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Volume 12
OPERATIONS BRANCH
FLOOD CONTROL SECTION

Revised October 1964

SACRAMENTO RIVER AND MAJOR AND MINOR TRIBUTARIES
PROJECT, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL
FOR
ELDER CREEK

FROM SACRAMENTO RIVER TO HIGH GROUND



U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

Sub 1

**OPERATION AND MAINTENANCE MANUAL
FOR
ELDER CREEK
FROM SACRAMENTO RIVER TO HIGH GROUND**

**SACRAMENTO AND MAJOR AND MINOR
TRIBUTARIES PROJECT, CALIFORNIA**

LOCATION	ADDITION OR REVISION	DATE
1-05 d.	Contract no. 63-78	Oct 1964
1-05 e.	Contract no. 64-33	Oct 1964
Exhibit B	Add drawing no. 50-4-3746	Oct 1964
Exhibit B	Add drawing no. 4-4-542	Oct 1964
Exhibit F	Add letter of acceptance dated 7 Jan 1964	Oct 1964
1-05 f.	Add contract no. 65-93	Jul 1966
1-05 g.	Add contract no. 66-28	Jul 1966
Exhibit B	Add drawing no. 50-4-4076	Jul 1966
Exhibit B	Add drawing no. 50-4-4118	Jul 1966
Exhibit F	Add letter of acceptance dated 11 Jan 1966	Jul 1966
1-05 i.	Add contract no. DACW05-70-C-0014	Jan 1970
Exhibit B	Add drawing no. 50-4-4490	Jan 1970
Exhibit F	Add copy of letter of acceptance dated 12 Jan 1970	Jan 1970
4-05 a.	Revised responsibility for maintenance of gaging station	Oct 1970
1-05 j.	Add contract no. DACW05-68-C-0067	Dec 1970
Exhibit B	Add drawing no. 50-4-4179	Dec 1970
Exhibit F	Add copy of letter of acceptance dated 19 Aug 1969	Dec 1970
1-05 k.	Add contract no. 70-0088	Feb 1971
Exhibit B	Add drawing no. 50-4-4377	Feb 1971
Exhibit F	Add copy of letter of acceptance dated 13 Jan 1971	Feb 1971
1-05	Add subparagraph l.	Sep 1977
4-06	Add subparagraph a. (page 28)	Sep 1977
Exhibit B	Add drawing no. 50-4-4892	Sep 1977
Exhibit F	Add copy of letter of acceptance dated 18 Aug 1976	Sep 1977
1-05	Add subparagraph m.	Oct 1984
Exhibit B	Add drawing no. 50-4-5602	Oct 1984
Exhibit F	Add copy of letter of transfer dated 15 May 1984	Oct 1984
1-05	Add subparagraph n	Nov 2010
Exhibit B	Add Plan Sheets G-1, C-1 to C-7 (8 sheets)	Nov 2010
Exhibit F	Add copy of letter of transfer dated 9 Nov 1961	3 Feb 2011
Exhibit F	Add copy of letter of transfer dated 10 Dec 1963	3 Feb 2011
Exhibit F	Add copy of letter of transfer dated 29 Nov 1965	3 Feb 2011
Exhibit F	Add copy of letter of transfer dated 6 Aug 1969	3 Feb 2011
Exhibit F	Add copy of letter of transfer dated 9 Dec 1969	3 Feb 2011

LOCATION	ADDITION OR REVISION	DATE
Exhibit F	Add copy of letter of transfer dated 23 Nov 1970	3 Feb 2011
Exhibit F	Add copy of letter of transfer dated 4 Jan 1984	3 Feb 2011
1-05	Changed subparagraph i to h (mis-numbered); renumbered subsequent paragraphs (i – n changed to h – m)	11 May 2011
Exhibit F	Add copy of letter of transfer dated 24 Nov 2010	11 May 2011

DISPOSITION FORM

(AR 340-15)

OFFICE SYMBOL OR FILE REFERENCE

SPKGD-L

SUBJECT Sacramento River and Major and Minor Tributaries Project, California - Operation and Maintenance Manual for Elder Creek

TO Chief, Constr-Opns Div

FROM Chief, Engineering Div

DATE 16 April 1963

CMT 1

Jensen/od/3333 *MAA*

1. Forwarded herewith for your records is one copy of an operation and maintenance manual, entitled, "Elder Creek from Sacramento River to High Ground."
2. Copies of the subject manual have been furnished the Division Engineer, the State Reclamation Board and the State Department of Water Resources.

1 Incl
O&M Manual

cc: Levees & Channels

for  *E.G.*
A. GOMEZ
Acting Chief, Engineering Division

jsy

POSITION FORM

(AR 340-15)

SYMBOL

SUBJECT

Sacramento River and Major and Minor Tributaries Project - Additions to Operation and Maintenance Manuals

TO Chief, Constn-Opns Div

FROM Chief, Engr Div

DATE 4 Nov 1964 ^{CMT 1}
Jensen/ek/3333

1. Forwarded herewith for your records are copies of additions to the operation and maintenance manuals for Elder Creek and Deer Creek, Sacramento River and Major Tributaries Project. These additions cover more recent construction work since initial issuance of the manuals and should be attached to your copies of respective manuals.

Copies of these additions have been furnished the Division Engineer, the Reclamation Board and the State Department of Water Resources.

1 Incl (in dupe)
Copies of Additions

cc: Design
Levees

A. Gomez
A. GOMEZ
Chief, Engineering Division

CORPS OF ENGINEERS

U. S. ARMY

OPERATION AND MAINTENANCE MANUAL
FOR
ELDER CREEK
FROM SACRAMENTO RIVER TO HIGH GROUND
SACRAMENTO RIVER AND MAJOR AND MINOR TRIBUTARIES
PROJECT, CALIFORNIA

Sacramento District
Corps of Engineers
U. S. Army
April 1963

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F	Letter of Acceptance by the State Reclamation Board.....	1 Sheet
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OPERATION AND MAINTENANCE MANUAL

FOR

ELDER CREEK
FROM SACRAMENTO RIVER TO HIGH GROUNDS
SACRAMENTO RIVER AND MAJOR AND MINOR TRIBUTARIES
PROJECT, CALIFORNIA

SECTION I

INTRODUCTION

1-01. Authorization. The Elder Creek Channel Improvement and Levee Construction unit of work was authorized as a part of the Sacramento River and Major and Minor Tributaries Project, California, by the Flood Control Act of 22 December 1944, Public Law 534, Seventy-eighth Congress, Second Session, Section 10 which reads in part as follows:

"Sacramento-San Joaquin River Basin - Sacramento River - the projects for the control of floods and other purposes on the Sacramento River, California, adopted by the Acts approved March 1, 1917, May 15, 1928, August 26, 1937 and August 18, 1941, are hereby modified substantially in accordance with the recommendations of the Chief of Engineers in House Document 649, Seventy-eighth Congress, Second Session - - - -"

The Elder Creek unit of work is one of the proposed improvements included in item c, paragraph 6, of the Chief of Engineers' recommendation to the Secretary of the Army in House Document No. 649. The proposed plan for construction is substantially the same as described in the report of the Sacramento District Engineer, dated 15 January 1944 (page 36, paragraph 59, item b, HD 649 - 78th Congress - 2nd Session); as listed in unpublished Table VI of above report; and as described in unpublished Table VI and Appendix A of above report with the exception that the design flow was increased from 14,000 c.f.s. to 17,000 c.f.s. Paragraph 101, Section I-Elder Creek, Appendix A, states in part:

"101 Proposed Improvement - The proposed improvement would consist of approximately 4 miles of new levees along Elder Creek from a point located about one mile west of U. S. Highway 99-W to the overflow area of Sacramento River. The capacity of the leveed channel with a 3-foot freeboard would be about 14,000 c.f.s. . . ."

Authorizing legislation by the State of California is contained in Section 12648 of the State Water Code and was enacted in Section 31, Chapter 1514, California Statutes of 1945.

1-02. Location. The Elder Creek levees and channel improvement project lies in the Sacramento Valley in Tehama County, California and adjacent to the town of Gerber. The work begins at the junction of Elder creek with the Sacramento River where the channel was cleared upstream for a distance of about 1-1/4 miles; thence continues upstream in a westerly direction with levees and channel improvement for a length of about 4.1 miles to high ground. The project location is indicated on the vicinity map of EXHIBIT A-1.

1-03. Description of the Project Works. The project works covered by this manual include the following:

- a. The cleared channel of Elder Creek from the Sacramento River upstream about 1-1/4 miles to the flood plain on the westerly side of the Sacramento River.
- b. The levees along both banks of Elder Creek and the improved channel from the flood plain on the westerly side of the Sacramento River upstream about 4.1 miles to high ground.
- c. Intermittent irrigation and drainage structures and intermittent bank protection along the above described levees.

1-04. Protection Provided. The project provides flood protection to the town of Gerber, consisting of about 150 houses and other related buildings; about 4,000 acres of adjacent agricultural lands; and to several highways and a railroad line which crosses the flood plain. The project design flow for Elder Creek is 17,000 cubic feet per second. For the project design levee grade at least 3 feet of freeboard has been provided over the project design flood plane. The grade of the adopted flood plane profile for Elder creek varies from elevation 225.0 feet at the lower end to elevation 278.2 feet at the upper end of the project. All the elevations are referred to U.S. Corps of Engineers datum.

1-05. Construction Data and Contractor. Construction required by the Corps of Engineers to bring levees of Elder Creek to project Standards and to improve the channel was accomplished under the following contracts:

- a. Emergency levee repairs on Elder Creek were performed under Contract No. DA-04-167-CIVENG-56-160 by C.S. Phillips Construction Company during the period from 12 March 1956 to 21 April 1956.
- b. Emergency levee repairs on the right and left banks of Elder Creek were accomplished under Contract No. DA-04-167-CIVENG-59-1 by W.E. Baker, contractor, during the period from 17 July 1958 to 16 August 1958.
- c. Levee construction channel improvement on Elder Creek from the Sacramento River to high ground was accomplished under Contract No. DA-04-167-CIVENG-61-24 by the Case-Hood Construction Company during the period from 7 September 1960 to 11 October 1961. Drawing No. 50-4-3622.

d. Emergency levee repairs on the right bank of Elder Creek were accomplished under Contract No. DA-04-167-CIVENG-63-78 by Claude L. Youngs, Inc. during the period from 25 June 1963 to 20 July 1963, Specification No. 2992, Drawing No. 50-4-3746.

e. Bank protection on the right bank of Elder Creek (Contract No. 7) was placed under Contract No. DA-04-167-CIVENG-64-33 by H. Earl Parker, Inc. during the period from 12 September 1963 to 10 December 1963, Specification No. 2985, Drawing No. 4-4-542.

f. Emergency levee repairs on the right and left banks of Elder Creek were accomplished under Contract No. DA-04-167-CIVENG-65-93 by Elmer G. Wendt, Inc. during the period from 16 March 1965 to 13 May 1965, Specification No. 3230, Drawing No. 50-4-4076.

g. Bank protection on the right and left banks of Elder Creek was accomplished under Contract No. DA-04-167-CIVENG-66-28 by A. Teichert & Son, Inc. during the period from 19 August 1965 to 10 December 1965, Specification No. 3283, Drawing No. 50-4-4118 (Contract No. 14).

h. Emergency rock revetment work at four sites along the left and right banks of Elder Creek was accomplished under Contract No. DACW05-70-C-0014 by Carl J. Woods during the period from 15 August 1969 to 26 November 1969. Specification No. 3668, Drawing No. 50-4-4490. This work was performed under PI 99 authorized by the Flood Control Act of 28 June 1955, 84th Congress First Session.

i. Stone protection on Elder Creek at Site Mile 0.75, 0.83 and 1.56 left bank and Site Mile 1.01 right bank (a portion of Unit 13, Sacramento River Bank Protection Project) was accomplished under Contract No. DACW05-68-C-0067 by H. Earl Parker during the period from 17 April 1968 to 29 August 1969. Specification No. 3369, Drawing No. 50-4-4179.

j. Bank protection at three locations on Elder Creek, right bank levee miles 0.20 and 1.35 and left bank levee mile 0.50. Work was accomplished under Contract No. DA-05-70-0088 by H. Earl Parker, Inc. during the period from 19 May 1970 to 24 September 1970. Specification No. 3426, Drawing No. 50-4-4377.

k. Bank protection and selective clearing on the left and right banks of Elder Creek, Site Miles 2.09 Right and 3.83 Left (Unit No. 27) was accomplished under Contract No. DACW05-75-C-0085 by Luhr Bros. Inc. during the period from 21 July 1975 to 15 October 1976. Specification No. 4461, Drawing No. 50-4-4892.

l. Emergency repairs to project levees on Elder Creek right bank levee, Tehama County, were accomplished under Contract No. DACW05-84-C-0042 by Roderick. Specification No. 6879/6896 Drawing No. 50-4-5602.

m. PL 84-99 rehabilitation repair on the left bank levee of Elder Creek, under Contract No. W91238-08-D-0016 (Task Order No. 0001) by Santos Excavating, Inc., was completed on September 9, 2008. Specifications: P.L. 84-99 Levee Rehabilitation Repairs.

Drawings: “PL 84-99 Levee Rehabilitation Repairs, CY2007 Order 3-5 Sites, Elder and Deer Creeks”, as-built drawings.

TABLE 1: ELDER CREEK

SITE	COORDINATES (NAD 83)				SITE LENGTH (FT)
	(N)	(W)	(N)	(W)	
001	40.05506,	-122.12766	to 40.05484,	-122.12737	110
Road Repair	40.05541,	-122.12797	to 40.05527,	-122.12779	71

1-06. Flood Flows. For purposes of this manual, the term “Flood” or “high water period” for Elder Creek within this project shall refer flows when the water surface in the creek reaches or exceeds the reading of 15.0 on the U.S.G.S. gage located on the right bank of Elder Creek one mile west of Gerber and 3.5 miles upstream from the junction of Elder Creek and the Sacramento River.

SECTION II

LOCAL COOPERATION REQUIREMENTS

2-01. Requirements of Local Cooperation. House Document No. 649, Seventy-eighth Congress, Second Session, requires local interests to (a) provide without cost to the United States all lands, easements, and rights-of-way necessary for the construction of the levees and channel improvements; (b) hold and save the United States free from damages due to construction of the levees and channel improvements; and (c) maintain and operate all levees and channel improvements after completion in accordance with regulations prescribed by the Secretary of the Army. The State of California by legislation amended in 1955 has agreed to furnish the required cooperation.

2-02. Assurances Provided by Local Interests. Section 12657 of the State Water Code states:

"12657. Except as otherwise provided in Chapters 1 and 2 of this part, the Reclamation Board shall give assurances satisfactory to the Secretary of War that local cooperation required by Section 3 of the Act of Congress approved December 22, 1944 (Public, numbered 534, Seventy-eighth Congress, Second Session), and Section 2 of the Act of Congress approved August 18, 1941, (Public, numbered 228, Seventy-eighth Congress, First Session), will be furnished by the State in connection with the flood control projects authorized and adopted in Sections 12648, 12650, 12651, 12652, 12654 and 12656.5 and on any flood control projects on any stream flowing into or in the Sacramento Valley or the San Joaquin Valley hereafter approved and authorized by Congress."

2-03. Acceptance by the State Reclamation Board. Responsibility for operating and maintaining the levees and channel of Elder Creek was officially accepted by the Reclamation Board of the State of California by letter dated 27 November 1961, see EXHIBIT F.

SECTION III

MAINTENANCE AND OPERATION - GENERAL PROCEDURE

3-01. Reference to Approved Regulations. This manual is submitted in accordance with provisions of Title 33 - Navigation and Navigable Waters, Chapter II, Corps of Engineers, Department of the Army, Part 208 - Flood Control Regulations, Maintenance and Operation of Flood Control Works, as of 1 January 1962, a copy of which is included as Exhibit A, Sheets 1 and 2.

3-02. Intent of Regulations. The general intent of the regulations approved by the Secretary of the Army is stated in paragraph 208.10(a)(1) as follows: "The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits."

The principle mission of the Corps of Engineers, during flood emergencies, is to insure that flood control works are properly operated and maintained and offer technical advice to enable local interests to obtain maximum flood protection. All other matters become secondary and will yield precedence to the accomplishment of the above-stated missions. During flood periods local interests maintain close liaison with the office of the District Engineer, Corps of Engineers. However, in the event it is evident that all available county and local resources are insufficient to cope with the situation and the necessity for an emergency proclamation is anticipated, requests for State assistance in flood fighting should properly be made direct to the Division of Water Resources, which is the State agency designated by the Directors of Public Works, to receive requests from local agencies for assistance in flood fighting. This agency is authorized to request Federal assistance from the Corps of Engineers when State and local resources are insufficient to cope with the situation. Therefore, it is desired to emphasize that requests for Federal assistance in flood fighting should be made only when it is evident that County, State and/or other local equipment and manpower will be exhausted and local resources are insufficient to cope with the flood emergency situation.

3-03. Purpose of this Manual. In view of the large number of local flood protection projects authorized by Congress and the repetitious nature of regulations to govern maintenance and operation of each individual project, and in order that local interests may be fully aware of the extent of the obligations assumed by them in furnishing assurances of local cooperation for projects to be constructed in the future, the general regulations described above were established by the Secretary of the Army. The general regulations approved by the Secretary of the Army, August 1944, were intended to be sufficiently broad in scope and general in nature as to be applicable to all flood-protect-projects for which such regulations are required by law.

Section 208.10(a)(10) of the regulations read as follows: "The Department of the Army will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under this part." This manual has, therefore, been prepared to furnish local interests with information on the project works and advise as to the details of the operation and maintenance requirements applicable to this particular project, to state procedure required by the Department of the Army, and to indicate satisfactory methods of flood-fighting operations and emergency repairs. The project works are to be maintained and operated in accordance with the Flood Control Regulations referred to above and interpretations thereof contained herein.

3-04. Definitions. As used hereinafter, the term "Superintendent" shall be defined to mean the person appointed by the local agency to be directly in charge of an organization which will be fully responsible for the continuous operation and inspection of the project works; the term "District Engineer" shall be defined to mean the District Engineer of the U. S. Army Engineer District, Sacramento, or his authorized representative. The term "flood" shall mean any flow in Elder Creek when the water surface reaches or exceeds the reading of 18.0 on the U.S.G.S. gaging station located on the right bank about one mile upstream from Gerber. The term "right bank" or "left bank" shall be defined to mean the right or left bank or side, respectively, of a stream or channel when facing downstream.

3-05. General Provisions of Regulation. In addition to that quoted in paragraph 3-02 above, the general provisions of the Flood Control Regulations, contained in paragraphs 208.10(a)(2), to 208.10(a)(9), both inclusive, are quoted as follows:

- "(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with regulations prescribed by the Secretary of the Army, as required by law, shall appoint a permanent committee consisting of, or headed by an official hereinafter called the "Superintendent", who shall be responsible for the development and maintenance of, and directly in charge of an organization responsible for the efficient operation and maintenance of all structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States.
- (3) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times.

- (4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the rights-of-way for the protective facilities.
- (5) No improvement shall be passed over, under or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any features of the works without prior determination by the District Engineer of the Department of the Army or his authorized representative that such improvements, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer, or, if otherwise obtained, shall be submitted for his approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the works.
- (6) It shall be the duty of the Superintendent to submit a semi-annual report to the District Engineer covering inspection, maintenance, and operation of the protective works.
- (7) The District Engineer or his authorized representative shall have access at all times to all portions of the protective works.
- (8) Maintenance measures or repairs which the District Engineer deems necessary, shall be promptly taken or made.
- (9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods."

3-06. Assistance to be Furnished by the District Engineer. The District Engineer will:

a. Furnish to local interests "As Constructed" drawings of the project works at the time they are transferred.

b. Make periodic inspections of the project works and notify local interests of any repairs or maintenance measures which the District Engineer deems necessary in addition to measures taken by the Superintendent.

c. Submit to the Office, Chief of Engineers, all cases of noncompliance with full details thereof for determination of corrective measures to be taken.

d. Make prior determination that any proposed encroachment, improvement, excavation, or construction within the right-of-way, or alteration of the project works, will not adversely affect the functioning of the protective facilities, and to furnish the Superintendent with an approval thereof in writing.

e. Assist local interests as may be practicable, in their duties of ascertaining storm developments having flood-producing potentialities, assembling flood-fighting forces and materials, and initiating and carrying out flood-fighting operations.

3-07. Responsibilities of the Superintendent. In line with the provisions of the Flood Control Regulations, the general duties of the Superintendent include the following:

a. Training of Key Personnel. Key personnel shall be trained in order that regular maintenance work may be performed efficiently and to insure that unexpected problems related to flood control may be handled in an expeditious and orderly manner. The Superintendent should have available the names, addresses, and telephone numbers of all his key men and a reasonable number of substitutes. These key men should, in turn, have similar data on all of the men who will assist them in the discharge of their duties. The organization of key men should include the following:

- (1) An assistant to act in the place of the Superintendent in case of his absence or indisposition.
- (2) Sector foremen in sufficient number to lead maintenance patrol work of the levee, inspect the channel, and operate the gate structures properly during flood periods. High qualities of leadership and responsibility are necessary for these positions.

b. Files and Records. The Superintendent shall maintain a file of reports, records, and drawings concerning the project works, readily available at all times to the District Engineer.

c. Encroachment or trespass on Right-of-Way. In accordance with the provisions of Flood Control Regulations 208.10(a)(4), no encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted on the rights-of-way for the protective facilities. The superintendent will, therefore, cause notices to be posted at conspicuous places along the project right-of-way directing public attention to this regulation. The Superintendent shall arrange for the prosecution of offenders under local ordinances and report action taken to the State Reclamation Board.

d. Permits for Right-of-Entry or Use of Portion of Right-of-Way. Permits for temporary right-of-entry or use of portion of the right-of-way shall not be issued without prior determination by the State Reclamation Board sufficiently in advance of issuance to permit adequate study and consideration and determination of conditions to be embodied in the permit document. Executed copies, in triplicate, of the permit document as issued shall be furnished the State Reclamation Board. See Exhibit G for sample permit of right-of-entry.

e. Permits for Improvements or Construction within the Project Right-of-Way. All requests for permits for construction of any improvements of any nature within the limits of the project right-of-way shall be referred to the District Engineer through the State Reclamation Board for determination that such construction will not adversely affect the stability, safety, and functioning of the protective facilities, and for definition of conditions under which permit should be granted. These conditions will include, among others, the following items:

- (1) That all work shall be performed:
 - (a) In accordance with standard engineering practice and in accordance with plans and specifications approved by the District Engineer or his authorized representative; drawings or prints of proposed improvements or alterations to the existing flood control works must be submitted for approval to the State Reclamation Board sufficiently in advance of the proposed construction to permit adequate study and consideration of the work.
 - (b) To the satisfaction of the District Engineer.
- (2) After completion of the work, "As Constructed" drawings or prints, in duplicate showing such improvements as finally constructed shall be furnished the District Engineer.

f. Coordination of Local Activities. In accordance with the provisions of Flood Control Regulations, paragraph 208.10(a)(9), the Superintendent will, during periods of flood flow, coordinate the functions of all agencies, both public and private, that are connected with the protective works. Arrangements shall be made with the local law enforcement agencies,

street departments, and railroad and utility companies for developing a coordinated flood-fighting program; and an outline of this program shall be filed with the District Engineer.

g. Inspection.

- (1) Flood Control Regulations, paragraph 208.10(b)(1), are quoted in part as follows:

"(b) Levees (1) Maintenance ... Periodic inspections shall be made by the Superintendent to insure that . . . maintenance measures are being effectively carried out . . . Such inspections shall be made immediately prior to the beginning of the flood season, immediately following each major high water period, and otherwise at intervals not exceeding 90 days and such intermediate times as may be necessary to insure the best possible care of the levee."

- (2) For sake of uniformity, and to the extent practicable, the dates of inspection shall be as follows: 1 November, 1 May, and immediately following each flood flow in excess of a reading of 15.0 on the U.S.G.S. gage located on the right bank of Elder Creek about one mile upstream from Gerber.

- (3) The suggested check lists and instructions shown in Exhibit E, Sheets 1 to 7 inclusive, are to be followed in each inspection to insure that no features of the protective system are overlooked. Check lists locally typed or printed in conformity with sheets 2, 4, and 6, shall have printed on the reverse side the applicable instructions shown on sheets 3, 5 and 7, Exhibit E. Carbon copy of the inspector's original field notes as recorded on the check list shall be transmitted to the District Engineer immediately following each inspection, and one copy included as an inclosure to the semiannual report as provided in paragraph 3-307(i)(1) of this manual.

h. Maintenance.

- (1) Flood Control Regulations, paragraph 208.10(b)(1) are quoted in part as follows:

"(b)(1) Maintenance. The Superintendent shall provide at all times such maintenance as may be required to

insure serviceability of the structures in time of flood. Measures shall be taken to . . . exterminate burrowing animals, and to provide for
. . . removal of wild growth and drift deposits, and repair of damage caused by erosion or other forces
. . . Immediate steps will be taken to correct dangerous conditions disclosed by such inspections. Regular maintenance repair measures shall be accomplished during the appropriate season as scheduled by the Superintendent."

- (2) Full responsibility for making the repairs and the methods used is placed on the Superintendent, but the experience and facilities of the District Engineer will be available to him for advice and consultation.
- (3) All repairs shall be made in accordance with standard engineering practice, to line and grade and in accordance with details shown on the construction drawings for the project works, copies of which are included in Exhibit B. No change or alteration shall be made in any feature of the project works without prior determination by the District Engineer that such alteration will not adversely affect the stability and functioning of the protective facilities. Plans and specifications of all changes or alterations that may be proposed by the Superintendent shall be submitted to the District Engineer for investigation and approval before prosecution of the work.

i. Reports.

- (1) Semi-Annual Report. In accordance with the provisions of the Flood Control Regulations, paragraph 208.10(a) (6), the State Department of Water Resources shall submit within a 10-day period following 1 December and 1 June of each year, a semi-annual report to the District Engineer covering inspection, maintenance, and operation of the protective works. This report will present a statement of:
 - (a) The physical conditions of the protective works as summarized from the logs of inspection.
 - (b) Flood behavior of the protective works, and flood-fighting activities during the period.
 - (c) Prosecutions for encroachment or trespass.

- (d) Permits issued for right-of-way or use of right-of-way.
- (e) Permits issued for improvements or construction within the project right-of-way.
- (f) Maintenance measures taken; nature, date of construction, and date of removal of temporary repairs; date of permanent repairs.
- (g) Fiscal statement of cost and maintenance and operation for the period.

A suggested form for submission of the semi-annual report is included as Exhibit D, Sheets 1 and 2.

3-08. Inspection Procedure. Since the enactment of State Legislation of Chapter 1528, Statutes of 1947, the Department of Water Resources, State of California, has made semi-annual inspections of all levees of authorized flood control projects in the Sacramento-San Joaquin drainage basin pursuant to the Federal Regulations as of 1 January 1962 (Title 33) and reports its findings to the local agency, the State Reclamation Board and the District Engineer of the U. S. Army Engineer District, Sacramento. This activity, initiated pursuant to Section 208.10(a) of the Federal Regulations, has in effect provided for transfer from the local agencies to the State Department of Water Resources the obligation of compliance with Sections 8371, 8372, and 8373 of the Water Code of the State of California. These sections of the Code require the local responsible agencies to submit a report to the State Department of Water Resources on or before 1 June of each year on the condition of the levees and channels within their jurisdiction. Supervisory powers and duties of the Department are applicable to all works of the authorized projects maintained and operated by the local agencies without regard to status of completion, or expenditure of Federal funds on the construction of such works.

The following procedure is used in inspecting the levees of the responsible maintaining agency:

Personnel of the State Department of Water Resources make a detailed inspection of the levees in the spring and fall of each year and note any required maintenance. The levee inspection objectives are to determine if the following items, which are a condensation of Federal Regulations, are being adhered to:

- (a) That all brush, trees and wild growth other than sod are removed from the levee crown and slopes.
- (b) That all weeds, grass and debris on the levee have been burned during the appropriate season, where not dangerous or impractical.

(c) That all grass and weeds on the levee have been mowed where removal by burning is dangerous or impracticable. This applies only on peat levees or where burning would constitute a hazard to improvement.

(d) That all burrowing animals have been exterminated.

(e) That all caves, slough, burrows, holes, slips, or other damaged portions of the levee have been repaired.

(f) That all irrigation and drainage structures through the levees are in good working condition.

(g) That no revetment work or riprap have been displaced, washed out or removed.

(h) That the crown of the levee is well shaped and maintained, and that unauthorized vehicular travel is restricted.

(i) That stock grazing on the levee is restricted to conditions and seasons when the levee would not be seriously scarred or otherwise damaged thereby.

(j) That encroachments are not being erected on the levee which would hinder travel by authorized patrol vehicles.

(k) Prevent the erection of structures on, additions to, or alterations of, the levee unless authorized by permit from the State Reclamation Board.

Following this detailed inspection, a joint field inspection is made with representatives of the responsible maintaining agency and the State Department of Water Resources to review and discuss the inspection report.

Upon completion of the fall inspection the State Department of Water Resources publishes an annual report entitled, "Status of Project Levee Maintenance" which indicates the degree of proficiency attained by each obligated local agency in providing required maintenance.

SECTION IV

FEATURES OF THE PROJECT SUBJECT TO FLOOD CONTROL REGULATIONS

4-01. Project Works. Construction along Elder Creek, as covered by this manual, consists of channel improvement from the Sacramento River to high ground and levees along both banks, stone protection at various places, and drainage structures from the flood plain on the westerly side of the Sacramento River upstream about 4.1 miles to high ground. For further details see the drawings of EXHIBIT B.

4-02. Levees.

a. Levees have been built along both banks of Elder Creek to adopted grade and section by new construction with a 12-foot crown width and side slopes of 1 on 3 waterside and 1 on 2 on the landside. The levee heights vary from a freeboard levee of about 3 feet to a maximum of 10 feet with an average of about 5.5 feet. In general, a minimum 30-foot waterside berm has been provided to ensure adequate protection to the levee toe. The patrol road surfacing consists of 4 inches of crushed mineral aggregate 10 feet in width. Access ramps, turnouts and turnarounds are also surfaced. For more complete detail of item included in construction of the above-mentioned levees, refer to the "As Constructed" drawings of EXHIBIT B. Regulations regarding inspection, maintenance and operation will be found in paragraphs 4-02b, 4-02c and 4-02d of this manual.

b. Inspection.

(1) Pertinent Requirements of the Code of Federal Regulations. Flood Control Regulations, paragraph 208.10 (b)(1), are quoted in part as follows:

"(b) Levees - (1) Maintenance . . . Periodic inspection shall be made by the Superintendent . . . to be certain that

(i) No unusual settlement, sloughing, or material loss of grade of levee cross section has taken place;

(ii) No caving has occurred on either the landside or the riverside of the levee which might affect the stability of the levee section;

(iii) No seepage, saturated areas, or sand boils are occurring.

- (iv) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged;
- (v) Drains through the levees and gates on said drains are in good working condition;
- (vi) No revetment work or riprap has been displaced, washed out, or removed;
- (vii) No action is being taken, such as burning grass and weeds, during inappropriate seasons, which will retard or destroy the growth of sod; (see Note (a) at end of subparagraph (1).
- (viii) Access roads to and on the levee are being properly maintained;
- (ix) Cattle guards and gates are in good condition;
- (x) Crown of levee is shaped so as to drain readily, and roadway thereon, if any, is well shaped and maintained;
- (xi) There is no unauthorized grazing or vehicular traffic on the levees;
- (xii) Encroachments are not being made on the levee right-of-way which might endanger the structure or hinder its proper and efficient functioning during times of emergency.

Such inspections shall be made immediately prior to beginning of the flood season; immediately following each major high water period, and otherwise at intervals not exceeding 90 days; and such intermediate times as may be necessary to insure the best possible care of the levee . . ."

Note (a)

Since the growth of sod on the slopes of the levees of this project is not practicable and as the nature of the levee growth warrants burning thereof to facilitate inspection, the provision of subparagraph b(1) of the regulations inconsistent therewith shall not apply. In place of item (vii), therefore, the following shall be observed:

Weeds, grasses and debris on the levee shall be burned during appropriate seasons, where not dangerous or impracticable, in order to permit the detection of cracks, holes, burrows, slips, and other damage and to permit the detection and extermination of burrowing animals and that grass and weeds on levee slopes be mowed where removal by burning is dangerous or impracticable, such as on peat levees or where burning would constitute a hazard.

- (2) To insure the taking of such maintenance measures as will be required for proper functioning of the levee, the following items shall be specifically covered in each inspection:
 - (a) Aggradation or degradation of the stream bed along the toe.
 - (b) Settlement of levee fill.
 - (c) Erosion of levee slopes; both sides of levees.
 - (d) Presence of seepage; saturated areas, or sand boils back of levee.
 - (e) Condition of access roads and roadway on levee.

c. Maintenance.

- (1) Repairs to Levee Embankment. Methods used for repair or reconstruction of the levee fill will depend on the extent of the damaged section. If of small extent, the most suitable method will be to bring the levee back to line and grade by a fill made in 6-inch layers of earth free from

brush, roots, sod or other unsuitable material. If of larger extent, the fill should be made in the same manner as the original construction, of selected material from borrow pits approved for the project, placed in uniform layers of loose material and not more than 6 inches in depth and compacted in accordance with the specifications under which the work was completed or compacted according to approved construction practices, the Superintendent shall provide at all times such maintenance as may be required to insure serviceability of the levees in time of flood.

- (2) Depredations of Burrowing Animals. Dens and runways formed within the levee by burrowing animals are frequently the causes of levee failures during flood stages. Burrowing animals such as muskrats, ground hogs, ground squirrels, moles and gophers, found in the levee should be exterminated. The dens and runways should be opened up and thoroughly compacted as they are back-filled. Levees kept properly cleared are not seriously menaced by burrowing animals as they prefer areas where a protective cover, such as high grass, weeds, and brush is found. Several methods of extermination are found effective, such as trapping, baiting, and poison gases, depending on the type of animal present and the time of year the work is done. Advice concerning the best methods in each locality can be obtained from the County Agricultural Agent.
- (3) Access Roads. Access roads to the levees shall be maintained in such condition that they will be accessible at all times to trucks used to transport equipment and supplies for maintenance of flood fighting.

d. Operation.

- (1) Pertinent Requirements of the Code of Federal Regulations. Flood Control Regulations, Par. 208.10 (b)(2) are quoted in part as follows:

"(2) Operation. During flood periods, the levee shall be patrolled continuously to locate possible sand boils or unusual wetness of the landward slope to be certain that:

- (i) There are no indications of slides or sloughs developing;
- (ii) Wave wash or scouring action is not occurring;
- (iii) No low reaches of levee exist which may be overtopped;
- (iv) No other conditions exist which might endanger the structures.

Appropriate advance measures will be taken to insure the availability of adequate labor and materials to meet all contingencies. Immediate steps will be taken to control any condition which endangers the levee and to repair the damaged section."

- (2) It shall be the duty of the local agency responsible for maintenance to keep in contact with the State Department of Water Resources' Flood Operation Center during all periods of flood danger as necessary to take advantage of its forecasts and maintain a patrol of the project works in their area during periods of flood in excess of reading of 15.0 on the gage located on the right bank of Elder Creek about one mile upstream from Gerber, as referred to in paragraph 1-06 of this manual.

The Flood Operations Center is responsible for data collection and issuance of a joint stream forecast with the U. S. Weather Bureau and coordinates with the Sacramento District Engineer, and other agencies to keep appraised of the current situation in accordance with terms of the memorandum of Understanding dated 1 November 1956, between the Division Engineer, U. S. Army Engineer Division, South Pacific, and the Director, Department of Water Resources, State of California, for cooperative action during flood emergencies.

4-03. Channels and Floodways.

a. Description. The channel of this project extends from the Sacramento River upstream along Elder Creek a distance of about 5.4 miles. Channel improvement consisted mostly of clearing between levees or banks and channel enlargement from degrading and borrowing operations. Regulations

regarding inspection, maintenance, and operation of channels and floodways will be found in paragraphs 4-03b, c and d of this manual.

b. Inspection.

- (1) Pertinent Requirements of the Code of Federal Regulations. Flood Control Regulations, Para. 208.10(g) (1) are quoted in part as follows:

"(g) Channels and floodways . . . (1) Maintenance. Periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that:

- (i) The channel or floodway is clear of debris, weeds, and wild growth;
- (ii) The channel or floodway is not being restricted by the depositing of waste materials, building of unauthorized structures or other encroachments;
- (iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;
- (iv) Banks are not being damaged by rain or wave wash, and that no sloughing of banks has occurred;
- (v) Riprap sections and deflection dikes and walls are in good condition;
- (vi) Approach and egress channels adjacent to the improved channel or floodway are sufficiently clear of obstructions and debris to permit proper functioning of the project works.

Such inspections shall be made prior to the beginning of the flood season and otherwise at intervals not to exceed 90 days. Immediate steps will be taken to remedy and adverse conditions disclosed by such inspections . . ."

- (2) The purpose of the flood-flow channels inspection is to insure that conditions which affect the channel capacity will remain the same, as far as

possible, as those considered in the design assumptions and that no new conditions develop that may affect the stability of the project structures. At each inspection required by Par. 208.10 (g(1) of the Flood Control Regulations, particular attention will, therefore, be given the following:

- (a) Location, extent and size of vegetal growth.
- (b) Unauthorized operations within the flood-flow channel right-of-way, such as excavations, buildings and other structures, levees, bank protection, or training dikes.
- (c) Rubbish and industrial waste disposal.
- (d) Changes in the channel bed such as aggradation or degradation, which would interfere with free-flow from side drainage structures or induce local meanders that would scour the banks.
- (e) Operations of any nature upstream from the project that would affect flow conditions within the limits of the flood control project.
- (f) Condition of project structure.
 - 1. Channel walls;
 - a. Deviation from alignment and grade.
 - b. Development of cracks and spalls.
 - c. Mechanical injuries.
 - 2. Fencing.
 - a. Injuries to post, fencing or barbed wire.
 - b. Damage to galvanizing.
 - 3. Earth fills:
 - a. Settlement.
 - b. Erosion of both slopes.

c. Excessive seepage or saturation area back of fills.

d. Condition of bank protection - concrete or stone blanket.

4. Right-of-way:

a. Presence of dumped refuse.

b. Encroachment or trespass.

(3) No excavation within the limits of this unit of the Elder Creek Project will be permitted unless an excavation permit has been approved by the State Reclamation Board.

(4) If any work is done to improve flow conditions in Elder Creek Project will be permitted unless an excavation permit has been approved by the State Reclamation Board

(5) The intent of these inspections is to disclose all conditions which in any way affect the stability of the structures and their functioning for the control of floods. Each inspection report should note and comment on any repair measures that have been taken since the last inspection. In making these inspections, the check sheets included as Exhibit E shall be explicitly followed.

c. Maintenance.

(1) Pertinent Requirements of the Code of Federal Regulations. Flood Control Regulations, Par. 208.10(g)(1) are quoted in part as follows:

". . . . Immediate steps will be taken to remedy any adverse conditions disclosed by such inspection"

(2) Shoaling or aggradation at the inlets or outlets of side drainage structures may render them inoperative. It is, therefore, imperative that all drains be kept open and unobstructed at all times.

(3) Dumped rock of other suitable types of protection should be placed at locations found by experience to be critical trouble points, with a view to stabilizing the channel alignment and preserving the general uniformity of the bank lines.

- (4) Sediment and debris plugs or other obstructions should be removed from the channel to prevent any tendency for the flows to be deflected within the channel. The heavy material likely to accumulate in the new channel at the mouths of tributaries should be removed to keep the channel clear.
- (5) The channel and right-of-way shall be kept reasonably clear of debris, refuse matter, or industrial wastes.
- (6) Weeds and other vegetal growth in the channel shall be cut in advance of flood season and together with all debris, removed from the channel.
- (7) All eroded concrete shall be repaired as soon as any reinforcing steel is exposed or erosion approaches a depth of 4 inches. For this purpose, it is recommended that the repair be made by thoroughly cleaning the surface by sandblasting and building up the section with pneumatically placed Portland cement mortar. All evidence of settlement, uplift, or failure of concrete structures shall be referred to the State Department of Water Resources for analysis and remedial measures.
- (8) All damage to fencing, whether resulting from accidental or willful injuries or from corrosion, shall be promptly repaired with new material in order to maintain satisfactory protection to the public.

d. Operation.

- (1) Pertinent Requirements of the Code of Federal Regulations, Par. 208.10(g)(2) are quoted in part as follows:

"(g) Channels and floodways . . . (2) Operation. Both banks of the channel shall be patrolled during periods of high water Appropriate measures shall be taken to prevent the formation of jams of debris. Large objects which become lodged against the bank shall be removed. The improved channel or floodway shall be thoroughly inspected immediately following each major high water period. As soon as practicable thereafter all snags and other debris shall be removed and all damage to . . . walls, drainage outlets or other flood control structures repaired."

4-04. Drainage and Irrigation Structures.

a. Description. Drainage and irrigation structures which extend through the levees are listed as follows:

DRAINAGE AND IRRIGATION STRUCTURES

Levee Mile	Size of Pipe	Other Description	Feet Below Crown
<u>UNIT NO. 1 - LEFT BANK OF ELDER CREEK</u>			
0.26	24"	Flap-gate Waterside	4.8
0.39	24"	" " "	4.6
0.52	24"	" " "	5.6
0.65	2-36"	" " "	8.6
0.76	24"	" " "	5.8
0.93	24"	" " "	5.0
1.10	24"	" " "	5.8
1.12	24"	" " "	5.1
1.30	24"	" " "	5.0
1.57	24"	" " "	5.8
1.70	3'36"	" " "	7.3
2.01	2-36"	" " "	7.6
2.24	24"	" " "	5.9
<u>UNIT NO. 2 - RIGHT BANK OF ELDER CREEK</u>			
0.11	24"	Flap-gate Waterside	5.4
0.51	24"	" " "	5.2

NOTE: All pipes through levees are corrugated metal.

b. Inspection.

(1) Pertinent Requirements of the Code of Federal Regulation. Flood Control Regulations, paragraph 208.10 (d)(1), are quoted in part as follows:

"(d) Drainage Structures (1) Maintenance - Adequate measures shall be taken to insure that inlet and outlet channels are kept open and that trash, drift, or debris is not allowed to accumulate near drainage structures. Flap gates and manually operated gates and valves on drainage structures shall be examined, oiled and trial operated at least once every 90 days Periodic inspections shall be made by the Superintendent to be certain that:

(i) Pipes, gates, operating mechanism, riprap and headwalls are in good condition;

(ii) Inlet and outlet channels are open;

(iii) Care is being exercised to prevent the accumulation of trash and debris near the structures and that no fires are being built near bituminous coated pipes:

(iv) Erosion is not occurring adjacent to the structure which might endanger its water tightness or stability. Immediate steps will be taken to repair damage, replace missing or broken parts, or remedy adverse conditions disclosed by such inspections."

(2) At each inspection the following items, if applicable, shall be particularly noted:

(a) Debris or other obstructions to flow.

(b) Condition of pipes and gates.

(c) Damage or settlement of pipe.

(d) Condition of concrete-cracks, spalls, erosion.

c. Maintenance.

- (1) All eroded concrete shall be repaired as soon as erosion reaches a depth of 4 inches or any reinforcing steel is exposed. For this purpose it is recommended that the repair be made by thoroughly cleaning the surface by sandblasting and building up the concrete to its original section with pneumatically-placed Portland cement mortar. All evidences of settlement, uplift, or failure of concrete structures should be referred to the State Engineer for analysis and recommendation of remedial measures.
- (2) If the inspection shows that the automatic drainage structures have been jammed in an open position by debris or other obstructions, they shall be thoroughly cleaned so that they swing freely to a true closure. If any parts of the gates have been damaged or broken, they shall be replaced by new parts.
- (3) Compliance with the provisions prescribed above pertaining to drainage structures is essential for proper maintenance of the levee system covered by this manual. Levee failures caused by neglected drainage structures are of common occurrence; it is, therefore, of utmost importance that these structures always be kept in perfect working condition in accordance with the regulations.
- (4) Care should be taken not to bury any of the side drainage inlets in the event that it becomes necessary to fill any of the low-lying pockets in back of the levee. Plans for the maintenance of drainage facilities at any such points should be submitted to the State Reclamation Board for approval before such work is started.

d. Operation.

- (1) Pertinent Regulations of the Code of Federal Regulations. Flood Control Regulations, paragraph 208.10(d)(2) are quoted in part as follows:
 - "(2) Operation. Whenever high water conditions impend, all gates will be inspected a short time before water reaches the invert of the pipe and objects which might prevent closure

of the gate shall be removed. Automatic gates shall be closely observed until it has been ascertained that they are securely closed..... All drainage structures in the levee shall be inspected frequently during floods to ascertain whether seepage is taking place along the lines of their contact with the embankment. Immediate steps shall be taken to correct any adverse conditions."

- (2) The outlets of side drainage structures inundate at relatively low river stages. They should, therefore, be inspected at the first sign of a rise in the river to make certain that the gates are not jammed in an open position and thus allow flood waters to enter behind the levee.

4-05. Miscellaneous Facilities.

a. Description. Miscellaneous structures or facilities which were constructed as a part of, or existed in conjunction with, the protective works, and which might affect their functioning, include the following:

- (1) Bridges.

- (a) The Santa Benito Avenue Bridge crossing Elder Creek at Gerber.
- (b) The Southern Pacific Railroad Bridge crossing Elder Creek at Gerber.
- (c) U. S. Highway No. 99W Bridge across Elder Creek.

- (2) Utility Relocations. Because of the nature of the construction of the levee by local interest, records of utility relocations are not available.

- (3) Hydrologic Facilities. A continuous water stage recorder and staff gage located on the right bank of Elder Creek about one mile upstream from Gerber. This station to be maintained by the U. S. Geologic Survey.

b. Inspection and Maintenance.

- (1) Pertinent Requirements of the Code of Federal Regulations. Flood Control Regulations, paragraph 208.10(h)(1) are quoted in part as follows:

- (3) Hydrologic facilities. A continuous water stage recorder and staff gage located on the right bank of Elder Creek about one mile upstream from Gerber. This station to be operated and maintained by the Department of Water Resources, State of California.

see revised (3) below *

*

"(h) Miscellaneous Facilities. (1) Maintenance. Miscellaneous structures and facilities constructed as a part of the protective works and other structures and facilities which function as a part of, or affect the efficient functioning of the protective works, shall be periodically inspected by the Superintendent and appropriate maintenance measures taken. Damaged or unserviceable parts shall be replaced without delay"

- (2) Inspection of the miscellaneous facilities shall be made at the same time that the inspection of the other features of the project are made, and shall be reported on check list No. 3, sheet No. 4 of EXHIBIT E.
- (3) The interest of the Corps of Engineers and the responsibility of the local interests in the existing highway and railroad bridges is confined to their effect on the safety and functioning of the flood control channel, but any conditions noted in the inspections that may affect them in any way should, as a matter of courtesy, be brought to the attention of the agencies maintaining and operating them. If the inspection of any miscellaneous structure, either existent or constructed in the future under permit, discloses any condition that indicates the probability of failure during periods of high water, the Superintendent shall address a letter to the owner of the structure, quoting this manual as authority and inviting attention to the conditions observed and requesting that immediate steps be taken to correct them. A copy of such letter shall be forwarded to the District Engineer for his information. A report on the action taken by the owner shall be submitted to the District Engineer to accompany the next semi-annual report. A suggested report form is included as EXHIBIT D of this manual.
- (4) The purpose of maintenance work is to insure continuous satisfactory operation of equipment. It is, therefore, important in such work that all possible causes of future trouble be found and corrected. Particular attention should be given to minor weaknesses which may be an indication of future trouble.

- c. Operation. Requirements of the Code of Federal Regulations. Flood Control Regulations, paragraph 208.10(h)(2) is quoted as follows:

"(2) Operation. Miscellaneous facilities shall be operated to prevent or reduce flooding during periods of high water. Those facilities constructed as a part of the protective works shall not be used for purposes other than flood protection without approval of the District Engineer unless designed therefor."

4-06. Environment Protection.

- a. Vegetation preserved as a part of selective clearing on the waterside berm or slope above the bank protection during prosecution of the contract shall not be removed as a part of normal maintenance. *
Dead trees with wildlife value will be retained except where they constitute a hazard to existing flood control works.

SECTION V

SUGGESTED METHODS OF COMBATING FLOOD CONDITIONS

5-01. Methods Suggested. Most of the methods described herein have been developed during years of experience with the various problems that often come up during periods of high water, and they are not intended to restrict the Superintendent, or others concerned, to a rigid set of rules for every condition that may arise. The remarks are primarily concerned with the earthen portions of the levee system. If problems not covered by these suggestions arise, where the Superintendent is in doubt as to the procedure to be taken, he will be expected to consult the State Department of Water Resources, and follow standard engineering practices in meeting the situation. It should be noted that it is much better to be over-prepared for a "flood-fight" than to find at the last moment that preparations were incomplete or unsatisfactory. Confidence of the protected persons and firms is a valuable asset that should not be carelessly lost through inefficient operation of the protection system in time of emergency.

5-02. Earthen Levees. An earthen levee is in danger whenever there is water against it. This danger is directly proportional to the height of the water, the duration of the flood stage, and the intensity of either the current or wave action. The danger is inversely proportional to the cross-sectional area of the levee, the levee's height, and the degree of maintenance. A well constructed levee of proper section should, if maintained and not overtopped, hold throughout any major flood. However, a serious accident may result in a break. Foundation troubles result in sand boils or a sinking levee, and the local use of unsatisfactory materials causes slides and sloughs. However, such threatened failures can be met if prompt action is taken and proper methods of treatment are used. Wave wash is to be expected whenever the levee is exposed to a wide stretch of open water and is serious if permitted to continue over a considerable length of time.

5-03. Premeditated Damage. Local interests should continually guard against premeditated damage to the levee. In the event of an extraordinary flood requiring a fight over long stretches of levee on both sides of the river, there is a natural temptation to relieve the strain by premeditated breaking of the opposite line.

5-04. Security. Personnel of the Corps of Engineers, whether military or civilian, are not vested with any civil police authority in the performance of their engineering duties, and they will not attempt to exercise any such authority. The responsibility for protecting flood control works against sabotage, acts of depredation or other unlawful acts rests with the local interests through local and State Governmental agencies.

5-05. Inspection of Flood Control Works. Immediately upon receipt of information that a high water is imminent, local interests responsible for maintenance should form a skeleton organization, capable of quick expansion, and assign individuals (Sector Foremen) to have charge of definite sections of levees. As his initial activity, each Sector Foreman should go over his entire sector and parts of adjacent sectors, making a detailed inspection, particularly with reference to the following matters:

- a. Sector limits; ascertain that the dividing line between sectors is plainly determined and, if necessary, marked.
- b. Condition of new levees and recent repairs.
- c. Condition of culverts, flap gates, and sluice gates.
- d. Transportation facilities; roads, rail and water communications.
- e. Material supply; quantity, location, and condition.
- f. Communications; locate and check all necessary telephones in the sector.

5-06. Preliminary Repair Work. After the initial inspection has been made, each Sector Foreman should recruit a labor crew and provide it with tools such as shovels, axes, wheelbarrows, etc. In addition, bulldozers, scrapers, trucks, etc. should be located and made ready for use in case of emergency. Then immediate action should be taken to perform the following work:

- a. Fill up holes or washes in the levee crown, slopes, and landside berms. Where new construction has been completed during the year, rain washes and deep gullies may have developed. While the levee is new, preparations should be made in advance to combat wave wash along the exposed reaches.
- b. Repair gaps where road crossings have been worn down and the levee is below grade. In filling the road crossings, it may be necessary to obtain material from landside borrow pits, in which case excavation for the material should be kept at least 50 feet from the toe of the levee. Any filling done in this connection should be tamped in place and, if in an exposed reach, subject to wave wash, the new section should be faced with bags of sand.
- c. Repair and close all flap gates on culverts and see that they are seated properly before they are covered with flood waters.

d. Ascertain that all roads to and along the levee are in a good state of repair. The Superintendent should obtain assistance from the county road forces to have all roads put in first-class condition.

e. Locate necessary tools and materials (sacks, sandbags, brush, lumber, lights, etc.), and distribute and store the same at points where active maintenance is anticipated.

f. Check and obtain repair of all telephone lines necessary for operation, obtain lists of all team forces, motorboats, motor cars, and truck transportation that can be made available.

g. Make thorough arrangements with reliable citizens of the community for the supply transportation, subsistence, and shelter for the necessary labor.

h. Communicate directly with owners of all stock pastured on the levee and direct that all stock be removed from the levee right-of-way. Cut all fences crossing the levee that do not have gates provided.

i. Investigate all drainage ditches on the landside of the levee and open these drains when obstructions exist. Prepare to cut the necessary seep drainage ditches; however, no attempt should be made to drain the levee slope until actual seepage takes place.

j. Remove all dynamite and explosives of any kind from the vicinity of the levee.

5-07. Disaster Relief. It is the responsibility of local, state, municipal authorities, supported by and/or working connection with the American Red Cross to adopt measures for the relief of flood disaster victims. Relief measures can be undertaken by the Department of the Army through its Army Area Commander under existing Army Regulations, but such measures will be undertaken only as a last resort, in extreme cases and under compelling circumstances where local resources are clearly inadequate to cope with the situation.

5-08 Flood Fight. After the above preliminary organization and precautions have been completed, the "flood fight" itself commences. The methods of combating various defects in the earthen levee described in the following paragraphs have been proved effective during many years of use by the War Department.

a. Drainage of slopes. This work can be done economically while awaiting developments and will serve to make the levees more efficient. Crews should be organized to cut seep drains at all places on the levee

and berm when seepage appears. The drains should be V-shaped, no deeper than necessary, and never more than 6" deep. Care must be taken not to cut the sod unnecessarily. In all instances, drains should be cut straight down the levee slope or nearly so. Near the toe of the slope the small drains should be Y'd together and led into larger drains, which, in general, should lead straight across the landside berm into the landside pits or nearest natural or artificial drain.

b. Sand Boils. These danger spots are serious if discharging material. The common method of controlling sand boils consists of walling up a watertight sack ring around the boil up to a height necessary to reduce the velocity of flow to a point at which material is no longer discharged from the boil. See Exhibit "C" Plate 1. The sack ring around the boil should be large enough to protect the defective area immediately surrounding the boil. If several boils of sufficient force to displace sand are observed a sack sublevee may be built around the entire nest of boils, rising to such a height that none of the boils will discharge with enough force to displace sand.

c. Wave Wash. The Supervisor for local interests and Sector Foremen should study the levee beforehand to determine the possibility of wave wash. All such reaches will be located well in advance and for use in emergency, a reserve supply of filled sacks and rolls of cotton bagging will be kept on board flats. If the slope is well sodded, a storm of an hour's duration should cause very little damage. During periods of high wind and high water, ample labor should stand by and experienced personnel should observe where the washouts are beginning by sounding or by actually wading along the submerged slope. Sections of cotton bagging should be placed over the washed areas, as shown on Exhibit "C", Plate 3. As an alternative, filling sacks should be placed in the cut in an effective manner and as soon as possible. The filled sacks should be laid in sections of sufficient length to give protection well above the anticipated rise. Bagging so laid must be thoroughly weighted down to be effective. Plate 2, Exhibit "C" shows a movable type of wave wash protection, also used with good results. Its advantage is that it can be rapidly built at any convenient place and easily set in place on the job.

d. Scours. A careful observation should be made of the river-side of the levee at all localities where a current of more than two feet per second is observed, or where profiles show a high water slope of two feet per mile or greater. Trouble may be looked for at the ends of old levee dikes, road-crossing ramps, old traverses, and places where pipes, sewers and other structures penetrate the levee. If any sign of scour is observed in the pits or at the ends of the dikes, soundings should be taken to observe the amount and progress of the scour. The approved method of construction to check scour in the pits, on the slopes, or at the ends of dikes will be to construct deflection dikes using brush, treetops, or lumber, driving stakes and wiring together, and filling in between with brush and filled sacks or stone.

e. Caving Bank Protection. As protection against active caving of riverbanks, rock-filled cribs are very effective if properly placed. Cribs are usually 14 by 14 feet in plan by 10 to 14 inches in inside depth. The cribs are constructed on a double thickness of 1" x 4" x 14' lumber, equivalent to 2" x 4" pieces, lapped rail fence fashion at all corners and intersections. They are divided into four compartments of about equal area by two perpendicular cross walls constructed in the same manner as the side walls. The floors and covers are built up of double 1" x 4" boards spaced about 9" center to center. Under the floor and perpendicular to the direction of the floor boards are five equally spaced pairs of 1" x 4" boards about 3 feet center to center. On top of the cover, perpendicular to the direction of the cover boards, are three pairs of top boards, one over each of the side walls and one over the central division wall. All intersections are nailed with one 20d nail. The compartments are filled with rock before covering. Each wall intersection of the fabricated cribs is securely fastened by a loop of No. 9 wire. See Exhibit "C", Plate 4.

5-09. Topping. Immediate consideration should be given the grade line of each levee section by comparison of existing grades with those shown on the drawings, Exhibit "B". If any reaches show a grade below the previous highest water, emergency topping should be undertaken at once to such a grade as may be established by the District Engineer of the U. S. Army Engineer District, Sacramento, as follows:

a. Sack topping. Sack topping may be used to raise the crown of the levee about three feet. The sacks should be laid stretcher-wise or along the levee for the first layer, crosswise for the second layer, and so on. Sacks should be lapped at least $1/3$ either way and well mauled into place. When properly sacked and tamped, one sack will give about three to four inches of topping. If gravel is available, it should be used for the front facing so as to avoid washing out.

b. Lumber and sack topping. This is the most commonly used method of raising low reaches in emergencies. In putting on this topping, as well as other topping, a careful line of levels should be run and grade stakes set in advance. 2" x 4" x 6' stakes should then be driven on the riverside of the crown six feet apart, and 1" x 12" boards nailed to the landside of the stakes. This wall, backed with a single tier of sacks, will hold out at least one foot of water. If a second foot is necessary, the layers of sacks will have to be increased in number and reinforced. The stakes should be driven three feet in the ground, and should project out three feet, thus providing, in extreme cases, a three-foot topping if properly braced behind with sacks and earth. In some instances, it may be practicable to back up the planking with tamped earth obtained in the vicinity in lieu of the sacks as shown on the drawing, Exhibit "C", Plate 5.

5-10. Transportation. In instances where it is necessary to send equipment over roads that are impassable due to mud or sand, their passage may be provided by the use of a plank road or by means of steel or wire mats. Telephone communication should be provided along dangerous stretches of the levee when travel or other satisfactory means of communication cannot be maintained.

5-11. Use of Government Plant. The District Engineer is authorized to use or loan Government property and plant in cases of emergency where life is in danger and there is no opportunity to secure prior authority suitable private equipment is available, provided that such use is without detriment to the Government.

EXHIBIT A

FEDERAL FLOOD CONTROL REGULATIONS

**TITLE 33 - NAVIGATION AND
NAVIGABLE WATERS
(as of 1 January 1962)**

**Chapter 11 - Corps of Engineers
Department of the Army**

**PART 208 - Flood Control Regulations
MAINTENANCE AND OPERATION OF FLOOD
CONTROL WORKS**

Pursuant to the provisions of section 3 of the Act of Congress approved June 22, 1936, as amended and supplemented, (Sec. 3, 49 Stat. 1871 as amended; 33 U.S.C. 701e), the following regulations are hereby prescribed to govern the maintenance and operation of flood control works:

Authority: §§ 208.10 to 208.91 issued under sec. 7, 58 Stat. 896; 33 U.S.C. 709. Additional authority is cited in parentheses following the sections affected.

§ 208.10 Local flood protection works maintenance and operation of structures and facilities.

(a) *General.* (1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits.

(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with regulations prescribed by the Secretary of the Army, as required by law, shall appoint a permanent committee consisting of or headed by an official hereinafter called the "Superintendent," who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States.

(3) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times.

(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the right-of-way for the protective facilities.

(5) No improvement shall be passed over, under, or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the District Engineer of the Department of the Army or his authorized representative that such improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer or, if otherwise obtained, shall be submitted for his approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the work.

(6) It shall be the duty of the superintendent to submit a semiannual report to the District Engineer covering inspection, maintenance, and operation of the protective works.

(7) The District Engineer or his authorized representatives shall have access at all times to all portions of the protective works.

(8) Maintenance measures or repairs which the District Engineer deems necessary shall be promptly taken or made.

(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods.

(10) The Department of the Army will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under this part.

(b) *Levees.* (1) *Maintenance.* The Superintendent shall provide at all times such maintenance as may be required to insure serviceability of the structures in time of flood. Measures shall be taken to promote the growth of sod, exterminate burrowing animals, and to provide for routine mowing of the grass and weeds, removal of wild growth and drift deposits, and repair of damage caused by erosion or other forces. Where practicable, measures shall be taken to retard bank erosion by planting of willows or other suitable growth on areas riverward of the levees. Periodic inspections shall be made by the Superintendent to insure that the above maintenance measures are being effectively carried out, and, further, to be certain that:

(i) No unusual settlement, sloughing, or material loss of grade or levee cross section has taken place;

(ii) No caving has occurred on either the land side or the river side of the levee which might affect the stability of the levee section;

(iii) No seepage, saturated areas, or sand boils are occurring;

(iv) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged;

(v) Drains through the levees and gates on said drains are in good working condition;

(vi) No revetment work or riprap has been displaced, washed out, or removed;

(vii) No action is being taken, such as burning grass and weeds during inappropriate seasons, which will retard or destroy the growth of sod;

(viii) Access roads to and on the levee are being properly maintained;

(ix) Cattle guards and gates are in good condition;

(x) Crown of levee is shaped so as to drain readily, and roadway thereon, if any, is well shaped and maintained;

(xi) There is no unauthorized grazing or vehicular traffic on the levees;

(xii) Encroachments are not being made on the levee right-of-way which might endanger the structure or hinder its proper and efficient functioning during times of emergency.

Such inspections shall be made immediately prior to the beginning of the flood season; immediately following each major high water period, and otherwise at intervals not exceeding 90 days, and such intermediate times as may be necessary to insure the best possible care of the levee. Immediate steps will be taken to correct dangerous conditions disclosed by such inspections. Regular maintenance repair measures shall be accomplished during the appropriate season as scheduled by the Superintendent.

(2) *Operation.* During flood periods the levee shall be patrolled continuously to locate possible sand boils or unusual wetness of the landward slope and to be certain that:

(i) There are no indications of slides or sloughs developing;

(ii) Wave wash or scouring action is not occurring;

(iii) No low reaches of levee exist which may be overtopped;

(iv) No other conditions exist which might endanger the structure.

Appropriate advance measures will be taken to insure the availability of adequate labor and materials to meet all

contingencies. Immediate steps will be taken to control any condition which endangers the levee and to repair the damaged section.

(c) *Flood walls.* (1) *Maintenance.* Periodic inspections shall be made by the Superintendent to be certain that:

(i) No seepage, saturated areas, or sand boils are occurring;

(ii) No undue settlement has occurred which affects the stability of the wall or its water tightness;

(iii) No trees exist, the roots of which might extend under the wall and offer accelerated seepage paths;

(iv) The concrete has not undergone cracking, chipping, or breaking to an extent which might affect the stability of the wall or its water tightness;

(v) There are no encroachments upon the right-of-way which might endanger the structure or hinder its functioning in time of flood;

(vi) Care is being exercised to prevent accumulation of trash and debris adjacent to walls, and to insure that no fires are being built near them;

(vii) No bank caving conditions exist riverward of the wall which might endanger its stability;

(viii) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged.

Such inspections shall be made immediately prior to the beginning of the flood season, immediately following each major high water period, and otherwise at intervals not exceeding 90 days. Measures to eliminate encroachments and effect repairs found necessary by such inspections shall be undertaken immediately. All repairs shall be accomplished by methods acceptable in standard engineering practice.

(2) *Operation.* Continuous patrol of the wall shall be maintained during flood periods to locate possible leakage at monolith joints or seepage underneath the wall. Floating plant or boats will not be allowed to lie against or tie up to the wall. Should it become necessary during a flood emergency to pass anchor cables over the wall, adequate measures shall be taken to protect the concrete and construction joints. Immediate steps shall be taken to correct any condition which endangers the stability of the wall.

(d) *Drainage structures.* (1) *Maintenance.* Adequate measures shall be taken to insure that inlet and outlet channels are kept open and that trash, drift, or debris is not allowed to accumulate near drainage structures. Flap gates and manually operated gates and valves on drainage structures shall be examined, oiled, and trial operated at least once every 90 days. Where drainage structures are provided with stop log or other emergency closures, the condition of the equipment and its housing shall be inspected regularly and a trial installation of the emergency closure shall be made at least once each year. Periodic inspections shall be made by the Superintendent to be certain that:

(i) Pipea, gates, operating mechanism, riprap, and headwalls are in good condition;

(ii) Inlet and outlet channels are open;

(iii) Care is being exercised to prevent the accumulation of trash and debris near the structures and that no fires are being built near bituminous coated pipes;

(iv) Erosion is not occurring adjacent to the structure which might endanger its water tightness or stability.

Immediate steps will be taken to repair damage, replace missing or broken parts, or remedy adverse conditions disclosed by such inspections.

(2) *Operation.* Whenever high water conditions impend, all gates will be inspected a short time before water reaches the invert of the pipe and any object which might prevent closure of the gate shall be removed. Automatic gates shall be closely observed until it has been ascertained that they are securely closed. Manually operated gates and valves shall be closed as necessary to prevent inflow of flood water. All drainage structures

in levees shall be inspected frequently during floods to ascertain whether seepage is taking place along the lines of their contact with the embankment. Immediate steps shall be taken to correct any adverse condition.

(c) **Closure structures—(1) Maintenance.** Closure structures for traffic openings shall be inspected by the superintendent every 90 days to be certain that:

- (i) No parts are missing;
- (ii) Metal parts are adequately covered with paint;
- (iii) All movable parts are in satisfactory working order;
- (iv) Proper closure can be made promptly when necessary;
- (v) Sufficient materials are on hand for the erection of sand bag closures and that the location of such materials will be readily accessible in times of emergency.

Tools and parts shall not be removed for other use. Trial erections of one or more closure structures shall be made once each year, alternating the structures chosen so that each gate will be erected at least once in each 3-year period. Trial erection of all closure structures shall be made whenever a change is made in key operating personnel. Where railroad operation makes trial erection of a closure structure infeasible, rigorous inspection and drill of operating personnel may be substituted therefor. Trial erection of sand bag closures is not required. Closure materials will be carefully checked prior to and following flood periods, and damaged or missing parts shall be repaired or replaced immediately.

(2) **Operation.** Erection of each movable closure shall be started in sufficient time to permit completion before flood waters reach the top of the structure sill. Information regarding the proper method of erecting each individual closure structure, together with an estimate of the time required by an experienced crew to complete its erection will be given in the Operation and Maintenance Manual which will be furnished local interests upon completion of the project. Closure structures will be inspected frequently during flood periods to ascertain that no undue leakage is occurring and that drains provided to care for ordinary leakage are functioning properly. Boats or floating plant shall not be allowed to tie up to closure structures or to discharge passengers or cargo over them.

(f) **Pumping plants—(1) Maintenance.** Pumping plants shall be inspected by the Superintendent at intervals not to exceed 90 days during flood seasons and 90 days during off-flood seasons to insure that all equipment is in order for instant use. At regular intervals, proper measures shall be taken to provide for cleaning plant, buildings, and equipment, repainting as necessary, and lubricating all machinery. Adequate supplies of lubricants for all types of machines, fuel for gasoline or diesel powered equipment, and flash lights or lanterns for emergency lighting shall be kept on hand at all times. Telephone service shall be maintained at pumping plants. All equipment, including switch gear, transformers, motors, pumps, valves, and gates shall be trial operated and checked at

least once every 90 days. Megger tests of all insulation shall be made whenever wiring has been subjected to undue dampness and otherwise at intervals not to exceed one year. A record shall be kept showing the results of such tests. Wiring disclosed to be in an unsatisfactory condition by such tests shall be brought to a satisfactory condition or shall be promptly replaced. Diesel and gasoline engines shall be started at such intervals and allowed to run for such length of time as may be necessary to insure their serviceability in times of emergency. Only skilled electricians and mechanics shall be employed on tests and repairs. Operating personnel for the plant shall be present during tests. Any

equipment removed from the station for repair or replacement shall be returned or replaced as soon as practicable and shall be trial operated after reinstallation. Repairs requiring removal of equipment from the plant shall be made during off-flood seasons insofar as practicable.

(2) **Operation.** Competent operators shall be on duty at pumping plants whenever it appears that necessarily for pump operation is imminent. The operator shall thoroughly inspect, trial operate, and place in readiness all plant equipment. The operator shall be familiar with the equipment manufacturers' instructions and drawings and with the "Operating Instructions" for each station. The equipment shall be operated in accordance with the above-mentioned "Operating Instructions" and care shall be exercised that proper lubrication is being supplied all equipment, and that no overheating, undue vibration or noise is occurring. Immediately upon final recession of flood waters, the pumping station shall be thoroughly cleaned, pump house sumps flushed, and equipment thoroughly inspected, oiled and greased. A record or log of pumping plant operation shall be kept for each station, a copy of which shall be furnished the District Engineer following each flood.

(g) **Channels and floodways—(1) Maintenance.** Periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that:

- (i) The channel or floodway is clear of debris, weeds, and wild growth;
- (ii) The channel or floodway is not being restricted by the depositing of waste materials, building of unauthorized structures or other encroachments;
- (iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;
- (iv) Banks are not being damaged by rain or wave wash, and that no sloughing of banks has occurred;
- (v) Riprap sections and deflection dikes and walls are in good condition;
- (vi) Approach and egress channels adjacent to the improved channel or floodway are sufficiently clear of obstructions and debris to permit proper functioning of the project works.

Such inspections shall be made prior to the beginning of the flood season and otherwise at intervals not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections. Measures will be taken by the Superintendent to promote the growth of grass on bank slopes and earth deflection dikes. The Superintendent shall provide for periodic repair and cleaning of debris basins, check dams, and related structures as may be necessary.

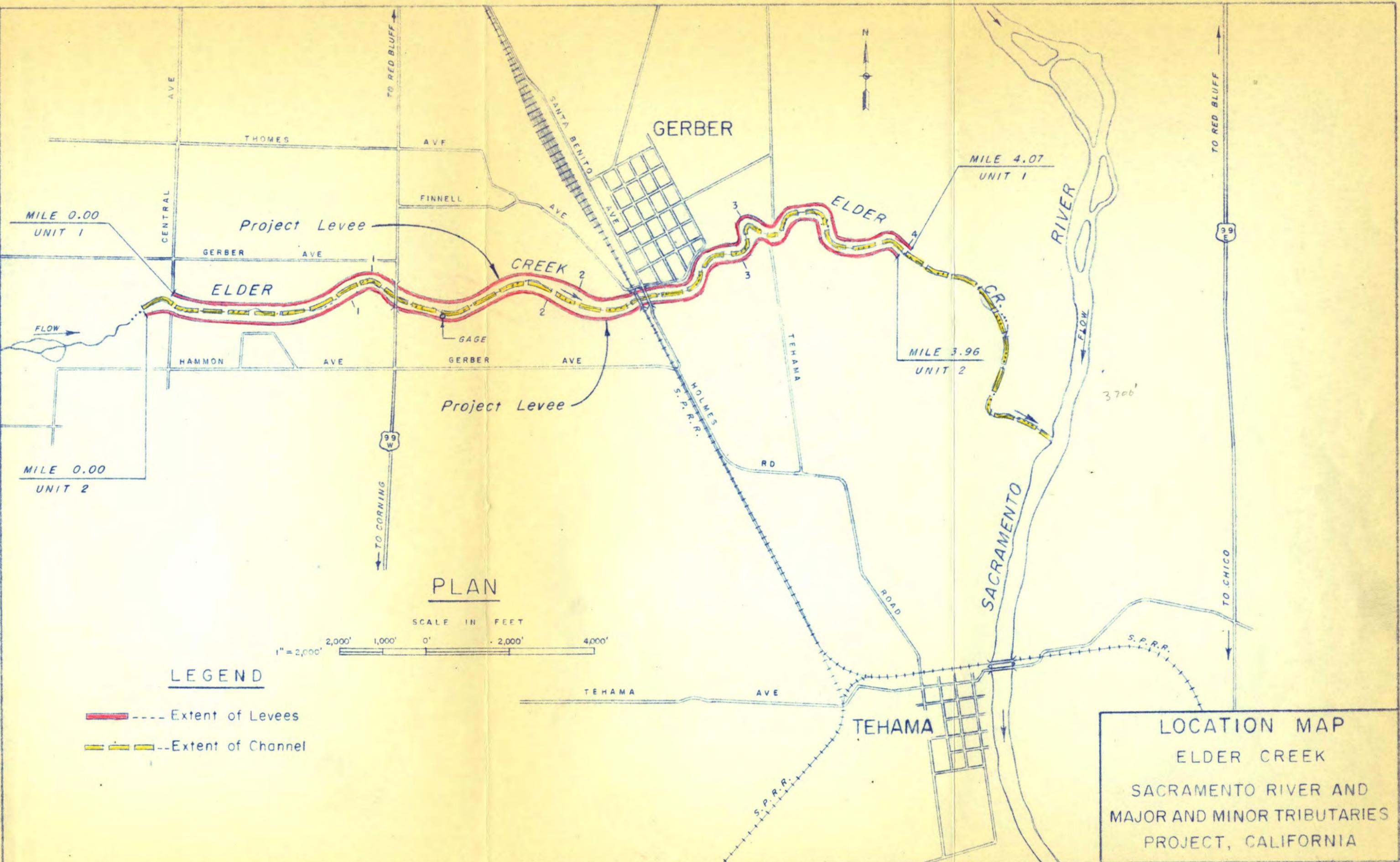
(2) **Operation.** Both banks of the channel shall be patrolled during periods of high water, and measures shall be taken to protect those reaches being attacked by the current or by wave wash. Appropriate measures shall be taken to prevent the formation of jams of ice or debris. Large objects which become lodged against the bank shall be removed. The improved channel or floodway shall be thoroughly inspected immediately following each major high water period. As soon as practicable thereafter, all snags and other debris shall be removed and all damage to banks, riprap, deflection dikes and walls, drainage outlets, or other flood control structures repaired.

(h) **Miscellaneous facilities—(1) Maintenance.** Miscellaneous structures and facilities constructed as a part of the protective works and other structures and facilities which function as a part of, or affect the efficient functioning of the protective works, shall be periodically inspected by the Superintendent and appropriate maintenance measures taken. Damaged or unserviceable parts shall be repaired or replaced without delay. Areas used for ponding in connection with pumping plants or for temporary storage of interior run-off during flood

periods shall not be allowed to become filled with silt, debris, or dumped material. The Superintendent shall take proper steps to prevent restriction of bridge openings and, where practicable, shall provide for temporary raising during floods of bridges which restrict channel capacities during high flows.

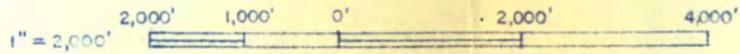
(2) **Operation.** Miscellaneous facilities shall be operated to prevent or reduce flooding during periods of high water. These facilities constructed as a part of the protective works shall not be used for purposes other than flood protection without approval of the District Engineer unless designed therefor.

(Sec. 1, 49 Stat. 1671, as amended; 33 U.S.C. Title) [9 F.R. 6069, Aug. 17, 1944; 9 F.R. 11030, Aug. 23, 1944]



PLAN

SCALE IN FEET



LEGEND

- — — Extent of Levees
- — — Extent of Channel

LOCATION MAP
 ELDER CREEK
 SACRAMENTO RIVER AND
 MAJOR AND MINOR TRIBUTARIES
 PROJECT, CALIFORNIA

EXHIBIT B

“AS CONSTRUCTED” DRAWINGS

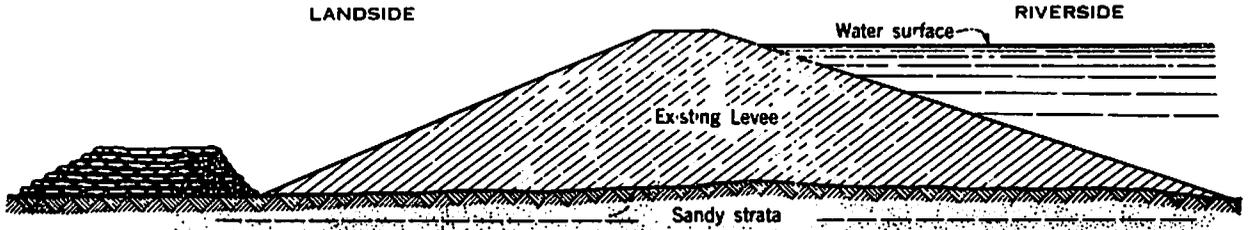
See separate folder for the following drawings:

<u>File No.</u>	<u>Title</u>
50-4-3210	Emergency levee repairs, rt. and lft. banks Elder Creek near Gerber, in 1 sheet.
50-4-3529	Emergency levee repairs on Elder Creek, in 3 sheets.
50-4-3622	Elder Creek Channel Improvement and levee construction, Sacramento River overflow area to 1.2 miles upstream from U.S. Highway 99W in 19 sheets. Also sheets 1A, 1B and 1C
50-4-3746	Emergency Levee Repairs, Elder Creek, Tehama County, in 1 sheet.
4-4-542	Bank Protection Left Bank Feather River Mile 6.7 and Right Bank Elder Creek in 4 sheets.
50-4-4076	Emergency Levee Repairs, Left and Right Banks of Elder Creek, near Gerber, Tehama County, in 1 sheet.
50-4-4118	Bank Protection Various Locations Left Bank Sacramento and American Rivers, Right and Left Banks Feather River and Elder Creek, in 12 sheets.
50-4-4490	Levee Repair, Elder Creek near Gerber.
50-4-4179	Bank Protection, Various Locations, Right and Left Banks, Sacramento River and Elder Creek, in 20 sheets.
50-4-4377	Bank Protection, Various Locations on Bear River and Feather River, Elder and South Dry Creek, in 14 sheets.
50-4-4892	Bank Protection, Various Locations, on Sacramento and Bear Rivers and Elder Creek, in 20 sheets.
50-4-5602	Elder/Deer Creeks, emergency levee and bank protection repairs, in 3 sheets.
None	PL 84-99 Levee Rehabilitation Repairs CY2007 Orders 3-5 Sites, Elder and Deer Creeks, Tehama County, California, in 8 sheets.

EXHIBIT C

PLATES OF SUGGESTED FLOOD FIGHTING METHODS

EXHIBIT C

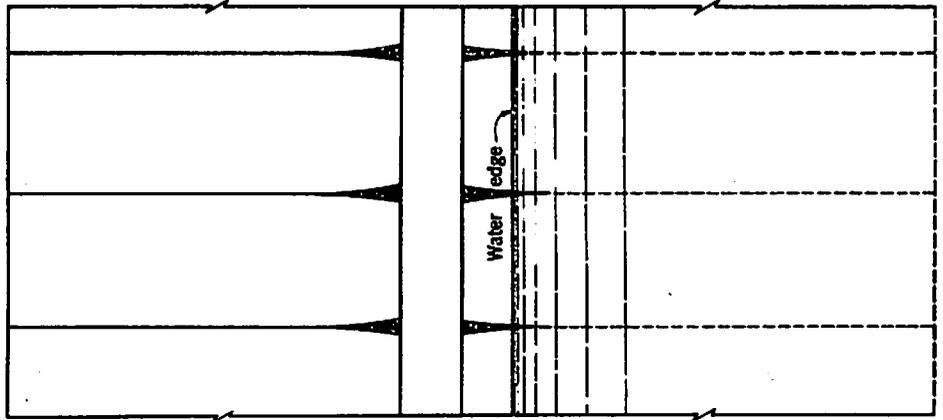
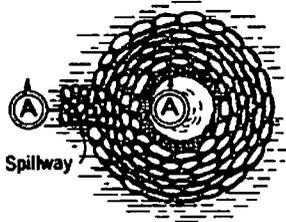


Note:
 Bottom width to be no less than 1½ times height.
 Be sure to clear sand discharge.
 Tie into levee if boil is near toe.

ELEVATION



SECTION A-A



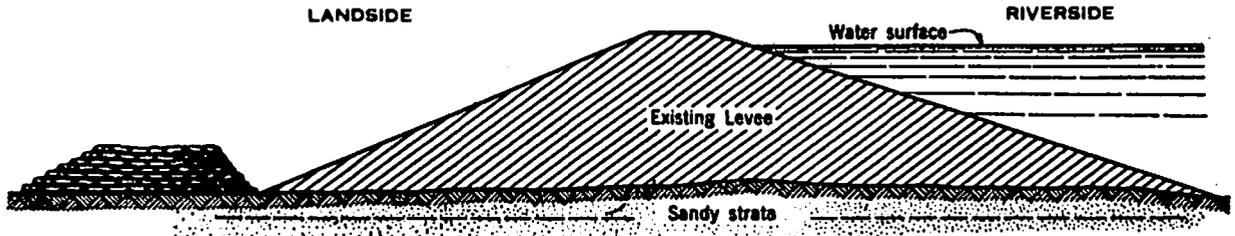
PLAN

Note:
 Do not sack boil which does not put out material.
 Height of sack loop or ring should be only sufficient to create enough head to slow down flow through boil so that no more material is displaced and boils clear.
 Never attempt to completely stop flow through boil.

SACRAMENTO RIVER , CALIFORNIA
 FLOOD CONTROL PROJECT

CONTROL OF SAND BOILS

U.S. ENGINEER OFFICE , SACRAMENTO, CALIF.
 MAY, 1946

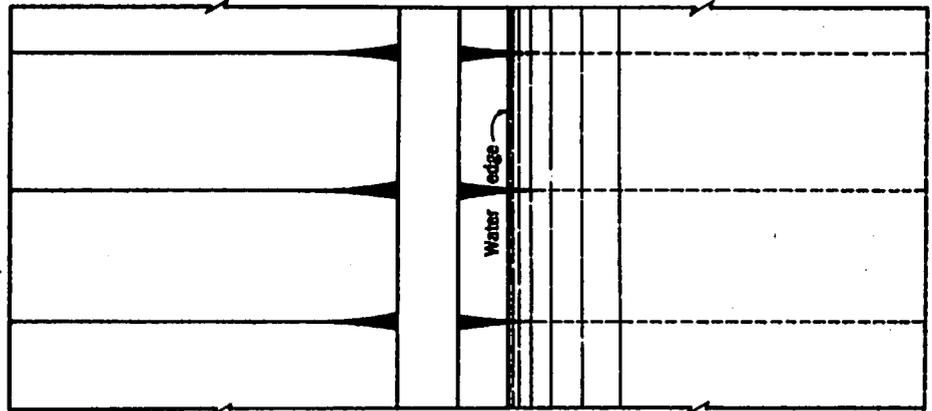
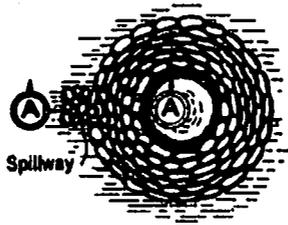


Note:
 Bottom width to be no less than 1 1/2 times height.
 Be sure to clear sand discharge.
 Tie into levee if boil is near toe.

ELEVATION



SECTION A-A



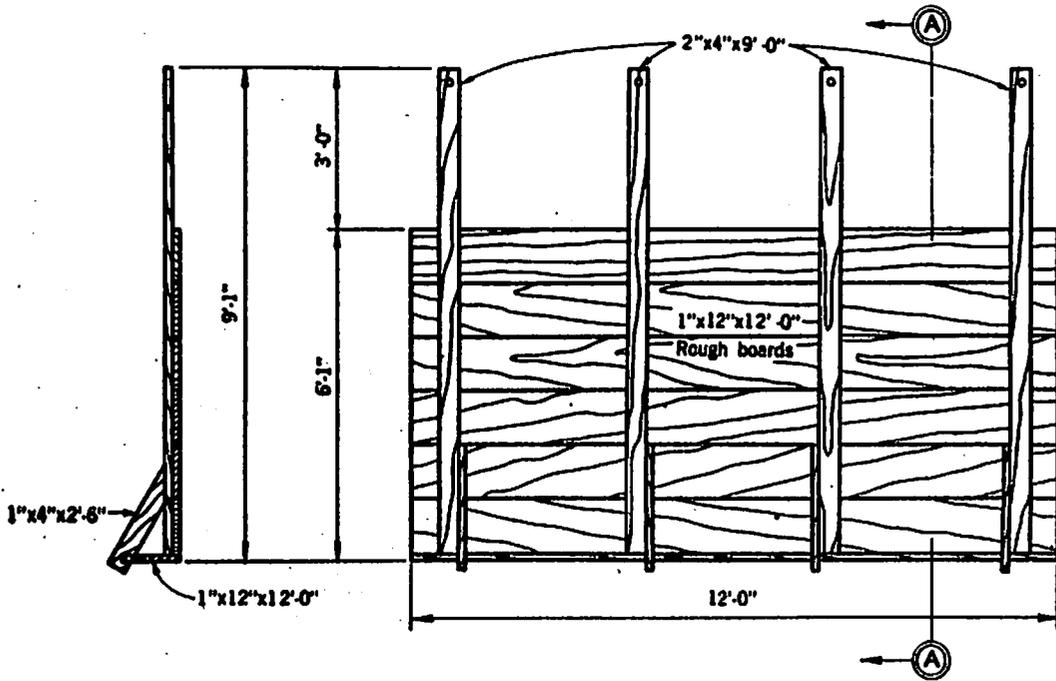
PLAN

Note:
 Do not sack boil which does not put out material.
 Height of sack loop or ring should be only sufficient to create enough head to slow down flow through boil so that no more material is displaced and boil runs clear.
 Never attempt to completely stop flow through boil.

**SACRAMENTO RIVER
 AND MAJOR AND MINOR TRIBUTARIES
 FLOOD CONTROL PROJECT**

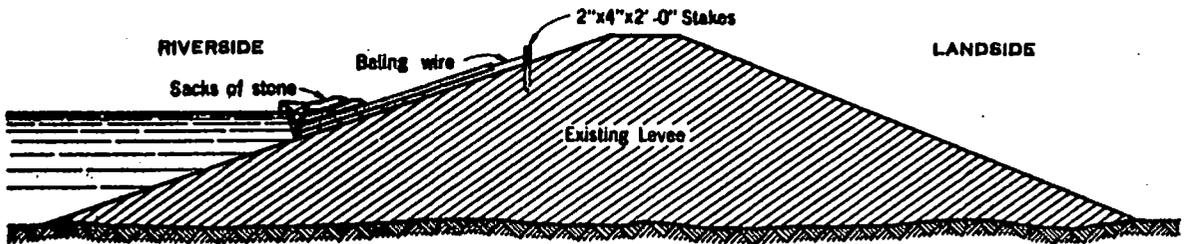
CONTROL OF SAND BOILS

U.S. ENGINEER OFFICE, SACRAMENTO, CALIF.



SECTION A-A

PLAN



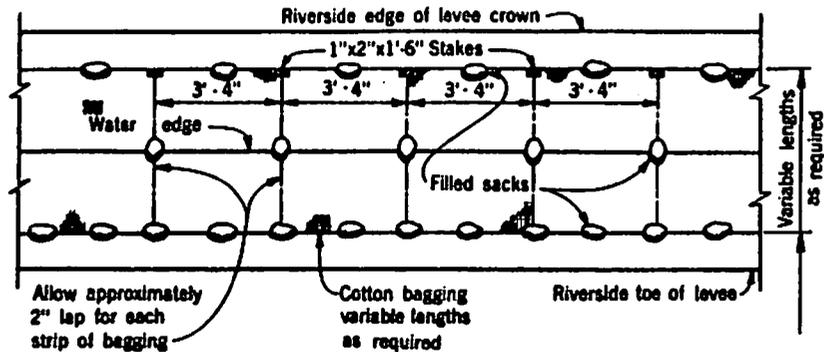
SECTION

BILL OF MATERIAL FOR 100 FEET	
LUMBER	
56 pieces	1" x 12" x 12'-0"
32 pieces	1" x 4" x 2'-6"
32 pieces	2" x 4" x 9'-0"
• 32 pieces	2" x 4" x 2'-0"
•	(Sharpened)
WIRE	
200'	baling wire
NAILS	
4)	lbs. 8d nails

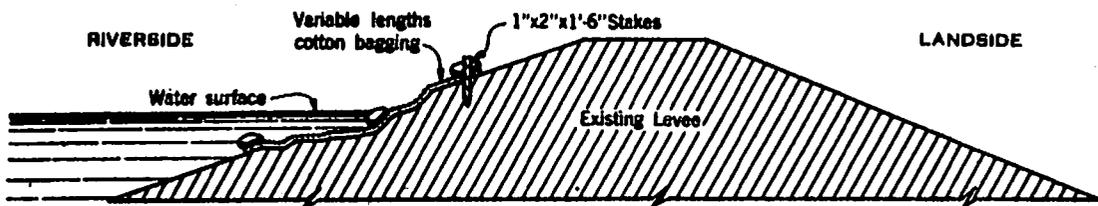
**SACRAMENTO RIVER
AND MAJOR AND MINOR TRIBUTARIES
FLOOD CONTROL PROJECT**

**MOVABLE
WAVE WASH PROTECTION**

U. S. ENGINEER OFFICE, SACRAMENTO, CALIF.



PLAN



SECTION

Note:

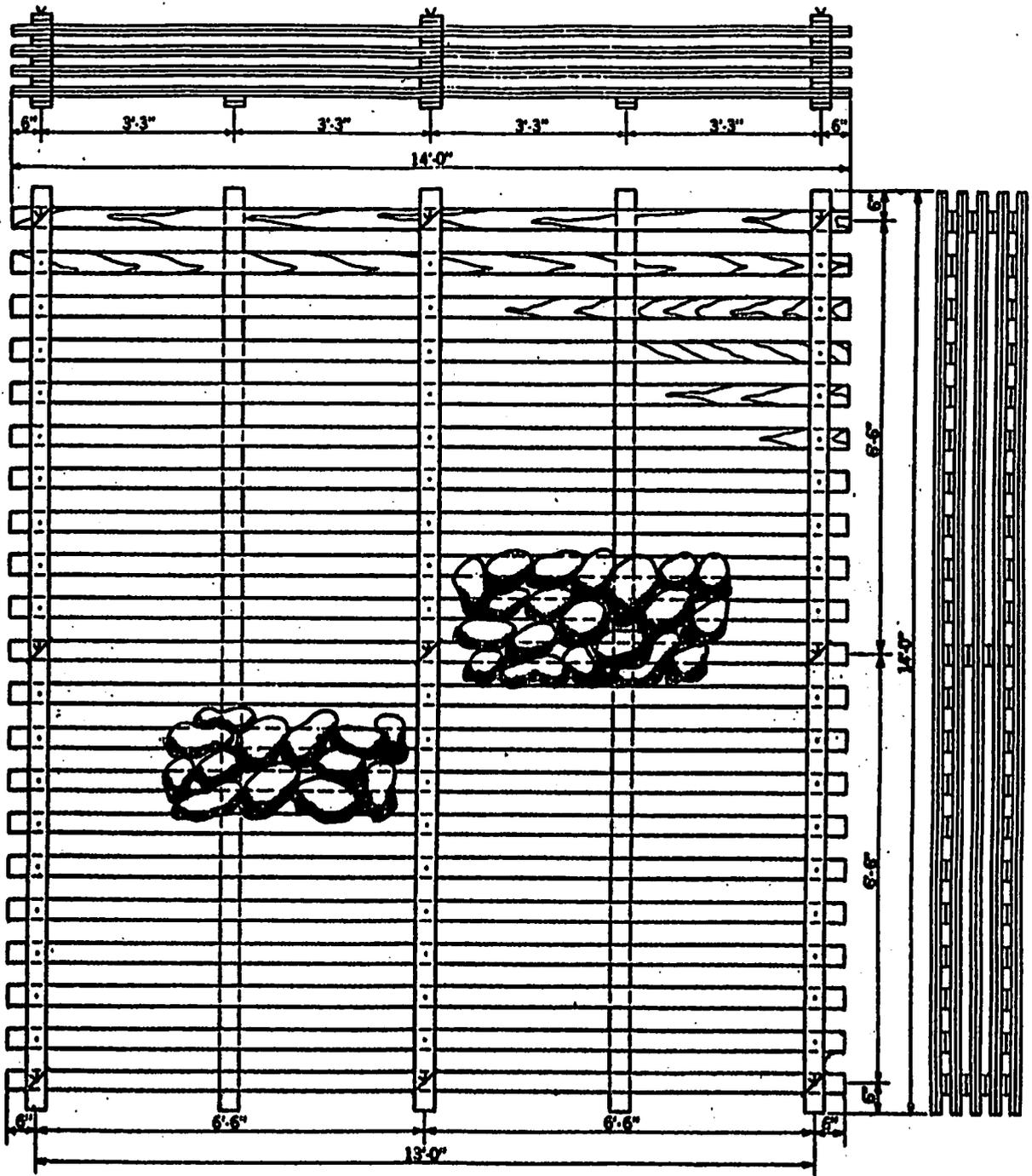
Lay lengths as required of cotton bagging approximately parallel with levee slope and across damaged section. Weight top and edges of bagging with filled sacks as shown above. The filled sacks should be wired or tied to each strip before laying in place. Stake the corners of each strip above water surface. Where cotton bagging is not available burlap secking may be substituted.

MATERIAL REQUIRED FOR 100 LINEAR FEET OF LEVEE
LUMBER
• 30 Stakes 1"x2"x1'-6"
• (Sharpened)
SANDBAGS
120 sand bags
Cotton bagging as required

**SACRAMENTO RIVER
AND MAJOR AND MINOR TRIBUTARIES
FLOOD CONTROL PROJECT**

WAVE WASH PROTECTION

U.S. ENGINEER OFFICE, SACRAMENTO, CALIF.



Note:

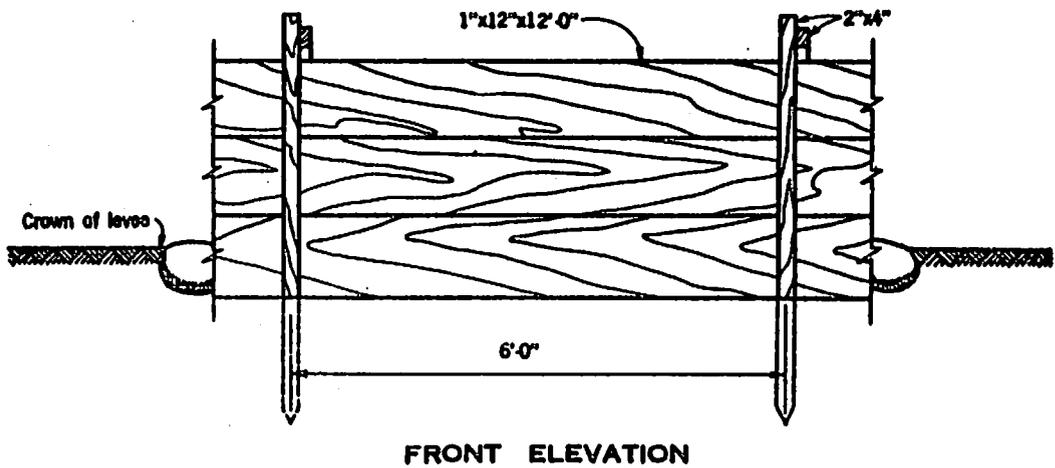
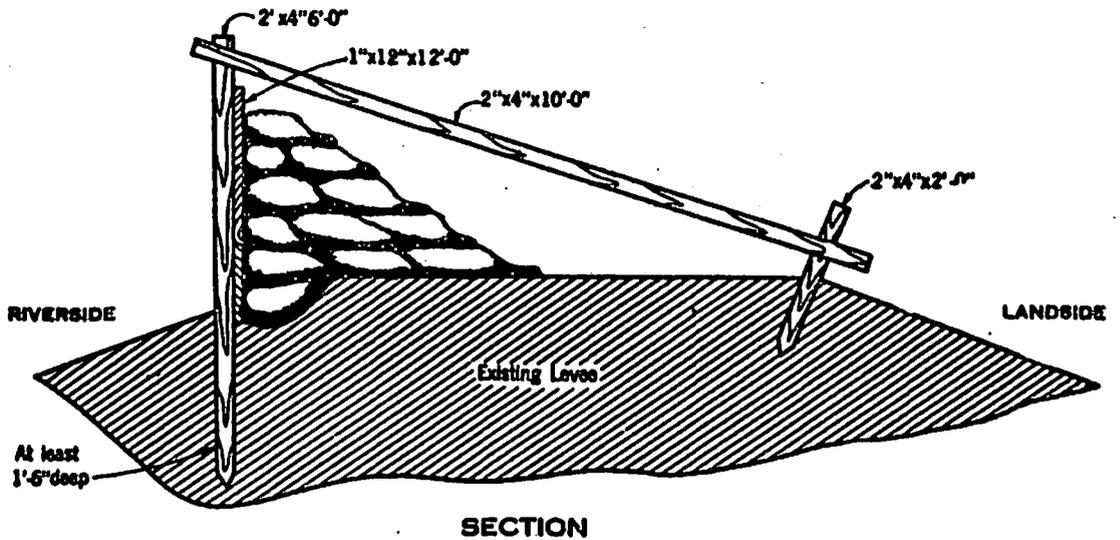
Cribs constructed of double thickness of 1"x4"x14'-0" lumber. Nail all intersections with 1-20d nail. Each intersection of walls securely fastened by a loop of No. 9 wire, tightly twisted.

BILL OF MATERIAL FOR ONE CRIB 13'-0"
LUMBER
130 pieces 1"x4"x14'-0"
WIRE
30' No. 9 wire
NAILS
12½ lbs. 20d nails

**SACRAMENTO RIVER
AND MAJOR AND MINOR TRIBUTARIES
FLOOD CONTROL PROJECT**

CAVING BANK PROTECTION

U. S. ENGINEER OFFICE, SACRAMENTO, CALIF.



BILL OF MATERIAL FOR 100 LINEAR FEET OF LEVEE	
LUMBER	
25 pieces	1"x12"x12'-0"
17 pieces	2"x4"x10'-0"
• 17 pieces	2"x4"x6'-0"
• 17 pieces	2"x4"x2'-0"
•	(Sharpened)
NAILS	
1 lb.	-8d nails
2 lbs.	-16d nails
SANDBAGS	
1100	bags

SACRAMENTO RIVER
AND MAJOR AND MINOR TRIBUTARIES
FLOOD CONTROL PROJECT

LUMBER AND SACK TOPPING

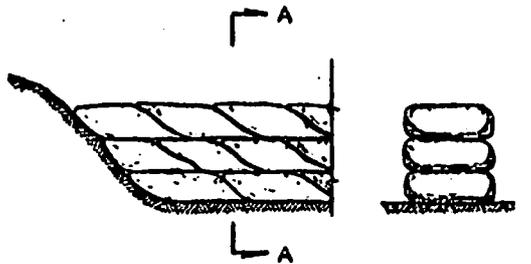
U. S. ENGINEER OFFICE, SACRAMENTO, CALIF.

LEVEE CONSTRUCTION

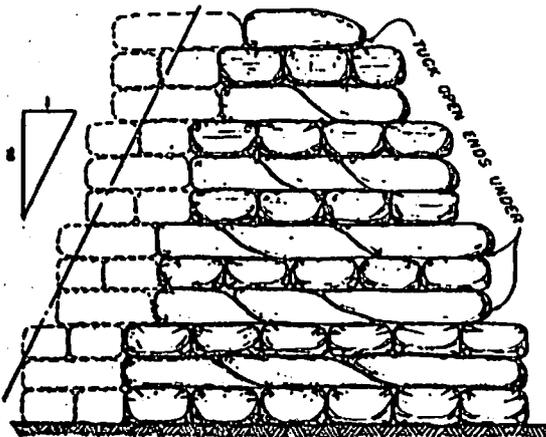
SANDBAGGING USED TO PREVENT OVERTOPPING OF EXISTING LEVEES AND FOR RETAINING FLOOD WATERS WHERE NO BACK-UP MATERIAL IS AVAILABLE.

INSTRUCTIONS:

1. FILL SANDBAGS 1/2 TO 2/3 FULL BUT LEAVE ENOUGH FLAP TO TURN UNDER. DO NOT TIE. LEAVE ENDS OPEN.
2. FOR HEIGHTS OF 1 FOOT AND LESS, LAY 3 SINGLE COURSES WITH BAGS LENGTHWISE AS SHOWN IN SKETCH 'A' BELOW.
3. FOR HEIGHTS GREATER THAN 1 FOOT, PLACE AS INDICATED IN SKETCH 'B' BELOW.
4. WHEN BAGS ARE PLACED FLATTEN OUT AND FILL VOIDS BY MASHING BAGS WITH FEET AND VIGOROUSLY TRAMP EACH COURSE OF THE LEVEE SECTION. THIS IS AN EXTREMELY IMPORTANT OPERATION FOR PROVIDING A LEVEE WHICH WILL BE AS IMPERVIOUS TO WATER AS POSSIBLE AND TO INSURE STABILITY OF SECTION. LOOSELY PLACED SANDBAGS IMPROPERLY KEVED TOGETHER MAY RESULT IN FAILURE AND CAUSE SERIOUS DAMAGE.



ELEVATION **SECTION A-A**
SKETCH A



LEVEE SECTION

FOR HEIGHTS IN EXCESS OF THE ABOVE (APPROX. 3'-6") HOLD SAME BATTER AND BUILD ON THE SIDE AS INDICATED BY DASHED LINES ABOVE. ALTERNATE HEADER COURSES (BAGS PLACED CROSSWISE) AND STRETCHER COURSES (BAGS PLACED LENGTHWISE).

SKETCH B

ESTIMATING DATA:

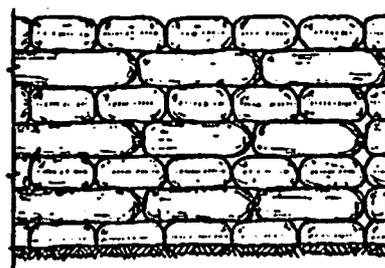
1. AVERAGE WEIGHT OF EACH FILLED SANDBAG, APPROX. 80 LBS.
2. APPROXIMATELY 1000 SANDBAGS ARE REQUIRED FOR EACH 100 SQ. FT. OF SURFACE (HEIGHT MULTIPLIED BY DISTANCE).

REVETMENTS

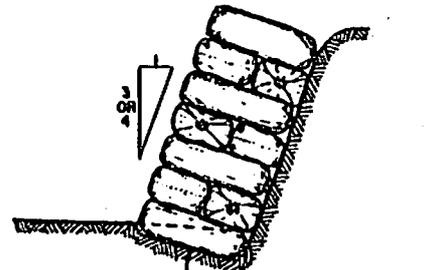
USED FOR EMERGENCY BANK PROTECTION TO PREVENT UNDER CUTTING AND CONTROL OF COURSE OF FLOOD CHANNELS.

INSTRUCTIONS:

1. FILL SANDBAGS 2/3 FULL AND TIE OPEN END.
2. TUCK IN BOTTOM CORNERS OF BAG AFTER FILLING.
3. PLACE BAGS PERPENDICULAR TO SLOPE.
4. LAY STRETCHER AND HEADER COURSES WITH CHOKE AND SIDE BEAMS IN: THUS:-



ELEVATION



SECTION

ESTIMATING DATA:

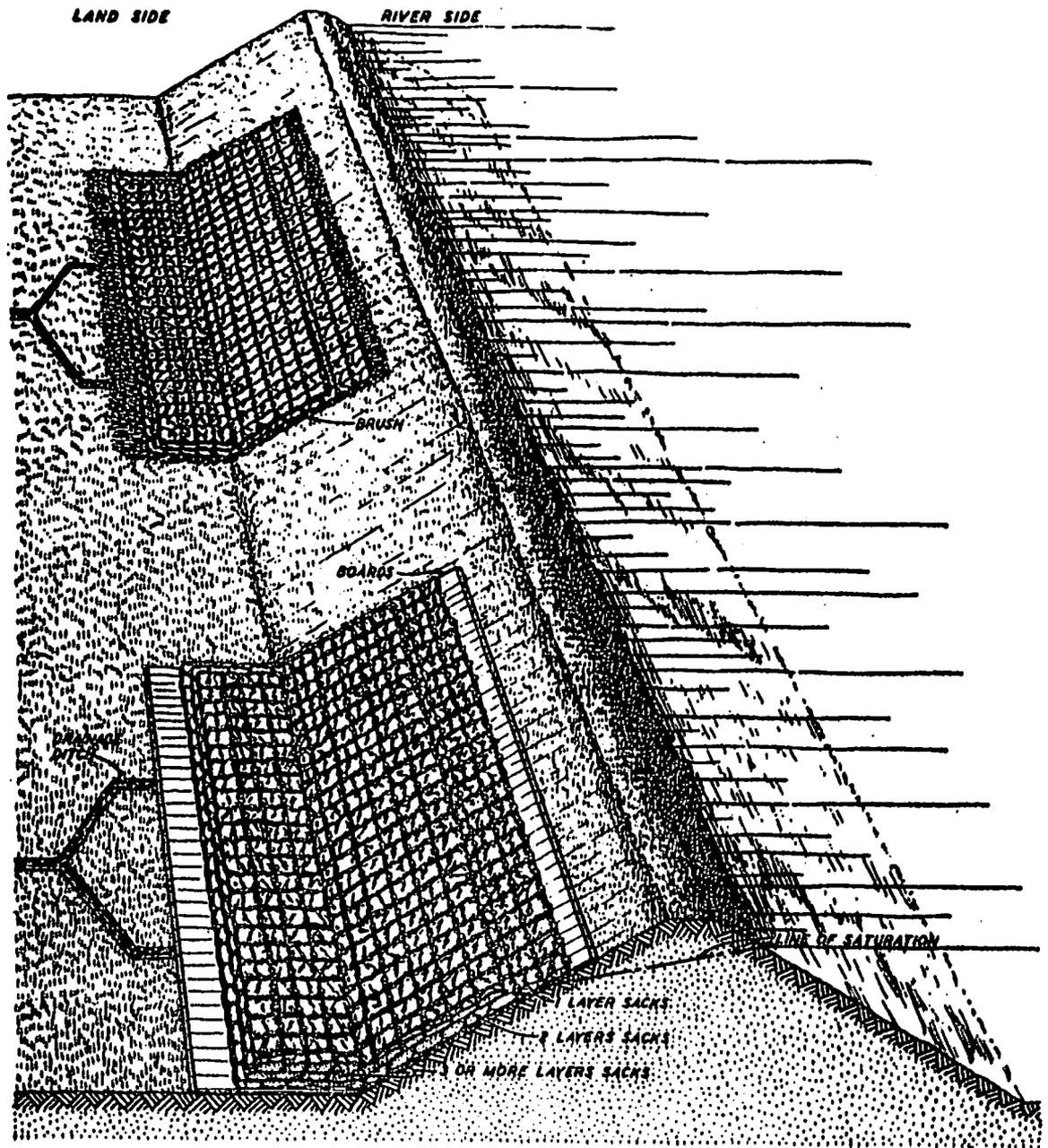
1. AVERAGE WEIGHT OF EACH FILLED SANDBAG APPROXIMATELY 85 LBS.
2. APPROXIMATELY 320 SANDBAGS ARE REQUIRED FOR EACH 100 SQ. FT. OF SURFACE TO BE REVETED.

FILL MATERIAL:

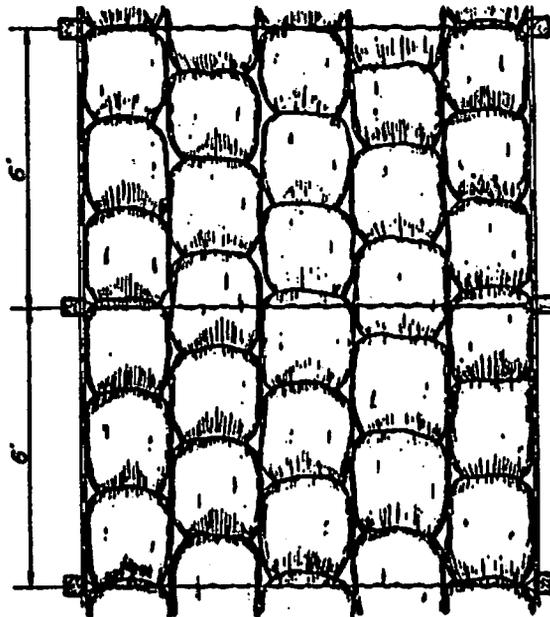
THE IDEAL MATERIAL FOR FILLING SAND BAGS IS A FINE SAND OR COARSE SILT. AVOID, AS MUCH AS POSSIBLE, THE USE OF COARSE GRAVEL AND HEAVY CLAYS.

**SACRAMENTO RIVER
AND MAJOR AND MINOR TRIBUTARIES
FLOOD CONTROL PROJECT
INSTRUCTIONS FOR
PLACING SANDBAGS**

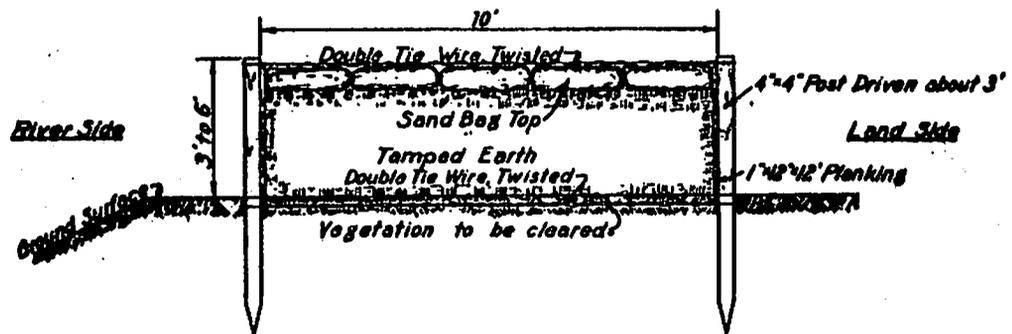
U. S. ENGINEER OFFICE, SACRAMENTO, CALIF.



SACRAMENTO RIVER
AND MAJOR AND MINOR TRIBUTARIES
FLOOD CONTROL PROJECT
BRUSHING AND SACKING
THE LANDSIDE SLOPE
U.S. CORPS OF ENGINEERS, SACRAMENTO, CALIF.



PLAN



END ELEVATION

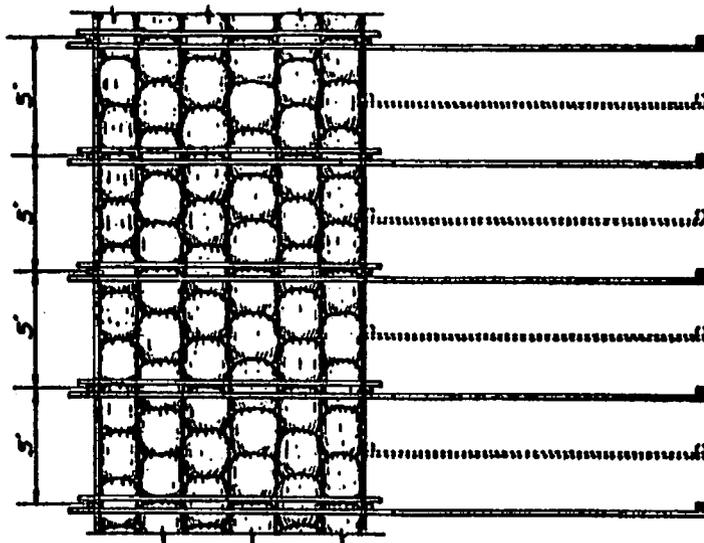
MATERIAL REQUIRED FOR 100 LINEAR FEET OF LEVEE		
4 FT HIGH	5 FT HIGH	6 FT HIGH
34 pieces 4"x4"x7' (sharpened) 1122	34 pieces 4"x4"x8' (sharpened) 1371	34 pieces 4"x4"x9' (sharpened) 1608
67 pieces 1"x12"x12' 1board feet	24 pieces 1"x12"x12' 1board feet	100 pieces 1"x12"x12' 1board feet
25 lbs. wire #12 gage	25 lbs. wire #12 gage	25 lbs. wire #12 gage
13 lbs. 10d nails	15 lbs. 10d nails	17 lbs. 10d nails
600 sand bags	600 sand bags	600 sand bags
148 cu. yds. earth	185 cu. yds. earth	222 cu. yds. earth

**SACRAMENTO RIVER
 AND MAJOR AND MINOR TRIBUTARIES**

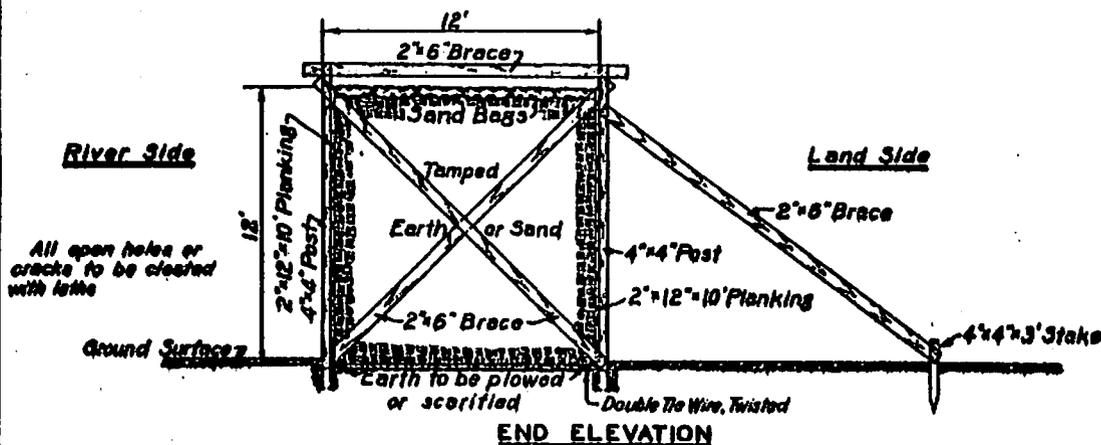
FLOOD CONTROL PROJECT

**3-6FT. MUD BOX LEVEE
 CONSTRUCTION DETAILS**

 U.S. CORPS OF ENGINEERS, SACRAMENTO, CALIF.



PLAN



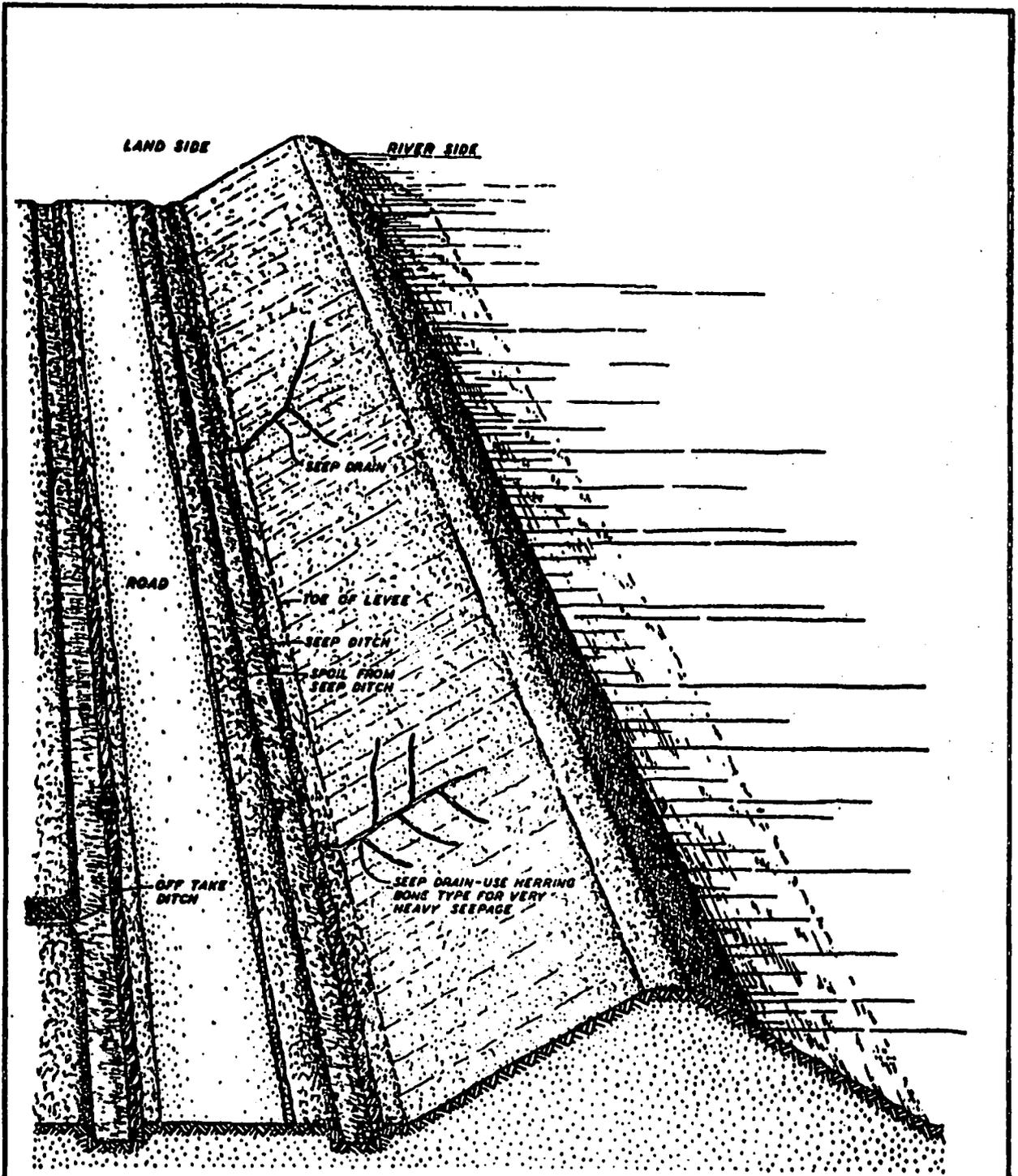
END ELEVATION

MATERIAL REQUIRED FOR 100 LINEAR FEET OF LEVEE			
LUMBER	SAND BAGS	NAILS	EARTH or SAND
40 Posts 4"x4"x14'	700	120 lbs-20d	534 cu yds.
240 Planks 2"x12"x10'		4 lbs-3d fine	
20 Braces 2"x6"x14'		WIRE	
60 Braces 2"x6"x15'		20 lbs #2 gage	
#20 Stakes 4"x4"x3'			
5 bundles laths			
Total Lumber 6587 board feet			

ADDITIONAL MATERIAL FOR BRACING BACK SIDE IN BETWEEN BENTS			
LUMBER	SAND BAGS	NAILS	EARTH or SAND
20 Posts 4"x4"x14'		6 lbs-20d	
20 Braces 2"x6"x15'			
#20 Stakes 4"x4"x3'			
Total Lumber 613 board feet			

Sharpened

SACRAMENTO RIVER AND
MAJOR AND MINOR TRIBUTARIES
FLOOD CONTROL PROJECT
MUD BOX BULKHEAD LEVEE
CONSTRUCTION DETAILS
U.S. CORPS OF ENGINEERS, SACRAMENTO, CALIF.



SACRAMENTO RIVER
AND MAJOR AND MINOR TRIBUTARIES

FLOOD CONTROL PROJECT

**METHOD OF
DRAINING LEVEE SLOPE**

U.S. CORPS OF ENGINEERS, SACRAMENTO, CALIF.

EXHIBIT D

SUGGESTED SEMI-ANNUAL REPORT FORM

TO: The District Engineer
U. S. Army Engineer
District, Sacramento
650 Capitol Avenue
Sacramento, California

(1 May 19__)
(1 Nov 19__)

Dear Sir:

The semi-annual report for the period (1 May 19__) to 31 October 19__
(1 November 19__ to 30 April 19__) Elder Creek Project levees and channel,
Tehama County, is as follows:

a. The physical condition of the protective works is indicated
by the inspector's report, copies of which are inclosed, and may be sum-
marized as follows:

(Superintendent's summary of conditions)

It is our intention to perform the following maintenance
work in order to repair or correct the conditions indicated:

(Outline the anticipated maintenance operations for the
following 6 months.)

b. During this report period, major high water periods (water
surface in Elder Creek reached or exceeded the reading of 15.0 on the
U. S. G. S. gage located on the right bank one mile upstream from Gerber)
occurred on the following dates:

<u>Dates</u>	<u>Maximum Elevation</u>
_____	_____
_____	_____
_____	_____

Comments on the behavior of the protective works during such high water periods are as follows:

(Superintendent's log of flood observations)

During the high water stages when the water level reached a height of _____, on the gage or excess thereof (dates) _____, it was necessary to organize and carry out flood operations as follows:

(See Maintenance Manual _____.)

c. The inspections have indicated (no) or (the following) encroachments or trespasses upon the project right-of-way.

d. (No) (_____) permits have been issued for (the following) improvements or construction within the project right-of-way.

Executed copies of the permit documents issued are transmitted for your files.

e. The status of maintenance measures, indicated in the previous semi-annual report as being required or as suggested by the representatives of the District Engineer, is as follows:

(Statement of maintenance operations, item by item with percent completion.)

f. The fiscal statement of the Superintendent's operations for the current report period is as follows:

	<u>Labor</u>	<u>Material</u>	<u>Equipment</u>	<u>Overhead</u>	<u>Total</u>
1. Inspection					
2. Maintenance					
3. Flood fighting Operations					
TOTAL					

Respectfully submitted,

Superintendent of Works

EXHIBIT E

SUGGESTED CHECK LISTS OF LEVEES, CHANNELS AND STRUCTURES

For definition of "flood" or "high water period" see paragraph 1-06 of this manual.

CHECK LIST NO. 2

ELDER CREEK
LEVEES AND CHANNEL

Inspector's Report Sheet No. _____

Inspector _____

Date _____

Superintendent _____

Item	Remarks
(a) Location by Station	
(b) Settlement, sloughing, or loss of grade	
(c) Erosion of levee slopes	
(d) Condition of roadways, including ramps	
(e) Evidence of seepage	
(f) Condition of farm gates and fencing	
(g) Maintenance measures taken since last inspection	
(h) Comments	

INSTRUCTIONS FOR COMPLETING SHEET 2, EXHIBIT E
(To be printed on back of sheet 2)

- Item (a) Indicate levee station of observance, obtained by pacing from nearest reference point; indicate right or left bank.
- Item (b) If sufficient settlement of earthwork has taken place to be noticeable by visual observation, indicate amount of settlement in tenths of a foot. If sloughing has caused a change in slope of the embankment sections, determine the new slope, Note areas where erosion or gulying of the section has occurred.
- Item (c) If sufficient erosion or gulying of back face of back toe of levee has taken place to be noticeable by visual inspection, indicate area affected and depth.
- Item (d) Note any natural change in any section of roadway or ramps. Indicate any inadequacy in surface drainage system.
- Item (e) Indicate any evidence of seepage through the embankment section.
- Item (f) Indicate the serviceability of all farm gates across the embankments and roadway, and indicate if repainting is required.
- Item (g) Indicate maintenance measures that have been performed since last inspection and their condition at the time of this inspection.
- Item (h) Record opinion, if any, of contributory causes for conditions observed and also any observations not covered under other columns.

NOTE: One copy of the Inspector's Report is to be mailed to the District Engineer immediately on completion, and one copy is to be attached to and submitted with the Superintendent's semi-annual report.

CHECK LIST NO. 3

CHANNEL AND RIGHT-OF-WAY
ELDER CREEK

Inspector's Report Sheet No. _____

Inspector _____

Date _____

Superintendent _____

Item	Remarks
(a) Name of channel and location by stations	
(b) Vegetal growth in channel	
(c) Debris and refuse in channel	
(d) New construction within right-of-way	
(e) Extent of aggradation or degradation	
(f) Condition of riprapped section	
(g) Condition of bridges	
(h) Measures taken since last inspection	
(i) Comments	

INSTRUCTIONS FOR COMPLETING SHEET 4, EXHIBIT E
(To be printed on back of Sheet 4)

- Item (a) Indicate station of observation obtained by pacing from nearest reference point.
- Item (b) Note nature, extent, and size of vegetal growth within the limits of flood flow channel.
- Item (c) Note nature and extent of debris and refuse that might cause clogging of the conduits of the irrigation intake works, fouling of the tainter gates, or the bridges over the channel.
- Item (d) Report any construction along the diversion channel or above the diversion channel or above the diversion works that has come to the attention of the inspector and that might affect the functioning of the project.
- Item (e) Indicate any change in grade or alignment of the channels, either by deposition of sediment or scour, that is noticeable by visual inspection. Estimate amount and extent.
- Item (f) Indicate any change that has taken place in the riprap such as disintegration of the rock, erosion, or movement of the rock. Note the presence of vegetal growth through the riprap.
- Item (g) Note any damage or settlement of the footings of the bridges. Indicate condition of wooden structures and if repainting is required. Indicate condition of bridge approaches, headwalls, and other appurtenances.
- Item (h) Indicate maintenance measures that have been performed since the last inspection and their condition at time of this inspection.
- Item (i) Record opinion, if any, of contributory causes for conditions observed, also any observations not covered under other columns.

NOTE: One copy of the Inspector's Report is to be mailed to the District Engineer immediately on completion, and one copy is to be attached to and submitted with the Superintendent's semi-annual report.

CHECK LIST NO. 4

DRAINAGE AND IRRIGATION STRUCTURES

ELDER CREEK

Inspector's Report Sheet No. _____

Inspector _____

Date _____

Superintendent _____

See drawings of Exhibit B for location of Stations

(a) Levee Mile	(b) Bank	(c) Debris or other obstruction to flow	(d) Damage or settlement of pipe or conduit	(e) Condition of concrete headwall or invert paving	(f) Condition of right-of-way adjacent to structures	(g) Repair measures taken since last inspection	(h) Comments
0.26	Left						
0.39	"						
0.52	"						
0.65	"						
0.76	"						
0.93	"						
1.10	"						
1.12	"						
1.30	"						
1.57	"						
1.70	"						
2.01	"						
2.24	"						
0.11	"						
0.51	"						

Unit No. 1 - Left Bank of Elder Creek

Unit No. 2 - Right Bank of Elder Creek

INSTRUCTIONS FOR COMPLETING SHEET 6, EXHIBIT E
(To be printed on back of Sheet 6)

- (1) Enter station of all structures under Column (a) for check list.
- (2) Inspect inlet, barrel, and outlet for accumulation of sediment, rubbish, and vegetal matter. Note condition under Column (c).
- (3) If any settlement or damage to the pipe, barrel, or invert of the drain has occurred, estimate the location and amount. Note particularly if any backfill has come into the pipe or been disturbed. Record observations under Column (d).
- (4) Inspect the concrete portions of the structures for evidence of settlement, cracks, "pop-outs", spaces, abrasive wear, or other deterioration. Record conditions under Column (e).
- (5) Inspect backfill area adjacent to structure for evidence of erosion caused by overflow of the drainage structure and note conditions in Column (f).
- (6) Under Column (g) indicate physical measures that have been taken to correct conditions reported in last inspection, and their condition at time of this inspection.
- (7) Under Column (h) record opinion, if any, of contributory causes for conditions observed, also any observations not covered under other columns.
- (8) A copy of the inspector's report is to be mailed to the District Engineer immediately on completion, and a record copy shall be attached to the Superintendent's semi-annual report.

EXHIBIT F

LETTER OF ACCEPTANCE BY THE STATE RECLAMATION BOARD

EXHIBIT F



DEPARTMENT OF THE ARMY
U.S. Army Engineer District, Sacramento
Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

REPLY TO
ATTENTION OF

NOV 24 2010

Flood Protection and Navigation Section

Mr. Jay Punia, Executive Officer
Central Valley Flood Protection Board
3310 El Camino Avenue, Room 151
Sacramento, California 95821

Dear Mr. Punia:

The U.S. Army Corps of Engineers has completed a portion of work under PL 84-99, Flood Control and Coastal Emergencies (FCCE) (33 U.S.C. 701n) (69 Stat. 186) for emergency management activities. Repairs were made to rehabilitate various sites within Elder Creek in Tehama County. Additional information about the repair and location of the sites may be found in the document titled, "Project Information Report for Public Law (P.L.) 84-99 Levee Rehabilitation, Deer and Elder Creeks, Tehama County, Amendment #1 (Final)", dated June 25, 2007.

The rehabilitation work meets the requirements of existing Operation and Maintenance Manuals (O&M) and enclosed revisions. The subject flood damage reduction project is considered complete as of the date of this letter. The repairs were completed under Contract Number W91238-08-D-0016, Task Order Number 1. As-constructed drawings and revisions to the Operation and Maintenance Manual are enclosed. The Central Valley Flood Protection Board shall continue to operate and maintain the completed Rehabilitation Effort as part of the project.

Mitigation plantings for the above work are required but have not been completed. The estimated completion date for the plantings is Spring 2011. All mitigation plantings will be ETL 1110-2-571 compliant. After completion of the plantings, a separate letter with addendum and as-builts will be sent to you.

If you have any questions regarding this project, please contact Ms. Paige Caldwell (916) 557-6919 or Ms. Christy Jones (916) 557-7107, Readiness Section. If you have any questions regarding this transfer, please contact Mr. Ryan Larson at (916) 557-7568 or Mr. Robert Murakami at (916) 557-6738, Flood Protection and Navigation Section.

A copy of this letter is being furnished to the Tehama County Flood Control and Water Conservation District, 9380 San Benito Avenue, Gerber, CA 96035.

Sincerely,

A handwritten signature in black ink, appearing to read "William J. Leady".

William J. Leady, P.E.
Colonel, U.S. Army
District Commander

Enclosure

Flood Protection and Navigation Section

cc: CESPCK-CO-E (Jones)

MURAKAMI *RM*

LARSON *RL*

NAGY *NB*

CALDWELL *EC*

OLSEN *OS*

MAHONEY *MA*

AW FAUSTINO *AF*

MULLINS *MS*

LEADY

\\spk-netapp1\COOPublic\FP&Nav\ICW\Transfer Letters\Elder Creek - Tehama County\W91238-08-D-0016\Transfer Letter Elder Creek W91238-08-D-0016.doc

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814



REPLY TO
ATTENTION OF

May 15, 1984

Navigation and Flood Control Unit

The Reclamation Board
State of California
1416 - Ninth Street, Room 455-6
Sacramento, California 95814

Gentlemen:

You are hereby notified that the Corps of Engineers has completed emergency repairs to project levees under authority of Section 5 of the Flood Control Act of August 18, 1941, as amended (Public Law 99, 84th Congress, 1st Session). The work was completed on April 27, 1984, and consisted of restoring the right bank levee of Elder Creek (Site 4), Tehama County in accordance with Contract Number DACW05-84-C-0042 and Drawing Number 50-4-5602. This work shall be maintained in accordance with the assurances which your Board provided for the Sacramento River and Major and Minor Tributaries Project. The completed work will be added by amendment to the Operation and Maintenance Manual for Elder Creek, Sacramento River and Major and Minor Tributaries Project. Copies will be furnished your office at a later date.

Sincerely,

Henry Lee
Lieutenant Colonel, Corps of Engineers
Acting Commander

EXHIBIT F

CERTIFIED
No. **779766**
RETURN RECEIPT REQUESTED

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

CD

January 4, 1984

Navigation and Flood Control Unit



The Reclamation Board
State of California
1416 - 9th Street, Room 455
Sacramento, California 95814

W1-3
ROMPALA/bs

Gentlemen:

RCK
KELLY

You are hereby notified that the Corps of Engineers has completed emergency repairs to project levees under authority of Section 5 of the Flood Control Act of August 18, 1941, as amended (Public Law 99, 84th Congress, 1st Session). The work was completed on December 28, 1983, and consisted of restoring the right and left bank levees of Elder and Deer Creeks, Tehama County in accordance with Contract Number DACW05-84-C-0042 and Drawing Number 50-4-5602. All sites were completed except Site 4 on Elder Creek which will be completed as weather permits, and Site 7 on Deer Creek which was deleted from the contract as mutually agreed. This work shall be maintained in accordance with the assurances which your Board provided for the Sacramento River and Major and Minor Tributaries Project. The completed work will be added by amendment to the Operation and Maintenance Manual for Elder and Deer Creeks Sacramento River and Major and Minor Tributaries Project. Copies will be furnished your office at a later date.

A
A. SMITH

H
HELM

B
BRUBAKER

B
DENNIS

D
DUFFLEY

LEE *H*

Sincerely,

W
WILLIAMS

W
#1493a

Arthur E. Williams
Colonel, Corps of Engineers
District Engineer

Copy Furnished:
Commander, South Pacific Division, ATTN: SPDCO-C

- cc:
- EM Div (Garrett)
- Engr Div (Civ Des Sec D - Pahl)
- Ops Br
- Valley Res Ofc

Vol. 12
Elder + Deer
Creeks

C
O
P
Y

THE RECLAMATION BOARD
STATE OF CALIFORNIA

C
O
P
Y

August 18, 1976

District Engineer
Sacramento District
U. S. Army Corps of Engineers
650 Capitol Mall
Sacramento, CA 95814

Dear Sir:

The Reclamation Board at its regular meeting of August 13, 1976, formally accepted from the District Engineer the completed flood control work on a portion of Unit No. 27 of the Sacramento River Bank Protection Project. The flood control work was transferred to the State of California by your letter of August 3, 1976.

The flood control work consisted of selective clearing, levee bank sloping, placement of stone bank protection, and such miscellaneous work as necessary to complete the construction at Sites Miles 2.09 Right Bank and 3.83 Left Bank, Elder Creek, Site Mile 2.6 Left Bank, Bear River and Sites Miles 173.8, 174.4 and 177.4 Right Bank, Sacramento River.

The work was constructed in a workmanlike manner and in conformance with Drawing No. 50-4-4892, Specification No. 4461, and Contract No. DACW 05-75-C-0085, insofar as could be determined visually.

Sincerely,

/s/ John F. Wright
for PAUL L. CLIFTON
General Manager

C
O
P
Y

THE RECLAMATION BOARD
STATE OF CALIFORNIA

C
O
P
Y

January 13, 1971

File No: 4130.60.403
Your Contract: 70-C-0088

District Engineer
U. S. Army Corps of Engineers
650 Capitol Mall
Sacramento, California 95814

Dear Sir:

Reference is made to your letter of December 23, 1970, concerning transfer to the State of California of a portion of the Sacramento River Bank Protection Project for maintenance and operation. The transferred sites were as follows:

<u>Waterway</u>	<u>Bank</u>	<u>Levee Mile</u>
Elder Creek	Right	0.20
	Right	1.35
	Left	0.50

This work was constructed in conformance with specification No. 3426, Contract No. DACW05-70-6-0088, Drawing No. 50-4-4377 and is a portion of the work to be done on Unit No. 18.

The Reclamation Board at its meeting of January 8, 1971, formally accepted the above-referred to work for operation and maintenance.

Sincerely yours,

/s/ Allan I. Wendroff
for A. E. McCOLLAM
Chief Engineer and General Manager

EXHIBIT F

23 December 1970

The Reclamation Board
State of California
1416 - 9th Street, Room 1335
Sacramento, California 95814

Gentlemen:

Reference is made to the joint inspection of 14 December 1970 made for the purpose of transferring a portion of the Sacramento River Bank Protection Project work (Unit #18), to the State of California for operation and maintenance.

The flood control work consists of bank sloping and placement of stone protection on Elder Creek left bank at levee mile 0.50 and right bank at levee miles 1.35 and 0.20. A list covering the completed work is inclosed. The work was completed on 14 December 1970 in accordance with Specification No. 3426, Contract No. DACW05-70-C-0088, Drawing No. 50-4-4377.

The work was performed under the general authority of the Flood Control Act of 1960, 86th Congress, 2nd Session and Section 2304(a), Title 10, and now meets the requirements of the Sacramento River Bank Protection Project. Therefore, said work together with the waterway banks contiguous thereto, is transferred as of 14 December 1970 to the State of California for operation and maintenance. This portion of the project work will be added by amendment to the Operation and Maintenance Manual for Elder Creek, Sacramento River Flood Control Project. Copies will be furnished your office at a later date.

Sincerely yours,

JAMES H. HIGMAN
Lieutenant Colonel, CE
Acting District Engineer

1 Incl (in dupe)
List

Copy furnished:
DWR, ATTN: John Wright

OCE
SPD

F&A (Cordano)

cd:
Engr-Lev & Chan
Engr-Prog Dev
Valley Res Ofc

*Vol 12
Elder Creek*

WAIT 7pp

COLEMAN

HENSON

HART

SHERG

HIGMAN

Sh

SUMMARY OF SACRAMENTO RIVER BANK PROTECTION

UNIT #18 - ELDER CREEK

ELDER CREEK:
SITE LEVEE MILE

STONE PROTECTION

LEFT BANK

L.F.

0.50

14+00 to 18+00

400

RIGHT BANK

1.35

57+20 to 62+20

500

0.20

-0+40 to 1+59

199

4+30 to 7+46

316

9+38 to 13+41

403

10118 Elder Creek

THE RECLAMATION BOARD
STATE OF CALIFORNIA

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January 12, 1970

District Engineer
Corps of Engineers
U. S. Army
650 Capitol Mall
Sacramento, California 95814

Dear Sir:

Reference is made to your letter of December 9, 1969 concerning transfer to the State of California of the four emergency rock revetment sites along the right and left banks of Elder Creek for maintenance and operation.

This work was constructed in accordance with Specification No. 3668, Contract No. DACW05-70-C-0014, Drawing No. 50-4-4490.

The Reclamation Board, at its meeting of January 9, 1970, formally accepted the above-referred to work for operation and maintenance.

Sincerely yours,

/s/

A. E. McCOLLAM
Chief Engineer and
General Manager

EXHIBIT F

SPKCO-0



The Reclamation Board
State of California
1416 - 9th Street, Room 1335
Sacramento, California 95814

Gentlemen:

Reference is made to the emergency project levee restoration work in Tehama County, authorized by Section 2304(a)(1), Title 10, U.S.C. and Section 5 of the Flood Control Act of 18 August 1941, as amended (Public Law 99, 84th Congress, 1st Session).

The authorized emergency work referred to above was inspected and completed on 28 November 1969, in accordance with Specification No. 3668, Contract No. DACW05-70-C-0014 and Drawing No. 50-4-4490. This work consisted of repairing approximately 1,200 feet of eroded levee, with placement of approximately 1,200 feet of rock revetment at four sites along the left and right banks of Elder Creek, near Gerber, California.

The completed flood emergency work, having restored the project levees previously transferred to your Board, shall be maintained and operated by the State of California in accordance with the Standard Operation and Maintenance Manual on Elder Creek, Unit of the Sacramento River Major and Minor Tributaries Project, California.

Sincerely yours,

GEORGE B. FINK
Colonel, CE
District Engineer

R.
ROMPALA/p

[Signature]
COLEMAN

[Signature]
HENSON

[Signature]
BART

[Signature]
FINK

~~Copy furnished:~~
DWR, ATTN: John Wright

Vol 12

CERTIFIED MAIL

RETURN RECEIPT REQUESTED

[Handwritten initials]
[Handwritten initials]

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The Reclamation Board
State of California

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AUG 19 1969
4130.60.303

District Engineer
Corps of Engineers
U. S. Army
650 Capitol Mall
Sacramento, California 95814

Dear Sir:

Reference is made to your letter of August 6, 1969 concerning transfer to the State of California of a portion of the Sacramento River Bank Protection Project, Unit No. 13, consisting of Site Mile 143.5, right bank, Sacramento River, and Sites Mile 0.75, 0.83 and 1.56, left bank, Elder Creek and Site Mile 1.01, right bank, Elder Creek for maintenance and operation.

This work was constructed in accordance with Specification No. 3369, Contract No. DACW05-68-C-0067, Drawing No. 50-4-4179.

The Reclamation Board, at its meeting of August 15, 1969, formally accepted the above referred to work for operation and maintenance.

Sincerely yours,

/s/ A. E. McCOLLAM
A. E. McCOLLAM
Chief Engineer and
General Manager

EXHIBIT F

6 August 1969

The Reclamation Board
 State of California
 1416 - 9th Street, Room 1335
 Sacramento, California 95814

Gentlemen:

Reference is made to the joint inspection of 4 August 1969, made for the purpose of transferring a portion of the Sacramento River Bank Protection Work (Unit #13), to the State of California for operation and maintenance.

The flood control work, consisting of bank sloping and placement of stone bank protection on the Elder Creek right and left banks and the Sacramento River right bank, is as follows:

<u>LEVEE UNIT</u>	<u>ELDER CREEK - LEFT BANK</u>	
<u>SITE MILE</u>	<u>STATION</u>	<u>L.F.</u>
0.75	35+70 to 40+00	430
0.83	43+75 to 48+50	475
1.56	80+70 to 83+00	230
	<u>ELDER CREEK - RIGHT BANK</u>	
1.01	36+13 to 50+00	1,387
<u>RIVER MILE</u>	<u>SACRAMENTO RIVER - RIGHT BANK</u>	
143.5	0+95 to 6+90	595
	7+27 to 7+70	43

The work was completed on 4 August 1969, in accordance with Specification No. 3369, Contract No. DACW05-68-C-0067, Drawing No. 50-4-4179. The work was performed under the general authority of the Flood Control Act of 1960, 86th Congress, 2nd Session; and Section 2304(a), Title 10, and now meets the requirements of the Sacramento River Bank Protection Project.

CERTIFIED MAIL

RETURN RECEIPT REQUESTED

Units 13/1/37
 & Vol 12

SFKCO-0
The Reclamation Board

6 August 1969

Therefore, said work, together with the waterway banks contiguous thereto, is transferred to the State of California for operation and maintenance.

This portion of the project work will be added by amendment to the Operation and Maintenance Manuals for the Sacramento River Flood Control Project, Supplement Nos. 131 & 137; and Elder Creek, Sacramento River and Major & Minor Tributaries Project. Copies will be furnished your office at a later date.

Sincerely yours,

GEORGE B. SKINNER
Lieutenant Colonel, CE
Acting District Engineer

Copy furnished:

✓ Dept Water Resources

✓ O.C.E.

✓ S.P.D.

✓ cc:

Engr-Lev&Chan

Engr-Prog Dev

Valley

F&A (Cordano)

Supply Divn

✓
ROMPALA/pp.

✓
COLEMAN

✓
HENSON

✓
HART

✓
SKINNER

6 Aug

Units 131, 137
& Vol 12

THE RECLAMATION BOARD
State of California
January 11, 1966

C
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District Engineer
Corps of Engineers
U. S. Army
650 Capitol Mall
Sacramento, California

Dear Sir:

Reference is made to your letter of November 29, 1965, concerning transfer to the State of California of the Sacramento River Bank Protection Project, Contract 14, ten sites between Sacramento and Gerber, in accordance with Specification No. 3283.

The Reclamation Board, at its meeting of January 6, 1966, formally accepted the above referred to work for operation and maintenance.

Sincerely yours,

/s/ A. E. McCollam
A. E. McCOLLAM
General Manager

29 November 1965

The Reclamation Board
State of California
1416 - 9th Street, Room 1335
Sacramento, California 95814

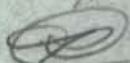
Gentlemen:

Reference is made to the joint inspections made on 17 & 19 November 1965, of flood control work pertaining to the Sacramento River Bank Protection Project for the purpose of transferring this work, upon completion, to the State of California for operation and maintenance.

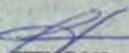
The flood control work, consisting of levee enlargement, levee set-back, shaping and placement of bank protection at 4 locations on Elder Creek near Highway U.S. 99W; one location on the Sacramento River at Hamilton Bend, three locations on the Feather River near Nicolaus and one location near the Gridley Bridge, and one location on the American River downstream from the "H" Street Bridge, as listed on the attached inclosure, was completed on 19 November 1965, in accordance with Specification No. 3283, Contract No. DA-04-167-GIVING-66-28 and Drawing No. 50-4-4118.

cont. 14

The flood control work as described on the attached inclosure now meets the requirements of the Sacramento River Bank Protection Project. Therefore, said flood control works, together with the waterway banks contiguous thereto are transferred to the State of California for operation and maintenance.

Hem

COLEMAN/I

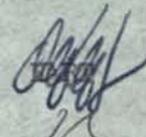
This portion of the project work will be added by amendment to the Operation and Maintenance Manual, Supplement Nos. 118-Elder Creek, 136, 141 and 152-Sacramento River Flood Control Project, and furnished your office at a later date.


HENSON

Sincerely yours,

ROBERT E. MATHE
Colonel, CE
District Engineer

*Units
118-1, 136/141,
152 + Vol 12
Elder Creek*


MATHE
cm

1 Incl
Summary Sheet

CERTIFIED MAIL

Copy furnished: RETURN RECEIPT REQUESTED cc. Lev & Chan; Prog Dev; Valley Res;
Dept Water Resources w/incl F&A (ATTN: C. Cordano)

1507-55

SUMMARY OF LEVEE UNITS - RIGHT & LEFT BANKS
 AMERICAN RIVER, SACRAMENTO RIVER, FEATHER RIVER & ELDER CREEK

Unit
19

LEVEE UNIT SITE MILE	LEVEE ENLARGEMENT	LINEAL FEET	LEVEE SETBACK	LINEAL FEET	BANK SLOPING	LINEAL FEET	STONE PROTECTION	LINEAL FEET	RIGHT OR LEFT BANK
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AMERICAN RIVER:

5.84					3+00to18+50	1550	3+00to18+50	1550	Left 118.1
------	--	--	--	--	-------------	------	-------------	------	------------

SACRAMENTO RIVER:

152.47			235+00to244+00	900			236+00to243+00	700	Left 130
--------	--	--	----------------	-----	--	--	----------------	-----	----------

FEATHER RIVER:

6.5					77+00to86+00	800	78+00to86+00	800	Left
7.5	16+00to31+00	1500	16+00to31+00	1500	31+00to32+00	100	16+00to32+00	1600	Left } 141
8.6	2+00to10+00	800	2+00to10+00	800			2+00to10+00	800	Left
49.6			3+00to14+00	1100	0+00to3+00	300	0+00 to 14+00	1400	Right 152

ELDER CREEK:

0.56					16+25to22+00	575	16+25to22+00	575	Right
1.25					62+60to70+50	790	62+60to70+50	790	Left
1.46					62+00to70+00	800	62+00to70+00	800	Right
1.85					124+50to131+00	650	124+50to131+00	650	Right

Vol 12

THE RECLAMATION BOARD
1215 O Street
Sacramento, California 95814

January 7, 1964

Refer to: 7001.60.401
4130.60.401

District Engineer
Corps of Engineers
U. S. Army
P. O. Box 1739
Sacramento 8, California

Dear Sir:

Reference is made to your letter of December 10, 1963, concerning transfer to the State of California of flood control work on Elder Creek, unit of the Sacramento River Major and Minor Tributaries Project, (Contract 7, Sacramento River Bank Protection), in accordance with Specification No. 2985.

The Reclamation Board, at its meeting of January 3, 1964, formally accepted the above referred to flood control work for operation and maintenance.

Sincerely yours,

A. E. McCollam /s/
A. E. McCOLLAM
General Manager

1 0 DEC 1963

The Reclamation Board
State of California
1215 "O" Street
Sacramento 14, California

Gentlemen:

Reference is made to the joint inspection made on 3 December 1963 of flood control work on Elder Creek, a unit of the Sacramento River Major and Minor Tributaries Flood Control Project for the purpose of transferring it, upon completion, to the State of California for operation and maintenance.

The flood control work performed is described as follows:

a. Emergency repair work consisting of constructing a levee setback 500 feet in length on the right bank of Elder Creek located one-half mile upstream from U.S. Highway 99W, was performed under the general authority of Public Law 99, 84th Congress, 1st Session. The work was completed on 20 July 1963 in accordance with Specification No. 2992, Contract No. DA-04-167-CIVENG-63-78 and Drawing No. 50-4-3746.

b. Placement of stone protection on right bank of Elder Creek at Site No. 1 (300 feet in length) and Site No. 2 (1000 feet in length) located one-half mile upstream from U.S. Highway 99W, was performed under the general authority of the Sacramento River Bank Protection Project (Public Law 86-645, 86th Congress, 2nd Session). The work was completed on 12 October 1963 in accordance with Specification No. 2485, Contract No. DA-04-167-CIVENG-64-33 and Drawing No. 4-4-542. Work under this contract does not include bank protection at River Mile 6.7 on the left bank of Feather River, which will be transferred by separate letter.

The above work as completed is hereby transferred to the State of California for operation and maintenance and now becomes the project levee replacing the levee reach transferred to the State on 9 November 1961.

VH 12

SPKRO-C
The Reclamation Board

10 DEC 1963

A copy of this letter is being transmitted to the Department of
Water Resources.

Sincerely yours,

ROBERT E. MATHE
Colonel, CE
District Engineer

Copy furnished:
Dept Water Resources
23rd & "R" Streets
Sacramento, Calif.
O.C.E.
S.P.D.

cc: Engr Div, Lev & Chan
Engr Div, Prog Dev Br
F & A Br
Northern Area Ofc
Operations Br (2)

Operations

LAK
12/5/63
KRISTOF/pnp

[Signature]
THOMPSON

[Signature]
HARRIS

[Signature]
MATHE

[Signature]
GD

2

Vol 12

[Handwritten mark]

The Reclamation Board
of the
State of California

November 27, 1961

District Engineer
Sacramento District
U. S. Corps of Engineers
P. O. Box 1739
Sacramento, California

Dear Sir:

Reference is made to your letter of November 9, 1961, concerning transfer to the State of California of levee improvement and bank protection work along Elder Creek from the Sacramento River overflow area upstream to 1.2 miles above U. S. Highway 99W, under Corps of Engineers Specification No. 2653.

The Reclamation Board, at its meeting of November 16, 1961, formally accepted the above-referred to levee and bank protection work for operation and maintenance.

Sincerely yours,

/s/Robert W. James
ROBERT W. JAMES
General Manager and Chief Counsel

Sac Riv Major & Minor

SPKHO-C

9 NOV 1961

The Reclamation Board
State of California
1215 "O" Street
Sacramento 14, California

Gentlemen:

Reference is made to the joint inspection made on 11 October 1961, of flood control work along Elder Creek, for the purpose of transferring it, upon completion, to the jurisdiction of the State of California for operation and maintenance.

The work, consisting of channel improvement, levee construction and bank protection on Elder Creek from Sacramento River Overflow Area to 1.2 miles upstream from U.S. Highway 99W, was completed on 11 October 1961 in accordance with Specification No. 2653, Contract No. DA-04-167-CIVENG-61-24 and Drawing No. 50-4-3622.

The flood control work described above now meets the requirements of the Sacramento River Major and Minor Tributaries Flood Control Project. Therefore, said flood control work, together with the waterway banks contiguous thereto, are hereby transferred to the State of California for operation and maintenance.

^{and}
The maintenance work required under the provisions of the Sacramento River Major and Minor Tributaries Flood Control Project shall be performed in accordance with existing Flood Control regulations, inclosed herewith, which have been prescribed by the Secretary of the Army pursuant to Section 3 of the Act of Congress, approved 22 June 1936. As provided under Paragraph 208.10(10) of these regulations, an Operation and Maintenance Manual covering the work under this portion of the project is in process of preparation and will be furnished to you upon completion.

Vol 12

9 NOV 1961

SPKRO-C
The Reclamation Board

A copy of this letter is being transmitted to the State Department of Water Resources.

Sincerely yours,

H. N. TURNER
Colonel, CE
District Engineer

1 Incl
P.C. Reg.

Copy furnished:
Dept Water Resources
23rd & "R" Streets
Sacramento, Calif.

O.C.E. w/o incl
S.P.D. w/o incl

cc: Engr Divn-Lev & Chan w/o incl
Engr Divn-Pro Dev Br w/o incl
Fin & Acctg Br w/o incl
Northern Area Ofc w/o incl

OPERATIONS BRANCH
CHANNELS & LEVES SECTION

RP

Concurrences	
Originator	LHK
Date	11/9/61
Dist. Engr.	<i>[Signature]</i>
Dep. Dist. Engr.	<i>[Signature]</i>
Exec. Asst.	<i>[Signature]</i>
Cmplr.	
Budget	
Fin. & Acctg.	
Mgmt.	
Property	
Office Service	<i>[Signature]</i>
Const. Opns.	<i>[Signature]</i>
Engr'g.	
R. E.	
Personnel	
Counsel	
Supply	
Security	
Safety	
Tech. Liaison	

Vol 12
[Signature]

EXHIBIT G

PERMIT

(Name of Levee Commission or City)

(Location)

Permission is hereby granted to:

(Name of Firm or Individual)

(Address)

TO: (Describe in these spaces the proposal, including kind and type of construction, purpose intended, location by stationing. Indicate passageway provided by means of gates, etc. Use separate sheets if necessary, identifying each by reference herein.)

Provided that:

Upon termination or expiration of this permit (whether by voluntary relinquishment by the grantee, by revocation by the grantor or otherwise) the grantee shall remove all structures, improvements, or appurtenances which may have been erected or constructed under this permit, and shall repair or replace any portion of the flood protection structure or right-of-way which may have been damaged by his operations (including grading and seeding, or sodding, if necessary), to the satisfaction of the grantor.

The structure or operation for which this permit is issued shall be maintained by the grantee in such manner as shall not injure or damage the flood protection structure, or interfere with its operation and maintenance in accordance with regulations of the Secretary of the Army.

The structure or operation covered by this permit may be damaged, removed or destroyed by the grantor in time of flood emergency if such action is determined by the grantor to be necessary in order to preserve life or property or prevent damage or impairment to the use or safety of the flood protection structure, and the grantor shall not be liable to the grantee for such damage or destruction.

Unless otherwise specifically provided herein, this permit may be cancelled at any time by the grantor upon 10 days written notice mailed to the address shown above. During such 10 day period, (or such other period as may be provided herein), the grantee will be permitted to remove any property or improvements installed under this permit, and to repair or replace any damage to the flood protection right-of-way or structures resulting from his use or operations. At the end of such period, the grantor shall have the right to possess and dispose of any such property or improvements remaining upon its right-of-way, and may proceed to repair or replace any such damage, and the grantee herein shall be liable to the grantor for the full cost of such repairs or replacements.

The construction, installation and maintenance of the structure or structures covered by this permit shall be subject to inspection by representatives of the grantor and the United States at all reasonable times.

In the event the work covered by this permit consists of or includes major construction, the cost of inspection thereof by the grantor and/or the United States shall be paid by the applicant.

Grantee agrees that it will not use the area or facilities covered by this permit, or permit such area to be used, for any purpose other than is specifically covered by this permit.

(Use these spaces for special conditions applicable to this permit.)

THIS PERMIT SHALL NOT BE VALID UNTIL APPROVED BY THE DISTRICT ENGINEER OF THE U. S. ARMY ENGINEER DISTRICT, SACRAMENTO, OR HIS AUTHORIZED REPRESENTATIVE.

Signature (Grantor) (Title) (Date)

Terms of this permit
are hereby accepted

Approved:

Signature (Grantee) (Date) _____ (Date)

District Engineer

REGULATIONS GOVERNING ISSUANCE OF PERMITS FOR USE OF
RIGHTS-OF-WAY FOR FLOOD PROTECTION PROJECTS

As the flood protection works and rights-of-way are owned by the Local Interests and will be operated and maintained by them in accordance with the Regulations of the Secretary of the Army, and issuance of any permits to use any part of the rights-of-way will be handled by the Local interests, with the restriction that no such permits may be issued without the approval of the District Engineer, as stated in Paragraph No. 208.10 (a) General, (5) of the Regulations, a copy of which is attached hereto.

Applications for use of the rights-of-way should be addressed to the City or Levee Commission having jurisdiction over the local flood protection project. The City or Levee Commission will then forward the application to the District Engineer, of the U. S. Army Engineer District, Sacramento, California, with its recommendation, with reasons for such recommendation. It is suggested that the application and recommendations be forwarded with a draft copy of the permit, in order that all objectionable features may be eliminated prior to its proffer to the applicant as this may prevent misunderstandings and arguments. If for any reason it is desired to forward the permit itself without this intervening step, five copies of the proposed permit should be included on which is stated the exact use of the rights-of-way, for which permission is being requested, together with any condition or restriction of the permit. The permit should be signed by the applicant and an official of the Local Interests. A drawing, sketch or detail plans as may be required to show the exact location, nature of work and proposed method of construction should be attached to each copy of the permit. If the permit is approved by the District Engineer, three copies will be returned. This will enable each party concerned to have a copy of the approved permit.

In any case where a permit is requested for any purpose which might cause disfigurement or damage to the flood protection rights-of-way or structure in its erection, use, or removal, it is suggested that the applicant be required to post a bond of sufficient amount to protect the Local Interests from any cost of repair or removal, and to guarantee faithful performance of the permit conditions. In such cases the permit should state the amount and conditions of the bond.

In cases involving major construction or other work which may directly affect the flood protection structure, it will be necessary that the United States inspect the work and the Local Interests may also desire to inspect it. As stated in the permit form, such inspection will be at the expense of the grantee, and this should be called to his attention. Except in cases of known financial security, arrangements should be made with the grantee for an advance deposit or bond to cover such costs.

There is attached hereto a copy of a permit form which has been successfully used by a number of cities and levee committees.

EXHIBIT H

Sample Log for Recording and
Reporting Operation of Pumping
Plant During Flood Period

EXHIBIT H

OPERATION OF AUXILIARY EQUIPMENT
AND
MISCELLANEOUS PLANT FACILITIES
DURING FLOOD PERIOD

DATE: _____

PERIOD: _____

SUPERINTENDENT: _____

Item No.	Description	Time	Remarks*
1	Pump controller and indicator in Pump Well "A"		
2	Automatic float operated water level recorder in distribution box		
3	Main switch board		
4	Flapgates in pump discharge lines		
5	By-pass outlet gates		
6	By-pass inlet gates		
7	Trash racks		
8	Slide gates in discharge conduits		
9	Power supply		
10	Lighting		
11	Miscellaneous		

*Brief note under Remarks and reference to more detailed comments on an attached sheet with appropriate cross references. See EXHIBITS D, F, and G for a guide as to breakdown of the respective items checked. Note in particular any abnormal noise, malfunctioning of equipment or any condition that develops that may or does impair the operation of the plant or unit thereof.

EXHIBIT H
(Attachment for Sheet 2 of EXHIBIT H)

OPERATION OF PLANT DURING FLOOD PERIOD

DATE: _____ PERIOD: _____ SUPERINTENDENT: _____

Item No.	Time	Remarks (Reference Sheet 2 of Exhibit H)

EXHIBIT H
Sheet 4 of 4