

Final Exercise

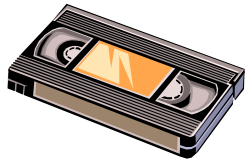
Life is a perpetual examination of our mastery of all we encounter.

Old Proverb

Contents

Final Examination..... 3
Final Examination Answer Sheet 15
Home Study Course Survey Form..... 17

Congratulations on completing the twelve units of this course. All that remains for you to obtain recognition and credit for completion is the final examination. This exam is intended to test your mastery of how to *Carry Out Floodplain Management in Your Locality, With Assistance from the National Flood Insurance Program.*



Before completing the exam, view the *last* video segment *Flooded Again: It's Time to Fight Back*. This video, produced by FEMA in September 1996, discusses the importance of taking actions to mitigate the consequences of future floods in your community. It will reinforce what you have learned in this course and provide further information to you and other officials. It is approximately 25 minutes in length.

The instructions for completing the exam are included on the enclosed answer sheet. When you have finished, mail the completed answer sheet to the address provided. Your examination will

be evaluated and the results returned to you within a few weeks. If a score of seventy-five percent or above is achieved, you will receive appropriate recognition by the North Carolina Association of Floodplain Managers.

**CARRYING OUT FLOODPLAIN MANAGEMENT
IN YOUR LOCALITY
WITH ASSISTANCE FROM THE NATIONAL FLOOD INSURANCE PROGRAM**

Final Examination

This exam is intended to test your mastery of the information presented in this home-study course. Record the best answer for each of the following questions on the following answer sheet. There is only one correct answer for each question. When you have finished, mail the answer sheet to the address provided. Your examination will be evaluated and the results returned to you as quickly as possible. Thank you for your initiative in completing this course.

1. A floodplain is:
 - a. the channel of a river or stream up to its natural banks.
 - b. the low lying area along a river, stream, lake ,or coast that is subject to flooding.
 - c. an area along a river, stream, lake, or coast that is developed and subject to flooding.
 - d. the area along a river, stream, lake, or coast that has flooded in the past.

2. The floodway is:
 - a. the channel and portion of the adjoining floodplain area required to discharge the base (100-year) flood without further increases in flood levels.
 - b. the area inundated by the base flood.
 - c. the area inundated by any particular flood.
 - d. the fringe of the area inundated by the base flood.

3. Floodplain management refers to:
 - a. regulatory land-use measures required for permitted development to be carried out consistent with the flood risk for the site.
 - b. regulatory and other measures required to be taken by a community to become eligible to participate in the National Flood Insurance Program.
 - c. reservation, protection, and enhancement of the natural resources and functions of floodplains.
 - d. all of the above.

4. Which of the following is true:
 - a. A “100-year” flood has a 100 percent chance of occurring at least once each century.
 - b. My community just experienced the “100-year” flood. The next one will occur 100 years from now.
 - c. A “100-year” flood has a one-percent chance of occurring in any year.
 - d. There are flood records that go back 100 years in my community. The largest flood that occurred during this period is the “100-year” flood.

5. Natural or relatively undisturbed floodplains:

- a. limit flooding naturally by temporarily storing floodwater.
 - b. provide many kinds of recreational opportunities.
 - c. contain places for outdoor education.
 - d. can increase a community's overall quality of life.
 - e. all of the above.
6. Flood insurance is available:
- a. only in mapped floodplain areas.
 - b. for insurable properties located anywhere in participating communities.
 - c. until a damage claim is paid.
 - d. only after the community has experienced the base flood to verify the floodplain areas where policies may be sold.
7. The state coordinating agency for the National Flood Insurance Program in North Carolina is:
- a. Department of Insurance
 - b. Department of Health and Natural Resources
 - c. Department of Land Resources
 - d. Department of Crime Control and Public Safety—Division of Emergency Management
8. The local floodplain management administrator is responsible for:
- a. ensuring that development activities within the community comply with local floodplain management regulations and other applicable codes and regulations.
 - b. deciding whether to grant permits for all development proposals within mapped floodplains.
 - c. reviewing permit applications and submitting them to local review boards so they can act on the applications.
 - d. approving all floodplain development permitted under the local ordinance, including deciding whether to grant any appeals or variances.
9. Within the 100-year floodplain, all new construction, substantial improvement, or restoration of substantially damaged residential structures must have the lowest floor (including basement) elevated to or above:
- a. the level of the largest known flood in the community.
 - b. the level of the average of the lowest floors of houses of all adjacent properties.
 - c. one foot above the identified base flood elevation.
 - d. the identified base flood elevation.
10. A detailed flood insurance study consists of:
- a. the Flood Insurance Study report, the Flood Hazard Boundary Map, and the Flood Boundary and Floodway Map.
 - b. the Flood Insurance Study report, the above maps, and other areas studied by approximate methods.
 - c. the Flood Insurance Study report, the Flood Insurance Rate Map, and the Flood Boundary and Floodway Map.

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- d. the Flood Insurance Study report, the Flood Hazard Boundary Map, and the Flood Insurance Rate Map.
11. The Flood Insurance Rate Map shows:
- 100-year and often 500-year floodplain areas.
 - base flood elevations.
 - location of elevation reference marks.
 - flood risk zones.
 - all of the above.
12. The Flood Boundary and Floodway Map shows:
- floodplain boundaries, floodway, cross sections.
 - base flood elevations, flood risk zones.
 - coastal high hazard areas.
 - all of the above.
13. The new format FIRM:
- includes floodway and other floodplain management information that was previously provided on separate Flood Boundary and Floodway Maps.
 - replaces Zones A1-A30 and V1-V30 with AE and VE.
 - identifies units in the Coastal Barrier Resources System.
 - a and b above.
 - all of the above.
14. “Cobra zones” are identified on FIRMs because:
- insurance rates are higher for properties now located in these areas.
 - only new construction in these areas may be covered by flood insurance.
 - no new flood insurance coverage may be provided after specified dates for new or substantially improved structures in these areas.
 - no flood insurance policy may be renewed in these areas after specified dates.
15. Elevation Reference Marks are:
- locations of known, recorded elevations measured from a reference surface or datum.
 - identified on flood maps with a small “x” and designated as “ERM” or “RM,” followed by a number.
 - used by the local administrator to determine elevations of nearby locations.
 - a and b above.
 - all of the above.
16. By using flood profiles contained in Flood Insurance Study reports:
- surveyors can locate elevation reference marks.
 - the local administrator and others can determine flood elevations at any point along the stream.
 - flood insurance rates can be calculated by agents or insurance underwriters.
 - the height of the lowest floor (including basement) above ground can be determined.
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- e. all of the above.
17. In coastal areas the boundary between the V Zone and the A Zone is where:
- a. the wave height is greater than three feet.
 - b. the wave velocity is greater than three feet per second.
 - c. the 100-year stillwater elevation is greater than three feet.
 - d. the limit of tidal flooding by waves is reached.
18. Instead of a cross section, coastal survey data are called a:
- a. wave envelope.
 - b. storm surge.
 - c. transect.
 - d. bathymetry.
19. For the NFIP, shallow flooding (Zones AO or AH) can exist:
- a. in flat areas where water collects or ponds in depressions.
 - b. in areas of no defined channels where water spreads out over the land surface.
 - c. at the edge of the floodplain of a stream where the depth of flooding is from 1-3 feet.
 - d. a and b
 - e. b and c
20. An “approximate study” shows:
- a. the estimated boundary of the Special Flood Hazard Area.
 - b. the base flood elevation.
 - c. elevation data in the Flood Insurance Study report.
 - d. all of the above.
21. Where BFE data are not available, such data are required to be developed for all new subdivision proposals and other proposed development (including proposals for manufactured home parks and subdivisions) greater than:
- a. 5 lots or 50 acres, whichever is less.
 - b. 50 lots or 50 acres, whichever is less.
 - c. 5 lots or 5 acres, whichever is less.
 - d. 50 lots or 5 acres, whichever is less.
22. Who is ultimately responsible for establishing the base flood elevation for unnumbered A Zones on a community’s FIRM?
- a. U.S. Army Corps of Engineers
 - b. FEMA
 - c. The community
 - d. The Division of Emergency Management

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23. Refer to the flood maps and the City of Kinston Flood Insurance Study. The base flood elevation (NGVD) for a development located at the northwest corner of Vernon Avenue and Greenville Highway in the Adkin Branch floodplain is:
- 42.8
 - 46.1
 - 43.6
 - 44.3
24. The nearest elevation reference mark for this development site, measured in a straight line, is:
- RM30
 - RM26
 - RM3
25. A development site is located on the south side of Baker Road at the intersection of Trenton Highway in Kinston. What is the distance from the intersection to the nearest study cross section?
- 180 feet
 - 90 feet
 - 360 feet
 - 800 feet
26. The elevation, in feet (NGVD), of the nearest reference mark is:
- 42.26
 - 35.71
 - 45.20
 - 39.72
27. The 100-year (base flood) elevation, in feet (NGVD), at the development site is:
- 48.0
 - 46.8
 - 46.2
 - 45.0
28. The developer wishes to virtually reduce all risk from flooding. What additional amount of elevation of the structure would be required to provide protection from the 500-year flood?
- 3.8 feet
 - 3.0 feet
 - 1.8 feet
 - 1.2 feet
29. A proposed development site in Kinston is located at the intersection of Sycamore Avenue and West Vernon Avenue (Hwy 70 & 258). Is the site within the 100-year floodplain?
- Yes
-

- b. No
 - c. The site is not shown on the flood map.
30. The 100-year stillwater elevation, in feet (NGVD), at Transect 11 on Bald Head Island is:
- a. 10.65
 - b. 10.1
 - c. 16.2
 - d. The transect does not exist.
31. Rouse Road crosses Briery Run in Kinston. The crossing lies between which two base flood elevation lines?
- a. 67 & 68
 - b. 66 & 67
 - c. 59 & 61
 - d. 59 & 60
32. A proposed development site is located on Crystal Drive in Kinston, 900 feet from the intersection with W. New Bern Road. Is the site within the floodway of the Neuse River?
- a. The site is not shown on the flood map.
 - b. No
 - c. Yes
33. A proposed development site in Kinston is located on the west side of Raleigh Laura Lane at its intersection with Greenville Highway. It is in the Adkin Branch floodplain. Which of the following should be used to determine the base flood elevation for location of the lowest floor of the structure?
- a. The Base Flood Elevation Line running through the site, shown on the FIRM
 - b. The Floodway Data table shown in the Flood Insurance Study report
 - c. The Flood Profiles shown in the Flood Insurance Study report
 - d. Use the average of the above.
34. What elevation, in feet (NGVD), should be used?
- a. 43.7
 - b. 44
 - c. 43.4
 - d. 46.1
 - e. The average of c & d
35. An out-of-state couple owns a lot on Snowy Egret Trail on Bald Head Island. They wish to build a retirement home. Which of the following building standards would have to be met:
- a. The lowest horizontal structural member of the lowest floor must be elevated to 18 feet (NGVD) on a pile or column foundation, with space below the floor free of obstruction.

- b. The lowest floor must be elevated to 14 feet (NGVD), with enclosed areas below for storage.
 - c. The lowest horizontal structural member of the lowest floor must be elevated to 14 feet (NGVD) on a pile or column foundation, with space below the floor free of obstruction.
 - d. The lowest floor must be elevated to 15 feet (NGVD), for best flood insurance rate, with enclosed areas below provided with openings in the walls to equalize water pressures.
36. A pre-FIRM house on Sabal Palm Trail in Bald Head Island is to be substantially improved. This requires elevation of the entire structure. What is the minimum elevation, in feet (NGVD), to which the lowest floor of the existing structure must be raised?
- a. 13
 - b. 12
 - c. 11
 - d. 10
37. For the purposes of the NFIP, a basement is defined as:
- a. any enclosed area below the ground level.
 - b. any enclosed area having its floor below ground level on all sides.
 - c. any enclosed area having its floor subgrade on three sides but above grade on the downhill side.
 - d. any enclosed area below the main living area of the house.

38. The lowest floor is:
- the basement, if one exists.
 - the top of the lowest floor in A Zones.
 - the bottom of the lowest structural member in V Zones.
 - the elevated floor of a building if the ground floor is only used for parking, limited storage, or building access.
 - all of the above.
39. A “substantial improvement” is any reconstruction, rehabilitation, addition, or other improvement to a structure, the cost of which equals or exceeds:
- the present market value of the structure.
 - the replacement cost of the structure.
 - 25 percent of the market value of the structure before the start of construction of the improvement or before the damage occurred.
 - 50 percent of the market value of the structure before the start of construction of the improvement or before the damage occurred.
 - none of the above.
40. For flood insurance rating purposes and to receive rating credit, floodproofing of non-residential structures must provide protection to at least the following level:
- 1 foot above the BFE
 - the BFE
 - 1 foot below the BFE
 - the 500-year flood
41. Enclosures below the BFE are to meet or exceed the following criteria:
- Provide a minimum of two openings having a net area of not less than one square inch for each square foot of enclosed area.
 - Use garage doors that meet this requirement.
 - Design to allow construction of partitions to finish into separate rooms.
 - Construct bottom of openings to be no higher than one foot above grade.
 - a, b, and c
 - a and d
42. Recreational vehicles placed on sites in the floodplain are to:
- be on the site for fewer than 180 consecutive days.
 - be fully licensed and ready for highway use.
 - have permanently attached additions that can help anchor the vehicle to the site.
 - a and b
 - all of the above.

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43. The space below the lowest floor of all new structures or substantial improvements to existing structures in V Zones must either be:
- designed to withstand all possible wave and wind forces from a Class V hurricane, or immediately evacuated upon issuance of a hurricane warning.
 - converted to habitable living space or used for storage of items that need to be protected from flooding.
 - protected by a flood insurance policy covering the structure components and contents, or waiving all future claims to disaster assistance.
 - free of obstruction or constructed with non-supporting breakaway materials without causing collapse, displacement, or other structural damage to other portions of the building.
44. Where the BFE is available, or estimated and referenced to the NGVD, the Elevation Certificate can only be prepared by a:
- building owner or contractor.
 - local floodplain management official.
 - registered land surveyor.
 - registered professional engineer or architect.
 - local or community attorney.
45. “Freeboard” is an added elevation requirement above the BFE that a community is encouraged to adopt to:
- account for the one-foot rise in the BFE from additional floodplain development outside the floodway.
 - serve as a margin of safety against extraordinary or unknown risks.
 - reduce the risk of flooding to the new or substantially improved structure and provide lower insurance rates.
 - a & c
 - all of the above.
46. Support to plan and carry out local floodplain management measures can often be gained by tying the need to reduce flood losses with:
- the need to satisfy local elected officials.
 - the need to allow landowners to meet their expectations as to how they wish to use their land.
 - the need to protect and maintain the natural resources and functions that floodplain areas possess.
 - the need to promote economic growth and jobs in the community now and in the future, by permitting any development that will achieve these community goals.

47. A development permit is required:
- only for new structures built in the floodplain.
 - for almost any development-related change to the floodplain.
 - only for modifications to structures built before the community joined the NFIP.
 - only for new construction or substantial improvements within the floodway.
48. Which of the following *is not* one of the four major steps in the permit process:
- Inspect the site/work.
 - Review the application package for compliance with the technical requirements of the ordinance.
 - Have the applicant treat you and your spouse to a meal at the best restaurant in town.
 - Review the application package for completeness.
 - Approve or deny the application.
49. Which of the following measures have to be carried out for substantially improved or damaged structures:
- Elevation of a rehabilitated structure in an A Zone
 - Elevation or floodproofing of a lateral or vertical addition in an A Zone
 - Rehabilitation of a pre-FIRM structure costing less than 50% of market value
 - Elevation or floodproofing of a substantially damaged structure
 - a, b, & d
 - a, c, & d
50. When a land owner feels that the flood map is inaccurate and verifies this through a detailed site survey that shows that both the ground elevation and the lowest floors of an existing structure are above the BFE, what can the owner do to get the flood map corrected?
- Get the local floodplain management administrator to have community officials remove the floodplain designation from the property.
 - Take legal action and sue the community for false representation.
 - Apply to FEMA for a Letter of Map Amendment.
 - Get the state NFIP coordinator to cite the community for failure to properly administer its floodplain management ordinance.
51. The issuance of a variance by the community to construct a structure below the BFE results in:
- reduced flood insurance premium rates.
 - an increase in flood insurance premium rates.
 - a satisfied property owner.
 - increased risk to the occupant's life and property.
 - a & c
 - b & d
52. Liability suits have been brought against a community because of:
- negligence on the part of the local floodplain management administrator or designee.
 - issuance of permits or approvals in violation of local regulations.

- c. sound and consistent enforcement of the local ordinance.
 - d. a & b
 - e. all of the above.
53. In North Carolina, the principal sources of outside assistance in administering the community's floodplain regulations are:
- a. State Division of Emergency Management and FEMA Region IV Office in Atlanta.
 - b. State Division of Emergency Management and FEMA Region III Office in Philadelphia.
 - c. State Department of Insurance and Attorney General.
 - d. National Association of State Floodplain Managers.
 - e. Natural Hazards Center, University of Colorado.
54. Sources of support for those assigned the responsibility for administering the local floodplain management ordinance may include:
- a. Citizens and elected and appointed officials
 - b. The Community Rating System and Community Assistance Program
 - c. Bureau of Alcohol and Firearms Control
 - d. State Controller
 - e. a & b
 - f. a, b, & d
55. In an unnumbered A Zone when the BFE is not available, the first floor level, as well as mechanical and electrical equipment, must be elevated:
- a. at least two feet above the highest adjacent natural grade—FEMA recommends three feet.
 - b. at least five feet or more above natural grade—this qualifies for the most reasonable flood insurance rates.
 - c. at or above any observable nearby high-water marks or historic flood heights.
 - d. the most restrictive of a or c.
56. What is required for a community to participate in the National Flood Insurance Program?
- a. FEMA flood map
 - b. Floodplain management ordinance
 - c. Floodplain management administrator
 - d. Flood event in the past five (5) years
 - e. b and c
 - f. All of the above.
57. The flood profiles in the Flood Insurance Study (FIS):
- a. should always be used to determine the BFE at a particular site in coastal flood studies.
 - b. are called transects in coastal flood studies.
 - c. should be used only when base flood elevation lines are not shown on flood maps.

- d. should be used to establish the boundaries of the floodway on the ground.
 - e. should always be used to determine the BFE at a site in riverine flood studies.
 - f. all of the above.
58. A community proposes to construct a stormwater detention pond along Stinky Creek to control non-point source pollution. The project would entail extensive dredging and filling, part of which will be in the floodway. According to a hydrologic and hydraulic analysis, conducted according to accepted engineering practices and standards, the project would cause increases in the BFE in excess of one foot. The community is required to submit the following, in part, to FEMA as part of its application for conditional approval prior to any construction:
- a. Documentation of individual legal notice to all impacted property owners
 - b. Certification that all structures located in the impacted area have flood insurance policies in effect
 - c. Certification that no structures are located in the impacted area
 - d. a and c
 - e. All of the above.
59. The purpose of FEMA's Community Assistance Visit is:
- a. to look for violations in order to suspend the community.
 - b. to assist the community in the implementation of their floodplain management program.
 - c. to get away from the office and to meet the local floodplain management administrator.
 - d. to visit with a number of flood insurance policy holders in the community.
60. The Community Rating System:
- a. provides a mechanism for communities to be suspended from the NFIP if they fail to accrue sufficient floodplain management points.
 - b. rates the performance of local floodplain management administrators to determine if they are qualified to do their job and what additional training is needed.
 - c. provides incentives, through reduced flood insurance premiums, for communities to adopt additional floodplain management measures beyond the minimum NFIP criteria.
 - d. keeps accountants gainfully employed calculating floodplain management points.

End of examination

**CARRYING OUT FLOODPLAIN MANAGEMENT
IN YOUR LOCALITY**
WITH ASSISTANCE FROM THE NATIONAL FLOOD INSURANCE PROGRAM
Home Study Course for North Carolina Community Officials

Final Examination Answer Sheet

Name _____
Title _____
Department or agency _____
Street address or Box # _____
City _____ NC _____
(Zip code)

*Please mark your answer to each question by obliterating the letter with a pencil or pen.
For example: Question 0 a ~~b~~ c d e*

- | | | |
|--------------|--------------|----------------|
| 1 a b c d | 21 a b c d | 41 a b c d e f |
| 2 a b c d | 22 a b c d | 42 a b c d e |
| 3 a b c d | 23 a b c d | 43 a b c d |
| 4 a b c d | 24 a b c | 44 a b c d e |
| 5 a b c d e | 25 a b c d | 45 a b c d e |
| 6 a b c d | 26 a b c d | 46 a b c d |
| 7 a b c d | 27 a b c d | 47 a b c d |
| 8 a b c d | 28 a b c d | 48 a b c d e |
| 9 a b c d | 29 a b c | 49 a b c d e f |
| 10 a b c d | 30 a b c d | 50 a b c d |
| 11 a b c d e | 31 a b c d | 51 a b c d e f |
| 12 a b c d | 32 a b c | 52 a b c d e |
| 13 a b c d e | 33 a b c d | 53 a b c d e |
| 14 a b c d | 34 a b c d e | 54 a b c d e f |
| 15 a b c d e | 35 a b c d | 55 a b c d |
| 16 a b c d e | 36 a b c d | 56 a b c d e f |
| 17 a b c d | 37 a b c d | 57 a b c d e f |
| 18 a b c d | 38 a b c d e | 58 a b c d e |
| 19 a b c d e | 39 a b c d e | 59 a b c d |
| 20 a b c d | 40 a b c d | 60 a b c d |

Congratulations on your completion of the entire course!

Send this answer sheet to:

W. Dave Canaan, Chairman,
North Carolina Association of Floodplain Managers
Mecklenburg County Engineering and Building Standards Department
700 N. Tryon Street, Charlotte, NC 28202
Telephone: (704) 336-3736 Fax: (704) 336-3846

No. of correct answers _____



North Carolina Division of Emergency Management
 North Carolina Association of Floodplain Managers



Carrying Out Floodplain Management in Your Locality

With Assistance from the National Flood Insurance Program

Home Study Course Survey Form

Name _____ Title _____

Locality _____ Experience as local floodplain manager ____ years

The purpose of this survey is to benefit from the experiences of its present users in identifying ways to *improve* the current course, to ensure that it does meet the needs of local floodplain management officials.

Please take time to complete this survey. You will be helping yourself and others. ***Please return to the address shown at the end of the form.*** Thank you.

1. How did you complete the course? Self-study? Group study? Classroom taught?
2. Approximately how many hours did it take? _____
3. Do you feel you had adequate resources, assistance, and support to complete the course?

4. Which units did you find most helpful to you and why?

5. Were there topics, descriptions, or material that were unclear or difficult? Explain.

6. What information and/or descriptions should be expanded in a future edition?

7. What information and guidance should be added?

8. In what ways could the present *text* be improved?

9. In what ways could the present *course* be improved?

10. Other comments you wish to make.

Please mail or fax to:

North Carolina Division of Emergency Management
NFIP - State Coordinator
116 West Jones Street
Raleigh, NC 27603-5408
FAX (919) 715-5408; Telephone (919) 733-5392