowest floor elevation, any No Rise or non-encroachment certifications for buildings in the floodway, V Zone certifications, or others;
- Any appeals or variances attached to the property;
- Any NFIP-related correspondence, such as a letter from the State approving the development from a State program or process; and
- Any LOMC related to the property or development.

Maintain these records using digital or paper copies. It's advisable to establish an electronic back-up process for hard copy documents.



**Student
Notes**

Visual 53: Knowledge Check 4

When during the development process should the recommended three inspections occur?



**Student
Notes**

Answer the question:

When during the development process should the recommended three inspections occur?

Prepare to share your response with the group.

Visual 54: Activity 5.2: A Day in the Life of a Floodplain Administrator—Part 2



Break into groups.

- Review the instructions.
- Answer the questions.
- Prepare to share your responses.

Activity 5.2: A Day in the Life of a Floodplain Administrator—Part 2

Purpose:

The purpose of this activity is for you to review a permit development proposal for compliance and completeness.

Time: 15 minutes

Materials: (Located in Student Manual)

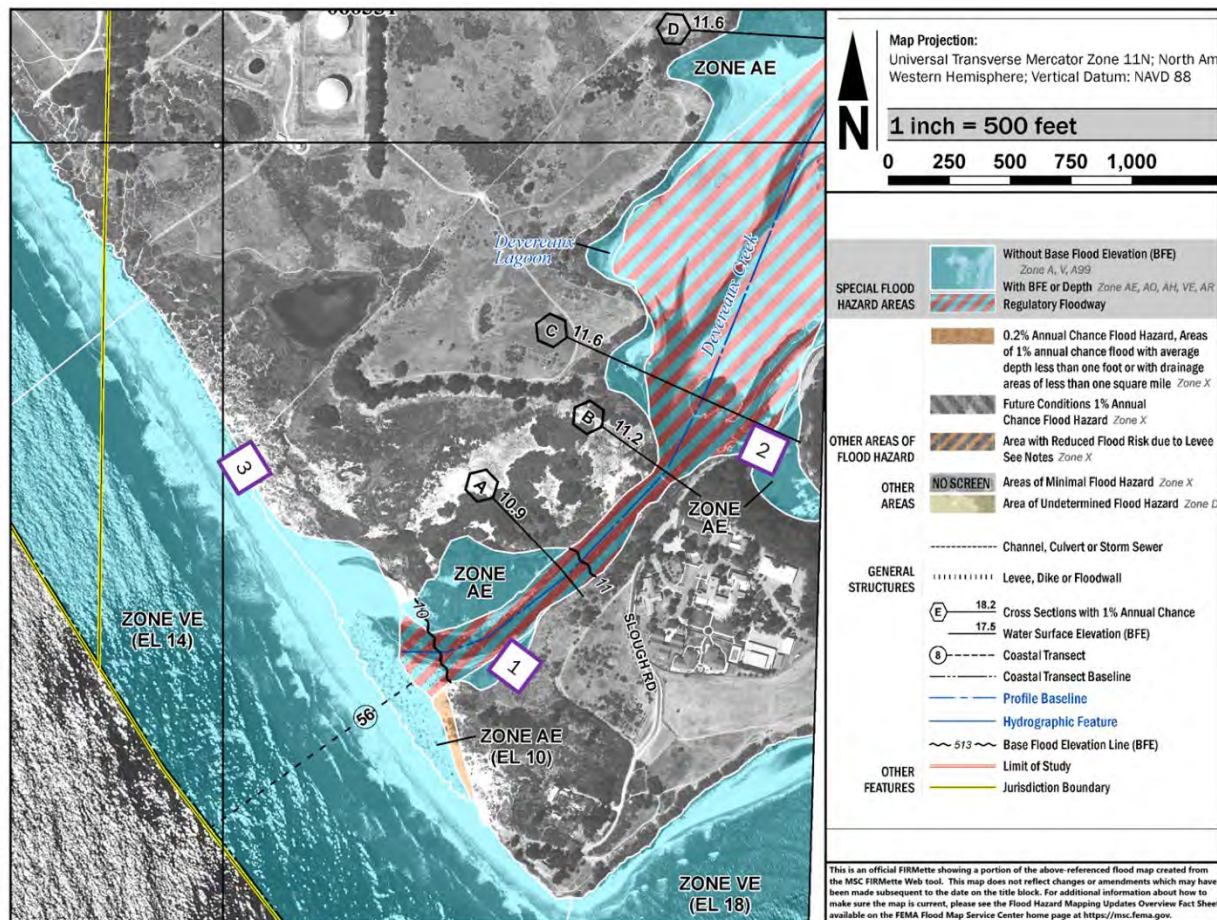
- Figure 16 Activity 5.2: Properties Site Map
- Activity 5.2 Response Sheet: Flood Administrator Review for Compliance and Completeness



Instructions:

- Divide into groups of three.
- Review “Figure 16 Activity 5.2: Properties Site Map”.
- Identify the three property locations on the map.
- Answer all the questions in “Activity 5.2 Response Sheet: Flood Administrator Review for Compliance and Completeness” that apply to the map locations and the Floodplain Administrator’s responsibilities to review a permit development proposal for compliance and completeness.
- Prepare to share your responses with the group.

FIGURE 16 ACTIVITY 5.2 PROPERTIES SITE MAP



ACTIVITY 5.2 RESPONSE SHEET: FLOOD ADMINISTRATOR REVIEW FOR COMPLIANCE AND COMPLETENESS.

Scenario: A new commercial structure is under proposal at site 1. While the building site indicator is a square, the entire parcel is quite large and extends up the hill halfway to Slough Road and to the East.

- A.** What permit guidance or recommendations can you give the applicant for development siting?
- B.** What information is necessary to collect if the proposed building site does not move?

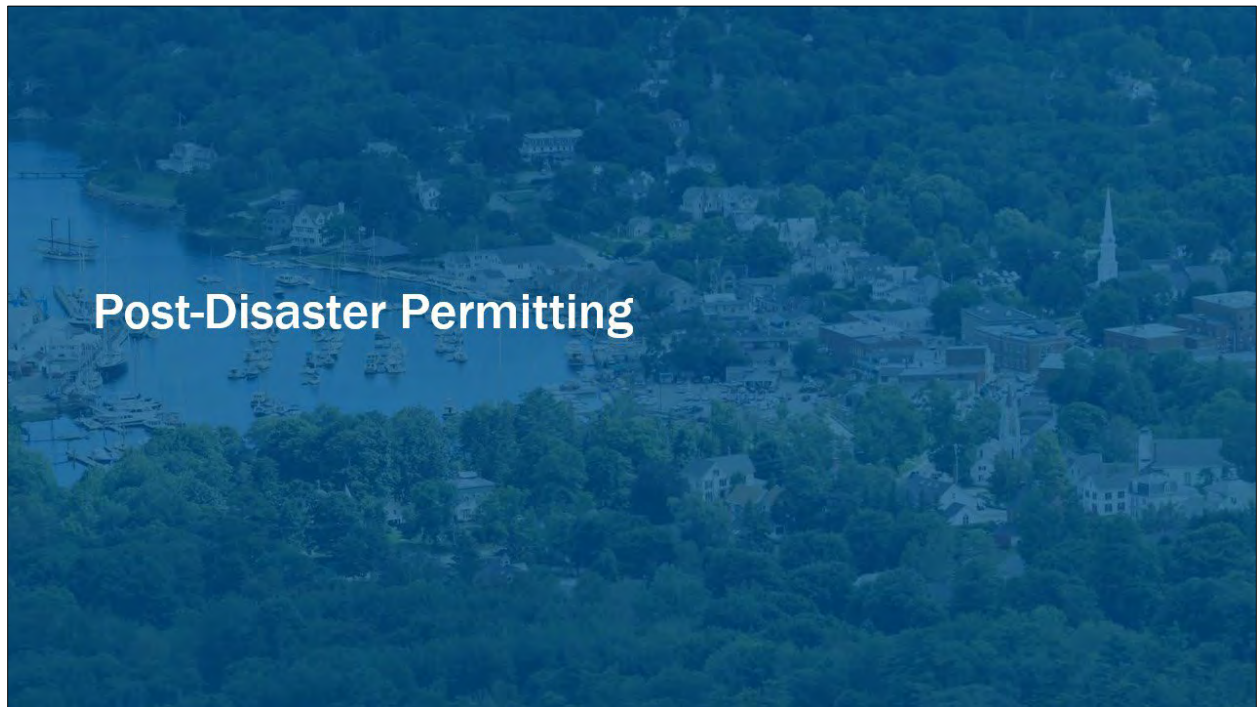
Scenario: A homeowner wants to remodel their home at site 2, which was built in 1984. They'd like to add a lateral addition to the house.

- A.** In addition to a detailed site plan, what information do you need to collect about the work during permit review that you would not collect if this was new construction?

Scenario: A new structure is being proposed at beachfront property #3.

- A.** Because of the flood zone at this location, which foundation type is appropriate: solid masonry walls, or piers and pilings?
- B.** For floodplain compliance in this zone, what needs to be above BFE?
- C.** What certification type is required in this Coastal High Hazard Area?

Visual 55: Post-Disaster Permitting



**Student
Notes**

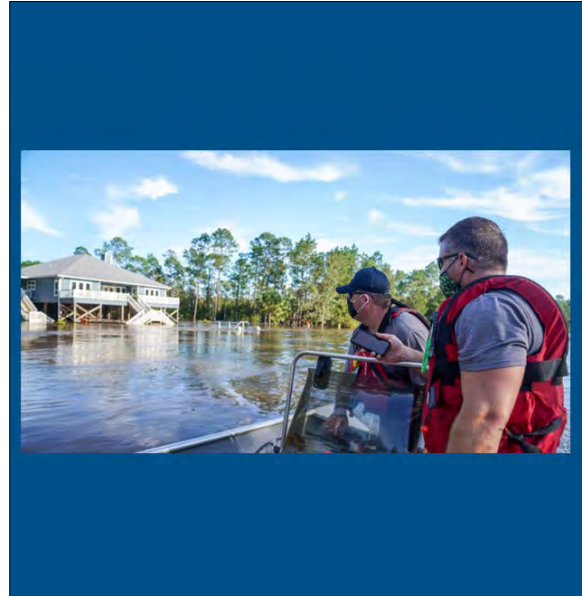
Permitting after a disaster or damaging event in a community.

Visual 56: Post-Disaster Permitting and Damage Assessments

After any disaster, communities may need to:

- Rapidly process large numbers of permits.
- Quickly assess damage to SFHA structures.

Permit fees can be waived but permit requirements cannot!



After a disaster, even if it's not a state or federally-declared disaster, a local community has the responsibility to issue permits and document damages.

In this unit, we also discussed SD requirements. Communities need to quickly conduct SD assessments and build lists of Substantially Damaged structures and those that are not Substantially Damaged.



Student Notes

Communicate to folks what permit requirements apply to them.

SD assessments should occur for damage of any origin to structures in the regulatory floodplain—recall the SD definition we learned earlier. Damaging events can include natural hazards like fires, tornadoes, snowstorms, or a car driving through a house.

It's also important that the community communicates to individuals what permit requirements will apply under these circumstances. Permit fees can be waived but requirements cannot! All development in the SFHA needs a permit.

Visual 57: Community Post-Disaster Permitting and Damage Assessment Actions

- Perform damage assessments and inspections.
- Determine if structures are Substantially Damaged.
- Provide determination letters before permitting.
- Require permits for development activity in the floodplain.
- Apply floodplain ordinance.
- Bring violations into compliance.



Communities are often in a hurry to rebuild after a disaster. Everyone in the community wants to return to normalcy and feel safe again; however, it is important to remember that floodplain development rules still apply.

The Floodplain Administrator and community must take several actions after a disaster including:



Student Notes

- Performing damage assessments and inspections,
- Determining if structures are Substantially Damaged,
- Provide SD determination letters to landowners prior to issuing any permits,
- Requiring permits for development activity in the floodplain,
- Applying floodplain ordinance requirements as appropriate, and
- Bringing violations into compliance.

Visual 58: Field Work

- Begin field work as soon as possible after the damage event.
- Conduct SD assessments:
 - o Verify the address
 - o Describe the damages (inside & outside)
 - o Estimate the depth of flooding
 - o Take photographs



Student Notes

If an event caused damage to structures in the SFHA, the Floodplain Administrator needs to get out in the field to conduct SD assessments. This should begin as soon as possible after an event. SD assessments include visiting damaged structures and:

- Verifying the address,
- Describing the damages inside and outside of the structure,
- Estimating the flooding depth, and
- Taking photographs.

Collecting this data will support the Floodplain Administrator in their responsibility of making SD determinations and sending letters to property owners.

Visual 59: FEMA Substantial Damage Estimator (SDE)

- Free digital tool
- Aids in collecting and organizing SD assessment data
- User inputs:
 - Construction quality, depreciation, and categorical damage by structural element
- Includes import and export functions



The purpose of the FEMA Substantial Damage Estimator (SDE) Tool is to collect and organize data to help make SD assessments in the field.

The SDE provides a formalized methodology for collecting and organizing the data required to make defensible determinations that meet the NFIP criteria.



Student Notes

The user provides the following inputs:

- Initial construction quality
- Depreciation rating
- Categorical damage by structural elements

The tool allows for the input and export of data, such as latitude and longitude, photos, and other data.



Online Resource

To learn more about the tool, visit the [FEMA Independent Study Course 285](https://training.fema.gov/is/courseoverview.aspx?code=IS-285) (<https://training.fema.gov/is/courseoverview.aspx?code=IS-285>) to learn more about the tool.

Visual 60: Provide Determination Letter

Must be issued before permit!

Written notice to owners deeming their property either Substantially Damaged or not:

- Is SD
- Is not SD
- For close calls (40% - 60% damaged):
 - Clearly document your decision.
 - Decision may be appealed.

Substantial Damage
Sample Letter to Notify Structure Owner of Determination

NOTICE OF SUBSTANTIAL DAMAGE DETERMINATION (RESIDENTIAL)

Dear [name of structure owner]:

The City of Floodville has reviewed your recent application for a permit to repair [describe proposed improvement/condition] for the existing residential structure located at [insert structure address], Floodville, NY 14056. These repairs are required as a result of flood damage from the storms of August 28–29, 2017.

The Department of Building Inspections has determined that this structure is located within a mapped Special Flood Hazard Area on the Flood Insurance Rate Map (FIRM), Panel 0150, with an effective date of June 19, 2009. As required by our floodplain management ordinance or building code, we have evaluated the proposed repairs and determined that the damage constitutes Substantial Damage for the structure. This determination is based on a comparison of the cost estimate of the proposed cost of repairs to the pre-damage market value of the structure (excluding land value). When the cost of repairs equals or exceeds 50 percent of the pre-damage market value of the structure, the damage is considered to be Substantial Damage under the requirements of the National Flood Insurance Program (NFIP) and the city's Floodplain Management Ordinance dated April 8, 2005.

As a result of this determination, you are required to bring the structure into compliance with the flood damage-resistant provisions of the City regulations and/or code [cite pertinent sections].

We would be pleased to meet with you and your designated representative (architect/builder) to discuss the requirements and potential options for bringing the structure into compliance. Several issues must be addressed to achieve compliance. The most significant requirement is that the lowest floor, as defined in the regulations/code, must be elevated to or above the base flood elevation (BFE) [or the elevation specified in the regulations/code] on the FIRM. You may wish to contact your insurance agent to understand how raising the lowest floor higher than the minimum required elevation can reduce NFIP flood insurance premiums.

Please resubmit your permit application along with plans and specifications that incorporate compliance measures. Construction activities that are undertaken without a proper permit are violations and may result in citations, fines, the removal of the non-compliant construction, or other legal action.

Sincerely,

Lisa Donaldson, Chief Inspector
Department of Building Inspections
888-888-0000

Letter Template from FEMA P-758



Student Notes

Once it's determined that a structure has been Substantially Damaged, the Floodplain Administrator must provide a determination letter to the property owner. This letter should be issued to the property owner before issuing a permit. After a disaster, a written notice should be provided. A letter is necessary whether the structure is deemed to be SD or not.

Special care should be taken to determine the SD status in cases where the damage amounts to values between 40% to 60%. In either case, clear documentation is necessary to explain why a decision was made, as these "close calls" are more likely to be appealed.



Online Resource

Don't forget the [FEMA SI/SD Desk Reference P-758](https://www.fema.gov/sites/default/files/documents/fema_nfip_substantial-improvement-substantial-damage-desk-reference.pdf). This guide provides resources for making SI/SD determinations, including templates, such as a template SD Determination Letter, which is shown on the slide. This document is available at: https://www.fema.gov/sites/default/files/documents/fema_nfip_substantial-improvement-substantial-damage-desk-reference.pdf

Visual 61: SI/SD Standard Operating Procedures (SOPs)

- Develop written procedures that can help staff make and document consistent determinations and improve efficiency.
- Having documented, standard procedures (and staff training) is critical, especially in the post-disaster period when large numbers of buildings may be damaged.

Developing SI/SD SOPs can help communities better manage post-disaster recovery. The community should develop written procedures that can help them make and document consistent determinations and improve efficiency.

The procedures should document standard procedures, as well as the plan for training staff in these procedures. Having a plan and knowing how to put it into action is critical, especially in post-disaster periods where there may be a large number of buildings damaged and many community staff may be helping with assessments.



Student Notes

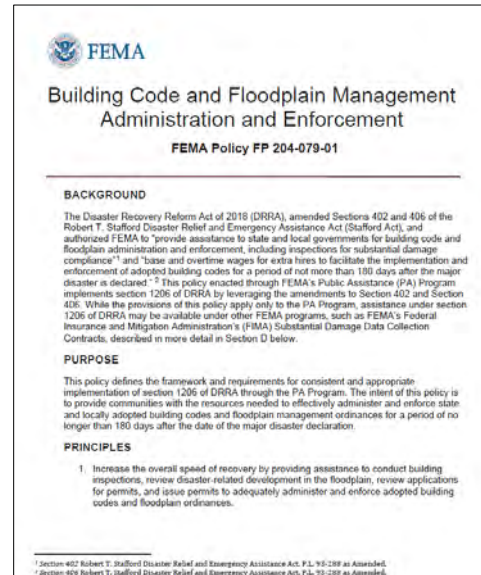
It is helpful to have:

- An updated inventory of structures in the SFHA in the Geographic Information System (GIS),
- Recent parcel or tax data,
- Outreach and communications materials ready ahead of time, and
- Staff trained on the SOPs.

All these elements will help a community improve their management of the recovery workload.

Visual 62: Disaster Recovery Reform Act of 2018

- Authorizes Federal assistance after major disaster declarations
- Eligible work:
 - Building code administration
 - Code enforcement
 - Floodplain ordinance administration and enforcement
 - SD determinations
- Recordkeeping responsibilities are very important!



The Disaster Recovery Reform Act Section 1206 authorizes FEMA to provide communities approved for Public Assistance after a Presidentially Declared Disaster with resources needed to administer their floodplain management programs.

Work eligible for reimbursement includes the following:

- Building code administration: Review and process building permits, provide training and outreach, establish plan review and inspection processes.
- Code enforcement: Inspect structures, carry out corrective actions, review and issue Elevation Certificates.
- Floodplain ordinance administration and enforcement
- SD determinations: Conduct field surveys, collect data, prepare repair cost and market value information, damage inventory, hire or train staff

Recordkeeping responsibilities are very important in the post-disaster environment and are critical to reimbursement through this program.

Funding is available for properly documented eligible activities occurring within 180 days after a major disaster declaration.



**Student
Notes**



**Online
Resources**

Access the following resources:

- [Fact Sheet](https://www.fema.gov/sites/default/files/documents/fema_drra-1206-companion-document.pdf)
(https://www.fema.gov/sites/default/files/documents/fema_drra-1206-companion-document.pdf)
- [Policy Document](https://www.fema.gov/sites/default/files/documents/fema_building-code-floodplain-management-drra-1206_policy_10-15-2020_0.pdf)
(https://www.fema.gov/sites/default/files/documents/fema_building-code-floodplain-management-drra-1206_policy_10-15-2020_0.pdf)

Visual 63: Knowledge Check 5

What are some important community responsibilities after a damage event?



Answer the question:



**Student
Notes**

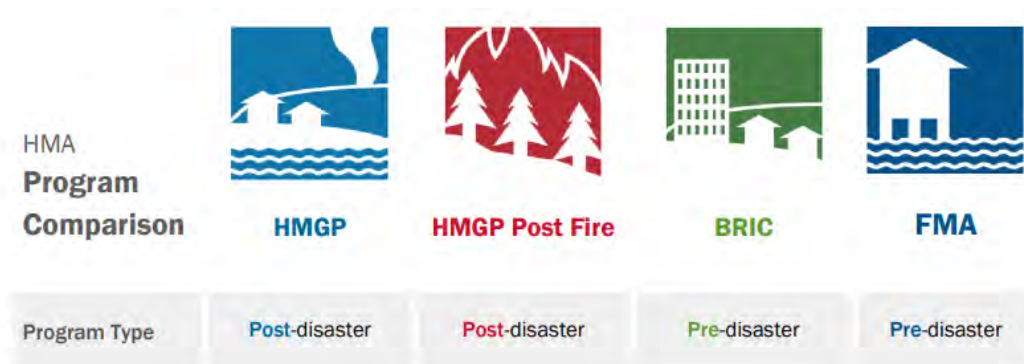
What are some important community responsibilities after a damage event?

Prepare to share your response with the group.

Visual 64: FEMA Hazard Mitigation Assistance (HMA)

Provides funding to help prevent or lessen future damages:

- Hazard Mitigation Grant Program (HMGP)
- Hazard Mitigation Post-Fire Grant Program (HMGP Post-Fire)
- Building Resilient Infrastructure and Communities (BRIC)
- Flood Mitigation Assistance (FMA)



FEMA's Hazard Mitigation Assistance (HMA) programs provide funding via grants to eligible applicants (typically local governments and non-profit agencies) for eligible mitigation measures that reduce disaster losses. "Hazard mitigation" is any sustainable action that reduces or eliminates long-term risk to people and property from future disasters.

There are several HMA grant programs:

- Hazard Mitigation Grant Program (HMGP): The main disaster-related program, which also includes a post-fire grant program. HMGP assists in implementing long-term hazard mitigation planning and projects following a Presidential Disaster Declaration. HMGP funding is available when authorized through a major disaster declaration. The community must also have a current Hazard Mitigation Plan adopted to qualify for funding.
- HMGP Post Fire: HMGP Post Fire Grants provide assistance to help communities implement hazard mitigation measures after wildfire disasters.
- Building Resilient Infrastructure and Communities (BRIC): This grant program provides support for States, local communities, Tribes, and territories as they undertake hazard mitigation projects to reduce the risks they face from disasters and natural hazards. States and territories that have had a major disaster declaration under the Stafford Act in the seven years prior to the annual application period start date are eligible to apply.
- Flood Mitigation Assistance (FMA): FMA is a non-disaster-related grant program that provides funds for planning and projects to reduce or eliminate the risk of flood damage to NFIP-insured buildings. This is a competitive program that provides funding annually to States, local communities, federally-recognized Tribes, and territories.



**Student
Notes**

In addition to FEMA's HMA programs, there are two other forms of disaster assistance for federally declared disasters, called Individual Assistance (IA) and Public Assistance (PA).



Online Resources

Refer to the following resources FEMA HMA Resources:

- [BRIC](https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities)
(<https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>)
- [Flood Mitigation Assistance \(FMA\) program](https://www.fema.gov/grants/mitigation/floods)
(<https://www.fema.gov/grants/mitigation/floods>)
- [HMGP](https://www.fema.gov/grants/mitigation/hazard-mitigation)
(<https://www.fema.gov/grants/mitigation/hazard-mitigation>)



Handout

Refer to Handout 5.2: HMA Program Comparison to learn more about the differences between the various HMA grant programs.

Visual 65: FEMA Individual Assistance (IA) and Public Assistance (PA)

IA	PA
- Provides assistance for individuals and businesses with disaster recovery needs - Not a substitute for flood insurance.	- Provides assistance to State, local, Tribal, or territorial facility owners that provide public services - Supports the repair and rebuilding of damaged facilities



Student Notes

FEMA provides two main types of assistance following major disasters such as hurricanes, tornadoes, straight-line winds, flooding, and other incidents: Individual Assistance (IA) and Public Assistance (PA).

IA is available for individuals and businesses and provides support in their disaster recovery. That support may include funds for temporary housing, emergency home repairs, or medical, dental, and funeral expenses resulting from the disaster.

PA is available for State, local, Tribal, and territorial facility owners and certain non-profit organizations that provide public services. It provides support for the repair and rebuilding of damaged facilities or public infrastructure after a disaster.

A Presidential Disaster Declaration may activate either or both categories. For example, it is possible for the community to receive public assistance after an event, but individuals are not able to access individual assistance if that category was not granted as part of the declaration.

IA is not a substitute for flood insurance. FEMA IA alone cannot make a property whole. Disaster assistance provides far less monetary support than the average flood insurance claim payment.



Online Resource

For more information on [IA and PA](https://www.fema.gov/assistance), visit <https://www.fema.gov/assistance>

Visual 66: Other Funding for Recovery

- Small Business Administration (SBA) loans
- Community Development Block Grants
- United States Department of Agriculture (USDA) Rural Development
- NFIP Increased Cost of Compliance (ICC) policy benefit/coverage



There are several other Federal programs that can help fund recovery following a disaster. Regardless of the funding source, all development occurring in the floodplain requires a permit.

Small Business Administration (SBA) loans are authorized through a separate process that may be coordinated with a Stafford Act Declaration. Even if FEMA declines a governor's request for a Stafford Act Declaration, the SBA criteria may be satisfied, and the SBA may make loans available to individuals and businesses.

Community Development Block Grants are various programs that are separately authorized; some are routine, and some are specially authorized for individual events.



Student Notes

United States Department of Agricultural (USDA) Rural Development offers loans, grants, and loan guarantees to help create jobs and support economic development and essential services such as:

- Housing,
- Health care,
- First responder services, and
- Water, electric, and communications infrastructure.

In a flooding event, an essential element of the recovery is flood insurance, which could be provided by either the NFIP or private flood insurance. NFIP policies include an Increased Cost of Compliance (ICC) coverage benefit, which will be discussed in the next unit.

**Online
Resource**

FEMA has put together a [Mitigation Resource Guide](https://www.fema.gov/sites/default/files/documents/fema_mitigation-resource-guide.pdf) that provides a robust list of available Federal grants, loans, and technical assistance programs. This document is available at

https://www.fema.gov/sites/default/files/documents/fema_mitigation-resource-guide.pdf.

Remember that regardless of funding source, all development in the floodplain requires a permit.

Visual 67: Unit 5 Summary

After completing this unit, you are now able to:

- Explain the Floodplain Administrator's roles, responsibilities, and oversight and compliance authority.
- Identify the permit development process steps.
- Explain the permitting review steps.
- Describe the Floodplain Administrator's post-event operations responsibilities.



You have completed Unit 5. You are now able to:



**Student
Notes**

- Explain the Floodplain Administrator's roles, responsibilities, and oversight and compliance authority;
- Identify the permit development process steps;
- Explain the permitting review steps; and
- Describe the Floodplain Administrator's post-event operations responsibilities.

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Unit 6: Flood Insurance

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Visual 1: Unit 6: Flood Insurance

Unit 6: Flood Insurance



Student Notes

Welcome to Unit 6: Flood Insurance. This unit should take about 30 minutes to complete.

Visual 2: Course Map Umbrella



Student Notes

You are now reviewing the Insure the Risk portion of the NFIP umbrella. Some topics we will discuss under this part of the umbrella include mandatory purchase requirements and insurance and floodplain management.

Visual 3: Unit 6 Objectives

After completing this unit, you should be able to:

- Describe the availability of flood insurance in participating NFIP communities.
- Describe the mandatory purchase requirements for flood insurance.
- Discuss the various elements of flood insurance policies under the NFIP.
- Identify Repetitive Loss (RL)/Severe Repetitive Loss (SRL) properties.
- Describe the purpose of Increased Cost of Compliance (ICC) coverage.



Student Notes

After completing this unit, you should be able to:

- Describe the availability of flood insurance in participating NFIP communities,
- Describe the mandatory requirements for flood insurance,
- Discuss the various elements of flood insurance policies under the NFIP,
- Identify Repetitive Loss (RL)/Severe Repetitive Loss (SRL) properties, and
- Describe the purpose of Increased Cost of Compliance (ICC) coverage.

Visual 4: Unit 6 Topics



- Flood Insurance Availability
- Mandatory Purchase Requirements
- Flood Insurance Rating Factors
- Insurance and Floodplain Management
- Repetitive Loss (RL)/Severe Repetitive Loss (SRL) Properties
- Increased Cost of Compliance (ICC) Coverage
- Unit Summary

Flood insurance is a very important element of the National Flood Insurance Program (NFIP). This unit will cover the following topics related to flood insurance:



Student Notes

- Flood Insurance Availability
- Mandatory Purchase Requirements
- Flood Insurance Rating Factors
- Insurance and Floodplain Management
- Repetitive Loss (RL)/Severe Repetitive Loss (SRL) Properties
- Increased Cost of Compliance (ICC) Coverage

Visual 5: Flood Insurance Availability

Flood Insurance Availability



**Student
Notes**

Before we discuss flood insurance and its availability, let's review the definition of a flood on the next slide.

Visual 6: Flood Insurance Definition: Flood (44 CFR § 59.1)

“A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area, or of two or more properties, from:

- Overflow of inland or tidal waters,
- Unusual and rapid accumulation or runoff of surface waters from any source,
- Mudflows and/or
- Collapse or subsidence of land (due to erosion, waves, or currents).”



Student Notes

A flood as “a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area, or of two or more properties, from:

- Overflow of inland or tidal waters,
- Unusual, rapid accumulation or runoff of surface waters from any source,
- Mudflows, and/or
- Collapse of land due to waves or currents above anticipated levels.

For the purpose of flood insurance claims, surface waters from any source includes artificial sources (e.g., a dam breach or a water main failure) not just rivers or oceans.

Visual 7: Flood Insurance Definition: Structure

- A walled and roofed building
- Principally above ground
- Affixed to a permanent site or foundation
- Manufactured homes and travel trailers built on a permanent chassis
- Includes finished construction or under construction



Student Notes

The NFIP defines a structure, for flood insurance purposes, as “a walled and roofed building, other than a gas or liquid storage tank, principally above ground and affixed to a permanent site or foundation; as well as a manufactured home on a permanent foundation.” Finished construction buildings, as well as buildings under construction, are eligible to be insurable.

Visual 8: NFIP Flood Insurance Availability

- Available community-wide in NFIP participating communities to those who are:
 - Inside the SFHA and outside the SFHA
 - Homeowners
 - Business Owners
 - Renters or Lessees
- Insurance is obtained from local insurance agents.
- One year policy term



The NFIP flood insurance is available to everyone in a participating community. This includes those:

- Inside the Special Flood Hazard Area (SFHA),
- Outside the Special Flood Hazard Area (SFHA),
- Homeowners,
- Business Owners, and/or
- Renters or Lessees (in any zone).

Acquiring flood insurance in the community is very important. For example, many homeowners do not know their homeowner's policy does not cover flood damage. Renters also often do not know they are also eligible for a flood insurance policy.



**Student
Notes**

To acquire flood insurance, the community contacts a local insurance agent. A local insurance agent can sell:

- “Direct” policies through FEMA.
- “Write Your Own” policies through companies that work with FEMA.

Flood insurance policies have a one-year policy term. FEMA sets rates and coverage rules and limitations.

Flood insurance is unavailable from the NFIP if a community does not participate in, or that has been suspended from, the NFIP.

Development can't be insured by the NFIP in Coastal Barrier Resources System (CBRS) areas or Otherwise Protected Areas (OPAs) after their designation dates.

Properties that have been identified as non-compliant (and for which a 1316 action has been taken) are also not eligible for NFIP flood insurance. You will learn more about this later in the unit.

Visual 9: Mandatory Purchase Requirements

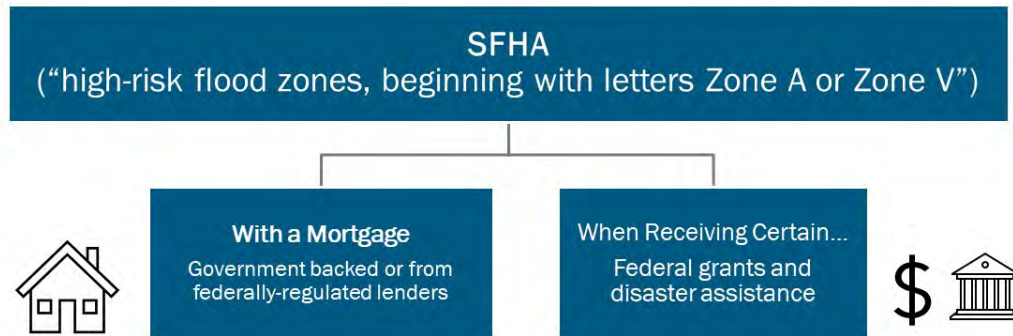
Mandatory Purchase Requirements



**Student
Notes**

Mandatory purchase requirements for flood insurance.

Visual 10: Flood Insurance Mandatory Purchase Requirements



While flood insurance can be purchased anywhere in a participating community, there are some situations where flood insurance is mandatory. As just discussed, the Flood Disaster Protection Act of 1973 mandates the purchase of flood insurance for properties in the designated SFHA.



Student Notes

If a structure is in a high-risk flood zone (A or V), the lender must require flood insurance as a condition of a government-backed loan. Flood insurance is also mandatory if a federally-backed mortgage is changed, extended, or discovered (e.g., mapped into the SFHA after a map revision).

The mandatory purchase of flood insurance also applies to any Federal financial assistance (disaster assistance or Federal grants) that involves the acquisition or construction of a building in the SFHA.

Visual 11: Knowledge Checks 1 and 2

Scenario: A business owner in Floodville, a NFIP-participating community, is planning to build a complex of restaurants, shops, and entertainment centers near a body of water. These facilities will not be located in the SFHA.

Is flood insurance available for this development?

Is flood insurance mandatory for this development?



Read the scenario: A business owner in Floodville, a NFIP-participating community, is planning to build a complex of restaurants, shops, and entertainment centers near a body of water. These facilities will not be located in the SFHA.



**Student
Notes**

Answer the following discussion questions:

Is flood insurance available for this development?

Is flood insurance mandatory for this development?

Prepare to share your responses with the group.

Visual 12: Flood Insurance Policy Waiting Period



POLICY SCENARIO	WAITING PERIOD
Obtained at loan closing	None (effective immediately)
Transferring an active policy	None (effective immediately)
After a flood map change	One day (conditions apply)
Post wildfire (on Federal land)	One day (conditions apply)
All other flood insurance policy	30 days

Building and contents flood insurance coverage can be purchased by individuals in the participating community at any time. However, there's usually a 30-day waiting period after premium payment before the policy is effective. This is to discourage property owners from waiting to purchase insurance until a storm is approaching.

There are a few exceptions to the 30-day waiting period:



Student Notes

- There is no waiting period if the initial purchase of flood insurance is in connection with the making, increasing, extending, or renewing of a loan. Coverage becomes effective at the time of the loan as long as the application and payment of premium is made at or prior to loan closing. Also, an active policy may be transferred with no gap in coverage.
- When the NFIP revises a flood map to show that a building is now in an SFHA when it was not previously, there is only a one-day waiting period on the policy. This exception only applies if it is purchased within the 13 months after the new map's effective date.
- If a privately-owned property is affected by a wildfire that originated on Federal land, and the flood insurance policy is purchased prior to or within 60 days of the fire-containment date, the 30-day waiting period is waived and replaced with only a 1-day waiting period.

Visual 13: Flood Insurance Rating Factors

Flood Insurance Rating Factors



**Student
Notes**

Flood insurance rating factors for a policy.

Visual 14: Flood Insurance Rating Factors Overview



Student Notes

The price of a flood insurance policy (its annual premium) is based on variables and flood hazards that are unique to each building. Variables include:

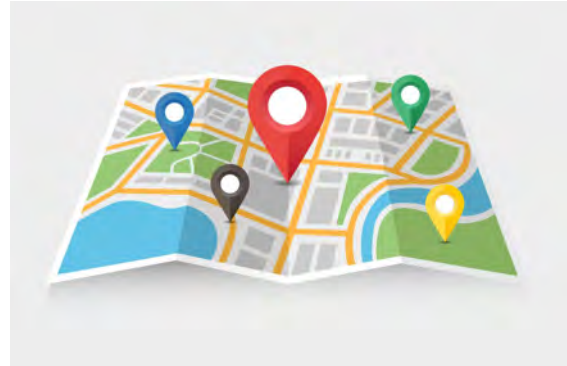
- Geographic location of the building,
- Structural variables or characteristics of the building, and
- Various policy discounts.

Policy discounts may apply for mitigation, Community Rating System (CRS) participation, and other statutory factors.

Property-specific pricing more accurately reflects the risk, helping policyholders make risk-informed decisions to lessen the effects of flooding and helping communities become more resilient.

Visual 15: Geographic Location

- Structure's address or latitude and longitude
- Distance to flooding source(s)
- Local relative elevation
- Elevation relative to flooding source(s)
- Census tract / territory
- Watershed



Identifying the geographic location of a building is important for determining a flood insurance rating factor. For example, the flood insurance rating factor will consider if a structure is in a participating community and assess its unique flood risk.



Student Notes

The distance from the building (using a structure's address or latitudinal and longitudinal coordinates) to the nearest flooding source(s) is calculated. A building's elevation relative to the surrounding area and relative to the nearby flooding source(s) are also considered. For example, (all else being equal) the closer a building is to the flooding source, the more at-risk it is to flooding. If a structure sits higher up relative to its surrounding elevations, the flood risk is lower.

The building's flood insurance rates will reflect the flood risks at that unique location.

Information on the territory, watershed, and drainage area at the building location are also incorporated.

Visual 16: Structural Variables

Based on building characteristics:

- Building occupancy
- Construction type
- Foundation type
- First floor height (at or above ground)
- Building replacement cost value
- Date of construction
- Number of floors in building (above ground)



Flood insurance also considers several structural variables, based on the characteristics of a building:

Building's occupancy type: Single-family home, manufactured home, multi-family structure, or commercial or non-residential building

Construction type: Indicates whether the building is frame or wood, masonry or concrete block, or another type of construction

Foundation type: Indicates whether a structure is elevated on a basement, crawlspace, or enclosure; is elevated on posts, piles, or piers; or is a slab-on-grade or other type of foundation and not elevated



Student Notes

First floor height value (for the first above-ground floor): Either directly provided or calculated based on a structure's foundation type

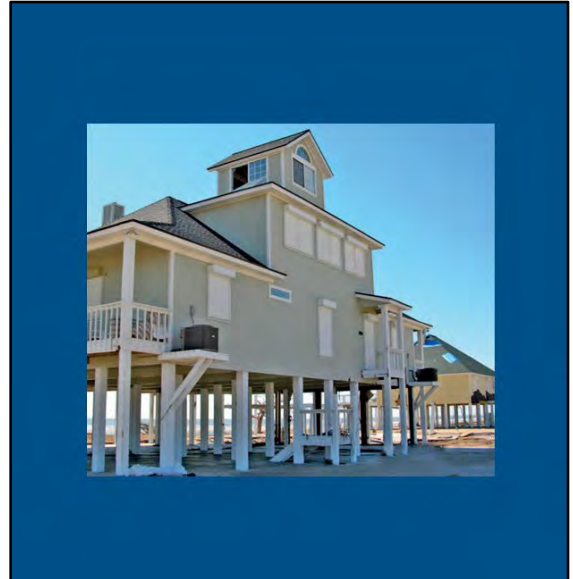
Replacement Cost Value: Rating characteristic that considers that higher-value and lower-value structures differ in what it costs to replace them

Date of construction: Rating characteristic based on the date that the building permit was issued, provided the actual start of construction, repair, reconstruction, or improvement was within 180 days of the permit date

Number of floors: Rating characteristic based on the number of floors above the ground, excluding basements, enclosures, and crawlspaces

Visual 17: Flood Insurance Discounts

- Machinery and equipment, elevated
- Foundation type: piers/posts/piles
- CRS community
- Flood openings (wet floodproofing)
- Dry floodproofing (non-residential)
- Statutory



There are various types of flood insurance discounts that can apply when a property owner takes flood mitigation steps to reduce damage to the property or for certain construction elements or thresholds.

For example, policy discounts can apply to buildings in any flood zone if certain covered machinery and equipment (M&E) servicing the building are elevated to at least the height of the first floor that is elevated above the ground.

There are discounts for certain foundation types and for being in a CRS participating community. Flood insurance policies in CRS participating communities receive a percentage discount based on the CRS Class (#) of that community.



Student Notes

A building in any flood zone with proper flood openings (wet floodproofing) in its enclosure or crawlspace may be eligible for a policy discount.

A non-residential building that's properly dry-floodproofed may be eligible for a policy discount in certain flood zones. For example, a building in a non-coastal AE zone that is dry-floodproofed to one foot above the Base Flood Elevation may be eligible for a dry floodproofing discount.

Certain statutory discounts are also available. These are outlined in Federal statute. For example, there is a statutory discount on the first \$35,000 of the first-year building coverage policy for any structure newly mapped into the SFHA.

Please note that FEMA automatically determines a policy's eligibility for these and other statutory discounts that may apply to properties located in Zones AR or A99 or pre-FIRM primary residences.

By considering several flood risk variables, location, building characteristics, and eligibility for mitigation discounts, FEMA is delivering flood insurance rates that better reflect a property's unique flood risk.

Visual 18: Knowledge Check 3

Which of the following is not a flood insurance rating factor?

- A. Distance to flooding source(s)
- B. Occupancy type (residential, non-residential)
- C. Owner's income bracket
- D. Building's foundation type



**Student
Notes**

Answer the question:

Which of the following is not a flood insurance rating factor?

Prepare to share your responses with the group.

Visual 19: Flood Maps and Flood Insurance

- Flood Insurance Rate Maps (FIRMs) reflect the current flood risk and help communities make floodplain management decisions.
- Floodplain Administrators must track all map revisions and updates.
- Any changes to the regulatory floodplain (SFHA) boundary can impact the mandatory flood insurance purchase requirements.



Flood Insurance Rates Maps (FIRMs) play an important role in identifying flood insurance requirements.

FIRMs reflect the current flood risk and help communities make good floodplain management decisions.

Communities apply the knowledge of their high-risk flood zones to comprehensive planning, development regulation, and mitigation opportunities.



Student Notes

It's the Floodplain Administrator's responsibility to track all map revisions and updates. This includes when an area, property, or structure is physically removed from or added to the SFHA.

Changes to the regulatory floodplain (SFHA) boundary can impact the mandatory flood insurance purchase requirements. For example, if the FIRM changes from Zone X to Zone A or V at a site (putting it in SFHA), the lender may demand that the building owner purchase flood insurance within 45 days at any time during the life of a loan.

If the FIRM changes from Zone A or V to Zone X at a site (putting it outside of the SFHA), flood insurance is no longer federally-mandated. However, the lender may still choose to require flood insurance.

Visual 20: Elevation Certificates and Flood Insurance

- The FEMA Elevation Certificate (EC) is used for both floodplain management and flood insurance purposes.
- Can be used by CRS communities to collect and maintain the as-built elevations of buildings
- Must be used by communities in CRS
- Not required to rate a flood insurance policy
- Provides detail about a structure that may result in a better flood insurance premium.

The FEMA Elevation Certificate is used for both floodplain management and flood insurance purposes. All communities must obtain and maintain certified as-built elevations of the lowest floor for new construction and Substantial Improvement (SI).

The EC is a great tool to document this information. FEMA recommends its use for all communities. Communities that participate in the Community Rating System (CRS) are required to collect finished construction Elevation Certificate to document these elevations.



Student Notes

Elevation Certificates are not a requirement for rating or receiving a flood insurance policy; however, an Elevation Certificate may help a policyholder by gathering more specific elevation data about their building. Data such as the foundation type, first floor height, lowest adjacent grade, elevation of machinery and equipment, and presence of flood openings are recorded.

The policy holder can submit the Elevation Certificate to their agent to determine whether it will lower their flood insurance premium. Policyholders are not penalized for providing an Elevation Certificate if it does not lower their rate; they will receive the lower of the calculated premiums.



**Online
Resource**

You may access the Elevation Certificate at the [National Flood Insurance Program Underwriting Forms](https://www.fema.gov/flood-insurance/find-form/underwriting) at <https://www.fema.gov/flood-insurance/find-form/underwriting>

Visual 21: Insurance and Floodplain Management

Insurance and Floodplain Management



**Student
Notes**

How floodplain management decisions can impact flood insurance policy requirements and rates.

Visual 22: Floodplain Management and Flood Insurance

Floodplain Management Regulations	Flood Insurance
Floodplain Administrators must ensure all floodplain development is compliant.	Compliance can impact flood insurance rates.
Regulations must apply in the SFHA; the community can apply them to a larger area.	Mandatory purchase applies inside the SFHA.
Higher standard regulations can apply to all flood zones.	Insurance is available in all flood zones.
Higher regulatory standards are optional.	Higher standards may lower premiums.
Violations must have legal penalties.	Violations lead to higher premiums and lost discounts.



Student Notes

You already know that communities must document and enforce compliance with local floodplain management ordinances and regulations that are tied to flood zones. The Floodplain Administrator is responsible for ensuring all floodplain development is compliant.

Federally regulated lenders enforce the flood insurance mandatory purchase requirement for properties located in SFHAs.

Remember, flood insurance is generally available for all insurable structures in a participating community, whether inside or outside the SFHA.

Because insurance premiums are actuarially based (risk-based), structures that violate floodplain management regulations could also have higher flood insurance premiums.

Also, foundation types, elevation of machinery and equipment, and other building plan decisions can impact flood insurance rates.

Higher regulatory standards in a community, such as freeboard or foundation requirements, may result in lower premiums. CRS participation can reduce premiums throughout the community.

Generally, the more mitigation and protection there is for the structure, the more discounts there are to lower flood insurance premiums.

Visual 23: Compliance Enforcement: Section 1316

- Local community can request action from FEMA after exhausting all compliance enforcement options on a non-compliant structure.
- Section 1316 declarations authorized by the National Flood Insurance Act of 1968.
- **FEMA issues a Section 1316 declaration**, denying flood insurance coverage for that property:
 - Stays with the property
 - Reduced market value
 - Risk of damage with no insurance compensation
 - Denial of most types of disaster assistance

Communities have a responsibility to enforce all adopted floodplain development regulations in their local floodplain ordinance, but sometimes, property owners don't play along.

FEMA can support a community's efforts to gain compliance, but only after the community has exhausted all compliance enforcement provisions in their adopted ordinance.

If all other compliance enforcement measures have failed, the community can formally request that FEMA issue a Section 1316 declaration on the non-compliant structure.



Student Notes

The authority for this comes from Section 1316 of the National Flood Insurance Act of 1968. It denies flood insurance coverage for any property that is found to be in violation of State or local floodplain laws, regulations, or ordinances.

There must be a clear and unequivocal declaration of the violation of laws or ordinances, a statement and citation of authority, and a notice of violation to the property owner for FEMA to deny coverage on the structure.

First, the property becomes ineligible for NFIP flood insurance. A 1316 declaration stays with the structure until it is fixed. It is not tied to the owner, and it is also not permanent. Once the structure is remedied and found to be fully compliant, the 1316 declaration can be rescinded.

A structure with a 1316 declaration risks having a reduced market value, possible mortgage foreclosure, exposure to damages with no insurance compensation, and denial of most types of disaster assistance.

Visual 24: Repetitive Loss (RL)/Severe Repetitive Loss (SRL) Properties

**Repetitive Loss (RL)/Severe Repetitive Loss (SRL)
Properties**



**Student
Notes**

Repetitive Loss (RL)/Severe Repetitive Loss (SRL) properties.

Visual 25: Repetitive Loss (RL) Properties

- NFIP-insured structures with NFIP-insured structures with two or more flood losses of \$1,000 each in any 10-year period since 1978.
- Increases flood insurance premiums



Student Notes

Multiple flood insurance claims may be a sign that the flood risk is higher for that structure, and it may need more attention.

A Repetitive Loss (“rep loss”/RL) structure is defined as an insured (or insurable) building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling ten-year period since 1978.

Visual 26: Severe Repetitive Loss (SRL) Properties

A building with historical flood-related losses of:

- Four or more losses of at least \$5,000 each (building and/or contents) or
- Two separate losses exceeding the structure's market value



What happens when a repetitive loss structure isn't mitigated and continues to experience flood damage? It may move into the category of Severe Repetitive Loss (SRL).

Severe Repetitive Loss structures are those structures with a high frequency of losses or a high value of claims.

The Severe Repetitive Loss group consists of any NFIP-insured residential property that has had one of these two things occur since 1978:



**Student
Notes**

- Four or more separate claim payments of more than \$5,000 each (this includes building and contents payments) and cumulative claims that exceed \$20,000.
- Two or more separate claim payments (for the building only) where the total of the payments exceeds the current value of the property.

Remember that the claims history follows the building not the owner. In either case, two of the claim payments must have occurred within 10 years of each other.

A Severe Repetitive Loss property will have higher insurance rates but may also qualify for mitigation funding options.

Visual 27: Repetitive Loss and Substantial Damage (SD)

- Repetitive Loss structures:
 - NFIP-insured
 - Two or more flood losses of \$1,000 each in any 10-year period since 1978
- A structure Substantially Damaged by flood:
 - Flood-damaged by a single event
 - Costs 50% or more of the pre-flood market value to restore



Student Notes

Remember that Substantially Damaged structures must be treated as new construction when repair work begins, regardless of the cause of the damage.

Comparing the Substantial Damage definition with the Repetitive Loss definition, you can imagine how a structure may have multiple smaller-cost damages and be a Repetitive Loss structure instead of a Substantially Damaged structure.

One way a community can prevent future losses and break the damage-repair cycle is to adopt a higher standard in their floodplain ordinance that applies Substantial Damage requirements to Repetitive Loss buildings. Doing so may make additional mitigation funding available for NFIP policyholders, such as Increased Cost of Compliance (ICC) Coverage.

Visual 28: Knowledge Check 4

Scenario: In 2007, a homeowner's flood insurance claim was paid in the amount of \$3,159 for flood damage on the first floor. In 2013, a second insurance claim was paid in the amount \$1,989 for a different flood event. The homeowner has an NFIP policy.

What type of loss structure would FEMA consider this building?



Student Notes

In 2007, a homeowner's flood insurance claim was paid in the amount of \$3,159 for flood damage on the first floor. In 2013, a second insurance claim was paid in the amount of \$1,989 for a second flood event. The homeowner has an NFIP policy.

What type of loss structure would FEMA consider this building?

Prepare to share your responses with the group.

Visual 29: Increased Cost of Compliance (ICC)

Increased Cost of Compliance (ICC)



**Student
Notes**

The purpose of Increased Cost of Compliance (ICC) coverage.

Visual 30: Increased Cost of Compliance (ICC) Coverage

- Standard flood insurance policy benefit
- Helps pay to repair or rebuild a flood-damaged building
- Available for buildings declared **substantially damaged by the local official**:
 - Up to **\$30,000** to help cover the cost of mitigation measures
- **Available for Repetitive Loss by flood buildings**:
 - Only if an adopted/enforced repetitive loss provision is in the local floodplain ordinance
 - Provision adds Repetitive Loss definition to the SD definition.



Student Notes

Increased Cost of Compliance, or ICC coverage, is part of most standard flood insurance policies under the NFIP.

If a policyholder qualifies to file an ICC claim, that ICC policy benefit helps to pay to repair or rebuild a flood-damaged building in compliance with current State or local floodplain management ordinances or laws.

ICC coverage provides up to \$30,000 to help cover the cost of mitigation measures for NFIP-insured structures that are declared SD by the community official.

If a community is enforcing a higher standard in their floodplain management ordinance that treats Repetitive Loss the same as Substantial Damage, then those NFIP-insured buildings also become eligible for ICC after a determination by the local official.

Visual 31: ICC Mitigation Solutions



- Floodproofing (non-residential properties only)
- Relocating to a new site
- Elevating above the flood level in the community
- Demolishing the building

You can remember the mitigation methods eligible for ICC coverage using the acronym “F.R.E.D.”:



Student Notes

F: Floodproofing (only an option for non-residential buildings). For a building to be certified as floodproofed, it must be watertight below the Base Flood Elevation. The walls must be substantially impermeable to water and designed to resist the stresses imposed by floods.

R: Relocation. This relates to moving the entire building to another location (on the same lot or a different lot) on higher ground or usually outside the floodplain.

E: Elevation. This is the most common means of reducing a building’s flood risk. It means raises the building to or above the BFE.

D: Demolition. This may be necessary in cases where the damage is too severe, the cost to mitigate is too high, or the building is in such poor condition that none of the other activities are feasible.

Visual 32: Local Floodplain Administrator's Role in ICC

- Make SD determinations and Repetitive Loss determinations; send official letter to owner
- Enforce Repetitive Loss provision in the floodplain ordinance
- Provide mitigation options to policyholders
- Coordinate to issue building permits for mitigation measures
- Issue Certificate of Occupancy/Compliance



The Floodplain Administrator plays an important role in promoting ICC coverage and providing owners with documents relevant to their ICC claims.

The Floodplain Administrator also has the following roles:

- Making SD and Repetitive Loss determinations to ensure that owners are notified promptly
 - These determination letters are the key element to a homeowner's ability to utilize the ICC coverage.
- Adopting and enforcing a Repetitive Loss provision in the local floodplain management ordinance to make more homeowners with NFIP policies eligible to use ICC coverage
- Knowing what mitigation options ICC covers, and which solution might apply to a given property, to assist and educate policyholders after a flood
- Coordinating to issue proper permits for mitigation measures and conduct inspections for compliance
- Issuing the Certificate of Occupancy or Compliance once the work is finished
 - The full amount of the property owner's ICC claim is not paid until the community issues that certificate.



**Student
Notes**

Visual 33: Knowledge Check 5

How much coverage under ICC is available to a policyholder to repair or rebuild a flood-damaged building to comply with their current local floodplain management ordinance?



Answer the question:



**Student
Notes**

How much coverage under ICC is available to a policyholder to repair or rebuild a flood-damaged building to comply with their current local floodplain management ordinance?

Prepare to share your responses with the group.

Visual 34: Flood Insurance Resources

- [NFIP policy information, graphics, and interactive tools](https://www.floodsmart.gov) (www.floodsmart.gov)
- [Flood Insurance Outreach Publications](https://www.fema.gov/flood-insurance/outreach-resources)
https://www.fema.gov/flood-insurance/outreach-resources
- [FEMA Mapping and Insurance eXchange \(FMIX\)](https://floodmaps.fema.gov/fhm/fmx_map.html)
https://floodmaps.fema.gov/fhm/fmx_map.html
- [Office of the Flood Insurance Advocate \(OFIA\)](https://www.fema.gov/flood-insurance/advocate)
https://www.fema.gov/flood-insurance/advocate



We have discussed a lot of information related to flood insurance; however, you may still have additional questions about it. The NFIP offers a wide range of publications, videos, and online tools that help stakeholders navigate the flood insurance process.

- For more information, go to [FEMA's Flood Insurance Outreach Publications website](https://www.fema.gov/flood-insurance/outreach-resources) (<https://www.fema.gov/flood-insurance/outreach-resources>)

Specialists at the FEMA Mapping and Insurance eXchange (FMIX) Customer Care Center can answer general inquiries about mapping and flood insurance.



**Student
Notes**

- If you have questions, call 1-877-336-2627 (1-877-FEMA-MAP) or visit [FEMA's Mapping and Insurance eXchange](https://www.floodmaps.fema.gov/fhm/fmx_main.html) at (https://www.floodmaps.fema.gov/fhm/fmx_main.html) to access live chat and email functions.

FEMA's Office of the Flood Insurance Advocate (OFIA) advocates for the fair treatment of policyholders and property owners. The office provides education and guidance on all aspects of the NFIP and makes recommendations for program improvements to FEMA leadership.

- You can contact the OFIA by visiting the [Flood Insurance Advocate](https://www.fema.gov/flood-insurance/advocate) page at (<https://www.fema.gov/flood-insurance/advocate>). Select the Ask the Advocate button located near the bottom of the page.

This concludes the topic discussion for Unit 6: Flood Insurance.

Visual 35: Unit 6 Summary

After completing this unit, you are now able to:

- Describe the availability of flood insurance in participating NFIP communities.
- Describe the mandatory purchase requirements for flood insurance.
- Discuss the relationship between sound floodplain management practices and insurance.
- Identify Repetitive Loss (RL)/Severe Repetitive Loss (SRL) properties.
- Describe the purpose of Increased Cost of Compliance (ICC) coverage.



You have completed Unit 6. You are now able to:

- Describe the availability of flood insurance in participating NFIP communities,
- Describe the mandatory requirements for flood insurance,
- Discuss the relationship between sound floodplain management practices and insurance,
- Identify Repetitive Loss (RL)/Severe Repetitive Loss (SRL) properties, and
- Describe the purpose of Increased Cost of Compliance (ICC) coverage.



Student Notes

Remember that under the NFIP, flood insurance is available to everyone in a participating community. This means that it's not just for those who live in high-risk floodplains.

Floodplain Administrators play an important role in this process, including:

- Raising awareness about flood insurance in the community,
- Tracking all map revisions and updates, and
- Ensuring all floodplain development is compliant.

Applying these Floodplain Administrator responsibilities will help improve the chances of better flood insurance policies in a community.

Unit 7: Course Summary

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Visual 1: Course Summary

Unit 7: Course Summary



Student Notes

In this unit, we will review the course learning objectives; provide you with additional resources, training, and contact information; and conduct an activity to assess what you have learned.

Visual 2: Unit 7 Objectives

After completing this unit, you should be able to:

- Identify additional resources, training, and contacts that support floodplain management.
- Identify the primary course learning objectives in an activity.



**Student
Notes**

After completing this unit, you should be able to:

- Identify additional resources, training, and contacts that support floodplain management.
- Identify the primary course learning objectives in an activity.

Visual 3: Unit 7 Topics



- Self-Reflection
- Resources, Training, and Contacts
- Activity 7.1: Floodplain Management Match Game
- Course Objectives Summary
- Unit Summary



Student Notes

The topics we will present in this unit include:

- Self-Reflection;
- Resources, Training, and Contacts;
- Activity 7.1: Floodplain Management Match Game; and
- Course Objectives Summary.

Visual 4: Self-Reflection: Continued Personal Growth

1. Compare the content discussed in this course to your previous expectations of the course,
2. Identify three new skills or pieces of information you acquired related to floodplain management.
3. Explain what made this skill or information valuable to your career goals.
4. Identify one area of improvement for your knowledge or skills.



Take a few moments to reflect on what you have learned in this course. For this self-reflection discussion:

1. Compare the content discussed in this course to their previous expectations of the course.
2. Identify three new skills or pieces of information they acquired related to floodplain management.
3. Explain what made this skill or information valuable to their career goals.
4. Identify one area of improvement for their knowledge or skills.



**Student
Notes**

Document your answers to Questions 2–4 in your Student Manual. Then prepare to share your response with the group.

Self-reflection notes:

Now that you had the opportunity to reflect on this course, we will provide you with some resources, training, and contacts that may help you improve your knowledge, skills, and abilities.

Visual 5: Resources, Training, and Contacts

Resources and Training

- NFIP 101: Introduction to Floodplain Management
- FEMA E/L 0273: Managing Floodplain Development Through the NFIP
- FEMA National Flood Insurance Technical Bulletins
- FEMA Flood Insurance Publications
- FEMA Flood Map Service Center (MSC)
- Association of State Floodplain Managers (ASFPM)

Contacts

- FEMA Regional Office
- State NFIP Coordinator
- State Floodplain Management Office

Consider these resources, training, and contacts to support your floodplain management goals and training needs.

Contacts can include your:

- FEMA Regional Office,
- State NFIP Coordinator,
- State Floodplain Management Office, and
- Local Floodplain Administrator.

Resources and Training:



**Student
Notes**

- [NFIP 101: Introduction to Floodplain Management](https://www.floods.org/training-center/online-training/asfpm-on-demand-learning/nfip101/)
(<https://www.floods.org/training-center/online-training/asfpm-on-demand-learning/nfip101/>)
- [FEMA E/L 0273: Managing Floodplain Development Through the NFIP](https://www.firstrespondertraining.gov/frts/npccatalog?id=2079)
(<https://www.firstrespondertraining.gov/frts/npccatalog?id=2079>)
- [FEMA National Flood Insurance Technical Bulletins](https://www.fema.gov/emergency-managers/risk-management/building-science/national-flood-insurance-technical-bulletins)
(<https://www.fema.gov/emergency-managers/risk-management/building-science/national-flood-insurance-technical-bulletins>)
- [FEMA Flood Insurance Publications](https://www.fema.gov/flood-insurance/outreach-resources/publications)
(<https://www.fema.gov/flood-insurance/outreach-resources/publications>)
- [Association of State Floodplain Managers \(ASFPM\)](https://www.floods.org/)
(<https://www.floods.org/>)
- [FEMA Flood Map Servicing Center \(MSC\)](https://msc.fema.gov/portal/home)
(<https://msc.fema.gov/portal/home>)

Visual 6: Activity 7.1: Floodplain Management Match Game



- Form into groups.
- Identify the floodplain management term or task that aligns with the correct letter in the answer bank.
- Prepare to share your responses.

Activity 7.1: Floodplain Management Match Game

Purpose:

In this activity, you will work in groups to review the learning objectives for this course.

Time: 15 minutes

Materials:



Activity

Figure 17 Activity 7.1: Graphic Organizer Floodplain Management Match Game
(Located in Student Manual)

Instructions:

1. Work in groups.
2. Use the “Figure 17 Activity 7.1: Graphic Organizer Floodplain Management Match Game” to match the answer with the correct floodplain management terminology or task.
3. Write the letter answer in the blank space provided.
4. Share your responses with the group.

FIGURE 17 ACTIVITY 7.1: GRAPHIC ORGANIZER FLOODPLAIN MANAGEMENT MATCH GAME

Statement	Answer Choices
- Administers Federal mitigation grant programs that provide funding to State, local, Tribal, and territorial governments ____ - A Floodplain Administrator may issue a permit only if it meets ____ - Program with the goal to create safer and stronger development in flood-prone areas through regulations and standards ____ - Federally-regulated and insured lenders must require flood insurance for properties located inside the ____ - To determine the BFE in riverine floodplains, you must measure along this to determine the distance between your site and the nearest cross-section ____ - Enabling land use authority for local communities to be able to enforce NFIP standards is provided by ____ - Regulation that sets the minimum requirements for communities with no FIRMs ____ - Regulation that sets the minimum requirements for communities with a FIRM, but no BFEs ____ - A Floodplain Administrator is responsible for checking a development permit application for ____ - A tool used to identify a property's location in relation to the SFHA is a ____ - Regulation that sets the minimum requirements for communities with FIRMs with floodways ____ - A Floodplain Administrator should check an Elevation Certificate for common errors such as ____ - Program that offers flood insurance discounts for NFIP communities that exceed minimum standards ____ - A source of more accurate BFEs than are depicted on the FIRM is the ____	- FEMA - The stream centerline - Flood Insurance Rate Map (FIRM) - States - NFIP - Flood Insurance Study (FIS) 44 CFR 60.3(a) 44 CFR 60.3(b) 44 CFR 60.3(d) - Completeness and compliance - Incorrect BFE source - Regulatory compliance - Community Rating System (CRS) - Special Flood Hazard Area (SFHA)

Visual 7: Course Objectives Summary

After completing this course, you are now able to:

- Explain the roles and responsibilities of Federal, State, and local agencies in the NFIP.
- Describe how a Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) are used to determine the flood zone and Base Flood Elevation (BFE).
- Identify the minimum NFIP regulations applicable to floodplain management.
- Explain the Floodplain Administrator's responsibilities in providing oversight and ensuring compliance.
- Describe the basic concepts of flood insurance under the NFIP.
- Identify additional resources, training, and contacts that support floodplain management.



Student Notes

After completing this course, you are now able to:

- Explain the roles and responsibilities of Federal, State, and local agencies in the NFIP;
- Describe how a Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) are used to determine the flood zone and Base Flood Elevation (BFE);
- Identify the minimum NFIP regulations applicable to floodplain management;
- Explain the Floodplain Administrator's responsibilities in providing oversight and ensuring compliance;
- Describe the basic concepts of flood insurance under the NFIP; and
- Identify additional resources, training, and contacts that support floodplain management.

Visual 8: Unit 7 Summary

After completing this unit, you are now able to:

- Identify additional resources, training, and contacts that support floodplain management.
- Identify the primary course learning objectives in an activity.



Student Notes

You have completed Unit 7. You are now able to:

- Identify additional resources, training, and contacts that support floodplain management.
- Identify the primary course learning objectives in an activity.

Visual 9: Course Completion



thank you



**Student
Notes**

Congratulations, you have completed this course. Feel free to meet with your instructors if you have additional questions about this training.