

FIRM

FLOOD INSURANCE RATE MAP
CITY OF
NORTHFIELD,
MINNESOTA
DAKOTA AND RICE COUNTIES

PANEL 8 OF 20

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

<u>COMMUNITY</u>	<u>NUMBER</u>	<u>PANEL</u>	<u>SUFFIX</u>
NORTHFIELD, CITY OF	270406	0008	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

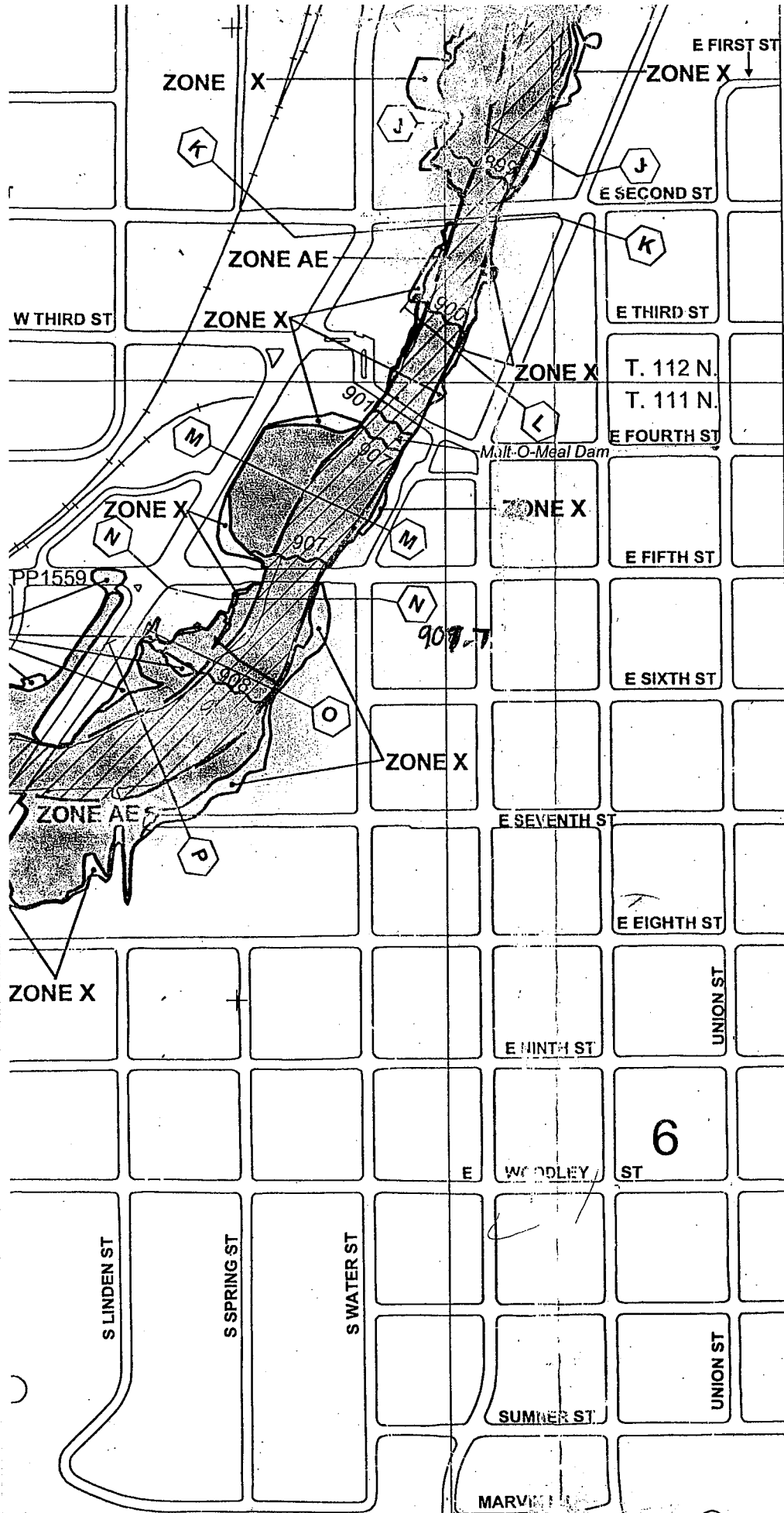


MAP NUMBER
2704060008 C

EFFECTIVE DATE
APRIL 2, 2003

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM



JOINS PANEL 0009

ELEVATION IN FEET (NGVD)

910
905
900
895
890
885
880

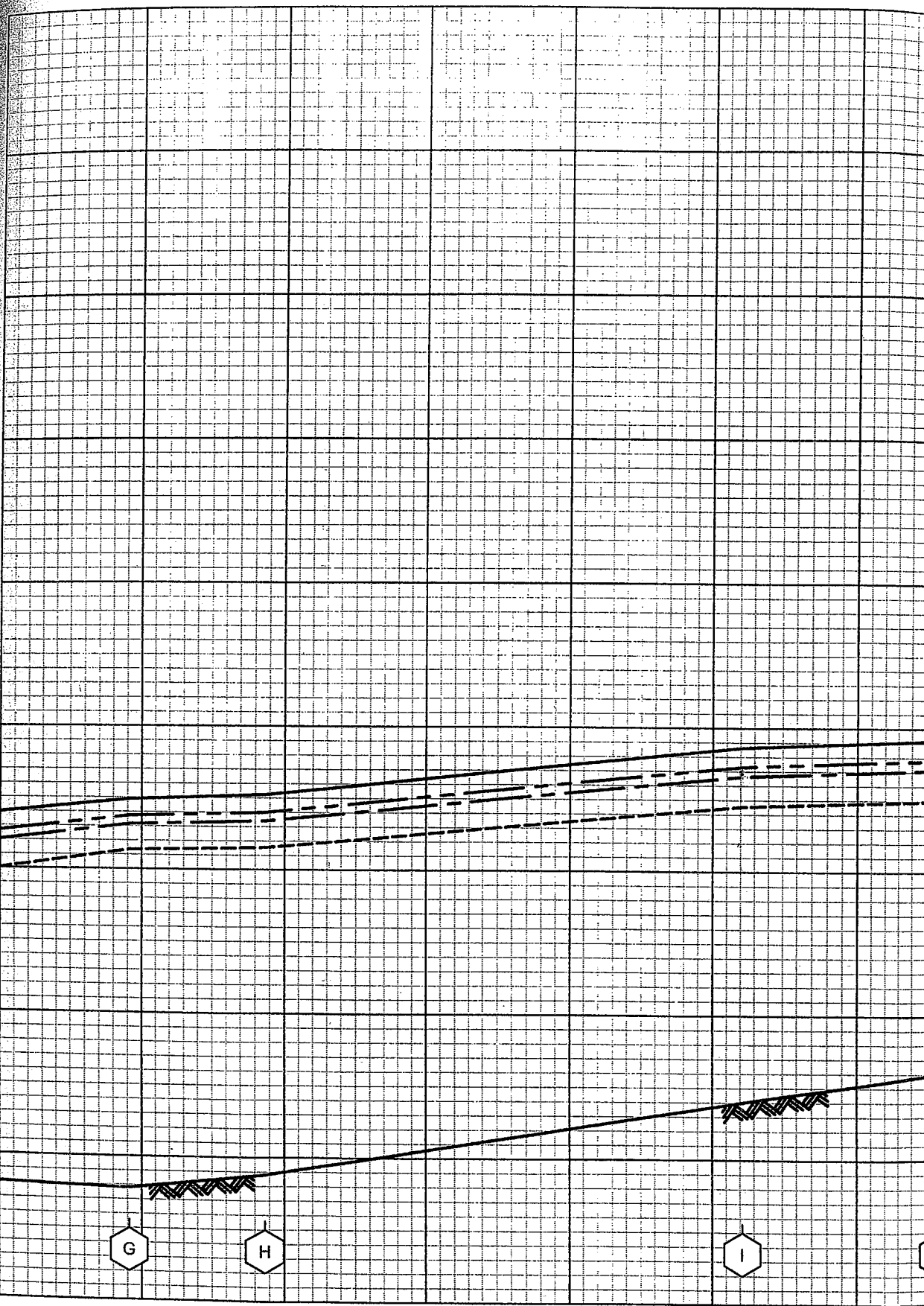
6,500 7,000 7,500 8,000 8,500 9,000 9,500

STREAM DISTANCE IN FEET

G

H

I



FLOODING SOURCE	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
					A REGULATORY	B WITHOUT FLOODWAY	C WITH FLOODWAY	D INCREASE
Cannon River	550	285/220 ²	1,380	8.6	890.2	890.2	890.3	0.1
A	1,700	515/410 ²	2,282	5.2	892.9	892.9	893.0	0.1
B	2,054	535	2,140	5.6	893.0	893.0	893.2	0.2
C	3,380	821/760 ²	5,074	2.3	894.7	894.7	895.1	0.4
D	4,562	801	4,374	2.7	895.2	895.2	895.6	0.4
E	6,278	927	3,527	3.4	896.1	896.1	896.4	0.3
F	6,956	450	2,732	4.3	896.9	896.9	897.3	0.4
G	7,434	575	2,718	4.3	897.0	897.0	897.4	0.4
H	9,107	258	2,273	5.2	898.7	898.7	899.1	0.4
I	9,795	170	1,484	7.9	898.7	898.7	899.2	0.3
J	10,099	133	1,399	8.4	899.4	899.4	899.7	0.3
K	10,505	141	1,564	7.5	900.0	900.0	900.3	0.3
L	11,147	199	1,880	6.3	907.0	907.0	906.9	0.1
M	11,490	180	1,747	6.8	907.6	907.6	907.7	0.1
N	11,769	222	2,047	5.8	907.9	907.9	908.1	0.2
O	12,162	232	2,338	5.1	908.2	908.2	908.4	0.2
P	13,250	366	2,643	4.5	909.1	909.1	909.3	0.2
Q	13,846	778	5,176	2.3	909.7	909.7	910.0	0.3
R	15,100	639	5,011	2.4	910.0	910.0	910.3	0.3
S	16,561	638	4,483	2.6	910.5	910.5	910.9	0.4
T	17,795	895	6,041	2.0	911.0	911.0	911.4	0.4
U	19,387	806	6,517	1.8	911.4	911.4	911.9	0.5
V	20,602	701	4,301	2.7	911.6	911.6	912.1	0.5
W	21,899	847	5,588	2.1	912.1	912.1	912.6	0.5
X	23,006	840/570 ²	5,634	2.1	912.5	912.5	913.0	0.5
Y								

¹Feet Above Corporate Limits
²Total width/Width within corporate limits

Protection elevation = Column C + 1 foot

FEDERAL EMERGENCY MANAGEMENT AGENCY
 CITY OF NORTFIELD, MN
 (DAKOTA AND RICE COUNTIES)

FLOODWAY DATA MSL = Mean Sea Level
 Floodway is determined by two pole measurements
 Distances between floodways and floodway ranges
 CANNON RIVER

TABLE 2

- c. Based upon the technical evaluation of the designated engineer or expert, the city shall determine the specific flood hazard at the site and evaluate the suitability of the proposed use in relation to the flood hazard.

(4) *Factors upon which the decision of the city council shall be based.* In passing upon conditional use applications, the city council shall consider all relevant factors specified in other sections of this division, and:

- a. The danger to life and property due to increased flood heights or velocities caused by encroachments.
- b. The danger that materials may be swept onto other lands or downstream to the injury of others or they may block bridges, culverts or other hydraulic structures.
- c. The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination, and unsanitary conditions.
- d. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner.
- e. The importance of the services provided by the proposed facility to the city.
- f. The requirements of the facility for a waterfront location.
- g. The availability of alternative locations not subject to flooding for the proposed use.
- h. The compatibility of the proposed use with existing development and development anticipated in the foreseeable future.
- i. The relationship of the proposed use to the comprehensive plan and flood plain management program for the area.

- j. The safety of access to the property in times of flood for ordinary and emergency vehicles.
- k. The expected heights, velocity, duration, rate of rise, and sediment transport of the floodwaters expected at the site.
- l. Such other factors which are relevant to the purposes of this division.

(5) *Conditions attached to conditional use permits.* Upon consideration of the factors listed above and the purpose of this division, the council shall attach such conditions to the granting of conditional use permits as it deems necessary to fulfill the purposes of this division. Such conditions may include, but are not limited to, the following:

- a. Modification of waste treatment and water supply facilities.
- b. Limitations on period of use, occupancy, and operation.
- c. Imposition of operational controls, sureties, and deed restrictions.
- d. Requirements for construction of channel modifications, compensatory storage, dikes, levees, and other protective measures.
- e. Flood proofing measures, in accordance with the State Building Code and this division. The applicant shall submit a plan or document certified by a registered professional engineer or architect that the flood proofing measures are consistent with the regulatory flood protection elevation and associated flood factors for the particular area.

(Ord. No. 827, 10-3-2005)

Sec. 34-891. Nonconforming uses.

(a) A structure or the use of a structure or premises which was lawful before the passage or amendment of this division but which is not in conformity with the provisions of this division may be continued subject to the following conditions. Historic structures, as defined in section

34-882(h)(21)b. of this division, shall be subject to the provisions of sections 34-891(a)(1) to (a)(5) of this division.

- (1) No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity.
- (2) Any structural alteration or addition to a nonconforming structure or nonconforming use which would result in increasing the flood damage potential of that structure or use shall be protected to the regulatory flood protection elevation in accordance with any of the elevation on fill or flood proofing techniques (i.e., FP-1 thru FP-4 flood proofing classifications) allowable in the State Building Code, except as further restricted in sections 34-891(a)(3) and 34-891(a)(6) below.
- (3) The cost of any structural alterations or additions to any nonconforming structure over the life of the structure shall not exceed 50 percent of the market value of the structure unless the conditions of this section are satisfied. The cost of all structural alterations and additions constructed since the adoption of the city's initial flood plain controls must be calculated into today's current cost which will include all costs such as construction materials and a reasonable cost placed on all manpower or labor. If the current cost of all previous and proposed alterations and additions exceeds 50 percent of the current market value of the structure, then the structure must meet the standards of section 34-884 or section 34-885 of this division for new structures depending upon whether the structure is in the floodway or flood fringe district, respectively.
- (4) If any nonconforming use is discontinued for 12 consecutive months, any future use of the building premises shall conform to this division. The assessor shall notify the zoning administrator in writing of instances of nonconforming uses that have been discontinued for a period of 12 months.
- (5) If any nonconforming use or structure is substantially damaged, as defined in sec-

tion 34-882(h)(20) of this division, it shall not be reconstructed except in conformity with the provisions of this division. The applicable provisions for establishing new uses or new structures in sections 34-884, 34-885, and 34-886 will apply depending upon whether the use or structure is in the floodway, flood fringe or general flood plain district, respectively.

- (6) If a substantial improvement occurs, as defined in section 34-882(h)(21) of this division, from any combination of a building addition to the outside dimensions of the existing building or a rehabilitation, reconstruction, alteration, or other improvement to the inside dimensions of an existing nonconforming building, then the building addition (as required by section 34-891(a)(2) above) and the existing nonconforming building must meet the requirements of section 34-884 or 34-885 of this division for new structures, depending upon whether the structure is in the floodway or flood fringe district, respectively.

(Ord. No. 827, 10-3-2005)

Sec. 34-892. Annexations.

Flood plain land that will be annexed into Northfield shall be subject to the provisions of this division upon annexation. Determination of the floodway and flood fringe within the general flood plain shall be made as provided in section 34-886(b).

(Ord. No. 827, 10-3-2005)

Sec. 34-893. Penalties for violation.

(a) Violation of the provisions of this division or failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with grants of variances or conditional uses) shall constitute a misdemeanor and shall be punishable as defined by law.

(b) Nothing herein contained shall prevent the city from taking such other lawful action as is necessary to prevent or remedy any violation. Such actions may include but are not limited to:

- (1) In responding to a suspected ordinance violation, the zoning administrator may

§ 65.10

44 CFR Ch. I (10-1-02 Edition)

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 po-

tential 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