

IN THE COUNTY LEGISLATURE OF JACKSON COUNTY, MISSOURI

A RESOLUTION authorizing the County Executive to execute Letters of Agreement with the Department of Homeland Security, Federal Emergency Management Agency, relating to the designation of the Atherton Levee and Atherton Blue Mills Levee as Provisionally Accredited Levees.

RESOLUTION #17263, April 26, 2010

INTRODUCED BY Fred Arbanas, County Legislator

WHEREAS, the Department of Homeland Security, Federal Emergency Management Agency (FEMA), is currently remapping flood zones throughout the County; and,

WHEREAS, during the remapping process Levee Districts are evaluated to determine if they meet the minimum requirements outlined in the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10); and,

WHEREAS, the attached Letters of Agreement represent a formal request to label each levee mentioned above as a Provisionally Accredited Levee (PAL) and will extend the time to meet the requirements of 44 CFR 65.10 through May 4, 2012; and,

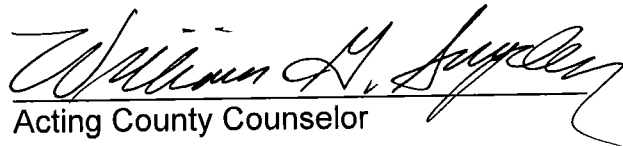
WHEREAS, the Letters of Agreement are in the best interests, health, safety and welfare of the citizens of Jackson County; now therefore,

BE IT RESOLVED by the County Legislature of Jackson County, Missouri, that the County Executive is hereby authorized to execute the attached Letters of Agreement as approved by the County Counselor.

Effective Date: This Resolution shall be effective immediately upon its passage by a majority of the Legislature.

APPROVED AS TO FORM:

Deputy/Assistant County Counselor


Acting County Counselor

Certificate of Passage

I hereby certify that the attached resolution, Resolution #17263 of April 26, 2010, was duly passed on April 26, 2010 by the Jackson County Legislature. The votes thereon were as follows:

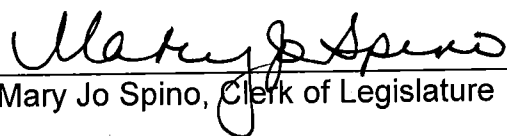
Yeas 8

Nays 0

Abstaining 0

Absent 1

4.27.10
Date


Mary Jo Spino, Clerk of Legislature

MJS

U.S. Department of Homeland Security
 Region VII
 9221 Ward Parkway, Suite 300
 Kansas City, MO 64114-3372



FEMA

February 3, 2010

Mr. Tom Krahenbuhl
 Stormwater & Building Codes Administrator
 Planning and Development Division
 Jackson County Public Works
 303 West Walnut
 Independence, Missouri 64050

Dear Mr. Krahenbuhl:

This letter is in regard to the Atherton Levee (351-R) shown on the effective Flood Insurance Rate Map (FIRM) and in the effective Flood Insurance Study (FIS) report for Jackson County, Missouri. The Department of Homeland Security, Federal Emergency Management Agency (FEMA), is producing a countywide FIS report and Digital Flood Insurance Rate Map (DFIRM) for Jackson County as part of FEMA's Flood Map Modernization (Map Mod) program.

During the DFIRM production, FEMA determined that the flood hazard information presented on the effective FIRM and in the FIS report is based, in some areas, on flood protection provided by the Atherton Levee. Based on the information available and on the mapping standards of the National Flood Insurance Program (NFIP) at the time that the FIS was performed, FEMA accredited the levee with providing protection from the flood that has a 1-percent-chance of being equaled or exceeded in any given year. This 1-percent-annual-chance flood also is referred to as the "base flood."

For FEMA to continue to accredit the identified levee with providing protection from the base flood, the levee must meet the requirements of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10), entitled "Mapping of Areas Protected by Levee Systems" (copy enclosed). In accordance with 44 CFR 65.10(a), the community or other party seeking recognition of a levee system is responsible for providing the data defined and outlined within the regulation. Please note, the design and construction data provided must be certified by a registered professional engineer or by a federal agency with responsibility for levee design.

FEMA understands that it may take time to acquire and/or assemble the documentation necessary to fully comply with 44 CFR 65.10. Therefore, FEMA has incorporated a process into the aggressive schedule of Map Mod that, if needed, will provide the community or other party seeking recognition of a levee system with additional time to submit all the necessary documentation. Initiation of this process can only take place if the levee owner, Atherton Levee District, and a representative of each impacted community sign and return the enclosed agreement within 90 days of the date of this letter (before May 4, 2010).

Completion and submittal of the enclosed agreement will officially request that FEMA label the levee as a Provisionally Accredited Levee (PAL) on the DFIRM and will serve as your agreement that, to the best of your knowledge, the levee meets the requirements of 44 CFR 65.10. As previously stated, the levee owner is responsible for submitting the data required by 44 CFR

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MAY 04 2010

www.fema.gov

MARY JO SPINO
 COUNTY CLERK

65.10 to certify the levee as providing protection from the base flood. The completed agreement must be submitted before May 4, 2010, for the levee to be designated as a PAL.

By endorsing the agreement, you acknowledge that if all necessary documentation to comply with 44 CFR 65.10 is not provided before May 4, 2012, FEMA will initiate a map revision which will show certain areas on the landward side of the levee as flood-prone. Upon receipt of the 44 CFR 65.10 submittal, we will review the data to determine whether the levee will continue to be accredited with providing protection from the base flood. Please note that affected communities that do not own and/or maintain the levee in question are not responsible for submitting data necessary for 44 CFR 65.10 compliance.

The approved levee will be labeled as a PAL during the 24-month period to convey to map users that levee certification verification is underway. FEMA recommends that you and other impacted communities implement outreach efforts to inform affected property owners that an assessment of the levee is underway. FEMA also encourages the purchase of flood insurance, even though coverage is not federally required.

If you have additional questions regarding the specific submittal requirements, please contact Dawn Kinsey of my staff at (816) 283-7055. We look forward to working with you and community officials to address this important matter. If there is anything we can do to facilitate the submittal process, please let us know.

Sincerely,



Robert G. Bissell
Director, Mitigation Division

Enclosures:

PAL Agreement

"Requirements of 44 CFR Section 65.10: Mapping of Areas Protected by Levee Systems"
"Meeting the Criteria for Accrediting Levees on Flood Maps: How-to-Guide for Floodplain
Managers and Engineers"

cc: Larry L. Daniels-Murray, CFM, DBARM LLC.
Randy Scrivner, State of Missouri NFIP Coordinator
Scott Vollink, P.E., U.S. Army Corps of Engineers, Kansas City District
Senator Christopher Bond
Senator Claire McCaskill
Representative Emanuel Cleaver

Letter of Agreement to Comply With the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10) and Request for Provisionally Accredited Levee (PAL) Designation

We, the undersigned, have received the letter from FEMA dated February 3, 2010, and the enclosed document entitled "Mapping of Areas Protected by Levee Systems." We understand that FEMA is in the process of providing updated flood maps for Jackson County, Missouri, and that the area behind the levee known as the Atherton Levee (351-R) will be remapped to reflect that the levee has been designated as a PAL.

We understand that all the necessary information to show that the levee known as Atherton Levee complies with 44 CFR 65.10 will be required before May 4, 2012. In addition, we understand that it is the responsibility of the levee owner, Atherton Levee District, to submit the data required by 44 CFR 65.10 before FEMA can certify the levees as providing protection from the base flood. This information will allow FEMA to move forward with the flood mapping for Jackson County, Missouri. We fully acknowledge that if complete documentation of compliance with 44 CFR 65.10 is not provided within the designated timeframe of 24 months, FEMA will initiate a map revision to redesignate certain areas on the landward side of the levees as floodprone.

Jackson County Representative:

Michael D. Sanders (signature)

Michael D. Sanders
JACKSON COUNTY EXECUTIVE (print)

Date:

May 4, 2010

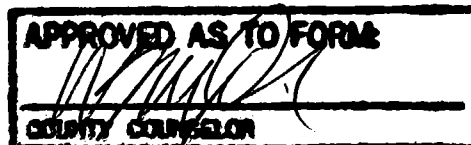
Other (if applicable):

Mary Jo Spino (signature)

MARY JO SPINO
CLERK OF COUNTY LEGISLATURE (print)

Date:

May 4, 2010



45
Res. #17263

U.S. Department of Homeland Security
Region VII
9221 Ward Parkway, Suite 300
Kansas City, MO 64114-3372



FEMA

February 3, 2010

Mr. Tom Krahenbuhl
Stormwater & Building Codes Administrator
Planning and Development Division
Jackson County Public Works
303 West Walnut
Independence, Missouri 64050

Dear Mr. Krahenbuhl:

This letter is in regard to the Atherton-Blue Mills Levee (351-R2) shown on the effective Flood Insurance Rate Map (FIRM) and in the effective Flood Insurance Study (FIS) report for Jackson County, Missouri. The Department of Homeland Security, Federal Emergency Management Agency (FEMA), is producing a countywide FIS report and Digital Flood Insurance Rate Map (DFIRM) for Jackson County as part of FEMA's Flood Map Modernization (Map Mod) program.

During the DFIRM production, FEMA determined that the flood hazard information presented on the effective FIRM and in the FIS report is based, in some areas, on flood protection provided by the Atherton-Blue Mills Levee. Based on the information available and on the mapping standards of the National Flood Insurance Program (NFIP) at the time that the FIS was performed, FEMA accredited the levee with providing protection from the flood that has a 1-percent-chance of being equaled or exceeded in any given year. This 1-percent-annual-chance flood also is referred to as the "base flood."

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MARY JO SPINO
COUNTY CLERK

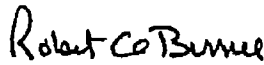
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Sincerely,



Robert G. Bissell
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Enclosures:

PAL Agreement

"Requirements of 44 CFR Section 65.10: Mapping of Areas Protected by Levee Systems"

"Meeting the Criteria for Accrediting Levees on Flood Maps: How-to-Guide for Floodplain Managers and Engineers"

cc: Gerald Barnes, President, Atherton-Blue Mills Levee District
Randy Scrivner, State of Missouri NFIP Coordinator
Scott Vollink, P.E., U.S. Army Corps of Engineers, Kansas City District
Senator Christopher Bond
Senator Claire McCaskill
Representative Emanuel Cleaver

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Jackson County Representative:

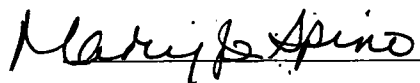
 (signature)

Michael D. Sanders
JACKSON COUNTY EXECUTIVE (print)

Date:

May 4, 2010

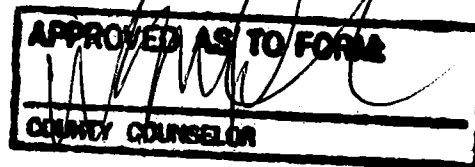
Other (if applicable):

 (signature)

MARY JO SPINO
CLERK OF COUNTY LEGISLATURE (print)

Date:

May 4, 2010



Memo

To: Jerry Page & Shelley M. Temple-Kneuvean
From: Tom Krahenbuhl, Stormwater & Building Codes Administrator, x-4466
Re: FEMA PAL Agreements
Date: 4/21/2010

Take a look at the attached acknowledgements. They are what FEMA calls PAL Agreements for Levee Districts. In Jackson County's case they mean that when we are approving development permits behind the Levee system we would treat them as being outside of the 100 years Flood Zone and no special requirements for building. If the Levee Districts fails to meet the FEMA criteria after the next 24 months, we would then treat developments from that point on as if they are in the 100 years flood zone. Under the UDC we would then require all structures to be elevated to at least 1 foot above the Base Flood Elevation and install special flood proofing materials.

I have met with the representatives of each of the two Levee Districts along with FEMA. All parties are aware of the requirements. Each of the Levee Districts are to sign separate agreements and return them to FEMA. The county will return there separate from the Levee Districts to FEMA.

Bill Snyder has reviewed these as well.

As you read in these agreements we are looking at a very near dead line for there signing and return to FEMA. Before May 4, 2010.

I have attached documents concerning these agreements for your review.

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REQUEST FOR LEGISLATIVE ACTION

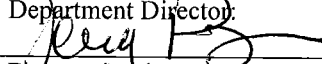
Completed by County Counselor's Office:

Res/~~Ord~~ No.: 17263

Sponsor(s): Fred Arbañas

Date: April 26, 2010

<p>SUBJECT</p>	<p>Action Requested <input checked="" type="checkbox"/> Resolution <input type="checkbox"/> Ordinance</p> <p>Project/Title: <u>Atherton Levee's, PAL Agreements with FEMA</u></p>										
<p>BUDGET INFORMATION <i>To be completed By Requesting Department and Finance</i></p>	<table border="1"> <tr> <td>Amount authorized by this legislation this fiscal year:</td> <td>\$</td> </tr> <tr> <td>Amount previously authorized this fiscal year:</td> <td>\$</td> </tr> <tr> <td>Total amount authorized after this legislative action:</td> <td>\$</td> </tr> <tr> <td>Amount budgeted for this item * (including transfers):</td> <td>\$</td> </tr> <tr> <td>Source of funding (name of fund) and account code number; FROM / TO</td> <td>FROM ACCT TO ACCT</td> </tr> </table> <p>* If account includes additional funds for other expenses, total budgeted in the account is: \$</p> <p>OTHER FINANCIAL INFORMATION:</p> <p><input checked="" type="checkbox"/> No budget impact (no fiscal note required) <input type="checkbox"/> Term and Supply Contract (funds approved in the annual budget); estimated value and use of contract: Department: Estimated Use: \$</p> <p>Prior Year Budget (if applicable): Prior Year Actual Amount Spent (if applicable):</p>	Amount authorized by this legislation this fiscal year:	\$	Amount previously authorized this fiscal year:	\$	Total amount authorized after this legislative action:	\$	Amount budgeted for this item * (including transfers):	\$	Source of funding (name of fund) and account code number; FROM / TO	FROM ACCT TO ACCT
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<p>PRIOR LEGISLATION</p>	<p>Prior ordinances and (date):</p> <p>Prior resolutions and (date):</p>										
<p>CONTACT INFORMATION</p>	<p>RLA drafted by (name, title, & phone): Tom Krahenbuhl, Floodplain Administrator X-4466</p>										
<p>REQUEST SUMMARY</p>	<p>FEMA (Federal Emergency Management Agency) is in the midst of remapping the flood zones throughout Jackson County, MO. As a part of the remapping process they review the Levies throughout the county to determine if they are constructed satisfactory to meet the minimum requirements to protect there specific area from flooding during a 100 year event.</p> <p>In this case Jackson County, MO currently has two such levies within the unincorporated area, and are known as Atherton Levee (351-R) and Atherton-Blue Mills Levee (351-R2). Both of these Levee Districts are owned and maintained by private Levee Districts. Should the Levee's fail to be properly maintained the land on the outside of levee would more than likely be placed back into the 100 year flood zone, therefore causing hardship to those properties in protection as well as financial effects for having to purchase (new or additional) flood insurance. Currently those properties are in an AE zone.</p> <p>This agreement provides acknowledgement that if the Levee Districts fail to maintain them the effected property will then revert back to a 100 year flood zone with revised regulatory development standards for the 100 year flood zone.</p>										

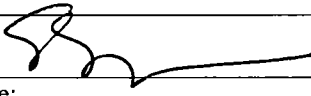
CLEARANCE	<input type="checkbox"/> Tax Clearance Completed (Purchasing & Department) <input type="checkbox"/> Business License Verified (Purchasing & Department) <input type="checkbox"/> Chapter 6 Compliance - Affirmative Action/Prevailing Wage (County Auditor's Office)	
ATTACHMENTS	Agreements for Atherton Levee (351-R) and Atherton-Blue Mills Levee (351-R2) and FEMA Copy-Code of Federal Regulations, Title 44, section 65.10 (44CFR 65.10) Fact Sheet-Meeting the Criteria of Accrediting Levee Systems on NFIP Flood Maps Fact Sheet-Requirements for Mapping Levees	
REVIEW	Department Director: 	Date: 4/21/2010
	Finance (Budget Approval): <i>If applicable</i>	Date:
	Division Manager:	Date:
	County Counselor's Office:	Date:

Fiscal Information (to be verified by Budget Office in Finance Department)

- This expenditure was included in the annual budget.
- Funds for this were encumbered from the _____ Fund in _____.
- There is a balance otherwise unencumbered to the credit of the appropriation to which the expenditure is chargeable and there is a cash balance otherwise unencumbered in the treasury to the credit of the fund from which payment is to be made each sufficient to provide for the obligation herein authorized.
- Funds sufficient for this expenditure will be/were appropriated by Ordinance # _____
- Funds sufficient for this appropriation are available from the source indicated below.

Account Number:	Account Title:	Amount Not to Exceed:

- This award is made on a need basis and does not obligate Jackson County to pay any specific amount. The availability of funds for specific purchases will, of necessity, be determined as each using agency places its order.
- This legislative action does not impact the County financially and does not require Finance/Budget approval.

CLEARANCE	<input type="checkbox"/> Tax Clearance Completed (Purchasing & Department) <input type="checkbox"/> Business License Verified (Purchasing & Department) <input type="checkbox"/> Chapter 6 Compliance - Affirmative Action/Prevailing Wage (County Auditor's Office)	
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REVIEW	Department Director:	Date:
	Finance (Budget Approval): <i>If applicable</i>	Date:
	Division Manager: 	Date: 4/22/10
	County Counselor's Office:	Date:

Fiscal Information (to be verified by Budget Office in Finance Department)

- This expenditure was included in the annual budget.
- Funds for this were encumbered from the _____ Fund in _____.
- There is a balance otherwise unencumbered to the credit of the appropriation to which the expenditure is chargeable and there is a cash balance otherwise unencumbered in the treasury to the credit of the fund from which payment is to be made each sufficient to provide for the obligation herein authorized.
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occurred in the flood plain since the existing floodway was developed. If the original hydraulic computer model is not available, an alternate hydraulic computer model may be used provided the alternate model has been calibrated so as to reproduce the original water surface profile of the original hydraulic computer model. The alternate model must be then modified to include all encroachments that have occurred since the existing floodway was developed.

(ii) The floodway analysis must be performed with the modified computer model using the desired floodway limits.

(iii) The floodway limits must be set so that combined effects of the past encroachments and the new floodway limits do not increase the effective base flood elevations by more than the amount specified in § 60.3(d)(2). Copies of the input and output data from the original and modified computer models must be submitted.

(3) Delineation of the revised floodway on a copy of the effective NFIP map and a suitable topographic map.

(d) *Certification requirements.* All analyses submitted shall be certified by a registered professional engineer. All topographic data shall be certified by a registered professional engineer or licensed land surveyor. Certifications are subject to the definition given at § 65.2 of this subchapter.

(e) *Submission procedures.* All requests that involve changes to floodways shall be submitted to the appropriate FEMA Regional Office servicing the community's geographic area.

[51 FR 30315, Aug. 25, 1986]

§ 65.8 Review of proposed projects.

A community, or an individual through the community, may request FEMA's comments on whether a proposed project, if built as proposed, would justify a map revision. FEMA's comments will be issued in the form of a letter, termed a Conditional Letter of Map Revision, in accordance with 44 CFR part 72. The data required to support such requests are the same as those required for final revisions under §§ 65.5, 65.6, and 65.7, except as-built certification is not required. All such re-

quests shall be submitted to the FEMA Headquarters Office in Washington, DC, and shall be accompanied by the appropriate payment, in accordance with 44 CFR part 72.

[62 FR 5736, Feb. 6, 1997]

§ 65.9 Review and response by the Administrator.

If any questions or problems arise during review, FEMA will consult the Chief Executive Officer of the community (CEO), the community official designated by the CEO, and/or the requester for resolution. Upon receipt of a revision request, the Administrator shall mail an acknowledgment of receipt of such request to the CEO. Within 90 days of receiving the request with all necessary information, the Administrator shall notify the CEO of one or more of the following:

(a) The effective map(s) shall not be modified;

(b) The base flood elevations on the effective FIRM shall be modified and new base flood elevations shall be established under the provisions of part 67 of this subchapter;

(c) The changes requested are approved and the map(s) amended by Letter of Map Revision (LOMR);

(d) The changes requested are approved and a revised map(s) will be printed and distributed;

(e) The changes requested are not of such a significant nature as to warrant a reissuance or revision of the flood insurance study or maps and will be deferred until such time as a significant change occurs;

(f) An additional 90 days is required to evaluate the scientific or technical data submitted; or

(g) Additional data are required to support the revision request.

(h) The required payment has not been submitted in accordance with 44 CFR part 72, no review will be conducted and no determination will be issued until payment is received.

[51 FR 30315, Aug. 25, 1986; 61 FR 46331, Aug. 30, 1996, as amended at 62 FR 5736, Feb. 6, 1997]

§ 65.10 Mapping of areas protected by levee systems.

(a) *General.* For purposes of the NFIP, FEMA will only recognize in its flood

hazard and risk mapping effort those levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with the level of protection sought through the comprehensive flood plain management criteria established by §60.3 of this subchapter. Accordingly, this section describes the types of information FEMA needs to recognize, on NFIP maps, that a levee system provides protection from the base flood. This information must be supplied to FEMA by the community or other party seeking recognition of such a levee system at the time a flood risk study or restudy is conducted, when a map revision under the provisions of part 65 of this subchapter is sought based on a levee system, and upon request by the Administrator during the review of previously recognized structures. The FEMA review will be for the sole purpose of establishing appropriate risk zone determinations for NFIP maps and shall not constitute a determination by FEMA as to how a structure or system will perform in a flood event.

(b) *Design criteria.* For levees to be recognized by FEMA, evidence that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood exists must be provided. The following requirements must be met:

(1) *Freeboard.* (i) Riverine levees must provide a minimum freeboard of three feet above the water-surface level of the base flood. An additional one foot above the minimum is required within 100 feet in either side of structures (such as bridges) riverward of the levee or wherever the flow is constricted. An additional one-half foot above the minimum at the upstream end of the levee, tapering to not less than the minimum at the downstream end of the levee, is also required.

(ii) Occasionally, exceptions to the minimum riverine freeboard requirement described in paragraph (b)(1)(i) of this section, may be approved. Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted to support a request for such an exception. The material presented must

evaluate the uncertainty in the estimated base flood elevation profile and include, but not necessarily be limited to an assessment of statistical confidence limits of the 100-year discharge; changes in stage-discharge relationships; and the sources, potential, and magnitude of debris, sediment, and ice accumulation. It must be also shown that the levee will remain structurally stable during the base flood when such additional loading considerations are imposed. Under no circumstances will freeboard of less than two feet be accepted.

(iii) For coastal levees, the freeboard must be established at one foot above the height of the one percent wave or the maximum wave runup (whichever is greater) associated with the 100-year stillwater surge elevation at the site.

(iv) Occasionally, exceptions to the minimum coastal levee freeboard requirement described in paragraph (b)(1)(iii) of this section, may be approved. Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted to support a request for such an exception. The material presented must evaluate the uncertainty in the estimated base flood loading conditions. Particular emphasis must be placed on the effects of wave attack and overtopping on the stability of the levee. Under no circumstances, however, will a freeboard of less than two feet above the 100-year stillwater surge elevation be accepted.

(2) *Closures.* All openings must be provided with closure devices that are structural parts of the system during operation and design according to sound engineering practice.

(3) *Embankment protection.* Engineering analyses must be submitted that demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability. The factors to be addressed in such analyses include, but are not limited to: Expected flow velocities (especially in constricted areas); expected wind and wave

action; ice loading; impact of debris; slope protection techniques; duration of flooding at various stages and velocities; embankment and foundation materials; levee alignment, bends, and transitions; and levee side slopes.

(4) *Embankment and foundation stability.* Engineering analyses that evaluate levee embankment stability must be submitted. The analyses provided shall evaluate expected seepage during loading conditions associated with the base flood and shall demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability. An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in the U.S. Army Corps of Engineers (COE) manual, "Design and Construction of Levees" (EM 1110-2-1913, Chapter 6, Section II), may be used. The factors that shall be addressed in the analyses include: Depth of flooding, duration of flooding, embankment geometry and length of seepage path at critical locations, embankment and foundation materials, embankment compaction, penetrations, other design factors affecting seepage (such as drainage layers), and other design factors affecting embankment and foundation stability (such as berms).

(5) *Settlement.* Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be maintained within the minimum standards set forth in paragraph (b)(1) of this section. This analysis must address embankment loads, compressibility of embankment soils, compressibility of foundation soils, age of the levee system, and construction compaction methods. In addition, detailed settlement analysis using procedures such as those described in the COE manual, "Soil Mechanics Design—Settlement Analysis" (EM 1100-2-1904) must be submitted.

(6) *Interior drainage.* An analysis must be submitted that identifies the source(s) of such flooding, the extent of the flooded area, and, if the average depth is greater than one foot, the water-surface elevation(s) of the base

flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters.

(7) *Other design criteria.* In unique situations, such as those where the levee system has relatively high vulnerability, FEMA may require that other design criteria and analyses be submitted to show that the levees provide adequate protection. In such situations, sound engineering practice will be the standard on which FEMA will base its determinations. FEMA will also provide the rationale for requiring this additional information.

(c) *Operation plans and criteria.* For a levee system to be recognized, the operational criteria must be as described below. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operation manual, a copy of which must be provided to FEMA by the operator when levee or drainage system recognition is being sought or when the manual for a previously recognized system is revised in any manner. All operations must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP.

(1) *Closures.* Operation plans for closures must include the following:

(i) Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists for the completed operation of all closure structures, including necessary sealing, before floodwaters reach the base of the closure.

(ii) A formal plan of operation including specific actions and assignments of responsibility by individual name or title.

(iii) Provisions for periodic operation, at not less than one-year intervals, of the closure structure for testing and training purposes.

(2) *Interior drainage systems.* Interior drainage systems associated with levee systems usually include storage areas,

gravity outlets, pumping stations, or a combination thereof. These drainage systems will be recognized by FEMA on NFIP maps for flood protection purposes only if the following minimum criteria are included in the operation plan:

(i) Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists to permit activation of mechanized portions of the drainage system.

(ii) A formal plan of operation including specific actions and assignments of responsibility by individual name or title.

(iii) Provision for manual backup for the activation of automatic systems.

(iv) Provisions for periodic inspection of interior drainage systems and periodic operation of any mechanized portions for testing and training purposes. No more than one year shall elapse between either the inspections or the operations.

(3) *Other operation plans and criteria.* Other operating plans and criteria may be required by FEMA to ensure that adequate protection is provided in specific situations. In such cases, sound emergency management practice will be the standard upon which FEMA determinations will be based.

(d) *Maintenance plans and criteria.* For levee systems to be recognized as providing protection from the base flood, the maintenance criteria must be as described herein. Levee systems must be maintained in accordance with an officially adopted maintenance plan, and a copy of this plan must be provided to FEMA by the owner of the levee system when recognition is being sought or when the plan for a previously recognized system is revised in any manner. All maintenance activities must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance. This plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures

and systems are maintained. At a minimum, maintenance plans shall specify the maintenance activities to be performed, the frequency of their performance, and the person by name or title responsible for their performance.

(e) *Certification requirements.* Data submitted to support that a given levee system complies with the structural requirements set forth in paragraphs (b)(1) through (7) of this section must be certified by a registered professional engineer. Also, certified as-built plans of the levee must be submitted. Certifications are subject to the definition given at §65.2 of this subchapter. In lieu of these structural requirements, a Federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide protection against the base flood.

[51 FR 30316, Aug. 25, 1986]

§65.11 Evaluation of sand dunes in mapping coastal flood hazard areas.

(a) *General conditions.* For purposes of the NFIP, FEMA will consider storm-induced dune erosion potential in its determination of coastal flood hazards and risk mapping efforts. The criterion to be used in the evaluation of dune erosion will apply to primary frontal dunes as defined in §59.1, but does not apply to artificially designed and constructed dunes that are not well-established with long-standing vegetative cover, such as the placement of sand materials in a dune-like formation.

(b) *Evaluation criterion.* Primary frontal dunes will not be considered as effective barriers to base flood storm surges and associated wave action where the cross-sectional area of the primary frontal dune, as measured perpendicular to the shoreline and above the 100-year stillwater flood elevation and seaward of the dune crest, is equal to, or less than, 540 square feet.

(c) *Exceptions.* Exceptions to the evaluation criterion may be granted where it can be demonstrated through authoritative historical documentation that the primary frontal dunes at a specific site withstood previous base flood storm surges and associated wave action.

[53 FR 16279, May 6, 1988]

Requirements for Mapping Levees

Complying with Section 65.10 of the NFIP Regulations

As part of a mapping project, it is the levee owner's or community's responsibility to provide data and documentation to show that a levee meets the requirements of Section 65.10 of the National Flood Insurance Program (NFIP) regulations. Links to Section 65.10 and many other documents are available on FEMA's Web site at www.fema.gov/plan/prevent/flm/lv_fm.shtm.

The FEMA requirements in Section 65.10 are separated into five categories:

1. General criteria;
2. Design criteria;
3. Operations plans and criteria;
4. Maintenance plans and criteria; and
5. Certification requirements.

The requirements for each of these areas are summarized below.

(A) GENERAL CRITERIA

For purposes of the NFIP, FEMA will only recognize in its flood hazard and risk mapping effort those levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with the level of protection sought through the comprehensive floodplain management criteria established by Section 60.3 of the NFIP regulations. Section 65.10 of the NFIP regulations describes the types of information FEMA needs to recognize, on NFIP maps, that a levee system provides protection from the flood that has a 1-percent chance of being equaled or exceeded in any give year (base flood). This information must be supplied to FEMA by the community or other party seeking recognition of a levee system at the time a study or restudy is conducted, when a map revision under the provisions of Part 65 of the NFIP regulations is sought based on a levee system, and upon request by the Administrator during the review of previously recognized structures. The FEMA review is for the sole purpose of establishing appropriate risk zone determinations for NFIP maps and does not constitute a determination by FEMA as to how a structure or system will perform in a flood event.

(B) DESIGN CRITERIA

For the purposes of the NFIP, FEMA has established levee design criteria for freeboard, closures, embankment protection, embankment and foundation stability, settlement, interior drainage, and other design criteria. These criteria are summarized in subsections below.

(B)(1) FREEBOARD

For riverine levees:

- A minimum freeboard of 3 feet above the water-surface level of the base flood must be provided.
- An additional 1 foot above the minimum is required within 100 feet on either side of structures (e.g., bridges) riverward of the levee or wherever the flow is constricted.



- An additional 0.5 foot above the minimum at the upstream end of the levee, tapering to not less than the minimum at the downstream end of the levee, is also required.

Exceptions to the minimum riverine freeboard requirements above may be approved if the following criteria are met:

- Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted.
- The material presented must evaluate the uncertainty in the estimated base flood elevation profile and include, but not necessarily be limited to:
 - An assessment of statistical confidence limits of the 1-percent-annual-chance discharge;
 - Changes in stage-discharge relationships; and
 - Sources, potential, and magnitude of debris, sediment, and ice accumulation.
- It must be also shown that the levee will remain structurally stable during the base flood when such additional loading considerations are imposed.

Under no circumstances will freeboard of less than 2 feet be accepted.

For coastal levees, the freeboard must be established at 1 foot above the height of the 1-percent-annual-chance wave or the maximum wave runup (whichever is greater) associated with the 1-percent-annual-chance stillwater surge elevation at the site.

Exceptions to the minimum coastal freeboard requirements above may be approved if the following criteria are met:

- Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted.
- The material presented must evaluate the uncertainty in the estimated base flood loading conditions. Particular emphasis must be placed on the effects of wave attack and overtopping on the stability of the levee.

Under no circumstances will a freeboard of less than 2 feet above the 1-percent-annual-chance stillwater surge elevation be accepted.

(B)(2) CLOSURES

The levee closure requirement is that all openings must be provided with closure devices that are structural parts of the system during operation and design according to sound engineering practice.

(B)(3) EMBANKMENT PROTECTION

Engineering analyses must be submitted to demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability.

The factors to be addressed in such analyses include, but are not limited to:

- Expected flow velocities (especially in constricted areas);
- Expected wind and wave action;

- Ice loading;
- Impact of debris;
- Slope protection techniques;
- Duration of flooding at various stages and velocities;
- Embankment and foundation materials;
- Levee alignment, bends, and transitions; and
- Levee side slopes.

(B)(4) EMBANKMENT AND FOUNDATION STABILITY

Engineering analyses that evaluate levee embankment stability must be submitted.

The analyses provided shall evaluate expected seepage during loading conditions associated with the base flood and shall demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability.

An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in U.S. Army Corps of Engineers (USACE) Engineering Manual 1110-2-1913, Chapter 6, Section II, may be used.

The factors that shall be addressed in the analyses include:

- Depth of flooding;
- Duration of flooding;
- Embankment geometry and length of seepage path at critical locations;
- Embankment and foundation materials;
- Embankment compaction;
- Penetrations;
- Other design factors affecting seepage (e.g., drainage layers); and
- Other design factors affecting embankment and foundation stability (e.g., berms).

(B)(5) SETTLEMENT

Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be maintained within the minimum freeboard standards set forth in B(1).

This analysis must address:

- Embankment loads,
- Compressibility of embankment soils,
- Compressibility of foundation soils,

- Age of the levee system, and
- Construction compaction methods.

A detailed settlement analysis using procedures such as those described in USACE Engineering Manual EM 1110-1-1904 must be submitted.

(B)(6) INTERIOR DRAINAGE

An analysis must be submitted that identifies the source(s) of such flooding; the extent of the flooded area; and, if the average depth is greater than 1 foot, the water-surface elevation(s) of the base flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters. Interior drainage systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof.

For areas of interior drainage that have average depths greater than 1 foot, mapping must be provided depicting the extents of the interior flooding, along with supporting documentation.

(B)(7) OTHER DESIGN CRITERIA

In unique situations, such as those where the levee system has relatively high vulnerability, FEMA may require that other design criteria and analyses be submitted to show that the levees provide adequate protection. In such situations, sound engineering practice will be the standard on which FEMA will base its determinations. FEMA also will provide the rationale for requiring this additional information.

(C) OPERATIONS PLANS AND CRITERIA

For a levee system to be recognized, the operational criteria must be as described below. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operation manual, a copy of which must be provided to FEMA by the operator when levee or drainage system recognition is being sought or when the manual for a previously recognized system is revised in any manner. All operations must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP.

(C)(1) CLOSURES

Operation plans for closures must include the following:

- Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists for the completed operation of all closure structures, including necessary sealing, before floodwaters reach the base of the closure;
- A formal plan of operation, including specific actions and assignments of responsibility by individual name or title; and
- Provisions for periodic operation, at not less than 1-year intervals, of the closure structure(s) for testing and training purposes.

(C)(2) INTERIOR DRAINAGE SYSTEMS

Interior drainage systems associated with levee systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof. FEMA will recognize these drainage systems on NFIP maps for flood protection purposes only if the following minimum criteria are included in the operation plan:

- Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists to permit activation of mechanized portions of the drainage system;
- A formal plan of operation, including specific actions and assignments of responsibility by individual name or title;
- Provision for manual backup for the activation of automatic systems; and
- Provisions for periodic inspection of interior drainage systems and periodic operation of any mechanized portions for testing and training purposes; no more than 1 year shall elapse between either the inspections or the operations.

(C)(3) OTHER OPERATION PLANS AND CRITERIA

FEMA may require other operating plans and criteria to ensure that adequate protection is provided in specific situations. In such cases, sound emergency management practice will be the standard upon which FEMA determinations will be based.

(D) MAINTENANCE PLANS AND CRITERIA

For levee systems to be recognized as providing protection from the base flood, the following maintenance criteria must be met:

- Levee systems must be maintained in accordance with an officially adopted maintenance plan, and a copy of this plan must be provided to FEMA by the owner of the levee system when recognition is being sought or when the plan for a previously recognized system is revised in any manner.
- All maintenance activities must be under the jurisdiction of a(n):
 - Federal or State agency;
 - Agency created by Federal or State law; or
 - Agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance.
- The maintenance plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained.
- At a minimum, the maintenance plan shall specify:
 - Maintenance activities to be performed;
 - Frequency of their performance; and
 - Person by name or title responsible for their performance.

(E) CERTIFICATION REQUIREMENTS

Data submitted to support that a given levee system complies with the structural requirements set forth in B(1) through B(7) above must be certified by a Registered Professional Engineer. Also, certified as-built plans of the levee must be submitted. Certifications are subject to the definition given in Section 65.2 of the NFIP regulations. In lieu of these structural requirements, a Federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide protection against the base flood.

Meeting the Criteria for Accrediting Levee Systems on NFIP Flood Maps

How-to-Guide for Floodplain Managers and Engineers

A levee system is a flood protection system that consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices. A levee is a manmade structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

As part of the flood mapping process, the Department of Homeland Security, Federal Emergency Management Agency (FEMA) and its State and local mapping partners review levee system data and documentation.

It is the levee owner's or community's responsibility to provide data and documentation to demonstrate that a levee system meets National Flood Insurance Program (NFIP) requirements as described in Title 44, Chapter 1, Section 65.10 of the Code of Federal Regulations (44 CFR Section 65.10), which you may view on the FEMA Web site at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

To be recognized as providing a 1-percent-annual-chance level of flood protection on the modernized NFIP maps, called Digital Flood Insurance Rate Maps (DFIRMs), levee systems must meet *and continue to meet* the minimum

design, operation, and maintenance standards (44 CFR Section 65.10)..

To help clarify the responsibilities of community officials, levee owners, or other parties seeking recognition of a levee system identified during a study/mapping project, FEMA issued Procedure Memorandum No. 34 (PM 34), *Interim Guidance for Studies Including Levees*, on August 22, 2005. PM 34 provided clarification of the procedures provided in Appendix H of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*.

FEMA issued Revised Procedure Memorandum No. 43, *Guidelines for Identifying Provisionally Accredited Levees*, on March 16, 2007, which allows issuance of preliminary and, in some cases, effective DFIRMs while communities/levee owners compile and submit required data and documentation. FEMA issued Procedure Memorandum No. 45, *Revisions to Accredited Levee and Provisionally Accredited Levee Notations*, in April 2008 to clarify map notes for accredited and provisionally accredited levee systems.

This document provides information regarding the types of data and documentation that must be submitted for levee systems to be accredited on DFIRMs, including a checklist and an index of further resources you may wish to consult.

COMMUNITIES WITH LEVEE SYSTEMS SHOULD KNOW:

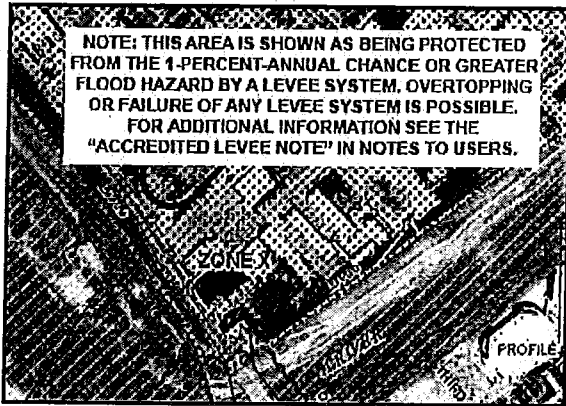
- The community and/or other party seeking recognition or continued recognition of a levee system must provide data and documentation showing that the levee system provides base (1-percent-annual-chance) flood protection for FEMA to credit the levee system with flood protection on a FIRM or DFIRM.
- Communities *must* actively participate in the levee system documentation process.
- Levee systems without sufficient data and documentation will not be credited with providing base flood protection.
- Some levee systems may qualify for the Provisionally Accredited Levee (PAL) designation.
- Guidance regarding the PAL designation and other levee issues is available at:

www.fema.gov/plan/prevent/fhm/lv_fpm.shtm



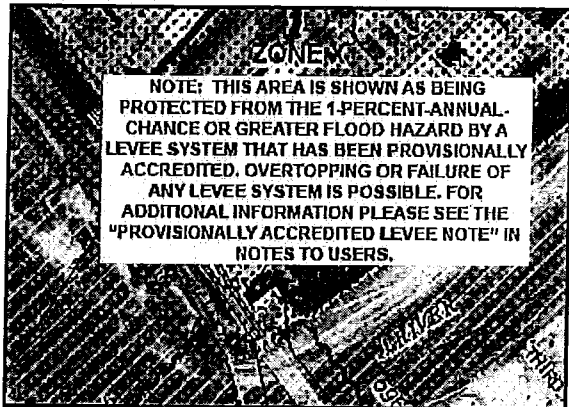
HOW FEMA WILL MAP LEVEE SYSTEMS

FEMA mapping requirements are designed to provide the people living and working behind levee systems with accurate, up-to-date flood hazard and risk information so that they may make wise decisions to minimize damage and loss of life. FEMA does not evaluate the performance of a levee system—this is the responsibility of the levee owner. FEMA is responsible for establishing levee system evaluation and mapping standards, determining flood insurance risk zones, and reflecting these determinations on DFIRMs.



Accredited Levee System

An accredited levee system is a system that FEMA has determined can be shown on a DFIRM as providing a 1-percent-annual-chance or greater level of flood protection. This determination is based on the submittal of data and documentation required by 44 CFR Section 65.10. The area landward of an accredited levee system is shown as a moderate-risk area, labeled Zone X (shaded), on the DFIRM except for areas of residual flooding, such as ponding areas, which will be shown as high-risk areas, called Special Flood Hazard Areas (SFHAs). Flood insurance is not mandatory in Zone X (shaded) areas, but is mandatory in SFHAs. FEMA strongly encourages flood insurance for all structures in levee-impacted areas.



Provisionally Accredited Levee (PAL) System

The PAL designation may be used for a levee system that FEMA has previously accredited with providing 1-percent-annual-chance flood protection on an effective FIRM/DFIRM, and for which FEMA is awaiting data and/or documentation that will show the levee system is compliant with 44 CFR Section 65.10. Before FEMA will apply the PAL designation to a levee system, the community or levee owner will need to sign and return an agreement indicating the data and documentation required for compliance with 44 CFR Section 65.10 will be provided within a specified timeframe. The impacted area landward of a PAL system also is shown as a moderate-risk area, labeled Zone X (shaded). Therefore, flood insurance is not mandatory for insurable structures in the levee-impacted area; however, it is strongly encouraged by FEMA as are other protective measures.



Levee System Not Accredited or De-accredited

If the levee system is not shown as providing 1-percent-annual-chance flood protection on an effective FIRM, the system is considered “not accredited” and the levee-impacted area is mapped as Zone AE or Zone A on a DFIRM, depending on the type of study performed for the area. If the levee system was previously shown as providing 1-percent-annual-chance flood protection on an effective FIRM or DFIRM, but does not meet the PAL requirements or is no longer eligible for the PAL designation, FEMA will de-accredit the levee system and re-map the levee-impacted area as an SFHA, labeled Zone AE or Zone A depending on the type of study performed. Flood insurance will be required for insurable structures with federally backed mortgages in SFHAs.

Design Criteria***Section of the NFIP Regulations: 65.10(b)**

Description: For levee systems to be recognized (i.e., accredited) by FEMA, evidence that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood exists must be provided. The following requirements must be met:

Checklist for Design Criteria:

<input type="checkbox"/>	Freeboard. Minimum freeboard required 3 feet above the Base Flood Elevation (BFE) all along length, and an additional 1 foot within 100 feet of structures (such as bridges) or wherever the flow is restricted. Additional 0.5 foot at the upstream end of a levee. Coastal levees have special freeboard requirements (see Paragraphs 65.10(b)(1)(iii) and (iv)).
<input type="checkbox"/>	Closures. All openings must be provided with closure devices that are structural parts of the system during operation and designed according to sound engineering practice.
<input type="checkbox"/>	Embankment Protection. Engineering analyses must be submitted that demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability.
<input type="checkbox"/>	Embankment and Foundation Stability Analyses. Engineering analyses that evaluate levee embankment stability must be submitted. The analyses provided must evaluate expected seepage during loading conditions associated with the base flood and must demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability. An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in the U.S. Army Corps of Engineers (USACE) Engineer Manual 1110-2-1913, <i>Design and Construction of Levees</i> , (Chapter 6, Section II), may be used.
<input type="checkbox"/>	Settlement Analyses. Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be maintained. This analysis must address embankment loads, compressibility of embankment soils, compressibility of foundation soils, age of the levee system, and construction compaction methods. In addition, detailed settlement analysis using procedures such as those described in USACE Engineer Manual 1110-1-1904, <i>Soil Mechanics Design—Settlement Analysis</i> , must be submitted.
<input type="checkbox"/>	Interior Drainage. An analysis must be submitted that identifies the source(s) of such flooding, the extent of the flooded area, and, if the average depth is greater than 1 foot, the water-surface elevation(s) of the base flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters.

Operation Plan Paragraph 65.10(c)(1) of the NFIP Regulations

Description: For a levee system to be recognized (i.e., accredited), the operational criteria must be as described below. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operation manual, a copy of which must be provided to FEMA by the operator when levee or drainage system recognition is being sought or when the manual for a previously recognized system is revised in any manner. All operations must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP.

Checklist for Operation Plan:

<input type="checkbox"/>	Flood Warning System. Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials that will be used to trigger emergency operation activities; and demonstration that sufficient flood warning time exists for the completed operation of all closure structures, including necessary sealing, before floodwaters reach the base of the closure.
<input type="checkbox"/>	Plan of Operation. A formal plan of operation including specific actions and assignments of responsibility by individual name or title.
<input type="checkbox"/>	Periodic Operation of Closures. Provisions for periodic operation, at not less than one-year intervals, of the closure structure for testing and training purposes.
<input type="checkbox"/>	Interior Drainage Plan. See below.

Interior Drainage Plan Paragraph 65.10(c)(2) of the NFIP Regulations

Description: Interior drainage systems associated with levee systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof. These drainage systems will be recognized by FEMA on NFIP maps for flood protection purposes only if the following minimum criteria are included in the operation plan.

Checklist for Interior Drainage Plan:

<input type="checkbox"/>	Flood Warning System. Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials that will be used to trigger emergency operation activities; and demonstration that sufficient flood warning time exists to permit activation of mechanized portions of the drainage system.
<input type="checkbox"/>	Plan of Operation. A formal plan of operation including specific actions and assignments of responsibility by individual name or title.

<input type="checkbox"/>	Manual Backup. Provision for manual backup for the activation of automatic systems.
<input type="checkbox"/>	Periodic Inspection. Provisions for periodic inspection of interior drainage systems and periodic operation of any mechanized portions for testing and training purposes. No more than 1 year shall elapse between either the inspections or the operations.

Maintenance Plan **Paragraph 65.10(d) of the NFIP Regulations**

Description: For levee systems to be recognized as providing protection from the base flood (i.e., accredited by FEMA), the maintenance criteria must be as described herein.

Checklist for Maintenance Plan:

<input type="checkbox"/>	Levee systems must be maintained in accordance with an officially adopted maintenance plan, and a copy of this plan must be provided to FEMA by the owner of the levee system when recognition is being sought or when the plan for a previously recognized system is revised in any manner.
<input type="checkbox"/>	All maintenance activities must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance.
<input type="checkbox"/>	This plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained. At a minimum, the plan shall specify the maintenance activities to be performed, the frequency of their performance, and the person by name or title responsible for their performance.

Certification **Paragraph 65.10(e) of the NFIP Regulations**

Description: Data submitted to support that a given levee system complies with the structural requirements set forth in "Design Criteria" (Paragraphs 65.10(b)(1) through (7) of the regulations) must be certified by a Registered Professional Engineer. Also, certified "as-built" plans of the levee must be submitted. Certifications are subject to the definition given in Section 65.2 of the NFIP regulations. In lieu of these structural requirements, a Federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide protection from the base flood.

Checklist for Certification Requirement:

<input type="checkbox"/>	All data submitted is certified by Professional Engineer or certified by a Federal agency.
<input type="checkbox"/>	Certified as-built levee plans are included in the submittal.

A NOTE ABOUT FLOOD RISK AND FLOOD INSURANCE

Levee systems are designed to provide a *specific level of protection*. They can be overtopped or fail during larger flood events.

Levee systems also decay over time. They require regular maintenance and periodic upgrades to retain their level of protection. When levees do fail, they often fail catastrophically. The resulting damage, including loss of life, may be much greater than if the levee system had not been built.

For all these reasons, FEMA strongly encourages people in levee-impacted areas to understand their flood risk, know and follow evacuation procedures, and protect their property by purchasing flood insurance protection, by floodproofing, or by taking other protective measures.

CHECKLIST INFORMATION

The checklist provided in this fact sheet is meant to assist local community officials and levee owners in gathering the data and documentation that will be required for FEMA to show a levee system as providing 1-percent-annual-chance flood protection on the community's DFIRM. Where possible, text from the actual NFIP regulations (44 CFR Section 65.10) was used.

The checklist is set up according to the appropriate paragraph of 44 CFR Section 65.10. For example, Design Criteria can be found in Paragraph 65.10(b):

Design Criteria:	Section of the NFIP Regulations: 65.10(b)
Description: For levee systems to be recognized (i.e., accredited) by FEMA, evidence that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood exists must be provided.	

For a comprehensive description of each item in this checklist, please see Appendix H of the *Guidelines and Specifications for Flood Hazard Mapping Partners*. Locations of this resource, and other useful resources, are provided below.

INDEX OF RESOURCES

This fact sheet is accessible, along with an assortment of other levee-related resources, through a dedicated portion of the FEMA Web site. The gateway to the FEMA-provided levee information, which is organized by stakeholder group to assist levee owners, community officials, and other stakeholders, is www.fema.gov/plan/prevent/fhm/lv_intro.shtm. The FEMA resources referenced in this fact sheet, listed below, are directly accessible through www.fema.gov/plan/prevent/fhm/lv_spm.shtm.

- Procedure Memorandum No. 34, *Interim Guidance for Studies Including Levees*
- Revised Procedure Memorandum No. 43, *Guidelines for Identifying Provisionally Accredited Levees*.
- Procedure Memorandum No. 45, *Revisions to Accredited Levee and Provisionally Accredited Levee Notations*
- Appendix H, "Mapping of Areas Protected by Levee Systems," of *Guidelines and Specifications for Flood Hazard Mapping Partners*.
- Section 65.10, *Mapping of Areas Protected by Levee Systems* of the NFIP regulations.

Flood insurance information can be found at www.fema.gov/business/nfip or on the NFIP's consumer Web site, www.FloodSmart.gov.

Links to the USACE Web site also are provided on the levee-dedicated pages; the resources discussed in this fact sheet are accessible through the USACE Web page at www.usace.army.mil/publications/eng-manuals.



Requirements of 44 CFR Section 65.10: Mapping of Areas Protected by Levee Systems

As part of a mapping project, it is the levee owner's or community's responsibility to provide data and documentation to show that a levee meets the requirements of Section 65.10 of the National Flood Insurance Program (NFIP) regulations. Links to Section 65.10 and many other documents are available on FEMA's Web site at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

The FEMA requirements in Section 65.10 are separated into five categories:

1. General criteria;
2. Design criteria;
3. Operations plans and criteria;
4. Maintenance plans and criteria; and
5. Certification requirements.

The requirements for each of these areas are summarized below.

(A) GENERAL CRITERIA

For purposes of the NFIP, FEMA will only recognize in its flood hazard and risk mapping effort those levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with the level of protection sought through the comprehensive floodplain management criteria established by Section 60.3 of the NFIP regulations. Section 65.10 of the NFIP regulations describes the types of information FEMA needs to recognize, on NFIP maps, that a levee system provides protection from the flood that has a 1-percent chance of being equaled or exceeded in any give year (base flood). This information must be supplied to FEMA by the community or other party seeking recognition of a levee system at the time a study or restudy is conducted, when a map revision under the provisions of Part 65 of the NFIP regulations is sought based on a levee system, and upon request by the Administrator during the review of previously recognized structures. The FEMA review is for the sole purpose of establishing appropriate risk zone determinations for NFIP maps and does not constitute a determination by FEMA as to how a structure or system will perform in a flood event.

(B) DESIGN CRITERIA

For the purposes of the NFIP, FEMA has established levee design criteria for freeboard, closures, embankment protection, embankment and foundation stability, settlement, interior drainage, and other design criteria. These criteria are summarized in subsections below.

(B)(1) FREEBOARD

For riverine levees:

- A minimum freeboard of 3 feet above the water-surface level of the base flood must be provided.
- An additional 1 foot above the minimum is required within 100 feet on either side of structures (e.g., bridges) riverward of the levee or wherever the flow is constricted.



- An additional 0.5 foot above the minimum at the upstream end of the levee, tapering to not less than the minimum at the downstream end of the levee, is also required.

Exceptions to the minimum riverine freeboard requirements above may be approved if the following criteria are met:

- Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted.
- The material presented must evaluate the uncertainty in the estimated base flood elevation profile and include, but not necessarily be limited to:
 - An assessment of statistical confidence limits of the 1-percent-annual-chance discharge;
 - Changes in stage-discharge relationships; and
 - Sources, potential, and magnitude of debris, sediment, and ice accumulation.
- It must be also shown that the levee will remain structurally stable during the base flood when such additional loading considerations are imposed.

Under no circumstances will freeboard of less than 2 feet be accepted.

For coastal levees, the freeboard must be established at 1 foot above the height of the 1-percent-annual-chance wave or the maximum wave runup (whichever is greater) associated with the 1-percent-annual-chance stillwater surge elevation at the site.

Exceptions to the minimum coastal freeboard requirements above may be approved if the following criteria are met:

- Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted.
- The material presented must evaluate the uncertainty in the estimated base flood loading conditions. Particular emphasis must be placed on the effects of wave attack and overtopping on the stability of the levee.

Under no circumstances will a freeboard of less than 2 feet above the 1-percent-annual-chance stillwater surge elevation be accepted.

(B)(2) CLOSURES

The levee closure requirement is that all openings must be provided with closure devices that are structural parts of the system during operation and design according to sound engineering practice.

(B)(3) EMBANKMENT PROTECTION

Engineering analyses must be submitted to demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability.

The factors to be addressed in such analyses include, but are not limited to:

- Expected flow velocities (especially in constricted areas);
- Expected wind and wave action;

- Ice loading;
- Impact of debris;
- Slope protection techniques;
- Duration of flooding at various stages and velocities;
- Embankment and foundation materials;
- Levee alignment, bends, and transitions; and
- Levee side slopes.

(B)(4) EMBANKMENT AND FOUNDATION STABILITY

Engineering analyses that evaluate levee embankment stability must be submitted.

The analyses provided shall evaluate expected seepage during loading conditions associated with the base flood and shall demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability.

An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in U.S. Army Corps of Engineers (USACE) Engineering Manual 1110-2-1913, Chapter 6, Section II, may be used.

The factors that shall be addressed in the analyses include:

- Depth of flooding;
- Duration of flooding;
- Embankment geometry and length of seepage path at critical locations;
- Embankment and foundation materials;
- Embankment compaction;
- Penetrations;
- Other design factors affecting seepage (e.g., drainage layers); and
- Other design factors affecting embankment and foundation stability (e.g., berms).

(B)(5) SETTLEMENT

Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be maintained within the minimum freeboard standards set forth in B(1).

This analysis must address:

- Embankment loads,
- Compressibility of embankment soils,
- Compressibility of foundation soils,

- Age of the levee system, and
- Construction compaction methods.

A detailed settlement analysis using procedures such as those described in USACE Engineering Manual EM 1100-2-1904 must be submitted.

(B)(6) INTERIOR DRAINAGE

An analysis must be submitted that identifies the source(s) of such flooding; the extent of the flooded area; and, if the average depth is greater than 1 foot, the water-surface elevation(s) of the base flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters. Interior drainage systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof.

For areas of interior drainage that have average depths greater than 1 foot, mapping must be provided depicting the extents of the interior flooding, along with supporting documentation.

(B)(7) OTHER DESIGN CRITERIA

In unique situations, such as those where the levee system has relatively high vulnerability, FEMA may require that other design criteria and analyses be submitted to show that the levees provide adequate protection. In such situations, sound engineering practice will be the standard on which FEMA will base its determinations. FEMA also will provide the rationale for requiring this additional information.

(C) OPERATIONS PLANS AND CRITERIA

For a levee system to be recognized, the operational criteria must be as described below. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operation manual, a copy of which must be provided to FEMA by the operator when levee or drainage system recognition is being sought or when the manual for a previously recognized system is revised in any manner. All operations must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP.

(C)(1) CLOSURES

Operation plans for closures must include the following:

- Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists for the completed operation of all closure structures, including necessary sealing, before floodwaters reach the base of the closure;
- A formal plan of operation, including specific actions and assignments of responsibility by individual name or title; and
- Provisions for periodic operation, at not less than 1-year intervals, of the closure structure(s) for testing and training purposes.

(C)(2) INTERIOR DRAINAGE SYSTEMS

Interior drainage systems associated with levee systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof. FEMA will recognize these drainage systems on NFIP maps for flood protection purposes only if the following minimum criteria are included in the operation plan:

- Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists to permit activation of mechanized portions of the drainage system;
- A formal plan of operation, including specific actions and assignments of responsibility by individual name or title;
- Provision for manual backup for the activation of automatic systems; and
- Provisions for periodic inspection of interior drainage systems and periodic operation of any mechanized portions for testing and training purposes; no more than 1 year shall elapse between either the inspections or the operations.

(C)(3) OTHER OPERATION PLANS AND CRITERIA

FEMA may require other operating plans and criteria to ensure that adequate protection is provided in specific situations. In such cases, sound emergency management practice will be the standard upon which FEMA determinations will be based.

(D) MAINTENANCE PLANS AND CRITERIA

For levee systems to be recognized as providing protection from the base flood, the following maintenance criteria must be met:

- Levee systems must be maintained in accordance with an officially adopted maintenance plan, and a copy of this plan must be provided to FEMA by the owner of the levee system when recognition is being sought or when the plan for a previously recognized system is revised in any manner.
- All maintenance activities must be under the jurisdiction of a(n):
 - Federal or State agency;
 - Agency created by Federal or State law; or
 - Agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance.
- The maintenance plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained.
- At a minimum, the maintenance plan shall specify:
 - Maintenance activities to be performed;
 - Frequency of their performance; and
 - Person by name or title responsible for their performance.

(E) CERTIFICATION REQUIREMENTS

Data submitted to support that a given levee system complies with the structural requirements set forth in B(1) through B(7) above must be certified by a Registered Professional Engineer. Also, certified as-built plans of the levee must be submitted. Certifications are subject to the definition given in Section 65.2 of the NFIP regulations. In lieu of these structural requirements, a Federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide protection against the base flood.



Provisionally Accredited Levees

April 2008



FEMA

Provisionally Accredited Levees

Overview

Over one quarter of the counties that the Federal Emergency Management Agency (FEMA) is mapping as part of its Flood Map Modernization (Map Mod) effort has levees/levee systems shown on their effective flood map. This affects millions of Americans. Therefore, the need to accurately show the risk of flooding behind levees is obvious. Citizens, community officials, builders, insurance agents, lenders, and others need to understand the risk to life and property that resides behind levees—risk that even the best flood-control system can not completely eliminate.

It is important to note that FEMA does not perform levee evaluations—this is the responsibility of the levee owner. A levee owner can be a Federal or State agency, a water management or flood control district, a local community, a levee district, a nonpublic organization, or an individual. The party responsible for operating and maintaining the levee must be a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the National Flood Insurance Program (NFIP).

FEMA is responsible for the following:

- Establishing appropriate risk zone determinations and reflecting these determinations on flood maps

- Establishing mapping standards, including minimum design, operation and maintenance criteria that must be met to have a levee/levee systems accredited as providing flood protection. FEMA will only accredit on its flood maps those levee systems that have met and continue to meet these minimum standards

FEMA is not responsible for the following:

- Designing, operating, certifying, or maintaining levee systems
- Examining levees
- Determining how a structure or system will perform in a flood event

What is a levee?

A levee is a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

What is a Provisionally Accredited Levee (PAL)?

A levee that FEMA has previously accredited with providing 1-percent-annual-chance protection on an effective Flood Insurance Rate Map (FIRM) or digital FIRM (DFIRM), and for which FEMA is awaiting data and/or documentation that will demonstrate the levee's compliance with 44 CFR Section 65.10 of the NFIP regulations. A PAL is shown on a DFIRM as providing 1 percent-annual-chance flood protection, and the area landward of the levee is shown as Zone X (shaded) except for areas of residual flooding, such as ponding areas, which will be shown as Special Flood Hazard Area.

FEMA's mapping requirements are designed to provide the people living and working behind the levee/levee systems with appropriate risk information so that they may minimize damage and loss of life. The requirements contain the technical information on design criteria as well as operation and maintenance plans.

The regulatory requirements for FEMA to accredit the flood protection capabilities of levees/levee systems are found in Title 44, Chapter 1 of the Code of Federal Regulations Section 65.10 (44 CFR Section 65.10), which you may view on FEMA's Web site at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

Compliance with 44 CFR Section 65.10 requirements rests with communities, levee owners, and/or local project sponsors—not FEMA. FEMA's responsibility is solely to review the information provided and either accredit the levee/levee systems as providing 1-percent-annual-chance flood protection on the flood map or, when the levee/levee systems is shown to be inadequate, to reveal the risk of flooding behind that levee/levee systems to the community and the public.

To help clarify its evaluation and mapping requirements for areas behind levees/levee systems, FEMA has issued two Procedure Memorandums—Procedure Memorandum No. 34 (PM 34) and Procedure Memorandum No. 43 (PM 43). You may view the PMs on FEMA's Web site at www.fema.gov/plan/prevent/fhm/gs_memos.shtm.

On August 22, 2005, FEMA issued PM 34 – *Interim Guidance for Studies Including Levees* – to help clarify the responsibility of community officials or other parties seeking recognition of a levee/levee system in providing information on levees/levee systems identified during a study/mapping project. PM

34 provided clarification of procedures to minimize delays in near-term study/mapping projects and to aid mapping partners in properly assessing how to handle levee mapping issues.

Documentation required to accredit a levee/levee system as providing 1-percent-annual-chance flood protection often is outdated or missing altogether. As part of a study/mapping project, PM 34 indicates that it is the levee owner or community's responsibility to provide documentation that the levee/levee system meets the requirements of 44 CFR Section 65.10.

Levees/levee systems that are presently shown as providing 1-percent-annual chance flood protection may qualify for the Provisionally Accredited Levee, or PAL, designation on a DFIRM. PM 43 – *Guidelines for Identifying Provisionally Accredited Levees*, issued as revised on March 16, 2007 – describes five scenarios (see below) for determining when a levee/levee system does or does not qualify as a PAL. A PAL is shown in a DFIRM as providing 1-percent annual-chance flood protection and the area landward of the levee is shown as Zone X (shaded) on a flood map except for areas of residual flooding such as ponding areas which will be shown as a Special Flood Hazard Area and labeled Zone A or AE, depending on the type of study performed for the area.

If a levee qualifies for the PAL designation, FEMA will provide the community 90 days to sign and return an agreement that indicates the data and documentation to comply with CFR Section 65.10 requirements will be provided within 24 months of the 90- day agreement period. If the signed agreement is not returned to FEMA within 90 days, the levees in the community are no longer eligible for the PAL designation. If the levee owner believes that the levee/levee system meets the requirements of 44 CFR Section 65.10 with the exception of maintenance deficiencies, the levee owner can request a 1-year correction period. If the levee/levee system does not meet the PAL requirements (including specific reporting deadlines depending upon the levee's status) the area landward of the levee will be remapped as Zone AE or Zone A depending on the type of study performed for the area.

The U.S. Army Corps of Engineers (USACE) has initiated a national levee inventory and assessment program to identify the condition, location, level of protection, and maintenance activities for all levees/levee systems within its jurisdiction. This inventory will assist in the assessment of the risk to public safety associated with levees/levee systems across the Nation. The USACE and FEMA are working together throughout the inventory and assessment phase to coordinate this effort with Map Mod

activities. The inventory data collected will be used by FEMA and the USACE to categorize levees for which the full documentation required by 44 CFR Section 65.10 is not readily available into the five scenarios described below.

For levees/levee systems that are included in the USACE Federal program, FEMA will actively coordinate with the appropriate USACE district to determine which projects do not provide protection from the 1-percent-annual-chance flood. In a collaborative effort, existing data or project-specific information will be evaluated to identify and validate levees/levee systems not accredited in the USACE's inventory.

For levees/levee systems within its program, the USACE determines which levees/levee systems will be offered a one-time-only 1-year maintenance deficiency correction period. This period was established to allow public sponsors/levee owners to correct levee maintenance deficiencies before the levee is placed in an inactive status in the USACE Rehabilitation & Inspection Program and becomes ineligible for Public Law 84-99 rehabilitation assistance. After coordinating with FEMA, the USACE will inform communities or levee owners of this status by letter.

It is important that communities and individuals have the most accurate and up-to-date information to make decisions based on the flood risk that exists in areas behind levees/levee systems. FEMA established this approach to allow the mapping to move forward for levees/levee systems meeting the criteria identified in the scenarios below. This approach also gives communities and levee owners a specified timeframe for the submittal of the full documentation necessary to show compliance with 44 CFR Section 65.10.

On the following pages are five possible scenarios for how PM 43 may be applied in different circumstances.

Non-USACE Program levees are defined to include the following:

- Levees not authorized by the U.S. Congress or other Federal agency authority;
- Levees built by other Federal agencies and not incorporated into the USACE Federal system;
- Locally built and maintained levees built by a local community; and
- Privately built by a nonpublic organization or individuals and maintained by a local community.

WARNING: Provisionally Accredited Levee. For explanation, see the Notes to Users.

The following Note to Users will be added:

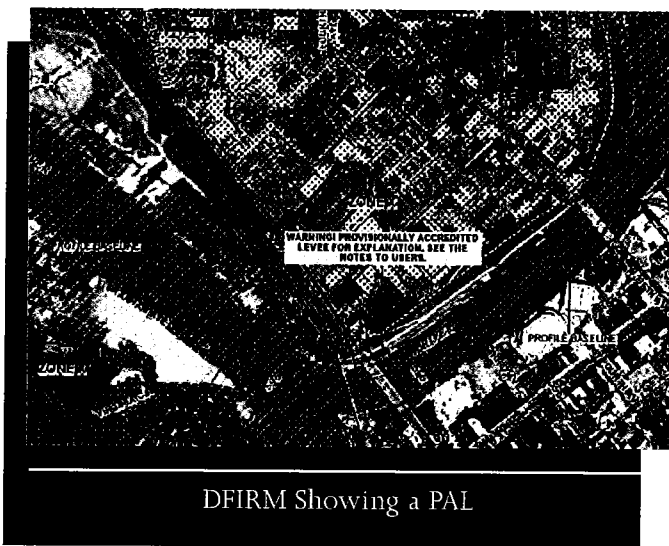
WARNING: This levee, dike, or other structure has been provisionally accredited and mapped as providing protection from the 1-percent-annual-chance flood. To maintain accreditation, the levee owner or community is required to submit documentation necessary to comply with 44 CFR Section 65.10 by (_____,_____,_____). Because of the risk of overtopping or failure of the structure, communities should take proper precautions to protect lives and minimize damages in these areas, such as issuing an evacuation plan and encouraging property owners to purchase flood insurance.

Scenario A

In this scenario, a levee/levee system that is not in the U.S. Army Corps of Engineers (USACE) Federal System (i.e., a non-USACE levee) is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood. This scenario includes two different possibilities.

In this case, the FEMA Regional Office will send a letter to the appropriate levee owner or community identifying those levees/levee systems for which 44 CFR Section 65.10 documentation is needed and provide a copy of this letter to the appropriate USACE district office. The FEMA letter will describe the PAL option and a potential option for a one-time-only, 1-year "maintenance deficiency correction period" associated with maintenance-deficient levees/levee systems. This letter will also request that the community/levee owner submit, within 90 days, one of the following:

- A signed agreement stating that, to the best of the community's/levee owner's knowledge, the levee/levee system in question meets 44 CFR Section 65.10 requirements and all requirements for a PAL application package. This is called Scenario A1.
- A signed letter stating that the community/levee owner has been notified of the one-time-only, 1-year "maintenance deficiency correction period" and agrees to proceed according to the associated process and requirements. This one time-only "maintenance deficiency correction period" will expire 1 year from the 91st day following the date of the initial notification letter. This is called Scenario A2.



Scenario A1:

If the community/levee owner believes that the levee/levee system meets 44 CFR Section 65.10 requirements at that time, then they may qualify for Scenario A1.

If the full documentation required to show compliance with 44 CFR Section 65.10 is readily available when the initial notification letter is sent, FEMA will request that the community/levee owner provide these documents within 30 days. If additional time is required to gather the proper documentation, the community/levee owner will choose to submit the PAL application package. For any community/levee owner that chooses the PAL option, the requirements for 44 CFR Section 65.10 must be submitted within 24 months of the 91st day following the date of the initial notification letter. Certification by a Registered Professional Engineer must accompany the submitted 44 CFR Section 65.10 data in compliance with Paragraph 65.10(e). In addition, the community/levee owner must submit a progress report to FEMA after 12 months to document progress toward obtaining 44 CFR Section 65.10 data and documentation.

Several conditions exist that may require FEMA to take immediate action to rescind the PAL designation and revise the DFIRM to show the area landward of the levee/levee system as Zone AE or Zone A (depending upon the type of study performed for the area):

- Neither the signed PAL agreement nor a request for a maintenance deficiency correction period is returned to FEMA before the 91st day following the date of the notification letter;
- The full documentation required for compliance with 44 CFR Section 65.10 is not provided within 24 months of the 91st day following the date of the initial notification letter; or
- The 12-month progress report is not provided to FEMA, and the FEMA Regional Office believes the PAL agreement should be rescinded.

Scenario A2:

If the community/levee owner believes that the levee/levee system meets 44 CFR Section 65.10 requirements with the exception of maintenance deficiencies, then they may qualify for Scenario A2.

Once the community/levee owner determines that maintenance deficiencies exist, the community/levee owner will have 90 days from the date of the initial notification letter to submit a signed letter requesting the maintenance deficiency correction period. At a minimum, this letter must clearly state:

- The only grounds for the levee/levee system in question not currently meeting the 44 CFR Section 65.10 requirements or PAL requirements are maintenance issues; and
- Within the 1-year “maintenance deficiency correction period,” the community/levee owner can remedy the maintenance deficiencies and submit one of the following:
 - All documentation necessary to comply with the requirements listed in 44 CFR Section 65.10; or
 - A request for a PAL designation and the entire PAL application package (PAL application requirements listed below).

If the community/levee owner submits a response before the 91st day following the date of the initial notification letter, the FEMA Regional Office will notify the community/ levee owner that the current study/mapping project will move forward and show the area landward of the levee/levee system as Zone AE or Zone A (depending upon the type of study performed for the area). The notification will state that the Letter of Final Determination (LFD) and effective DFIRM will be delayed until the 1-year correction period has elapsed. For FEMA to remove the Zone AE or Zone A designation landward of the levee/levee system, the community and/or levee owner must submit the following within the 1-year correction period:

- All the requirements listed in 44 CFR Section 65.10; or
- A request for a PAL designation and the entire PAL application package (PAL application package requirements listed below).

If all the data and documents required to comply with 44 CFR Section 65.10 are submitted before the 1-year correction period has elapsed, FEMA will issue the LFD and show the levee/levee system on the effective DFIRM as accredited. However, if a request for a PAL designation

and a PAL application package are submitted and approved before the 1-year correction period has elapsed, then FEMA will issue the LFD and show the levee/levee system on the effective DFIRM as provisionally accredited. In addition, for the PAL option, the community/levee owner must provide a progress report to the FEMA Regional Office after 12 months to document progress toward obtaining 44 CFR Section 65.10 data

If any of the following alternatives occur, FEMA will direct the contractor or mapping partner to remap the area landward of the levee/levee system as Zone AE or Zone A, depending upon the type of study performed for the area:

- The community/levee owner does not submit a signed response letter before the 91st day following the date of the initial notification letter.
- The community/levee owner is granted the 1-year correction period, but does not submit the required data within the 1-year correction period.
- The submitted deficiency correction data are determined to be inadequate.
- A request for a PAL designation and the entire PAL application package is not submitted and approved before the 1-year correction period has elapsed.
- The 12-month PAL progress report is not provided to FEMA, and the FEMA Regional Office believes the PAL designation should be rescinded.
- The full data and documentation required to comply with 44 CFR Section 65.10 is not provided within 24 months of the final day of the correction period.
- The data and documentation submitted to meet the requirements of 44 CFR Section 65.10 or the PAL application is determined to be inadequate.

Scenario B:

In this scenario, the levee/levee system is in the USACE Federal System and is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood and there is no information indicates the levee does not provide this level of protection. Additionally, the project inspection rating is within an acceptable range (as defined by USACE).

If full documentation to comply with the requirements of 44 CFR Section 65.10 is readily available when the initial notification letter is sent, the FEMA Regional Office will request that the community/levee owner/local project sponsor provide these documents within 30 days. If the community/levee owner/local project sponsor requires time to gather the proper documentation, they should choose to submit the PAL Application Package.

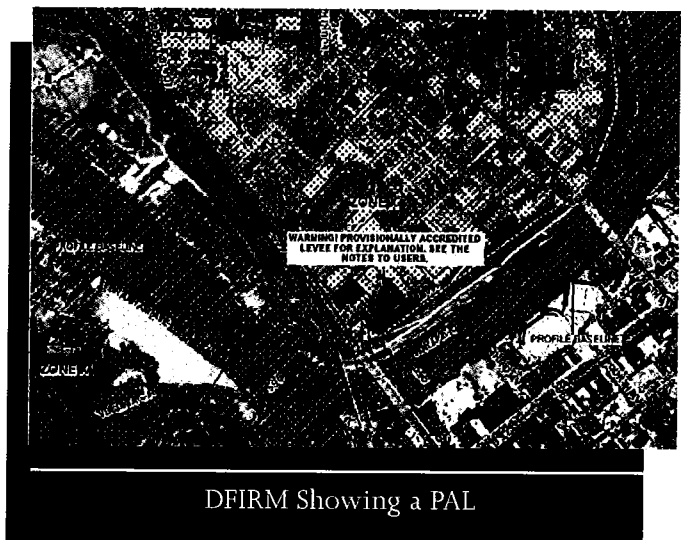
For any community/levee owner/local project sponsor that chooses the PAL, the documentation required to comply with 44 CFR Section 65.10 requirements must be submitted within 24 months of the 91st day following the date of the initial notification letter. Certification by a Registered Professional Engineer must accompany the submitted 44 CFR Section 65.10 data in compliance with Paragraph 65.10(e). An official letter from the USACE certifying that the levee has been adequately designed and constructed to provide 1-percent-annual-chance flood protection may be submitted in lieu of the certification noted above. In addition, the community/levee owner/local project sponsor must submit a progress report to FEMA after 12 months to document progress toward obtaining data and documentation to comply with 44 CFR Section 65.10

Several conditions could occur that may result in the PAL designation being rescinded and FEMA taking immediate action to revise the DFIRM in the area landward of the levee. If any of the following conditions apply, FEMA will direct the contractor or mapping partner to remap the area landward of the levee as Zone AE or Zone A, depending upon the type of study performed for the area:

- The signed PAL agreement is not returned to FEMA within 90 days of the initial notification letter.
- The full documentation for 44 CFR Section 65.10 is not provided within 24 months of the final day of the 90-day agreement period.
- The 12-month PAL progress report is not provided to FEMA, and the FEMA Regional Office believes rescission is necessary.
- The data submitted to meet the requirements of 44 CFR Section 65.10 or the PAL application is determined to be inadequate.

USACE levees are defined to include:

- Levees built by the USACE that were authorized for construction by the U.S. Congress or by USACE continuing authorities (e.g., Section 205);
- Levee projects constructed by non-Federal interests or other (non-USACE) Federal agencies and incorporated into the USACE Federal system by specific congressional action;
- Federal projects that are either operated and maintained by the USACE or turned over to a local sponsor for operation and maintenance; and
- Non-Federal projects within the Rehabilitation and Inspection Program (RIP), Public Law 84-99.



DFIRM Showing a PAL

Scenario C:

In this scenario, the levee/levee system is in the USACE Federal System and is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood. However, the USACE has determined that the levee's recent inspection ratings are "Fair," "Poor," or "Unacceptable."

Scenario C includes two different possibilities:

Scenario C1:

- The USACE has determined that the levee's recent inspection ratings are listed as fair, poor, or unacceptable;
- The USACE has determined that the project status in the RIP has been switched from active to inactive; and
- The USACE has not provided a 1-year maintenance deficiency correction period for the levee.

The FEMA Regional Office will coordinate with the appropriate USACE District office regarding levee projects in the USACE inventory that have received an inspection rating of fair, poor, or unacceptable. The USACE will evaluate any existing data or project-specific information to determine that the levee does not provide 1-percent-annual-chance flood protection.

Once these projects have been identified, the USACE will send a notification letter to the community/levee owner/local project sponsor to inform them that the levee status has been switched from active to inactive in the USACE RIP and is no longer eligible for PL 84-99 rehabilitation assistance because of maintenance deficiencies. These deficiencies will not allow the levee to meet the minimum requirements of the 44 CFR Section 65.10; thus, the levee does not provide 1-percent-annual-chance flood protection. The deficiencies will be identified in the USACE letter. The USACE District office will provide a copy of this letter to the FEMA Regional Office. The FEMA Regional Office then will send a letter to the community/levee owner/local project sponsor stating that the area landward of the levee will be remapped as Zone AE or Zone A, depending upon the type of study performed for the area.

These levee systems will not be eligible for the PAL option.

Scenario C2:

- The levee has received an fair, poor, or unacceptable inspection rating;
- The levee was in an active status in the USACE RIP prior to September 30, 2005 (FY06); and
- The USACE has offered a one-time-only, 1-year "maintenance deficiency correction period" to remedy the maintenance deficiencies of the levee.

Once these projects have been identified, the USACE will send a notification letter to the community/levee owner/local project sponsor to inform them of the levee's specific maintenance deficiencies. This letter will also inform the community/levee owner/local project sponsor that they are eligible for the one-time-only, 1-year "maintenance deficiency correction period," which provides them 1 year to resolve any levee maintenance deficiencies. The USACE District office will provide a copy of this letter to the FEMA Regional Office.

The FEMA Regional Office then will send a letter to the community/levee owner/local project sponsor explaining the PAL option (Scenario C2) and that FEMA will proceed with the current study/mapping project and will remap the area landward of the levee that will be mapped as Zone AE or Zone A, depending upon the type of study performed for the area. The LFD and effective DFIRM will be delayed until the 1-year correction period has elapsed. For FEMA to remove the Zone AE or Zone A designation landward of the levee, the following requirements must be met within the 1 year correction period:

- Evidence has been provided to show that the maintenance deficiencies have been remedied. This evidence will be provided to the FEMA Regional Office by the appropriate USACE District office.
- All of the requirements listed in 44 CFR Section 65.10 have been addressed or a request for a PAL designation and the entire PAL application package has been submitted.

The FEMA Regional Office will coordinate with the appropriate USACE District regarding levee projects to evaluate and determine the adequacy of any data submitted before the 1-year correction period has elapsed. If the data complies with 44 CFR Section 65.10, FEMA will issue the LFD and show the levee on the effective DFIRM as accredited. Alternatively, if a request for a PAL designation and a PAL application package are submitted and approved before the 1-year correction period has elapsed, then FEMA will issue the LFD and show the levee on the effective DFIRM as provisionally accredited. In addition, to the

community/levee owner/local project sponsor must submit a progress report to FEMA after 12 months to document progress toward obtaining documentation and data to comply with 44 CFR Section 65.10.

If any of the following alternatives occur, FEMA will direct the contractor or mapping partner to remap the area landward of the levee as Zone AE or Zone A, depending upon the type of study performed for the area:

- The community/levee owner/local project sponsor is granted the 1-year correction period, but does not submit the required data within the 1-year correction period.
- The submitted deficiency correction data is determined to be inadequate.
- The 12-month PAL progress report is not provided to FEMA, and the FEMA Regional Office believes the PAL designation should be rescinded.
- A request for a PAL designation and the entire PAL application package is not submitted and approved before the 1-year correction period has elapsed.
- The full documentation necessary to comply with 44 CFR Section 65.10 is not provided within 24 months of the final day of the correction period.
- The data submitted to meet the requirements of 44 CFR Section 65.10 or the PAL application are determined to be inadequate.

Scenario D:

In this scenario, the levee/levee system is in the USACE Federal System and is not shown on the effective flood map as providing protection from the 1-percent-annual-chance flood. There is no issue with how to map the area behind the levee because it previously has been determined that the levee does not provide 1-percent-annual-chance flood protection. The flood map will continue to show the levee as not providing 1-percent-annual-chance flood protection unless it is determined that the levee actually does provide this level of protection.

These levee systems will not be eligible for the PAL option.

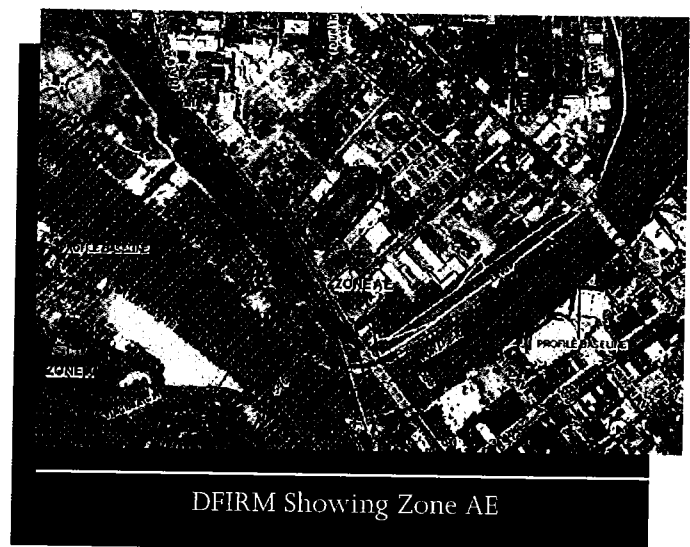
Scenario E:

In this scenario, the levee/levee system is in the USACE Federal System and is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood. However, the USACE has determined, and FEMA has validated, that the levee does not meet an adequate level of protection. Although the levee inspection rating is not listed as fair, poor, or unacceptable, the levee may have failed or experienced overtopping by less than the 1-percent-annual-chance flood.

The FEMA Regional Office will verify the engineering and mapping data used to produce the effective FIRM and determine whether it is the most up-to-date information, based on the best available data. However, the FEMA Regional Office will also determine if better data are available than the data used to produce the effective FIRM. The FEMA Regional Office will coordinate with the USACE district office to either verify the current flood data are the best available or provide the more recent and accurate data. The USACE district office will use the best available data, as identified by the FEMA Regional Office, to determine whether the levee provides an adequate level of protection.

The FEMA Regional Office will notify the community, levee owner, or local project sponsor that the levee no longer provides 1-percent-annual-chance flood protection. FEMA also will provide the reasons for the levee no longer providing protection. If the project sponsor cannot provide the documentation necessary to show compliance with 44 CFR Section 65.10, the area landward of the levee will be mapped as Zone AE or Zone A, depending upon the type of study performed for the area.

These levee systems will not be eligible for the PAL option.

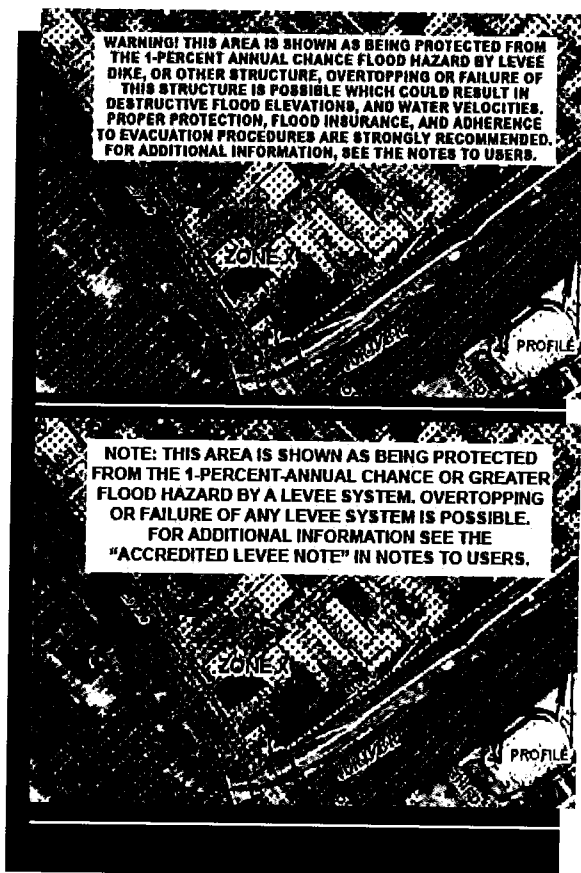


How Will FEMA Map Levees?

FEMA's mapping requirements are designed to provide the people living and working behind the levee with appropriate risk information so that they may minimize damage and loss of life. It is important to note that FEMA does not evaluate the performance of a levee—this is the responsibility of the levee owner. FEMA is responsible for establishing mapping standards and risk determination zones and reflecting these determinations on flood maps.

FEMA issued Procedure Memorandum No. 45, *Revisions to Accredited Levee and Provisionally Accredited Levee Notations*, in April 2008 to clarify map notes for accredited and provisionally accredited levees/levee systems. For all accredited levee systems and PAL systems, the area landward of the levee system that is only identified as being protected by the levee system from the base (1-percent-annual-chance) flood will continue to be mapped as a moderate-risk area, with the Zone X (shaded) flood insurance risk zone designation shown on the affected DFIRM panel(s).

The requirements in PM 45 apply to all DFIRMs that will become effective on and after December 1, 2008.

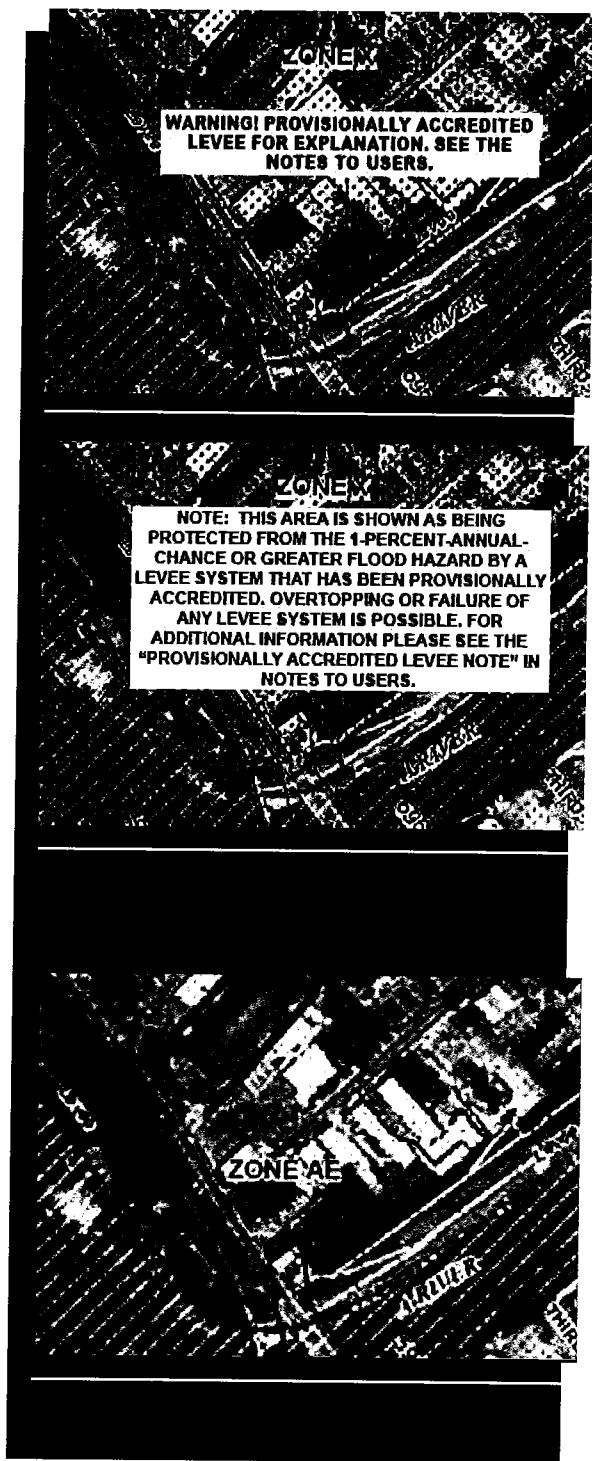


Levee Accredited on DFIRM (Issued Before December 1, 2008)

An accredited levee is a levee that FEMA shows on a FIRM as providing protection from the 1-percent-annual-chance or greater flood. This determination is based on the submittal of data and documentation as required by the NFIP regulations. The area landward of an accredited levee is shown as Zone X (shaded) on the FIRM except for areas of residual flooding, such as ponding areas, which will be shown as Special Flood Hazard Area. Flood insurance is not mandatory in Zone X (shaded); however, it is strongly encouraged for all structures in areas behind levees.

Levee Accredited on DFIRM (Issued After December 1, 2008)

An accredited levee is a levee that FEMA shows on a FIRM as providing protection from the 1-percent-annual-chance or greater flood. This determination is based on the submittal of data and documentation as required by the NFIP regulations. The area landward of an accredited levee is shown as Zone X (shaded) on the FIRM except for areas of residual flooding, such as ponding areas, which will be shown as Special Flood Hazard Area. Flood insurance is not mandatory in Zone X (shaded); however, it is strongly encouraged for all structures in areas behind levees.



Provisionally Accredited Levee (PAL) (Issued Before December 1, 2008)

A PAL is a designation for a levee that FEMA has previously accredited with providing 1-percent-annual-chance flood protection on an effective FIRM, and for which FEMA is awaiting data and/or documentation that will show the levee's compliance with NFIP regulations. Before FEMA will designate a levee as a PAL, the community or levee owner will need to sign and return an agreement that indicates that documentation required for compliance with 44 CFR Section 65.10 of the NFIP regulations will be provided within a specified timeframe, depending upon the levee's status. Flood insurance is not mandatory for structures behind a levee with provisional status however, it is strongly encouraged.

Provisionally Accredited Levee (PAL) (Issued After December 1, 2008)

A PAL is a designation for a levee that FEMA has previously accredited with providing 1-percent-annual-chance flood protection on an effective FIRM, and for which FEMA is awaiting data and/or documentation that will show the levee's compliance with NFIP regulations. Before FEMA will designate a levee as a PAL, the community or levee owner will need to sign and return an agreement that indicates that documentation required for compliance with 44 CFR Section 65.10 of the NFIP regulations will be provided within a specified timeframe, depending upon the levee's status. Flood insurance is not mandatory for structures behind a levee with provisional status however, it is strongly encouraged.

Levee Not Accredited or De-accredited on FIRM

If the levee is not shown as providing protection from the 1-percent-annual-chance flood on an effective FIRM, the levee is considered "not accredited" and is mapped as Zone AE or Zone A, depending upon the type of study performed for the area. If the levee was previously shown providing protection from the 1-percent-annual-chance flood on an effective FIRM but does not meet the Provisionally Accredited Levee (PAL) requirements or is no longer eligible for the PAL, FEMA will "de-accredit" the levee and the area landward of the levee will be remapped as Zone AE or Zone A (high-risk flood zones) depending on the type of study performed for the area. Flood insurance will be required for structures with a federally backed mortgage.

For more information on levees, please visit
FEMA's Web site at:

www.fema.gov/plan/prevent/fhm/lv_intro.shtm.