



**FEMA**

March 19, 2007

Ms. Sheila Stogsdill  
Acting Planning Director  
City of Lawrence  
P.O. Box 708  
Lawrence, KS 66044

Dear Ms. Stogsdill:

This is in regard to the Lawrence Unit levee shown on the effective Flood Insurance Rate Map (FIRM) and in the effective Flood Insurance Study (FIS) report for Douglas County, Kansas. As you may know, the Department of Homeland Security, Federal Emergency Management Agency (FEMA), is in the process of producing a countywide FIS report and Digital Flood Insurance Rate Map (DFIRM) for Douglas County. This effort is being undertaken as part of FEMA's Flood Map Modernization (Map Mod) program.

As part of FEMA's effort to produce the DFIRM, it was 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 Lawrence Unit. 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), it is the responsibility of the community or other party seeking recognition of a levee system to provide the data defined and outlined within the regulation. Specifically, 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 you with additional time to submit all the necessary documentation. Initiation of this process can take place only if you, the levee owner, and a representative of each impacted community sign and return the enclosed agreement within 90 days of the date of this letter. 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. The completed agreement must be submitted **before June 18, 2007**, for the levee to receive the PAL designation.

By endorsing the agreement, you agree to provide all the necessary documentation to comply with 44 CFR 65.10 **before June 18, 2009**. If you are unable to submit all of the documentation necessary to

meet the requirements of 44 CFR 65.10 before this date, FEMA will initiate a map revision to redesignate certain areas on the landward side of the levee as floodprone.

The levees will be labeled as PALs during the 24-month period to convey to map users that levee certification verification is underway. FEMA recommends that you, the levee owner, and the 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 the documentation necessary to fully comply with 44 CFR 65.10, including an existing operation and maintenance plan and record of an on-site inspection by a registered professional engineer, is readily available, please submit the data to this office within 30 days of the date of this letter. Upon receipt of your submittal, FEMA will review the data and determine whether the levee will continue to be accredited with providing protection from the base flood.

If you have additional questions regarding the specific submittal requirements, please contact Julie Grauer of my staff, either by telephone at (816)-283-7044 or by facsimile at (816) 283-7963.

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 Bissell  
Director, Mitigation Division  
FEMA Region VII

Enclosures: PAL Agreement  
"Mapping of Areas Protected by Levee Systems"

cc: Mike Amyx, Mayor, City of Lawrence  
Rhonda Montgomery, State of Kansas NFIP Coordinator  
Don Meier, Corps of Engineers, Kansas City District  
Jud Kneuvean, Corps of Engineers, Kansas City District  
Senator Sam Brownback, Washington, DC, Office  
Senator Pat Roberts, Washington, DC, Office  
Representative Dennis Moore, Washington, DC, Office

**Letter of Agreement and Request for Provisionally Accredited Levee (PAL) Designation and Agreement to Provide Adequate Compliance with the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10)**

We, the undersigned, have received the letter from FEMA dated March 19, 2007, 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 Douglas County, Kansas and that the area behind the levee known as Lawrence Unit will be remapped to reflect that the levee has been designated as a PAL.

To the best of our knowledge, the levee known as Lawrence Unit meets the requirements of 44 CFR 65.10. We hereby submit to FEMA, within 90 days (**before June 18, 2007**) our agreement to provide FEMA with all the necessary information to show that the levee known as Lawrence Unit complies with 44 CFR 65.10. We understand that this documentation will be required **before June 18, 2009**. This information will allow FEMA to move forward with the flood mapping for Douglas County, Kansas. We fully understand 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 revision to the Flood Insurance Rate Map to redesignate the area as floodprone.

Levee Owner Representative \_\_\_\_\_ (signature)

\_\_\_\_\_ (print)

Date: \_\_\_\_\_

Community CEO \_\_\_\_\_ (signature)

\_\_\_\_\_ (print)

Date: \_\_\_\_\_

Other (if applicable) \_\_\_\_\_ (signature)

\_\_\_\_\_ (print)

Date: \_\_\_\_\_

**Title 44 Code of Federal Regulations (CFR) Section 65.10**  
**Mapping of Areas Protected by Levee Systems**

[Code of Federal Regulations]

[Title 44, Volume 1]

[Revised as of October 1, 2005]

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TITLE 44: EMERGENCY MANAGEMENT AND ASSISTANCE

CHAPTER I: FEDERAL EMERGENCY MANAGEMENT AGENCY, DEPARTMENT OF  
HOMELAND SECURITY

PART 65: IDENTIFICATION AND MAPPING OF SPECIAL HAZARD AREAS--Table of Contents

Sec. 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 Sec. 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 Sec. 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]