

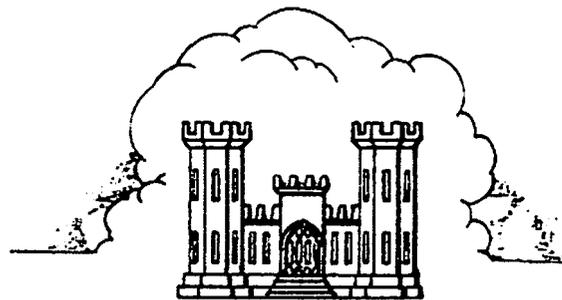
OPERATION AND MAINTENANCE MANUAL

FOR

MORMON SLOUGH PROJECT

SAN JOAQUIN COUNTY, CALIFORNIA

PART No. I-LEVEES AND CHANNELS
SAN JOAQUIN RIVER TO BELLOTA



DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL

SUBJECT

SPKED-D

Mormon Slough, Calaveras River, California
Additions to O&M Manual

Ch, C-Ops Division

FROM Ch, Engineering Div DATE 28 December 1984
POTTER/lp/3572

CMT1

1. Inclosed are two copies of additions to the operation and maintenance manual for the Mormon Slough project, Part No. 1, Levees and Channels, San Joaquin River to Bellota. The additions reflect completed construction work for the Jack Tone Road Bridge Emergency Bank Protection project.

2. A copy of the additions has been furnished to the Division Engineer. Copies of the additions have been furnished to the Reclamation Board and the Department of Water Resources.

Incl (dupe)
as

GEORGE C. WEDDELL
Chief, Engineering Division

cc:

Civ Des Br

Civ Des Sec C

Civ Des Sec D

**OPERATION AND MAINTENANCE MANUAL
MORMON SLOUGH PROJECT
SAN JOAQUIN COUNTY, CALIFORNIA**

PART NO. 1
LEVEES AND CHANNELS
SAN JOAQUIN RIVER TO BELLOTA

LOCATION	ADDITION OR REVISION	DATE
Section I	Add paragraph 1-01a	5 Dec 1984
Section I	Add paragraph 1-03h	5 Dec 1984
Section I	Add paragraph 1-05f	5 Dec 1984
Section II	Add paragraph 2-02a	5 Dec 1984
Section II	Add paragraph 2-03a	5 Dec 1984
Paragraph 4-03e	Add subparagraphs 2(a), (b), (c), (d)	5 Dec 1984
Exhibit B	Add drawing File No. SJ-4-103	5 Dec 1984
Exhibit H	Add copy of letter of transfer dated 17 Apr 1984	5 Dec 1984
Exhibit F	Add copy of transfer letter dated 19 Aug 1968	26 Mar 2010
Exhibit F	Add copy of Summary of Mormon Slough inspection Contract 68-0020 Unit No. 2	26 Mar 2010
Exhibit F	Add copy of transfer letter dated 9 Jan 1969	26 Mar 2010
Exhibit F	Add copy of Summary of Mormon Slough inspection referenced Contract 68-0060 Unit No. 1	26 Mar 2010
Exhibit F	Add copy of transfer letter dated 30 Oct 1969	26 Mar 2010
Exhibit F	Add copy of Summary of Mormon Slough inspection Contract 69-0078 Unit No. 3	26 Mar 2010
Section I	Add second paragraph to section 1-02	6 Apr 2010
Section I	Add Description of Additional Project Works paragraph and paragraphs i, j, k, l to section 1-03	6 Apr 2010
Section I	Add second paragraph 1-04. Protection Provided and table	6 Apr 2010
Section I	Add paragraphs g, h, i, j to section 1-05	6 Apr 2010
Section III	Add subparagraphs (c) and (h) to section 3-07 part g	6 Apr 2010
Section III	Add subparagraphs (c) and (h) to section 3-07 part h	6 Apr 2010
Section III	Add table and following paragraph to 3-07 h(3)	6 Apr 2010
Section III	Add paragraphs l, m, n, o, p, q, r, s to section 3-08	6 Apr 2010
Section IV	Add second paragraph to section 4-02	6 Apr 2010
Section IV	Add second description paragraph and 4 following tables in section 4-04	6 Apr 2010
Section IV	Add second description paragraph, bridges table and following paragraph to section 4-05.a.1	6 Apr 2010
Section IV	Add entire section 4-06. Floodwalls	6 Apr 2010
Section V	Add Floodwalls paragraph to section 5-02	6 Apr 2010
Section V	Add second paragraph to section 5-08	6 Apr 2010

LOCATION	ADDITION OR REVISION	DATE
Exhibit B	Add as-built number E-2060 Mormon Slough and Potter Creek Levee Improvement Plans, in 50 pages.	6 Apr 2010
Exhibit B	Add drawing named CALDEM14.DWG Upper Calaveras River Levee Improvement Plans, in 75 pages.	6 Apr 2010
Exhibit B	Add drawing named ACCESS.DWG Upper Calaveras River Cherry Lane, in 4 pages.	6 Apr 2010
Exhibit B	Add as-built file no. E-2059 Stockton Diverting Canal Levee Improvement Plans, in 77 pages.	6 Apr 2010
Exhibit F	Add copy of letter of transfer dated 1 Jul 2003	6 Apr 2010

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EXHIBITS

A	Federal Flood Control Regulations	Sheets 1 and 2
A-1	Location Map	1 Sheet
B	"As Constructed" Drawings	Detached
C	Plates of Suggested Flood Fighting Methods . .	Plates 1 thru 10
D	Suggested Semi-Annual Report Form	Sheets 1 and 2
E	Suggested Check Lists of Levees, Channels and Structures	Sheets 1 thru 7
F	Letter of Acceptance by the State Reclamation Board	Sheets 1 thru 3
G	Sample Permit for Use of Right-of-Entry	Sheets 1 thru 3

EXHIBIT H April 17, 1984 transfer letter.
DEC 5-84

OPERATION AND MAINTENANCE MANUAL
MORMON SLOUGH PROJECT – SAN JOAQUIN COUNTY
PART NO. 1 – LEVEES AND CHANNELS

SAN JOAQUIN RIVER TO BELLOTA

SECTION I

INTRODUCTION

1-01. Authorization. The Mormon Slough Project, San Joaquin County, California, was authorized by the Flood Control Act approved 23 October 1962 in Public Law 87-874, 87th Congress, Second Session, which states in part:

“The project for flood protection on Mormon Slough, Calaveras River, California, is hereby authorized substantially in accordance with the recommendations of the Chief of Engineers in House Document Numbered 576, 87th Congress, at an estimated cost of - - - -.”

In the report of the Chief of Engineers to the Secretary of the Army, dated 28 August 1962, the Chief of Engineers stated that he concurred in the Recommendations of the Board of Engineers for Rivers and Harbors. In paragraph 10 of House Document No. 576, the recommendations of the Board were as follows:

“Recommendations . . . Accordingly, the Board recommends improvement for flood control on Mormon Slough, the Diverting Canal, and the Calaveras River, California, consisting of channel enlargement and clearing, slope paving, levees, gated drainage structures, a pumping plant, railroad adjustments, and appurtenant works; all generally in accordance with the plan of the District Engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable”

1-01a Construction of emergency bank protection work along the right bank Mormon Slough at the Jack Tone Road bridge under authority of Section 14 of the 1946 Flood Control Act, as amended, was approved by the Office of the Chief of Engineers on October 29, 1981. Funding for construction was approved on December 1, 1982.

1-02. Location. The Mormon Slough Flood Control Project is located in San Joaquin County and in the general vicinity north and east of the city of Stockton, California. Channel improvement begins at the San Joaquin River and proceeds upstream on the Stockton Diverting Canal to Mormon Slough; thence upstream on Mormon Slough to Bellota, California, a total distance of about 24.5 miles. A backwater levee has been constructed on the left bank of the Calaveras River upstream from the Stockton Diverting Canal for about 0.75 miles and on the left bank of Potter Creek from Mormon Slough upstream to Jack Tone Road.

The project has been extended with local funding to include levee modifications along Mormon Slough, Potter Creek, Upper Calaveras River, and Stockton Diverting Canal. The project location is indicated on the vicinity map included in EXHIBIT APPENDIX - 1.

1-03. Description of the Project Works. The three pumping plants are covered under another manual designated Part No. 2. The project works covered by this manual (Part No.1) include the following:

- a. The improved channel and levees along both banks of the Calaveras River from the Stockton Deep Water Ship Channel to its junction with the Stockton Diverting Canal, a distance of about 5.7 miles.
- b. The improved channel and levee along both banks of the Calaveras River from the Stockton Diverting Canal to the McAllen Road, a distance of about 0.6 miles.
- c. The improved channel and levees along both banks of the Stockton Diverting Canal from the Calaveras River to its junction with Mormon Slough, a distance of about 5.0 miles.
- d. The improved channel and levees along both banks of Mormon Slough from the Diverting Canal to Potter Creek, a distance of about 2.3 miles.
- e. The improved channel and levee along the left bank of Potter Creek from the Mormon Slough to the Jack Tone Road, a distance of about 0.9 miles.
- f. The improved channel and intermittent spoil dikes and levees along Mormon Slough from Potter Creek to Bellota, a distance of about 11.2 miles.
- g. Intermittent irrigation and drainage structures and intermittent bank protection along the above described levees and channels.
- h. Gabion bank protection on the right bank of Mormon Slough at Jack Tone Road Bridge under authority of Section 14 of the 1946 Flood Control Act, as amended.

Description of Additional Project Works. The original Mormon Slough project works are described in “Operations and Maintenance Manual for Mormon Slough Project San Joaquin County, California, Part No. 1 – Levees and Channels San Joaquin River to Bellota” U.S. Army Corps of Engineers, Sacramento, California 1970, and “Operations and Maintenance Manual for Mormon Slough Project San Joaquin County, California, Part No. 2 – Pumping Plants” U.S. Army Corps of Engineers, Sacramento, California 1970. Additional project works added through this addendum include the following:

- i. Improvement of levees on both banks of the Mormon Slough upstream from the Stockton Diverting Canal to the confluence with Potter Creek. The right bank of Mormon Slough has been modified 400 feet upstream from its confluence with Potter Creek.
 - j. Improvement of levee on left side of Potter Creek from Mormon Slough to Jack Tone Road.
 - k. Improvements of levee on both sides of Stockton Diverting Canal from the Mormon Slough northwest to the confluence with the Upper Calaveras River. Intermittent floodwall construction on the right bank along the same reach.
 - l. Improvements of Levee on both sides of Upper Calaveras River from the junction with the Stockton Diverting Canal to the Central California Traction railroad tracks.
- 1-04. Protection Provided. The project provides flood protection from flood flows on the Calaveras River, Mormon Slough, the Stockton Diverting Canal and Potter Creek to adjacent agricultural lands consisting of about 37,000 acres of orchards, vineyards and cultivated fields; the city of Stockton; three mainline railroads, two local railroads and one branch line; US Highway 99 and numerous State highways and County roads. The project design flow for Mormon Slough is 12,500 cubic feet per second; for Potter Creek 1,000 cubic feet per second; and for the Stockton Diverting Canal and lower reach of the Calaveras River 13,500 cubic feet per second. For the project levees, at least 3 feet of freeboard has been provided over the project design flood plane. The adopted flood plane for Mormon Slough varies from elevation 124.1 at the upper end near Bellota to elevation 44.5 at the Stockton Diverting Canal; for the Stockton Diverting Canal the adopted flood plane varies from elevation 44.5 at Mormon Slough to elevation 24.8 at its junction with the Calaveras River; for the Calaveras River the adopted flood plane varies from 24.8 at the Diverting Canal to elevation 7.4 at its junction with the San Joaquin River; for Potter Creek the adopted flood plane varies from elevation 57.8 at Jack Tone Road to elevation 51.2 at Mormon Slough. All elevations refer to mean sea level datum, 1929 adjustment.

For the additional project works, the peak design flows at various location and corresponding 100-yr. floodplain elevations are indicated in the following table:

Segment	Location	Peak Design Flow (cfs)	100-Yr Floodplain Elevation (ft)
Upper Calaveras River	Highway 99	1,176	31.8
Stockton Diverting Canal	Main Street	14,843	39
Stockton Diverting Canal	Hwy 99 Bridge	14,817	33
Mormon Slough	At Potter A	15,143	54
Potter Creek	Jack Tone Road	1,319	59.9

For additional project works 3.3 feet of freeboard has been provided over the project design floodplain for all areas in which the levee was raised.

- 1-05. Construction Data and Contractor. Work required by the Corps of Engineers to bring the levees on the Mormon Slough Project to project standards and to excavate the channels was accomplished under the following contracts:
- a. Channel improvement from Jack Tone Road to Bellota was accomplished under Contract No. DACW05-68C-0060 by H. Earl Parker, Inc. during the period from 8 April 1968 to 13 January 1969. Specification No. 3321, Drawing No. CA-4-48.
 - b. Levee construction and channel improvement from the mouth of the Stockton Diverting Canal to Jack Tone Road was accomplished under Contract No. DACW05-68C-0020 by R.P. Burrus during the period from 3 October 1967 to 15 August 1968, Drawing No. 3-4-147.
 - c. Railroad relocation for the Southern Pacific Railroad and Stockton Terminal & Eastern Railroad was accomplished under Contract No. DACW05-68C-0074 by Hertel Construction Co. during the period from 24 April 1968 to 30 September 1968. Specification No. 3486, Drawing No. CA-5-56.
 - d. Levee crown surfacing and bank protection from the mouth of the Calaveras River upstream to McAllen Road bridge was accomplished under Contract No. DACW05-69-C-0078 by Claude C. Wood Co. during the period from 17 June 1969 to 16 October 1969. Specification No.3600, Drawing No.3-4-148.
 - e. Bank protection and structure modifications on Mormon Slough from the mouth of Potter Creek upstream to Bellota was accomplished under Contract No. DACW05-70-C-0036 by E.W. Eldridge and Roy D. Garren Jr. during the period from 10 October 1969 to 12 May 1970. Specification No. 3642A, Drawing No. CA-13-60.
 - f. Section 14 emergency bank protection along Mormon Slough right bank at Jack Tone Road Bridge was accomplished on April 13, 1984 under Contract

DACW05-84-C-0041 by James Ferry Construction, AJV, James L. Ferry & Sons, Inc. and James L. Ferry, Jr. – Specification No. 6844, Drawing File No. SJ-4-103.

Construction required to bring the additional project works described in this addendum to project standard was accomplished under the following contracts:

- g. Levee modification along both banks of the Mormon Slough and the left bank of Potter Creek was accomplished by Teichert Construction, during the period from August 1997 to October 1998.
- h. Levee modification on both banks of the Stockton Diverting Canal and floodwall construction was accomplished by Teichert Construction, during the period from August 1997 to October 1998.
- i. Levee modification on both banks of the Upper Calaveras River was accomplished by Teichert Construction, during the period from January 1998 to October 1998.
- j. Bridge parapet modifications and floodproofing for Cal-Trans Bridges was accomplished by Benco Construction, during the period from April 1998 to October 1998.

1-06. Flood Flows. For purposes of this project, the term “Flood” or “high water period” for Mormon Slough shall refer to flows when the water surface in the stream reaches or exceeds the reading of 12.0 on the gage located on the left bank of the Mormon Slough near Bellota and approximately 1,400 feet upstream from the Escalon-Bellota Road. (This stage reading corresponds to a flow of about 10,000 cfs in Mormon Slough at the gage)

SECTION II

LOCAL COOPERATION REQUIREMENTS

2-01. Requirements of Local Cooperation. House Document No. 576 requires that, prior to construction, local interests give assurances satisfactory to the Secretary of the Army that they will, without cost to the United States:

- a. Furnish all lands, easements, and rights-of-way, including soil-disposal areas, necessary for construction of the works.
- b. Accomplish all relocations and alterations of roads, streets, buildings, pipelines, utilities, bridges, and other structures (except railroad facilities) made necessary by the construction work.
- c. Hold and save the United States free from damages due to the construction work.
- d. Maintain and operate all the works after completion, including the lower Calaveras River, in accordance with regulations prescribed by the Secretary of the Army.
- e. Prescribe and enforce regulations designed to prevent encroachment of any type that would impair the flood-control effectiveness of the works.
- f. House Document No. 576 further requires that Federal maintenance of the existing Stockton and Mormon Channels Project (Diverting Canal) for navigation be discontinued upon completion of the improvements recommended therein.

2-02. Assurances Provided by Local Interests. The Reclamation Board of the State of California, by letter dated 13 December 1963, advised the Sacramento District Engineer that the Mormon Slough Project was authorized by the State of California by Chapter 915 of the Statutes of 1963 and that the Reclamation Board would, upon request, give the required assurances to the Corps of Engineers under Chapter 1438 of the Statutes of 1963.

2-03. Acceptance by The Reclamation Board. Responsibility for operating and maintaining the Mormon Slough Project was officially accepted by the Reclamation Board of the State of California by letters dated 21 October 1968, 13 January 1969 and 14 April 1970, See EXHIBIT F.

2-02a On September 1, 1983 the Reclamation Board provided written assurances of local cooperation for emergency bank protection work along the right bank of Mormon Slough at Jack Tone Road Bridge under the authority of Section 14 of the 1946 Flood Control Act, as amended.

2-03a Responsibility for operating and maintaining the emergency bank protection on the right bank of Mormon Slough at the Jack Tone Road Bridge was transferred to the Reclamation Board by a letter dated April 17, 1984, see EXHIBIT H.

DEC 5 - 84

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, as of 1 January 1962, Chapter II, Corps of Engineers, Department of the Army, Part 208 - Flood Control Regulations, Maintenance and Operation of Flood Control Works, 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 Department of Water Resources, which is the State agency designated by the Director 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 protection 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 floodfighting 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. The Reclamation Board is the State agency which provided the assurances for the project; The Department of Water Resources is the responsible State agency who has supervisory power over the maintenance and operation of the flood control project; The assurer shall designate a local agency to act for the assurer and implement the instructions contained herein; This agency shall hereinafter be designated as the "Superintendent." The term "District Engineer" shall be defined to mean the District Engineer of the US Army Engineer District, Sacramento, or his authorized representative. The term "flood" shall mean any flow in Mormon Slough when the water surface reaches or exceeds the reading of 12.0 on the California Department of Water Resources gaging station located on the left bank 1,400 feet upstream from the Escalon-Bellota Road. 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 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 feature 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 the State Reclamation Board "As Constructed" drawings of the project works at the time they are transferred.
- b. Make periodic inspections of the project works and notify the State Reclamation Board 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.
- 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 to the extent permitted by existing laws and regulations.

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 their 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 take whatever action is necessary under his own authority to remove any unauthorized encroachment or to prosecute the trespassers. Some encroachment permits (landscaping and fencing) have been granted to various owners along the lower reaches of the Calaveras River by the Reclamation Board, see paragraph 4-02c(4) of this manual.

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.

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; drawings or prints of proposed improvements or alterations to the existing flood control works must be submitted for approval to the District Engineer 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 of 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), 208.10(c)(1) and 208.10(h)(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.”

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

“(h) Miscellaneous facilities (Bridge Parapets and Retaining Walls) (1) Maintenance. Miscellaneous structures and facilities constructed as a part of the protective works and other structure and facilities which function as a part of or affect the efficient functioning of the protective works, shall be periodically inspected by the Superintendent.....”

(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 12.0 on the State Department of Water Resources gage located on the left bank of Mormon Slough just upstream from the Escalon-Bellota Road.

(3) The suggested check lists and instructions shown in EXHIBIT E, Sheets 1 to 7 inclusive, should 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 of 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 enclosure to the semi-annual report as provided in paragraph 3-07(i)(1) of this manual.

h. Maintenance.

(1) Flood Control Regulations, paragraph 208.10(b)(1), 208.10(c)(1) and 208.10(h)(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 promote the growth of sod as required, . . . 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.”

“(c) Flood walls – (1) Maintenance. 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.”

“(h) Miscellaneous facilities (Bridge Parapets and Retaining Walls)(1) Maintenance. Damaged or unserviceable parts shall be repaired or replaced without delay.” It is the Bridge Owner's responsibility to clean debris that affects the bridge openings. The Flood Control District Superintendent will only take action if the restriction caused by the debris affects the safety and functionality of the flood control channel. Please refer to O&M Manual, page 37, item b. (3).

(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.

Effort shall be made to maintain the original design roughness in each channel segment the original design roughness for each segment is included in the following table:

Segment	Approximate Stations	Channel Manning's n-value	Start Location	Stop Location
Diverting Canal	0+00 – 258+00	0.030	Confluence with Upper Calaveras River	Confluence with Mormon Slough
Mormon Slough	330+00 – 496+56	0.030	Confluence with Stockton Diverting Canal	Confluence with Potter Creek
Potter Creek	0+00 – 49+30	0.030	Confluence with Potter Creek	Jack Tone Road
Upper Calaveras River	308+00 – 338+00	0.030	Confluence of Diverting Canal and Calaveras River	1000 ft Downstream of McAllen Road
	338+00 – 384+00	0.040	1000 ft Downstream of McAllen Road	700 ft Downstream of Hwy 99
	384+00 – 391+00	0.050	700 ft Downstream of Hwy 99	Highway 99 Bridge
	391+00 – 450+00	0.030	Highway 99 Bridge	Central California Traction Railroad
	450+00 – 460+00	0.035	Central California Traction Railroad	Maintenance Reach Area
	460+00 – 497+47	0.040	Maintenance Reach Area	Maintenance Reach Area
	497+47 – 497+97	0.035	Maintenance Reach Area	Solari Ranch Road
Lower Calaveras River	0+00 – 191+45	0.035	Confluence with San Joaquin River	Pacific Avenue
	191+45 – 293+00	0.030	Pacific Avenue	Confluence of Diverting Canal and Calaveras River

All maintenance and any wildlife and habitat mitigation measures undertaken in connection with the additional project works will be accomplished in accordance with the Final Environmental Impact Report, Final Supplemental Environmental Impact Report, and the Findings Mitigation Monitoring Program and Statement of Overriding Considerations for this project. These documents are on file with the San Joaquin Area Flood Control Agency.

i. Reports.

(1) Semi-Annual Report. The 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 occurrences and 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 of 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. At the discretion of the responsible State agency which provided the assurances for the project, the report submitted pursuant to Chapter 1528, Statutes of 1947 by the Department of Water Resources may be considered to fulfill the requirements of paragraph 3-07i above

provided the report complies with all provisions of that paragraph and provided the State Reclamation Board so indicates in writing to the District Engineer.

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 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, sloughs, burrows, holes, slips, or other damaged portions of the levee has 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.

This section shall be amended to include inspection and subsequent report of inspection of floodwalls, bridge parapets, and retaining walls. The following items shall be included as floodwall, bridge parapet and retaining wall items to be inspected:

- l. That no seepage is occurring under the structure, no soil piping or undue settlement has occurred which affects the stability of the wall and no trees exist, the roots of which might extend under the wall and offer accelerated seepage paths.
- m. That concrete is maintained such that cracking, chipping, or breaking is not occurring to an extent which might affect the stability of the wall.
- n. That encroachments are not being erected which might endanger the structure or hinder its functioning in time of flood.
- o. That trash and debris adjacent to walls is removed periodically and that no fires are built near floodwalls.
- p. That no bank caving or bed scour conditions riverward of the wall exists which might endanger its stability.
- q. That trash and debris are removed periodically from bridge openings. Please refer to O&M Manual, page 37, item b. (3).
- r. That rock slope protection (revetment) is inspected and replaced as necessary as described under section 4-03.e.1 of the original Operations and Maintenance Manual for Mormon Slough Project.
- s. That graffiti or other improper markings are removed from concrete surfaces at the discretion of the Flood Control District.

Following this detailed inspection, a joint field inspection is made by the Superintendent and representatives of 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 on the Mormon Slough Project consists of channel improvement extending from the San Joaquin River to high ground at Bellota, intermittent levees, spoil banks, irrigation and drainage structures and intermittent bank protection. For further details see the drawings of EXHIBIT B.

4-02. Levees.

a. Description. Levees have been built along the Calaveras River, Stockton Diverting Canal, Potter Creek and at intermittent locations along Mormon Slough. Existing levees along both banks of the Calaveras River, along the left bank of the Diverting Canal and along the right bank of Mormon Slough upstream from Tobacco Road for a distance of about 2.6 miles have been provided with access ramps and crown surfacing. New levees have been built to adopted grade and section with a 12-foot crown width and side slopes of 1 on 3 waterside and 1 on 2 landside. The patrol road surfacing consists of 4 inches of crushed mineral aggregate 10 feet in width. Surfaced access ramps and the necessary turnouts and turnaround have been provided. For more complete detail of items included in construction of the above-mentioned levee, 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.

Levee modifications, and new levees for most additional works have been constructed to adopted grade and section with 12-foot crown width and side slopes of 1 on 3 waterside and 1 on 2 on the landside. Existing levees have been raised over 3 feet in some locations to provide the designed 3.3 feet of freeboard. In situations where existing levees have been raised, the top 6 inches of the existing levee has been sacrificed and re-compacted after stripping. For levee fill sections in locations where the levee needed to be raised more than 1 foot, minimum 2 foot bench cuts were used on the landside to support the fill. A 3 foot keyway was constructed on the landside for required fills less than or equal to 1 foot. A 12 foot keyway was constructed on the landside for required fills of greater than 1 foot. A minimum 4 inch aggregate base course has been included on top of the levees. Newly constructed levees were constructed according to the descriptions in the original operations and maintenance manuals. For more complete detail of items included in construction of the aforementioned levee modifications and new levees, refer to the As Constructed Drawings which are on file with the San Joaquin Area Flood Control Agency.

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 or 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 streambed 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 no 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 backfilled. 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.

(4) Levee Encroachments. (Calaveras River in the reach from the Southern Pacific Railroad downstream to its mouth at the San Joaquin River.)

(a) GENERAL:

1 Certain existing encroachments have been placed under an encroachment permit and approved by the State Reclamation Board.

2 Maintenance of the encroachment and encroachment area will be the responsibility of the property owner.

3 Liability for damages due to the encroachments will run to the property owner.

4 Failure on the part of the permittee to maintain the encroachment in an acceptable manner will result in action by the Superintendent to effect removal.

(b) VEGETATION:

1 Existing. Trees, shrubs and ground cover on the landside levee slope existing 1 November 1969 have been permitted to remain, under permit, with the following exceptions: Pampas Grass, *Pyracantha* species, Bamboo, Berry Vines, and Cactus species.

2 New. New plantings will be considered on an individual basis when permit application is made. All new plantings will conform to criteria in the "Levee Encroachment-Guide for Fencing and Vegetation on Project Levees, Mormon Slough Unit No. 3".

3 Maintenance. Plants and shrubs will be trimmed and maintained to allow maximum visibility for inspection of the levee slope and toe. Watering of vegetation will be controlled to prevent erosion of the levee. Excavation into the levee slope for watering basins will be limited to a maximum depth of 1 foot.

(c) FENCES:

1 Existing. Fences existing 1 November 1969 will be permitted to remain on the landside levee slope, under permit, with the following exceptions:

- a. Solid type fences will be limited to a maximum height of four feet.
- b. Open type fences (i.e. chain link, hog wire, etc.) will be limited to a maximum height of six feet.
- c. Open type fences will not be covered with vegetation so as to obstruct vision of the levee slope.

2 New. New fences will be considered on an individual basis when permit application is made.

d. Operation.

(1) Pertinent Requirements of the Code of Federal Regulations. Flood Control Regulations, paragraph 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 Superintendent 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 12.0 on the gage located on the left bank of Mormon Slough about 1400 feet upstream from Escalon-Bellota Road 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: along the Calaveras River from the San Joaquin River upstream to McAllen Road; along the Diverting Canal from the Calaveras River upstream to Mormon Slough; along Mormon Slough from the Diverting Canal upstream to Bellota; and along Potter Creek from Mormon Slough upstream to Jack Tone Road, a total distance of about 25.7 miles. The channel improvements consisted mostly of clearing between the 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 paragraph 4-03b, c and d of this manual.

b. Inspection.

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

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

- (1) 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 by the Superintendent 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 . . ."

(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 effect the stability of the project structures. At each inspection required by paragraph 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 Mormon Slough Project will be permitted unless an excavation permit has been approved by the State Reclamation Board and the District Engineer.

(4) If any work is done to improve flow conditions in Mormon Slough Project an excavation permit must be obtained from the Superintendent and approved by the District Engineer.

(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, paragraph 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 or 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 in accordance with criteria of the California State Water Control Boards.

(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 clearing 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, paragraph 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."

e. Special Instructions.

(1) Revetment Work. Due to the fact that many reaches of contiguous bank have been constructed with stone protection work consisting of quarry stone or cobbles, the provisions of paragraphs 4-03b(1)(v) and 4-03b(2)(f)3.d. are expanded to include the following:

- (a) Where scour, wash, settlement or failure of a portion of the originally provided stone protection has been noted, or where inspection indicates that such damage may result during the next flood or high water period, the scour or wash shall be filled with earth free from brush, roots, sod or other unsuitable material and additional stone shall be placed upon the earth fill to bring the stone protection to its original section. In case of emergency and when stone is not available, sand bags or bags filled with gravel may be used for temporary repair measures.
- (b) When permanent repair of the stone protection is made, the stone used shall, as far as possible, be similar to the kind and gradation as originally used, and shall be placed to the thickness as shown on the drawings of Exhibit B.
- (c) In the event an inspection reveals that due to scour, settlement or other causes, stone protection on the levee or bank is required beyond the limits of the original construction or in reaches of the levee or bank not originally provided with such protection, local interests will provide additional sloping of the bank and placement of stone protection as needed to protect completed work. The work shall be done in a manner acceptable under standard engineering practice.
- (d) Trees and brush should not be allowed to grow through the stone blanket to the extent that it displaces the stone or causes increase in velocities against the

4-03e.

(2) Due to the construction of 96 feet of stone filled gabions along the right bank of Mormon Slough at Jack Tone Road, the provisions of paragraphs 4.03.b.(1)(v) and 4.03.b.(2)(f) are expanded to include the following:

- (a) Where scour, wash, settlement or failure of a portion of the originally provided slope protection has been noted, or where inspection indicates that such damage may result during the next flood or high water period, repairs shall be made to restore the slope protection to its original condition. In areas where a fracture, scour, slip or settlement has occurred to such an extent to expose a portion of the protected bank, the gabions shall be removed, the wash or scour filled, and the gabions replaced. Slope, grade and thickness of the repaired slope protection shall conform to the existing bank facing.
- (b) When isolated areas of wire mesh strands of the gabions are damaged and/or rusted away, the remaining strands of wire mesh shall be tied together with strands of galvanized wire of minimum 8 gage, spaced 2-1/2 inches on centers each way. In spaces where damages are greater than 2 feet square, a new piece of wire mesh shall be installed and wired to the existing mesh with 8-gage wire.
- (c) In the event an inspection reveals that due to scour, settlement or other causes, slope protection on the levee or bank is required beyond the limits of the original construction, local interests will provide additional revetment as needed to protect completed work. The work shall be done in a manner acceptable under standard engineering practice.
- (d) Trees and brush should not be allowed to grow through the gabions to the extent that they displace the stone or cause an increase in velocities against the banks. The brush or trees should be cut at least every other year. Herbicides may be used if proper precautions are taken to prevent damaging drift, poisoning of the water, or damage to adjacent crop lands.

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bank. The brush or trees should be cut at least every other year. Herbicides may be used if proper precautions are taken to prevent damaging drift, poisoning of the water or damage to adjacent crop lands.

4-04. Drainage and Irrigation Structures.

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

Levee : Mile :	Size of : Pipe :	OTHER STRUCTURE DESCRIPTION	: Invert below : Crown--feet
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UNIT NO. 15 MORMON SLOUGH - RIGHT BANK

1.18	18" CMP	Drain Inlet - Ungated (a)	7.0
1.49	18" CMP	Drain Inlet - Ungated (a)	6.0
1.52	12" Stl	2-inch breather WS - Pump L.S.	11.0
2.10	14" Stl	Valve W.S. - Pump L.S.	9.5
2.64	8" Stl	Abandoned	1.0
3.64	10" Stl	Pump W.S. - 24" Standpipe L.S.	4.5
3.88	10" Stl	Pump W.S. - 24" Standpipe L.S.	5.0
3.98	8" Stl	Pump W.S. - 30" Standpipe L.S.	4.0
4.75	12" Stl	Pump W.S. - 30" Standpipe L.S.	14.3
5.28	14" Conc	24" Standpipe W.S.	7.5
5.46	14" Conc	8" Standpipe W.S.	3.5
5.58	18" CMP	Drain Inlet - Ungated (a)	3.5
6.54	16" Conc	Siphon across channel	4.0
6.75	12" Conc	24" Standpipe W.S. - Pump W.S.	5.0
7.15	8" Stl	Abandoned	3.0
7.15	12" Conc	36" Standpipe L.S.	1.5
7.38	10" Conc	Pump W.S. - 30" Standpipe W.S.	4.0

Drainage and Irrigation Structures (Cont'd)

Levee : Mile :	Size of : Pipe :	OTHER STRUCTURE DESCRIPTION	: Invert below : Crown--feet
<u>UNIT NO. 15 MORMON SLOUGH - RIGHT BANK</u>			
7.70	10" Conc	Pump W.S. - 30" Standpipe W.S.	4.0
8.00	10" Conc	Pump W.S. - 30" Standpipe W.S.	3.0
8.65	18" CMP	Drain Inlet - Ungated (a)	3.5
8.78	18" CMP	Drain Inlet - Ungated (a)	3.0
8.88	18" CMP	Drain Inlet - Ungated (a)	3.0
9.12	18" CMP	Drain Inlet - Ungated (a)	3.0
9.59	18" CMP	Drain Inlet - Ungated (a)	5.0
9.62	8" Stl	Pump W.S. - 42" Standpipe W.S.	5.0
9.75	18" CMP	Drain Inlet	3.5
9.76	24" Conc	Pump L.S. - 30" Standpipe L.S.	22.0
10.01	18" CMP	Drain Inlet - Ungated (a)	5.0
10.22	18" CMP	Drain Inlet - Ungated (a)	4.5
10.47	18" CMP	Flapgate W.S.	7.5
10.49	18" CMP	Flapgate W.S.	7.5
10.49	6" Stl	30" Standpipe L.S. - Bolted cap W.S.	4.5
10.75	6" Stl	Pump W.S. - 30" Standpipe L.S.	1.0
11.12	12" Conc	Siphon under channel	--
11.27	12" Conc	Pump W.S. - Standpipe L.S.	4.0
11.64	18" CMP	Drain Inlet - Ungated (a)	4.0
11.79	18" CMP	Drain Inlet - Ungated (a)	4.5
12.13	12" Conc	Pump W.S. - 30" Standpipe W.S.	5.5

Drainage and Irrigation Structures (Cont'd)

Levee :	Size of :		: Invert below
Mile :	Pipe :	OTHER STRUCTURE DESCRIPTION	: Crown--feet

UNIT NO. 15 MORMON SLOUGH - RIGHT BANK

12.28	8" Stl	Pump W.S.	3.5
12.65	2-48" CMP	Flapgates W.S. - Riser unit W.S.	11.5
12.66	10" Stl	Pump W.S. - Standpipe L.S.	3.5
12.83	30" CMP	Flapgate W.S.	8.5
13.02	8" Stl	Pump W.S. - 24" Standpipe W.S.	3.5
13.43	30" CMP	Flapgate W.S.	8.5
13.46	10" Stl	Pump W.S. - Siphon breaker L.S.	4.5

UNIT NO. 15 - DIVERTING CANAL - RIGHT BANK

13.79	30" CMP	Flapgate W.S.	9.5
14.66	42" CMP	Siphon breaker in 20" Manhole L.S.	8.5
15.42	2-20"Stl	Pumping Plant No. 3 discharge lines	1.9
15.42	30" Conc	Pumping Plant No. 3 - Gravity conduit (30" x 30")	18.0
15.58	30" CMP	Flapgate W.S.	9.5
15.70	30" CMP	Flapgate W.S.	9.5
15.96	10" Stl	Pump W.S. - 20" Standpipe L.S.	3.5
16.29	12" Conc	Pump W.S. - Riser Unit W.S.	3.3
16.64	2-30" Stl	Pumping Plant No. 2 - Discharge lines	4.5
16.64	48" Conc	Pumping Plant No. 2 - Gravity conduit (48" x 48")	17.3
16.83	30" CMP	Flapgate W.S.	10.0
17.74	2-14" Stl	Pumping Plant No. 1 - Discharge lines	3.0

Drainage and Irrigation Structures (Cont'd)

Levee : Mile :	Size of : Pipe :	OTHER STRUCTURE DESCRIPTION	: Invert below : Crown--feet
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UNIT NO. 15 - DIVERTING CANAL - RIGHT BANK

17.74	30" Conc	Pumping Plant No. 1 - Gravity conduit (30" x 30")	17.6
18.01	30" CMP	C M Riser Unit L.S. - Flapgate W.S.	13.0

UNIT NO. 15 - CALAVERAS RIVER - LEFT BANK

18.54	36" CMP	Flapgate W.S. - Riser unit W.S.	15.0
18.68	30" CMP	Flapgate W.S. - Riser unit W.S.	7.0
18.76	14" Conc	Pump W.S. - 36" Standpipe W.S.	8.5

UNIT NO. 15 - CALAVERAS RIVER - RIGHT BANK

19.35	10" Conc	Siphon - Standpipe L.S.	Unknown
19.93	16" Stl	Gasline crossing	Unknown
20.14	24" Stl	Flapgate W.S.	12.0
20.21	6" Stl	Gasline crossing	2.5
20.76	24" Conc	Flapgate W.S.	12.5
21.20	27" Conc	Siphon under channel	5.5
21.21	16" - 18" & 24" Stl	Flapgates W.S. - Riser units W.S.	4.6
21.22	2-36" Stl	Flapgates W.S. - Riser Units W.S.	4.6
21.79	12" Stl	Hung on upstream side Pacific Ave Bridge	4.0
22.37	4-5-1/2" Stl	Hung on upstream side Pershing Ave Bridge	5.0
22.76	12" Conc	Siphon under Channel - Riser unit W.S.	3.5
22.98	14" Stl	Pump W.S.	6.0
23.47	12" Stl	Pump W.S.	8.0

Drainage and Irrigation Structures (Cont'd)

Levee : Size of :		: Invert below
Mile : Pipe :	OTHER STRUCTURE DESCRIPTION	: Crown--feet

UNIT NO. 15 - CALAVERAS RIVER - RIGHT BANK

24.14	8" Conc	Sewerline - Siphon breaker W.S.	3.1
24.14	12" Conc	Sewerline - Siphon breaker W.S.	4.0
24.24	14" Stl	Pump W.S. - Standpipe W.S.	12.0
24.24	10" Stl	Pump W.S. - Standpipe W.S.	12.0
25.05	12" Stl	Pump W.S. - Riser Unit L.S.	5.3
25.26	4" Stl	Pump W.S.	2.0
25.38	12" Stl	Riser Unit W.S. - Standpipe L.S.	5.0

UNIT NO. 16 - MORMON SLOUGH - LEFT BANK

0.27	12" Conc	Pump L.S. - Standpipe L.S.	14.0
0.44	14" Conc	Pump W.S. - Standpipe W.S.	3.5
0.82	18" CMP	Drain Inlet - Ungated (a)	4.5
0.96	2-12" Conc	Pump W.S. - 36" Standpipe W.S.	12.0
1.16	12" Conc	Pump W.S. - 30" Standpipe W.S.	4.0
1.52	14" Conc	Pump W.S. - 30" Standpipe W.S.	3.3
1.69	12" Conc	Pump W.S. - 30" Standpipe W.S.	3.0
1.95	12" Conc	Pump W.S. - Distribution box W.S.	3.0
2.47	12" Conc	Pump W.S. - 30" Standpipe L.S.	3.0
2.52	18" CMP	Drain Inlet - Ungated (a)	3.5
2.82	36" CMP	Ungated (a)	10.0
3.53	12" Conc	Pump W.S. - 30" Standpipe W.S.	4.3
3.53	24" Conc	Pump W.S. - 30" Standpipe W.S.	6.9

Drainage and Irrigation Structures (Cont'd)

Levee : Mile :	Size of : Pipe :	OTHER STRUCTURE DESCRIPTION	: Invert below : Crown--feet
<u>UNIT NO. 16 - MORMON SLOUGH - LEFT BANK</u>			
3.65	12" Conc	Pump W.S. - 24" Standpipe W.S.	4.0
4.24	10" Stl	Pump W.S. - 30" Standpipe L.S.	3.0
4.33	18" CMP	Drain Inlet - Ungated (a)	3.0
4.35	12" Conc	Pumps W.S. - 30" Standpipe W.S	3.0
4.61	12" Conc	Pump W.S. - 30" Standpipe W.S.	3.0
5.21	12" Conc	Pump W.S. - 36" Standpipe L.S.	2.5
5.45	14" Conc	Siphon under channel - Standpipe L.S.	2.0
5.69	18" CMP	Drain Inlet - Ungated	3.0
5.95	14" Conc	Pump W.S. - 30" Standpipe W.S.	3.0
6.24	12" Conc	Pump W.S.	3.5
6.53	12" Conc	Siphon under channel - Pump W.S. & L.S.	3.0
6.70	18" CMP	Drain Inlet - Ungated (a)	3.0
7.08	18" CMP	Drain Inlet - Ungated (a)	3.0
7.10	18" CMP	Drain Inlet - Ungated (a)	3.0
7.36	10" Stl	Pump W.S. - 30" Standpipe L.S.	2.5
7.47	8" Stl	Pump W.S. - 30" Standpipe L.S.	3.5
7.71	10" Stl	Pump W.S. - 36" Standpipe L.S.	4.0
8.05	7" Stl	Standpipe L.S.	1.0
8.83	18" CMP	Drain Inlet - Ungated (a)	6.0
9.77	18" CMP	Drain Inlet - Ungated (a)	3.5
10.07	18" CMP	Drain Inlet - Ungated (a)	3.5

Drainage and Irrigation Structures (Cont'd)

Levee :	Size of :		: Invert below
Mile :	Pipe :	OTHER STRUCTURE DESCRIPTION	: Crown--feet

UNIT NO. 16 - MORMON SLOUGH - LEFT BANK

10.34	10" Stl	Pump W.S. - 30" Standpipe W.S.	3.5
10.50	18" CMP	Flapgate W.S.	5.5
10.51	18" CMP	Flapgate W.S.	6.0
10.52	8" Stl	Pump waterside - 30" Standpipe L.S.	5.0
10.84	2-12" Conc	Pump W.S. - 36" Standpipe W.S.	5.0
11.05	18" CMP	Drain Inlet - Ungated (a)	3.5
11.14	12" Conc	Siphon under channel	3.5
11.20	12" Conc	Pump W.S. - 30" Standpipe L.S.	3.0
11.41	18" CMP	Drain Inlet - Ungated (a)	3.5
11.45	30" CMP	Flapgate W.S.	6.0
11.74	10" Stl	Pump W.S. - 36" Standpipe W.S.	4.0
12.24	30" CMP	Flapgate W.S.	5.5
12.27	12" Conc	Pump W.S. - 30" Standpipe L.S.	5.0
12.58	30" CMP	Flapgate W.S.	9.0
12.94	30" CMP	Flapgate W.S.	10.5
13.07	12" Conc	Pump W.S. - 30" Standpipe L.S.	5.0
13.18	18" CMP	Pump W.S. - 42" Standpipe L.S.	4.5

UNIT NO. 16 - DIVERTING CANAL - LEFT BANK

14.71	42" Conc	Siphon under channel - Manhole L.S.	8.5
16.02	16" Stl	Pumps L.S. - Flapgate W.S.	5.5
16.02	26" Stl	Pump L.S. - Flapgate W.S.	5.5

Drainage and Irrigation Structures (Cont'd)

Levee : Size of :		: Invert below
Mile : Pipe :	OTHER STRUCTURE DESCRIPTION	: Crown--feet

UNIT NO. 16 - DIVERTING CANAL - LEFT BANK

16.53	24" Stl	Flapgate W.S. - Riser unit W.S.	4.5
16.69	6" & 24" Stl	Flapgate W.S. - Manhole L.S.	8.0
16.91	24" Stl	Pump L.S. - Flapgate W.S.	8.5
17.79	18" & 24" Stl	Flapgates W.S. - Riser units L.S.	4.5

UNIT NO. 16 - CALAVERAS RIVER - LEFT BANK

18.98	16" & 20" Stl	Pump L.S. - Flapgate W.S.	5.8
19.68	1-20" Stl & 2-16" Stl	Pump L.S. - Flapgate W.S.	3.5
20.27	3" Stl	Ungated (a)	3.5
20.53	12" Stl	Watermain	4.0
20.92	10" Stl	Pump L.S. - Gate valve L.S.	8.0
21.36	4" Stl	Pump W.S.	1.0
21.54	12" Conc	Siphon under channel - Riser unit W.S.	4.3
21.55	8" Stl	Capped L.S.	4.2
22.21	6" Conc	Pump W.S.	4.0
22.27	9" Stl	Pump W.S.	3.7
22.37	7" Stl	(Abandoned)	2.5
22.47	10" Stl	Pump L.S. - Riser unit W.S.	5.0
22.88	18" Stl	Pump L.S. - Siphon breaker W.S.	5.1
23.36	18" Stl	Pump L.S. - Siphon breakers W.S.	3.2
23.36	20" Stl	Pump L.S. - Siphon breakers W.S.	4.3

Drainage and Irrigation Structures (Cont'd)

Levee Mile	Size of Pipe	Other Structure Description	Invert Below Crown Feet
UNIT NO. 17 – POTTER CREEK – RIGHT BANK			
0.33	16" Conc	Siphon under channel – 30" Standpipe L.S.	4.0
0.59	14" Conc	Siphon under channel	3.0
0.60	18" CMP	Drain Inlet – Ungated (a)	3.8
UNIT NO. 18 – POTTER CREEK – LEFT BANK			
0.00	30" CMP	Flapgate W.S.	6.0
0.28	30" CMP	Flapgate W.S.	6.0
0.29	14" Conc	Siphon under channel – Riser unit L.S.	3.3
0.54	30" CMP	Flapgate W.S.	6.0
0.55	16" Conc	Siphon under channel	5.0

Note on abbreviations: W.S. = Waterside

L.S. = Landside

(a) = Landside adjacent ground elevation above Project Design Flood Plane

Added February 1999:

Description. Drainage and irrigation structure construction, extension or replacement has been completed according to As Constructed Drawings. Levee mile and station references are relative to the As Constructed Drawings. Newly constructed, extended, or protected drainage structures are listed in the following table. Segments identified in the following table are defined in the Vicinity Map (see EXHIBIT APPENDIX-1).

Segment: Upper Calaveras

Approximate Station	Corresponding Levee Mile	Bank	Pipe Diameter (inches)	Remarks
310 + 46	5.88	L	Double 6' x 6' Box	New return structure constructed
310 + 80	5.89	L	56	Protected in Place
318 + 30	6.03	L	30	Extended 15-feet
345 + 65	6.55	R	30	New Culvert constructed
351 + 10	6.65	L	30	New Culvert constructed
393 + 00	7.44	L		Protected in place
395 + 00	7.48	L	30	New culvert constructed
404 + 10	7.65	R	12	Protected in Place
418 + 40	7.92	L	12	Removed existing
419 + 50	7.95	R		Removed existing
420 + 45	7.96	R	30	New culvert constructed
433 + 00	8.20	L	18	Removed existing

434 + 65	8.23	L	30	New culvert constructed
449 + 00	8.50	R		Extended 10-feet

Segment: Stockton Diverting Canal

93 + 85	1.78	R	30	Protected in place
154 + 20	2.92	R	30	Protected in place

Segment: Mormon Slough

0 + 79	0.01	R	36	Protected in place
17 + 28	0.33	R	15	Protected in place
47 + 50	0.90	L	32	Protected in place
48 + 45	0.92	R	32	Protected in place
57 + 68	1.09	R	2 x 48	Protected in place
66 + 15	1.25	L	30	Protected in place
84 + 10	1.59	L	30	Protected in place
109 + 60	2.08	R	18	Protected in place
125 + 00	2.37	L	30	Protected in place

Section: Potter Creek

145 + 26	2.75	L	30	Protected in place
150 + 50	2.85	L	30	Protected in place
173 + 30	3.28	L	30	Protected in place

For specific locations and detailed descriptions of drainage and irrigation structures please see As Constructed Drawings which are on file with the San Joaquin Area Flood Control Agency.

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 evidence of settlement, uplift, or failure of concrete structures should be referred to the State Department of Water Resources 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 reached 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 the 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.

<u>Levee Mile - Left Bank</u>	<u>:</u>	<u>Stream</u>	<u>:</u>	<u>Name of Road</u>
		<u>Unit No. 16</u>		
0.15		Mormon Slough		Escalon - Bellota Road
2.80		Mormon Slough		Fine Road
4.06		Mormon Slough		Flood Road

Levee Mile - Left Bank	Stream	Name of Road
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Unit No. 16

6.48	Mormon Slough	Milton Road
7.09	Mormon Slough	Duncan Road
7.34	Mormon Slough	SP Railroad
8.32	Mormon Slough	Copperopolis Road
10.51	Mormon Slough	Jack Tone Road
11.58	Mormon Slough	Farm Bridge (Panella)
13.87	Diverting Canal	East Main Street
15.04	Diverting Canal	SP Railroad
15.59	Diverting Canal	Linden Road
16.38	Diverting Canal	S.T. & E. Railroad
16.71	Diverting Canal	US Highway 99 (2)
16.89	Diverting Canal	Waterloo Road
17.26	Diverting Canal	Cherokee Road
17.61	Diverting Canal	C.C.T. Railroad
17.83	Diverting Canal	Wilson Way
18.31	Diverting Canal	Sanguinetti Lane
18.67	Calaveras River	SP Railroad
18.99	Calaveras River	West Lane (2)
19.22	Calaveras River	W.P. Railroad
19.93	Calaveras River	El Dorado Avenue
20.54	Calaveras River	Pacific Avenue
20.84	Calaveras River	Pedestrian Bridge
21.16	Calaveras River	Pershing Avenue

Levee Mile - Left Bank	:	Stream	:	Name of Road
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Unit No. 16

22.48	:	Calaveras River	:	Interstate 5 (North)
22.50	:	Calaveras River	:	Interstate 5 (South)

Unit No. 18

0.00	:	Potter Creek	:	Jack Tone Road
0.29	:	Potter Creek	:	Farm Bridge (Magnacco)
0.56	:	Potter Creek	:	Farm Bridge (Lavaggi)

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

(3) Hydrologic Facilities. A continuous water stage recorder and staff gage located on the left bank of Mormon Slough about 1400 feet upstream from Escalon-Bellota Road. Another continuous water stage recorder with associated staff gages is located on the right bank of the Diverting Canal about 200 feet downstream from Cherokee Lane. These stations to be operated and maintained by the State of California Department of Water Resources, in cooperation with the San Joaquin County Flood Control and Water Conservation District.

(4) Low Water Crossings. Low water crossings are listed as follows:

Unit	:	Levee Mile - Right Bank	:	Stream
15	:	4.91	:	Mormon Slough
15	:	8.79	:	Mormon Slough
15	:	11.10	:	Mormon Slough

(5) Flashboard Dams. To be maintained by local owners.

Unit	Levee Mile – Right Bank	Stream
15	4.74	Mormon Slough
15	8.29	Mormon Slough
15	10.50	Mormon Slough
15	11.82	Mormon Slough
15	16.76	Diverting Canal

(6) Calaveras River Control Structure. To be maintained by local owners.

15	400' west of 0.00	Calaveras River
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Added February 1999:

Description. The following bridges and features (parapets and retaining walls) shall be added to section 4-05.a.1. The owners of miscellaneous facilities shall be responsible for their maintenance.

(1) Bridges.

Stream	Station	Corresponding Levee Mile	Road Name	Features
Diverting Canal	157 + 95	2.99	Highway 26	Retaining Wall
Upper Calaveras	391 + 00	7.41	Highway 99	Retaining Wall & Concrete Lining
Upper Calaveras	448 + 42	8.49	Central California Traction RR	

For specific locations and detailed descriptions of miscellaneous facilities please see As Constructed Drawings which are on file with the San Joaquin Area Flood Control Agency.

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:

“(h) Miscellaneous Facilities. (1) Maintenance. Miscellaneous structures and facilities constructed as 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

*3. If water is in dam
by the bridge can be removed.
The water level will be
reduced.*

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.

(1) 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 therefore."

(2) The flashboard dams listed under paragraph 4-05a. (5) shall be operated to prevent bank caving and sloughing by reason of rapid draw-down. All required flashboards may be placed in the dams during the period from 15 April to 15 October. All flashboards shall normally be out during the 15 October to 15 April flood period. However, flashboards may be temporarily installed during this flood period upon receipt of specific written approval from the Superintendent. This approval will include instructions for prompt removal of these flashboards whenever floods are imminent.

(3) It is estimated that the Calaveras River Control Structure listed under paragraph 4-05a. (6) will pass approximately 600 c.f.s. during a project design flow of 12,500 c.f.s. in the Calaveras River at Bellota. This is less than the estimated non-damaging flow capacity of the Calaveras River below the dam. The Mormon Slough channel has been designed and constructed to pass the design flow of 12,500 c.f.s. Accordingly, local interests if they so desire, can completely shut off floodflows from the Calaveras River by closure of the gates in their dam. To prevent floodflows in the Calaveras River the gates should be closed in the period from 1 November to 15 April of each year.

4-06. Floodwalls.

a. Description. Floodwalls have been built where raising the levee using fill was not possible. The floodwalls were constructed near the hinge point of the land or water side of the existing levee. For specific locations and detailed descriptions of water side of floodwalls please see As Constructed Drawings which are on file with the San Joaquin Area Flood Control Agency. Regulations regarding inspection, maintenance and operation are included in paragraphs 4-06.b., 4-06.c., and 4-06.d. of this addendum.

b. Inspection.

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

“(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) The 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....”

(1) During periodic inspections specified in section 4-06.b.1 notice shall also be taken of graffiti and other improper markings hindering the aesthetic value of floodwalls. All graffiti abatement repairs shall be accomplished by methods acceptable in standard engineering practice.

c. Maintenance.

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

“All repairs shall be accomplished by methods acceptable in standard engineering practice.”

c. Operation.

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

“(2) Operation. Continuous patrol of the wall shall be maintained during flood periods to locate possible leakages at monolith joints or seepage underneath the wall. Floating plant or boats will not be allowed to lie against or to 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.”

SECTION V

SUGGESTED METHODS OF COMBATING FLOOD CONDITIONS

This section shall be amended to include floodwalls in addition to earthen levees.

- 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 through 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.
- Floodwalls. A floodwall 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. A well constructed floodwall with proper foundation should, if maintained and not overtopped, hold through any major flood. Seepage under the floodwall or leakage through joints may result in failure.
- 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 levee.

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 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 to 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 Corps of Engineers.

Floodwalls installed as part of this project are founded in levees, therefore the methods suggested for combating various defects in the earthen levees shall also apply to floodwalls.

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 Foreman 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 polyethylene sheeting or canvas 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 canvas or polyethylene sheeting should be placed over the washed areas, as shown on Exhibit "C", Plate 3. As an alternative, filled 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 riverside 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 plant 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 for such use. The authority also extends to saving of property where no suitable private equipment is available, provided such use is without detriment to the Government.

EXHIBIT A

FEDERAL FLOOD CONTROL REGULATIONS

**TITLE 33 - NAVIGATION AND
NAVIGABLE WATERS
(as of 1 January 1963)**

Chapter 11 Corps of Engineers
Department of the Army

**PART 108 - Flood Control Regulations
MAINTENANCE AND OPERATION OF FLOOD
CONTROL WORKS**

AUTHORITIES: §5208.10 issued under
sec. 7, 58 Stat. 890; 33 U.S.C. 709,
(Sec. 3, 49 Stat. 1571, as amended; 33
U.S.C. 701c) [P.F.R. 9999, Aug. 17, 1944];
9 F.R. [10203, Aug. 22, 1944].

§ 208.10 Local flood protection works:
maintenance and operation of struc-
tures 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 regu-
lations 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 re-
sponsible for the development and main-
tenance 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 material
needed during a flood emergency shall
be kept on hand at all times.

(4) No encroachment or trespass which
will adversely affect the efficient oper-
ation 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 proj-
ect right-of-way, nor shall any change
be made in any feature of the works
without prior determination by the Dis-
trict Engineer of the Department of the
Army or his authorized representative
that such improvement, excavation, con-
struction, or alteration will not adversely
affect the functioning of the protective
facilities. Such improvements or alter-
ations as may be found to be desirable
and permissible under the above deter-
mination shall be constructed in accor-
dance with standard engineering
practice. Advice regarding the effect of
proposed improvements or alterations
on the functioning of the project and in-
formation concerning methods of con-
struction acceptable under standard en-
gineering practice shall be obtained from
the District Engineer or, if otherwise
obtained, shall be submitted for his ap-
proval. 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 super-
intendent to submit a semiannual report
to the District Engineer covering inspec-
tion, maintenance, and operation of the
protective works.

(7) The District Engineer or his au-
thorized representative shall have ac-
cess at all times to all portions of the
protective works.

(8) Maintenance measures or repairs
which the District Engineer deems nec-
essary 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 con-
nected with the protective works are co-
ordinated with those of the Superintend-
ent's organization during flood periods.

(10) The Department of the Army will
furnish local interests with an Operation
and Maintenance Manual for each com-
pleted 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 prac-
ticable, 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 pres-
sure 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 in-
appropriate 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 dur-
ing times of emergency.

Such inspections shall be made im-
mediately 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 neces-
sary to insure the best possible care of
the levee. Immediate steps will be taken
to correct dangerous conditions disclosed
by such inspections. Regular mainte-
nance repair measures shall be accom-
plished 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 ade-
quate 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 pre-
vent 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 en-
danger its stability;

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

Such inspections shall be made im-
mediately prior to the beginning of the flood
season, immediately following each major
high water period, and otherwise at
intervals not exceeding 90 days. Meas-
ures to eliminate encroachments and ef-
fect repairs found necessary by such in-
spections shall be undertaken immedi-
ately. All repairs shall be accomplished
by methods acceptable in standard en-
gineering practice.

(2) *Operation.* Continuous patrol of
the wall shall be maintained during flood
periods to locate possible leakage at mon-
olith 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 con-
struction 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) 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) **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 30 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 necessity 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 opera-

tion 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;

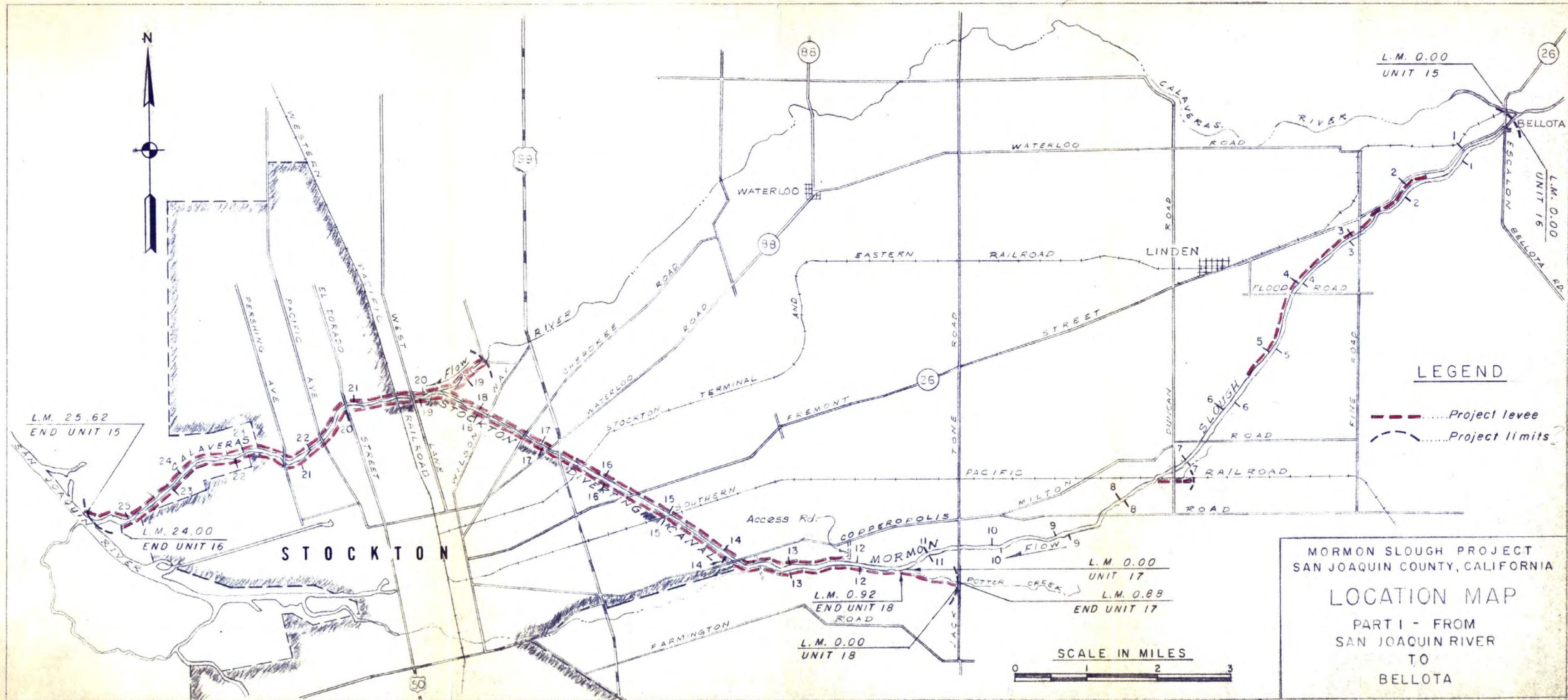
(vi) Approach and egress channels adjacent to the improved channel or floodway are sufficiently clear of obstructions and debris to permit proper functioning of the project works.

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 these 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 snag 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. 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.



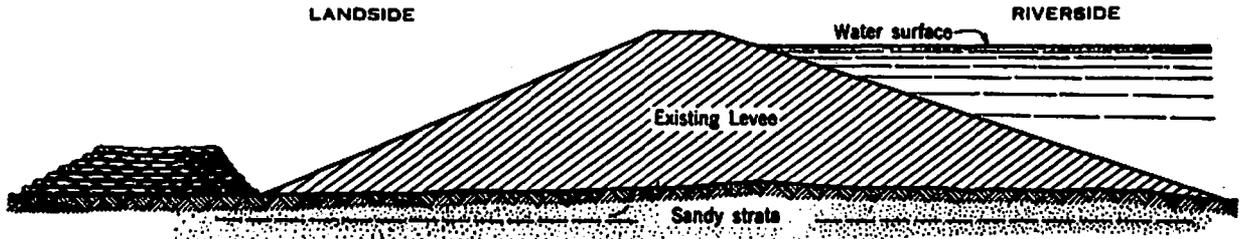
MORMON SLOUGH PROJECT
 SAN JOAQUIN COUNTY, CALIFORNIA
LOCATION MAP
 PART I - FROM
 SAN JOAQUIN RIVER
 TO
 BELLOTA

EXHIBIT B
“AS CONSTRUCTED”
DRAWINGS

<u>File No.</u>	<u>Title</u>
CA-4-48	Channel Improvement from Jack Tone Road to Bellota, in 40 sheets.
3-4-147	Levee Construction and Channel Improvement from the Mouth of the Diverting Canal to Jack Tone Road, in 52 sheets.
CA-5-56	Railroad Relocation for Southern Pacific Railroad and Stockton Terminal & Eastern Railroad, in 17 sheets.
3-4-148	Levee Crown Surfacing and Bank Protection from San Joaquin River to McAllen Road Bridge, in 14 sheets.
CA-13-60	Project Modification Under Public Law 99/84, in 22 sheets.
SJ-4-103	Gabion Bank Protection at right bank of Jack Tone Bridge Under Sec 14.
E-2060	Mormon Slough and Potter Creek Levee Improvement Plans, in 50 pages.
CALDEM14.DWG	Upper Calaveras River Levee Improvement Plans, in 75 pages.
ACCESS.DWG	Upper Calaveras River Cherry Lane, in 4 pages.
E-2059	Stockton Diverting Canal Levee Improvement Plans, in 77 pages.

EXHIBIT C

PLATES OF SUGGESTED FLOOD FIGHTING METHODS

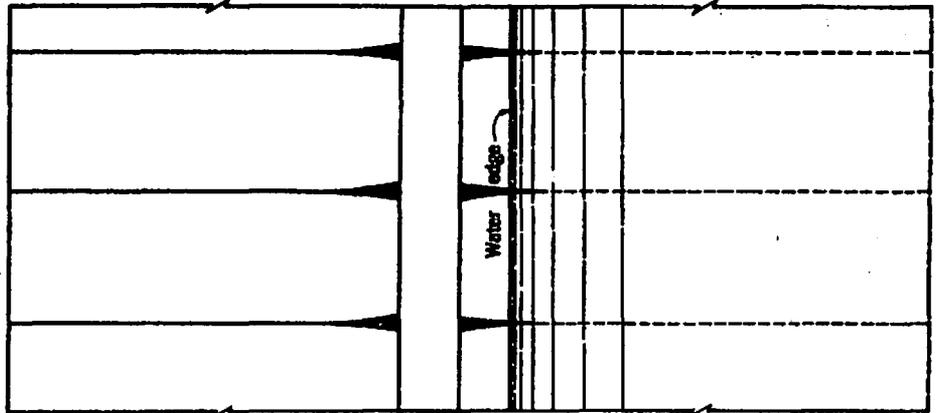
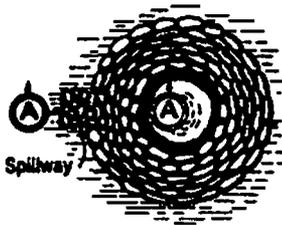


Note:
 Bottom width to be no less than 1½ times height.
 Be sure to clear sand discharge.
 Tie into levee if boil is near toe.

ELEVATION



SECTION A-A



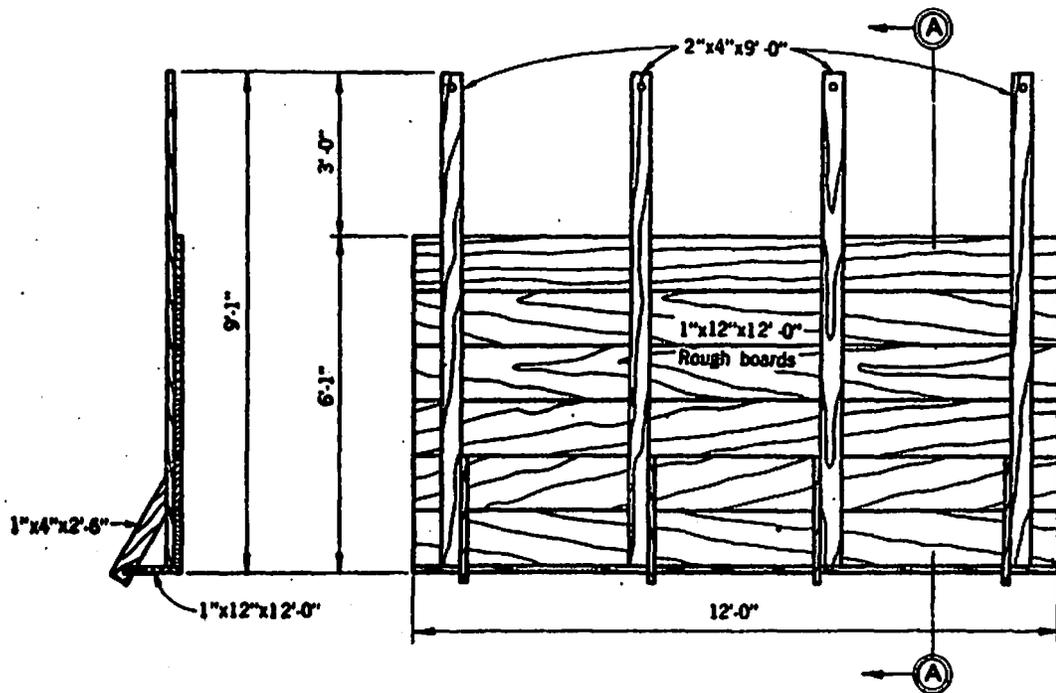
PLAN

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 boil runs clear.
 Never attempt to completely stop flow
 through boil.

MORMON SLOUGH
 SAN JOAQUIN COUNTY
 FLOOD CONTROL PROJECT

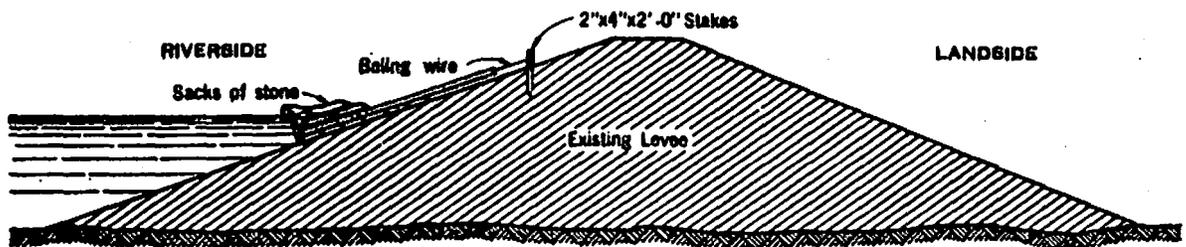
CONTROL OF SAND BOILS

U.S. ENGINEER OFFICE, SACRAMENTO, CALIF.



SECTION A-A

PLAN



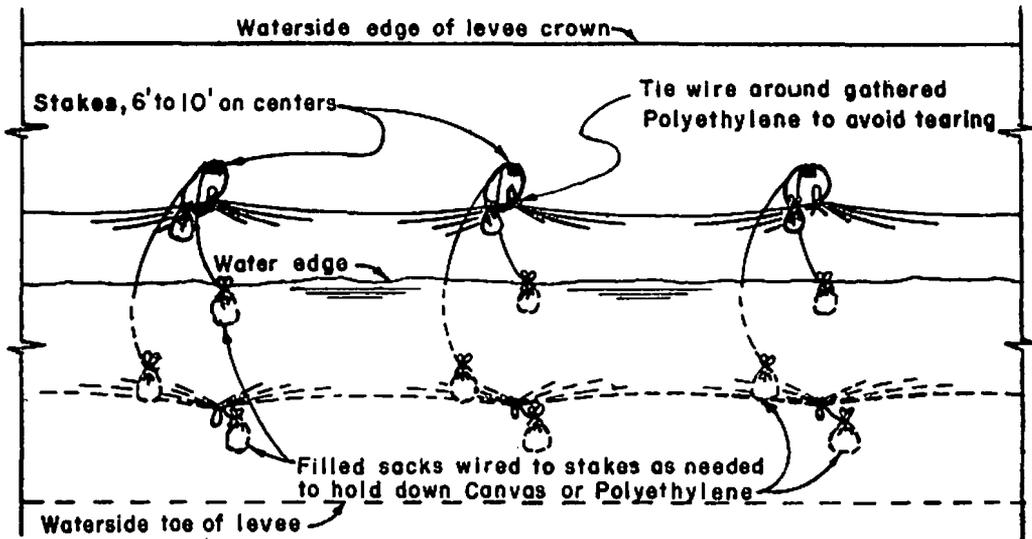
SECTION

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

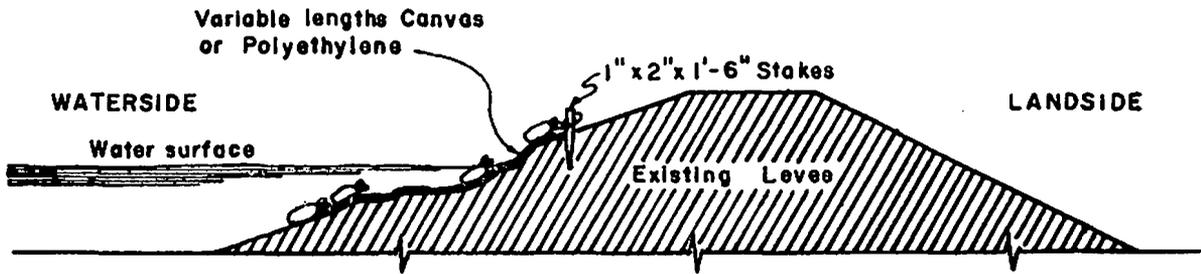
MORMON SLOUGH
 SAN JOAQUIN COUNTY
 FLOOD CONTROL PROJECT

**MOVABLE
 WAVE WASH PROTECTION**

U. S. ENGINEER OFFICE, SACRAMENTO, CALIF.



PLAN



SECTION

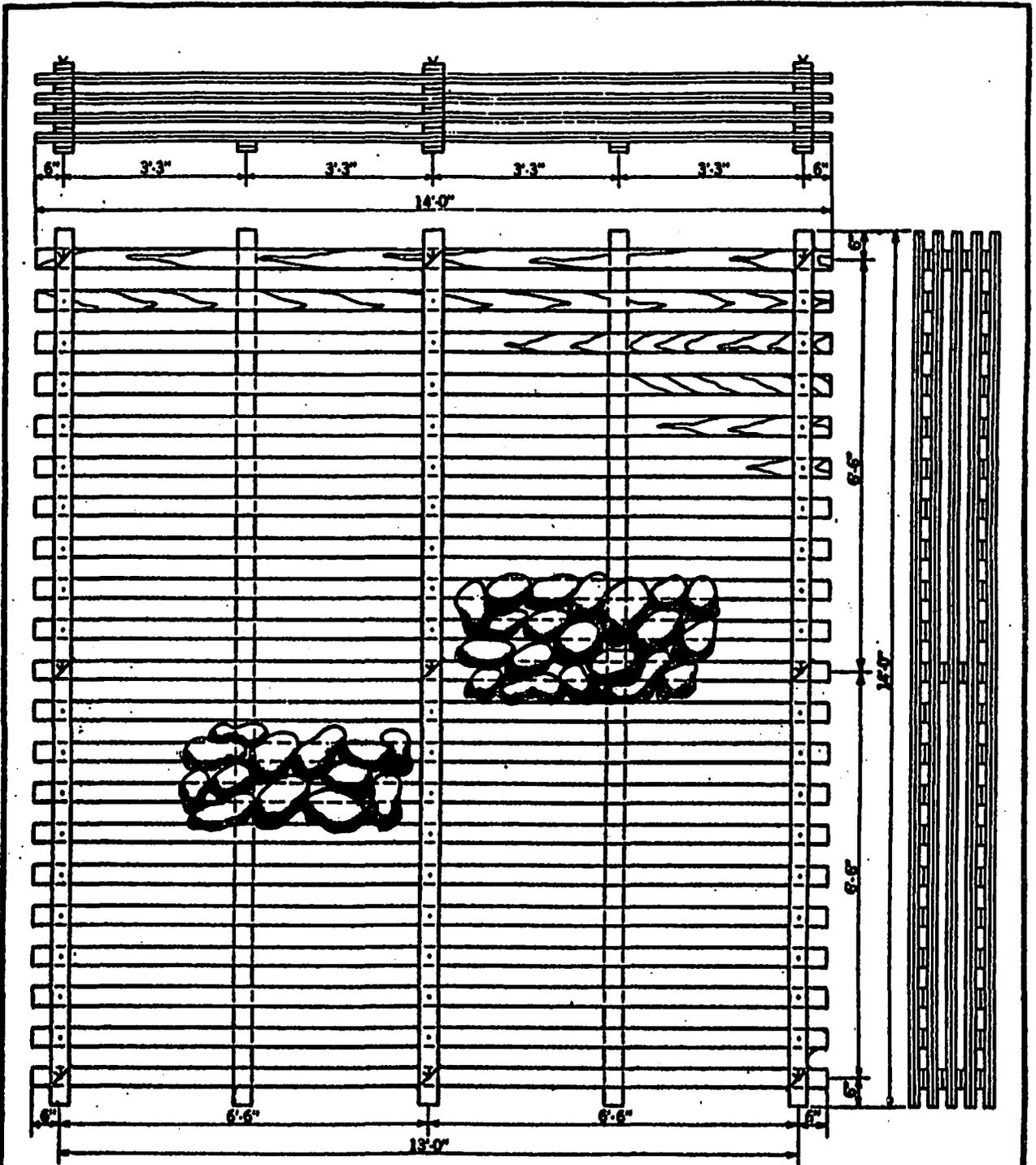
NOTE:

Use Polyethylene sheets, preferably 16' to 20' wide available in std. 100' long rolls, approx. 6 mil thickness, or canvas as available. Lay chosen length of Polyethylene sheeting or canvas parallel with levee slope, tie upper edge to stakes, tie sacks to bottom edge. Crew will then toss all bottom sacks over damaged slope at the same time to avoid tearing. Intermediate filled sacks will be immediately placed to hold down canvas or plastic. HAVE ALL ITEMS PREPARED BEFOREHAND.

MATERIAL REQUIRED FOR 100 LINEAR FEET OF LEVEE
LUMBER
• 30 Stakes 1"x2"x1'-6" • (Sharpened)
SANDBAGS
120 sandbags Canvas or Polyethylene sheeting as required

MORMON SLOUGH
SAN JOAQUIN COUNTY
FLOOD CONTROL PROJECT
WAVE WASH PROTECTION

US Army Engineer District
Sacramento, California



Note:

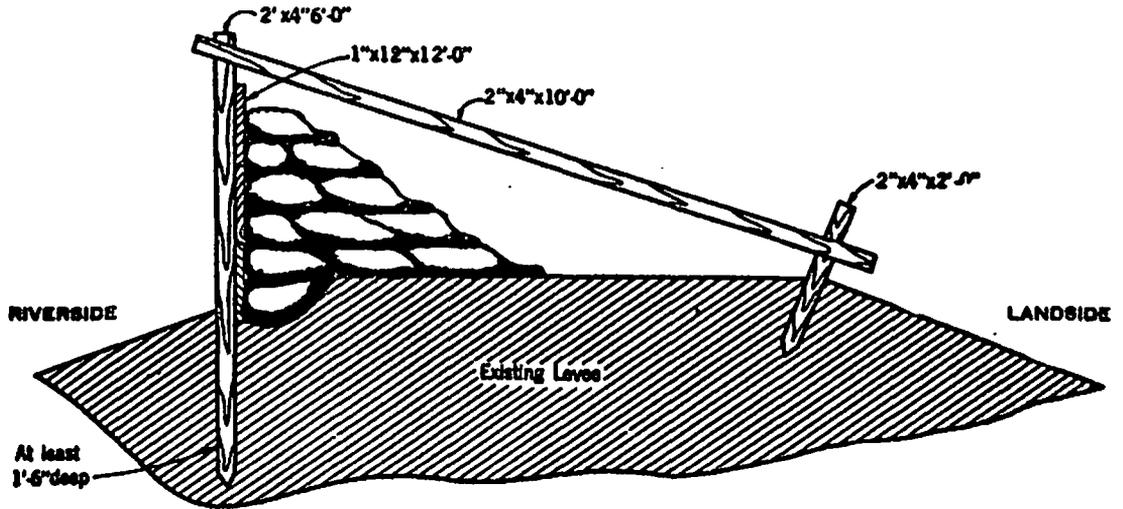
Crib constructed of double thickness of 1"x4"x14'-0" lumber. Nail all intersections with 1-20d nail. Each intersection of wale securely fastened by a loop of No. 9 wire, tightly twisted.

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

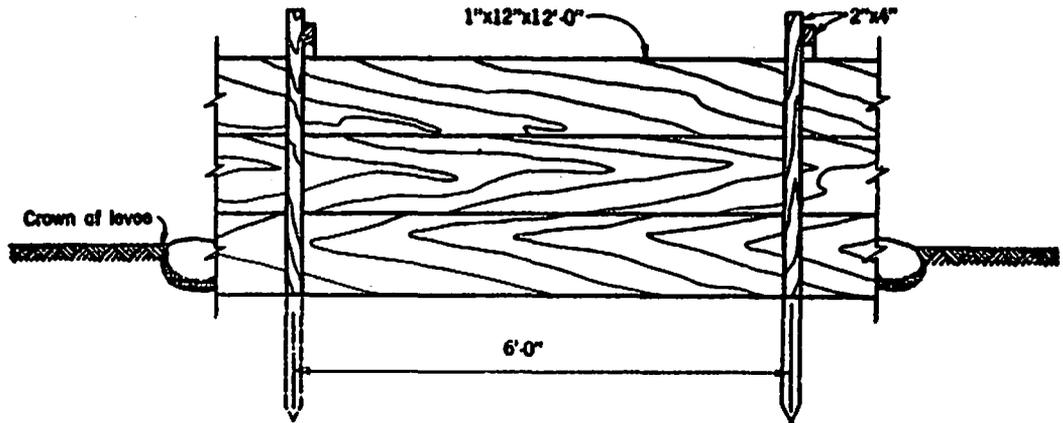
MORMON SLOUGH
 SAN JOAQUIN COUNTY
 FLOOD CONTROL PROJECT

CAVING BANK PROTECTION

U.S. ENGINEER OFFICE, SACRAMENTO, CALIF.



SECTION



FRONT ELEVATION

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

MORMON SLOUGH
SAN JOAQUIN COUNTY
FLOOD CONTROL PROJECT

LUMBER AND SACK TOPPING

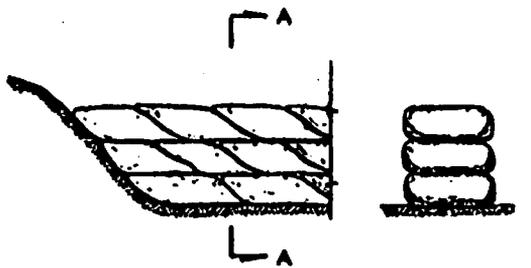
U. S. ENGINEER OFFICE, SACRAMENTO, CALIF.

LEEVE CONSTRUCTION

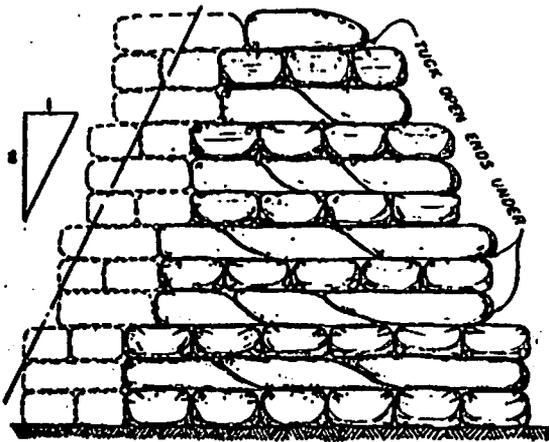
SANDBAGGING USED TO PREVENT OVERTOPPING OF EXISTING LEEVES AND FOR RETAINING FLOOD WATERS WHERE NO BACK-UP MATERIAL IS AVAILABLE.

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 LEEVE SECTION. THIS IS AN EXTREMELY IMPORTANT OPERATION FOR PROVIDING A LEEVE WHICH WILL BE AS IMPERVIOUS TO WATER AS POSSIBLE AND TO INSURE STABILITY OF SECTION. LOOSELY PLACED SANDBAGS IMPROPERLY KEYED TOGETHER MAY RESULT IN FAILURE AND CAUSE SERIOUS DAMAGE.



ELEVATION **SECTION A-A**
SKETCH A



LEEVE 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:

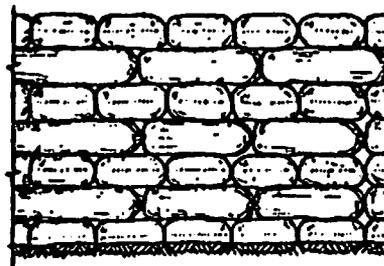
1. AVERAGE WEIGHT OF EACH FILLED SANDBAG, APPROX. 50 LBS.
2. APPROXIMATELY 1000 SANDBAGS ARE REQUIRED FOR EACH 100 SQ. FT. OF SURFACE (HEIGHT MULTIPLIED BY DISTANCE).

REVETMENTS

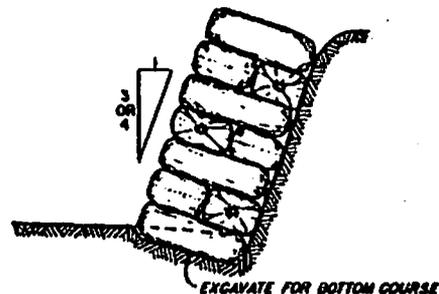
USED FOR EMERGENCY BANK PROTECTION TO PREVENT UNDER CUTTING AND CONTROL OF COURSE OF FLOOD CHANNELS.

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 SEAMS IN; THUS:-



ELEVATION



SECTION

ESTIMATING DATA:

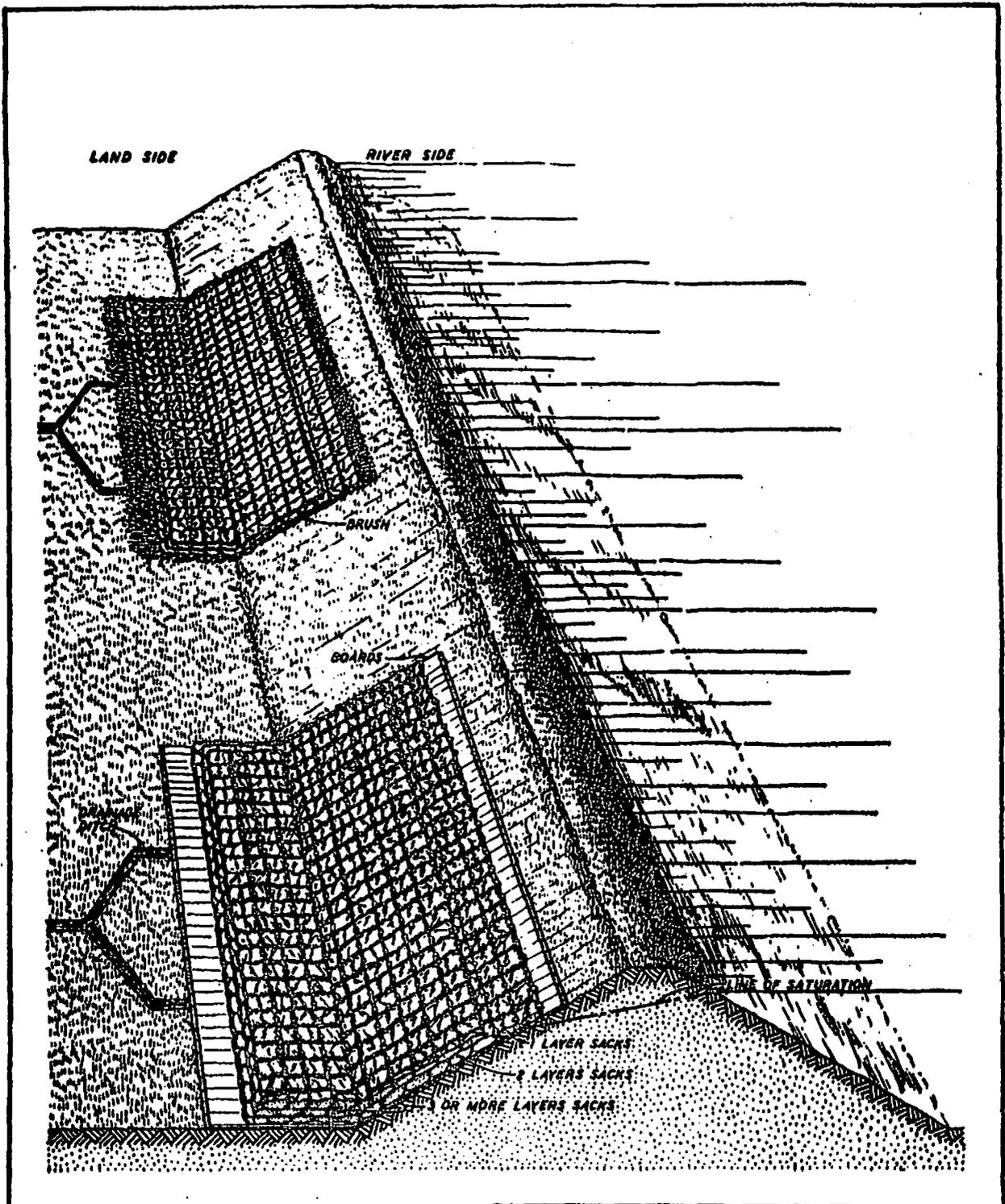
1. AVERAGE WEIGHT OF EACH FILLED SANDBAG APPROXIMATELY 65 LBS.
2. APPROXIMATELY 320 SANDBAGS ARE REQUIRED FOR EACH 100 SQ. FT. OF SURFACE TO BE REVETED.

FILL MATERIAL:

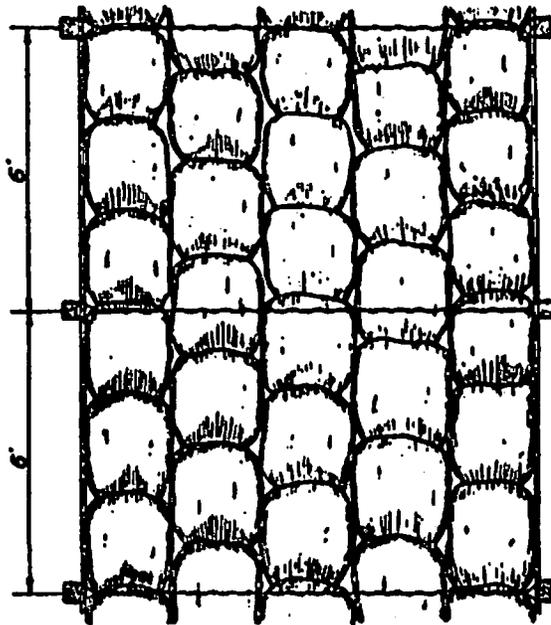
THE IDEAL MATERIAL FOR FILLING SAND BAGS IS A FINE SAND OR COARSE SILT. AVOID, AS MUCH AS POSSIBLE, THE USE OF COARSE GRAVEL AND HEAVY CLAYS.

MORMON SLOUGH
SAN JOAQUIN COUNTY
FLOOD CONTROL PROJECT
**INSTRUCTIONS FOR
PLACING SANDBAGS**

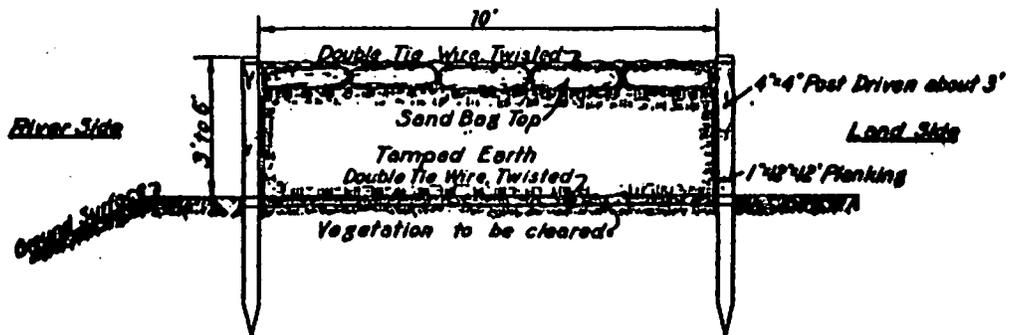
U. S. ENGINEER OFFICE, SACRAMENTO, CALIF.



MORMON SLOUGH
SAN JOAQUIN COUNTY
FLOOD CONTROL PROJECT
**BRUSHING AND SACKING
THE LANDSIDE SLOPE**
U.S. CORPS OF ENGINEERS, SACRAMENTO, CALIF.



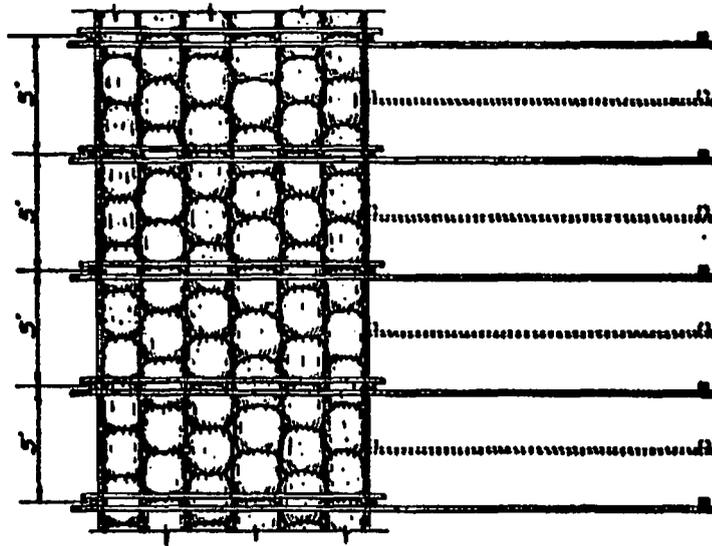
PLAN



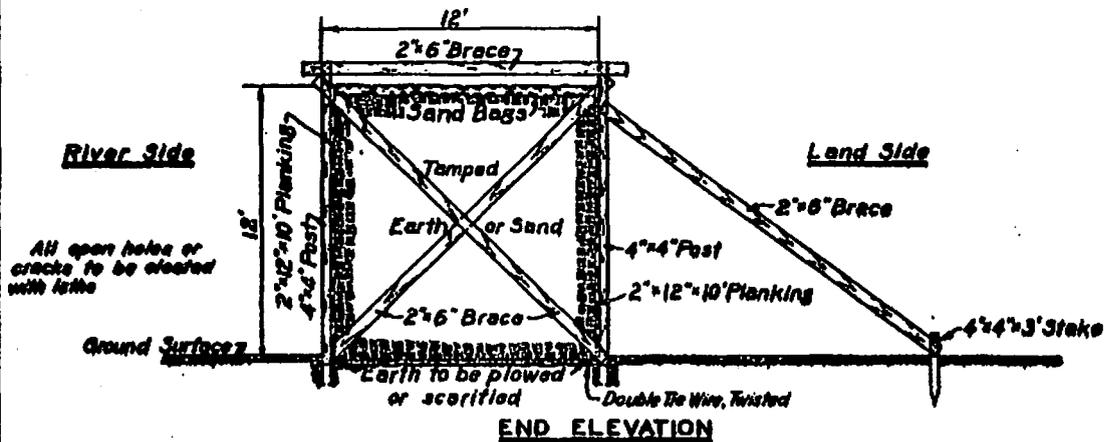
END ELEVATION

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' board feet	84 pieces 1"x12"x12' board feet	100 pieces 1"x12"x12' board feet
25 lbs. wire #12 gage	25 lbs. wire #12 gage	25 lbs. wire #12 gage
15 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

MORMON SLOUGH
SAN JOAQUIN COUNTY
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"x10'	700	120 lbs.-20d	534 cu yds.
240 Planks 2"x12"x10'		4 lbs.-3d fine	
20 Braces 2"x6"x14'			
60 Braces 2"x6"x10'			
20 Stakes 4"x4"x3'		WIRE	
5 bundles laths		20 lbs. #12 gage	
Total Lumber 6987 board feet			

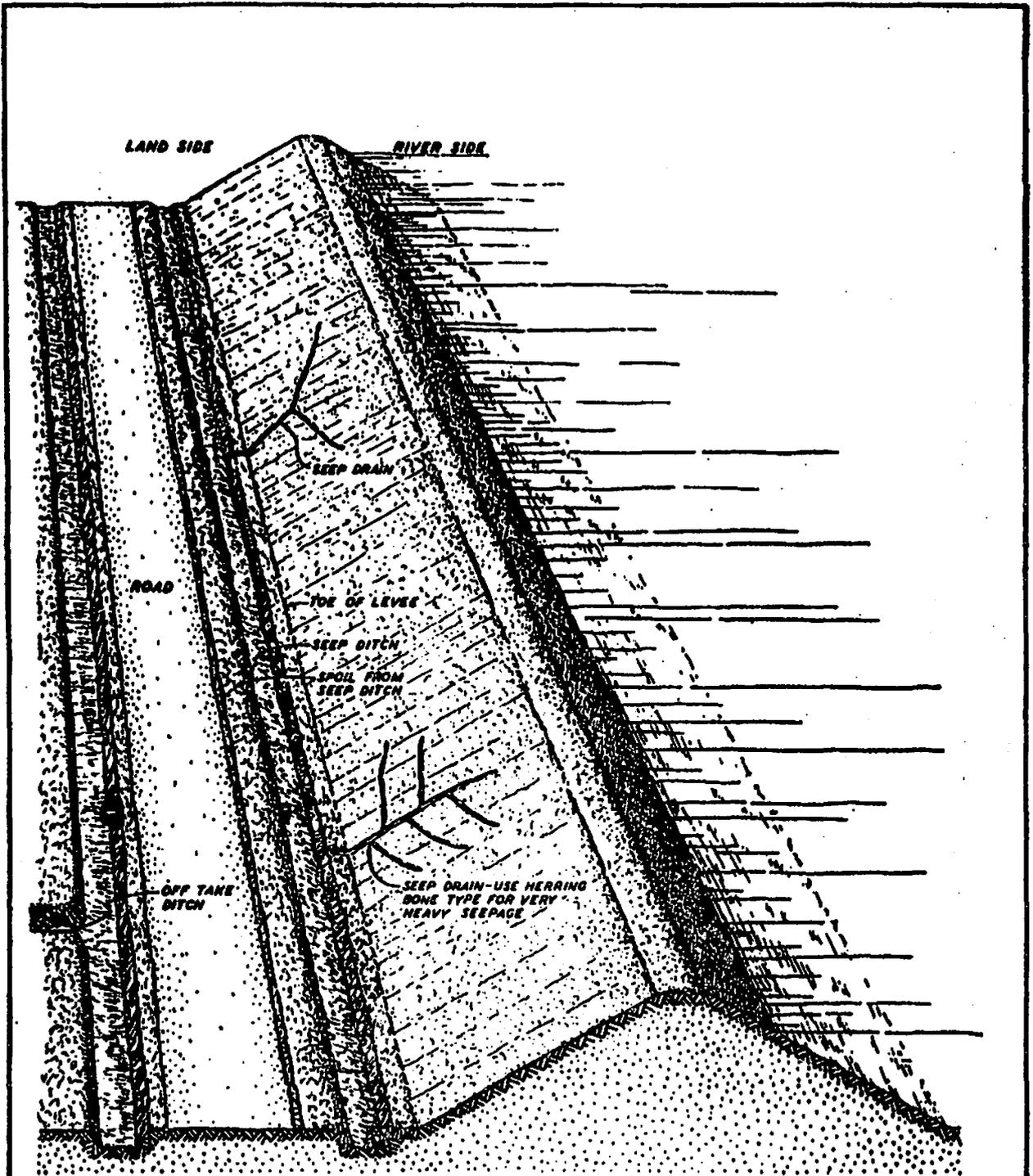
ADDITIONAL MATERIAL FOR BRACING EACH SIDE IN BETWEEN BENT'S			
LUMBER	SAND BAGS	NAILS	EARTH or SAND
20 Posts 4"x4"x10'		6 lbs.-20d	
20 Braces 2"x6"x14'			
20 Stakes 4"x4"x3'			
Total Lumber 813 board feet			

Sharpened

MORMON SLOUGH
SAN JOAQUIN COUNTY
FLOOD CONTROL PROJECT

**MUDBOX BULKHEAD LEVEE
CONSTRUCTION DETAILS**

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



MORMON SLOUGH
SAN JOAQUIN COUNTY
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__) Mormon Slough Project levees and channels, San Joaquin, 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 summarized 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 Mormon Slough reached or exceeded the reading of 12.0 on the State Department of Water Resources gage (located on the left bank of Mormon Slough about 1,400 feet upstream from the Escalon-Bellota Road Bridge) 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

MORMON SLOUGH
LEVEES AND CHANNELS

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 nautral 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 immediatly 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
MORMON SLOUGH

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.

SUGGESTED CHECK LIST NO. 4

DRAINAGE AND IRRIGATION STRUCTURES
MORMON SLOUGH

Inspector's Report Sheet No. _____

Inspector _____

Date _____

Superintendent _____

(a)	Location by 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 structure	
(g)	Repair Measures taken since last inspection	
(h)	Comments	Location of pipes as shown under paragraph 4-04

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

C
O
P
Y

The Reclamation Board
State of California

C
O
P
Y

JAN 13 1969
Refer to: 4130.50.101

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

Dear Sir:

Reference is made to your letter of January 9, 1969 concerning transfer to the State of California of the Mormon Slough Flood Control Project, Unit No. 1 (Jack Tone Road to Bellota), for maintenance and operation.

This work was constructed in accordance with Specification No. 3321, Contract No. DACW05-68-C-0060, Drawing No. CA-4-48.

The Reclamation Board, at its meeting of January 10, 1969, formally accepted the above referred to work for operation and maintenance, with the exception, as indicated in your letter of transfer, that this unit of work is subject to additional work as appropriate to cover items found deficient at the time of the joint inspection of January 7, 1969.

Sincerely yours,

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

C
O
P
Y

The Reclamation Board
State of California

C
O
P
Y

OCT 21 1968
Refer to: 4130.50.102

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

Dear Sir:

Reference is made to your letter of August 19, 1968 concerning transfer to the State of California of the Mormon Slough Flood Control Project, Unit No. 2 (mouth of Diverting Canal to Jack Tone Road) for maintenance and operation.

This work was constructed in accordance with Specification No. 3356, Contract No. DACW05-68-C-0020, Drawing No. 3-4-147.

The Reclamation Board, at its meeting of September 6, 1968, 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

JHMacC:pa

THE RECLAMATION BOARD
STATE OF CALIFORNIA

April 14, 1970

C
O
P
Y

C
O
P
Y

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

Refere to: 4130.50.104

Dear Sir:

Reference is made to your letter of October 30, 1969 concerning transfer to the State of California of the Mormon Slough Flood Control Project, Unit No. 3, right and left banks of the Calaveras River from the San Joaquin River to the McAllen Road Bridge for maintenance and operation.

This work was constructed in accordance with Specification No. 3600, Contract No. DACW05-69-C-0078, Drawing No. 3-4-148.

The Reclamation Board, at its meeting of April 10, 1970, formally accepted the above-referred to work for operation and maintenance.

Sincerely yours,

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

SPEKIO-F

19 August 1968

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

Gentlemen:

Reference is made to the joint inspection of 18 July 1968, made for the purpose of transferring a portion of the Mormon Slough Flood Control Project, Unit No. 2 (mouth of Diverting Canal to Jack Tone Road), to the State of California for operation and maintenance.

The flood control work, consisting of levee construction, channel improvement, placement of stone bank protection, and 3 interior drainage pumping plants on the Calaveras River, Stockton Diverting Canal, Mormon Slough and Tributaries, is listed on the attached tabulation. The work was completed on 15 August 1968, in accordance with specification No. 3356, Contract No. DACW05-68-C-0020, Drawing No. 3-4-147.

The work was performed under the general authority of the Flood Control Act of 23 October 1962 (Public Law 87-874, 87th Congress, 2nd Session).

The flood control work as described on the attached tabulation now meets the requirements of the Mormon Slough Flood Control Project. Therefore, said flood control work, together with the waterway banks contiguous thereto, are transferred to the State of California for operation and maintenance.

The maintenance work required under the provisions of the Mormon Slough Flood Control Project shall be performed in accordance with existing Flood Control Regulations, inclosed herewith, which have been prescribed

CERTIFIED MAIL

RETURN RECEIPT REQUESTED

*Mormon Slough
Part No. 1+2
Exhibit F/G*

19 August 1968

SPKKO-F
The Reclamation Board

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 Operations and Maintenance Manual covering this portion of work will be furnished your office at a later date.

Sincerely yours,

2 Incl
As stated

CRAWFORD YOUNG
Colonel, CE
District Engineer

Copy furnished:
DWR
~~OCE~~
~~SPD~~

- cc:
- ✓ Engrg Div (Lev & Chan)
- ✓ Engrg Div (Prog Dev Br)
- ✓ F & A Br (Cordano)
- ✓ Valley Res Ofc (2)
- ✓ Opns Br

JK
ROMPALA/blc

[Signature]
COLEMAN *McB*

[Signature]
HENSON

[Signature]
HART

[Signature]
YOUNG

[Signature]
21

LK

Marmion Slough
Part No. 1 & No. 2
Exhibit F/G

2
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

SUMMARY OF MORMON SLOUGH FLOOD CONTROL PROJECT
 CONTRACT 68-0020 Unit No. 2

Bank	Levee Construction	Lineal Feet	Stone Protection	Lineal Feet	Channel Improvement	Line
<u>Calaveras River</u>						
Left	0+00 to 34+07.9	3408				
<u>Stockton Diverting Canal</u>						
Right	0+00 to 253+99	25399	28+22 to 42+15	1393	0+00 to 421+36	42,136
Left			257+00 to 262+00	650*		
<u>Mormon Slough</u>						
Right	253+99 to 337+00 0+00 to 111+63.6	8301 11164	380+00 to 383+00 280+50 to 286+00	450* 700*	See Above	
Replacement Levee						
Right	379+80 to 386+80 393+20 to 403+20	700 1000				
<u>Potter Creek</u>						
Left	0+00 to 48+28	4828	20+00 to 21+10 31+20 to 31+95	110 145*	1+00 to 40+42	391.2

542

4,373

* = Includes Transitions

Mormon Slough
 Part No. 1
 Exhibit F

COLEMAN

SEKCO-0

9 January 1969

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

Gentlemen:

Reference is made to your letter dated 8 January 1969 and also the joint inspection of 7 January 1969, made for the purpose of transferring Unit No. 1 of the Mormon Slough Flood Control Project, Jack Tone Road to Belleta, to the State of California for operation and maintenance.

The flood control work was completed on 7 January 1969, in accordance with Specification No. 3321, Contract No. DACW05-68-C-0060, Drawing No. CA-4-48. The major contract items are listed on the attached tabulation. The work was performed under the general authority of the Flood Control Act of 23 October 1962 (Public Law 87-874, 87th Congress, 2nd Session). This unit of project work with the exception of being subject to additional work as appropriate to cover items listed in your letter dated 8 January 1969 now meets the requirements of the Mormon Slough Flood Control Project. Therefore, said flood control work, together with the waterway banks contiguous thereto, are transferred to the State of California for operation and maintenance.

R
ROMPALA/blc


COLEMAN


HENSON


HABER

FINK ♀

The maintenance work required under the provisions of the Mormon Slough 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 Operations and Maintenance Manual covering this work will be furnished your office at a later date.

Sincerely yours,

GEORGE B. FINK
Colonel, CE
District Engineer

Mormon Slough
Part No. 1
Exhibit F

2 Incls
as stated

Copy furnished:
DWR
; OCE; SPD

copy to Fink & Haber 10 Jan 69

cc: Engr-Lev&Chan; Engr-Prog Dev;
Valley Res Ofc; F&A Br (Cordano)

SUMMARY OF MORMON SLOUGH FLOOD CONTROL PROJECT
CONTRACT NO. DACW05-68-C-0060 - UNIT NO. 1

MORMON SLOUGH - LEFT BANK

Channel Improvement	Lin Ft	Levee Replacement	Lin Ft	Dike Construction	Lin Ft	Levee Crown		Stone Protection	Lin Ft
						Shaping & Surfacing	Lin Ft		
422+12 to 458+58 =	3646	438+35 to 458+30 =	1995	604+15 to 618+22 =	1407			527+45 to 531+75 =	430
466+02 to 531+75 =	6573	506+00 to 513+44 =	744	665+50 to 678+60 =	1310			533+75 to 536+55 =	280
533+60 to 537+08 =	348			704+40 to 706+16 =	176			594+25 to 598+70 =	445
548+40 to 578+00 =	2960			714+00 to 723+00 =	900			813+85 to 818+50 =	465
583+23 to 604+15 =	2092			737+69 to 739+73 =	204				
610+14 to 620+40 =	1026			782+27 to 787+10 =	483				
634+70 to 649+18 =	1448								
655+80 to 706+65 =	5085								
758+70 to 765+70 =	700								
775+50 to 816+84 =	4134								
907+00 to 915+80 =	880								

MORMON SLOUGH - RIGHT BANK

422+40 to 442+00 =	1960	451+16 to 469+08 =	1792	692+22 to 750+15 =	5793	505+75 to 510+75 =	500
499+48 to 509+80 =	1032	625+70 to 633+66 =	796	751+05 to 817+80 =	6675	529+85 to 531+75 =	190
530+25 to 531+75 =	150			818+43 to 900+30 =	8187	533+75 to 556+55 =	2280
533+75 to 537+14 =	339						

S.P.R.R. DRAIN
LEFT BANK

Levee Enlargement Lin. Ft.

0+00 to 10+46 = 1046
11+50 to 25+28 = 1378

mormon slough
Part No. 1
Exhibit F

SPKCO-0 (Unit #1 - Mormon Slough FCP - 7 Jan 69)

INSTRUCTIONS TO DELIVERING EMPLOYEE		
<input type="checkbox"/> Show to whom and date delivered	<input type="checkbox"/> Show to whom, date, and address where delivered	<input type="checkbox"/> Deliver ONLY to addressee
(Additional charges required for these services)		
RECEIPT		
Received the numbered article described below.		
REGISTERED NO.	SIGNATURE OR NAME OF ADDRESSEE (Must always be filled in)	
CERTIFIED NO.	1 <u>J. H. Mac Clellan</u>	
INSURED NO.	2 SIGNATURE OF ADDRESSEE'S AGENT, IF ANY	
DATE DELIVERED	SHOW WHERE DELIVERED (only if requested)	

055-16-71548-9 GPO

SPKCO-0

30 October 1969

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



Gentlemen:

Reference is made to the joint inspection of 2 October 1969, made for the purpose of transferring the final portion of the Mormon Slough Flood Control Project, Unit No. 3, Calaveras River levee crown surfacing and bank protection, San Joaquin River to McAllen Road Bridge, San Joaquin County, to the State of California for operation and maintenance.

The flood control work as listed on the attached sheet was completed on 22 October 1969, in accordance with Specification No. 3600, Contract No. DACW05-69-C-0078, Drawing No. 3-4-148. The work was performed under the general authority of the Flood Control Act of 23 October 1962 (Public Law 87-874, 87th Congress 2nd Session). This unit of project work now meets the requirements of the Mormon Slough Flood Control Project. Therefore, said flood control work, together with the waterway banks contiguous thereto, are transferred to the State of California for operation and maintenance.

The maintenance work required under the provisions of the Mormon Slough 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 this work will be furnished your office at a later date.

Sincerely yours,

GEORGE B. FINK
Colonel, CE
District Engineer

2 incls
as stated

Copy furnished:

~~OCE~~
~~SPD~~

CC: Engr Div-Lev&Chan; Prog Dev Br; Valley; F&A(Cordano)

ROMAPALA/

COLEMAN

HENSON

HART

FINK

Mormon Slough Part No. 1 Exhibit F

To Chairman & Huber 7 NOV 69

SUMMARY OF MORMON SLOUGH FLOOD CONTROL PROJECT

CONTRACT NO. DACW05-69-C-0078 - UNIT NO. 3

CALAVERAS RIVER-RIGHT BANK

<u>LEVEE SETBACK</u>	<u>LIN. FT.</u>	<u>LEVEE CROWN</u>	<u>SHAPING & SURFACING</u>	<u>LIN. FT.</u>	<u>STONE PROTECTION</u>	<u>LIN. FT.</u>
6+00A to 25+00A	= 1900	0+00A to 26+80A	= 2680		1+90A to 26+80A	= 2490
19+00B to 47+00B	= 2800	0+00B to 48+44B	= 4844		18+50B to 48+44B	= 2994
		0+00D to 29+42D	= 2942			
		30+50D to 98+50D	= 6800			
		103+00D to 123+53D	= 2053			
		*46+50E to 49+00E	= 250			
		0+30F to 17+00F	= 1670			
		17+70G to 42+50G	= 2480			

CALAVERAS RIVER - LEFT BANK

0+00C to 11+90C	= 1190	20+50C1 to 21+90C1	= 140 (Site 1)
0+80E to 15+70E	= 1490	44+60C1 to 47+85C1	= 325 (Site 2)
17+00E to 28+10E	= 1110	61+55C1 to 63+00C1	= 145 (Site 3)
28+90E to 65+40E	= 3650	96+50C to 99+30	= 280 (Site 4)
66+80E to 97+10E	= 3030		
98+00E to 129+10E	= 3110		

*(left bank traverse)

Mormon Slough
Part No. 1
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

July 1, 2003

Navigation and Flood Control Unit

Mr. Peter D. Rabbon, General Manager
The Reclamation Board
State of California
1416 - 9th Street, Room 1601
Sacramento, California 95814

Dear Mr. Rabbon:

This letter is to transfer the completed series of levees and floodwalls, associated with the San Joaquin Area Flood Control Agency (SJAFCA) Reimbursement Flood Control Project in the Stockton Metropolitan area, to The Reclamation Board for the Operation, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R). This project was constructed under Congressional authorization provided in the Water Resources Development Act (WRDA) of 1996, Public Law 104-303, Section 211 "Reimbursement". Refer to the "Agreement Between the Department of the Army and the San Joaquin Area Flood Control Agency for Reimbursement for Stockton Metropolitan Area Watershed, California (Urban Features) Project" dated March 2, 2002 (encl 1).

The completed works being transferred are the features of the Federally Based Plan section of the Section 211 Study dated November 1999 and revised May 2000. The project works consist of levee improvements at several locations in the Stockton Watershed Area along the Bear Creek system including Bear Creek, Mosher Creek Diversion, Upper Mosher Creek upstream to the EBMUD Aqueduct, Paddy and South Paddy Creeks, Pixley Slough, and Bear Creek Wing Levee, but excluding the Lower Mosher Slough element and the 3300-feet of Upper Mosher Creek upstream of the EBMUD Aqueduct and the Calaveras River system; and including part of the Upper Calaveras River, from Station 365+00 on the left bank and Station 381+00 on the right bank down to the Stockton Diverting Canal, Mormon Slough, and Potter Creek-A as generally described in the Section 211 Study Report.

The Sacramento District, USACE, certifies that this project is designed and constructed to provide protection against the base flood per FEMA criteria contained in 44 CFR Chapter 1, Part 65; requirements as specified in Section 65.10(e). Refer to the March 24, 2000 letter from the District Engineer to SJAFCA (encl 2).

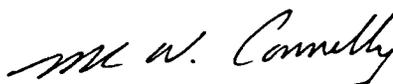
Murakami
Tavana
file 8

-2-

A final set of the Operations and Maintenance Manual (O&M), Project Plans and Specifications, and as-built drawings, in the form of a CD Rom and a hard copy, has already been submitted to your office.

The final walk-through occurred on October 6, 1999. If you have any questions regarding the project, please contact Mr. Patrick Dwyer, Project Manager, Programs and Project Management Division at (916) 557-7802. If you have any question regarding this transfer, please contact Mr. Mohsen Tavana at (916) 557-5282 or Mr. Bob Murakami at (916) 557-6738.

Sincerely,



Mark W. Connelly
Lieutenant Colonel,
Corps of Engineers
Acting District Engineer

Enclosures

Note: On 10-16-2003, sent a signed copy of
Transfer letter to Pete Rabbon (Rec Board)

EXHIBIT G

SAMPLE PERMIT

for use of

RIGHT-OF-ENTRY

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 passage-way 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 of safety of the flood protection structure, and the grantor shall not be liable to the grantee for such damage or destruction.

EXHIBIT G

Sheet 1 of 3

Unless otherwise specifically provided herein, this permit may be cancelled at anytime 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 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.

C-O-P-Y

April 17, 1984

Navigation and Flood Control Unit

The Reclamation Board
State of California
1416 Ninth Street, Room 445-6
Sacramento, California 95814

Members of the Board:

This is in regard to resolution of September 1, 1983 providing assurance of local cooperation by your Board for emergency bank protection work to be accomplished by the Corps of Engineers under authority of Section 14 of the 1946 Flood Control Act and Section 2304 (2), Title 10, U.S.C.

The authorized work was completed on April 13, 1984, in accordance with the Contract No. DACW05-84-C-0041 and Specification No. 6844, and consisted of about 100 feet ⁺ of gabion bank protection along Mormon Slough right bank at Jack Tone Road in San Joaquin County.

The completed work, together with the waterway banks contiguous thereto, is hereby transferred on April 16, 1984 to the Reclamation Board, State of California, for operation and maintenance, in accordance with Title 33, Part 208, Flood Control Regulations enclosed.

An operation and maintenance manual for the completed work will be furnished your Board at a later date. This manual will fully outline your responsibilities as the operating agency. Written acceptance of the completed work is requested.

Sincerely,

Arthur E. Williams
Colonel, Corps of Engineers
District Engineer

Enclosure

EXHIBIT H

ADDITIONS
Page 4 of 4
December 5, 1984

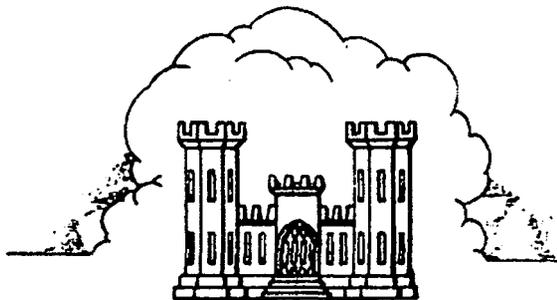
OPERATION AND MAINTENANCE MANUAL

FOR

MORMON SLOUGH PROJECT

SAN JOAQUIN COUNTY, CALIFORNIA

PART No. 2 - PUMPING PLANTS



DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

MORMON SLOUGH
PROJECT

PART NO. 2

**OPERATION AND MAINTENANCE MANUAL
MORMON SLOUGH PROJECT
SAN JOAQUIN COUNTY, CALIFORNIA**

**PART NO. 2
PUMPING PLANTS**

LOCATION	ADDITION OR REVISION	DATE
Exhibit G	Add copy of letter of transfer dated 19 Aug 1968	26 Mar 2010

OPERATION AND MAINTENANCE MANUAL
MORMON SLOUGH PROJECT
PART NO. 2 - PUMPING PLANTS

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1-03	Project Description	2
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EXHIBITS

<u>Number</u>	<u>Subject</u>	<u>Sheets</u>
A	Federal Flood Control Regulations	1 and 2
B	Location Map	1 Sheet
C	Stage - Time - Flow Curves	1 thru 3
D	"As Constructed" Drawings	Detached
E	Manufacturer's Data	Detached
F	Photographic Prints of Structure	1 thru 22
G	Letter of Acceptance by State Reclamation Board	1 Sheet
H	Lubrication Schedule	1 thru 4
I	Inspection Check List	1 thru 7
J	Sample Log of Operation	1 thru 5

OPERATION AND MAINTENANCE MANUAL
FOR MORMON SLOUGH PROJECT
SAN JOAQUIN COUNTY, CALIFORNIA
PART NO. 2 - PUMPING PLANTS

SECTION I

INTRODUCTION

1-01. Authorization. The Mormon Slough Project, San Joaquin County, California, was authorized by the Flood Control Act approved 23 October 1962 in Public Law 87-874, 87th Congress, Second Session, which states in part:

"The project for flood protection on Mormon Slough, Calaveras River, California, is hereby authorized substantially in accordance with the recommendations of the Chief of Engineers in House Document Numbered 576, 87th Congress, at an estimated cost of \$1,960,000."

In the report of the Chief of Engineers to the Secretary of the Army, dated 28 August 1962, the Chief of Engineers stated that he concurred in the Recommendations of the Board of Engineers for Rivers and Harbors. In paragraph 10 of House Document No. 576, the recommendations of the Board were as follows:

"Recommendations . . . Accordingly, the Board recommends improvement for flood control on Mormon Slough, the Diverting Canal, and the Calaveras River, California, consisting of channel enlargement and clearing, slope paving, levees, gated drainage structures, a pumping plant, railroad adjustments, and appurtenant works; all generally in accordance with the plan of the District Engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable"

1-02. Location. The Mormon Slough Flood Control Project is located in San Joaquin County and in the general vicinity north and east of the City of Stockton, California. Operation and maintenance of the levees and channels on the Mormon Slough Project is covered in Operation and Maintenance Manual, Part No. 1 - Levees and Channels. This manual covers the three pumping plants located on the right bank of the Stockton Diverting Canal and two precipitation gages. Plant No. 1 is located a short distance upstream from Wilson Way, Plant No. 2 is upstream from US Highway 99, and Plant No. 3 is located a short distance upstream from Linden Road. For location of the precipitation gages see Section VI, paragraph 6-01(d). For further location details see Exhibit B.

1-03. Project Description. Facilities provided for the three pumping plants are as follows:

<u>Plant No.</u>	<u>No. Pumps</u>	<u>H.P.</u>	<u>Rated Capacity c.f.s.</u>	<u>Size Gravity Drain Pipe</u>	<u>Provision For Future Pump</u>
1	2	20	8 each	30" x 30"	1
2	2	125	50 each	48" x 48"	2
3	2	50	20 each	30" x 30"	1

For more detailed description of the pumping plant facilities see paragraph 6-01 of this manual.

1-04. Construction Data and Contractor. Work required to complete the pumping plants was accomplished under Contract No. DACW05-68C-0020 by R. P. Burris during the period from 1 October 1967 to 19 August 1968. Specification No. 3356, Drawing No. 3-4-147.

SECTION II

LOCAL COOPERATION REQUIREMENTS

2-01. Requirements of Local Cooperation. House Document No. 576 requires that, prior to construction, local interests give assurances satisfactory to the Secretary of the Army that they will, without cost to the United States:

- a. Furnish all lands, easements, and rights-of-way, including spoil-disposal areas, necessary for construction of the works.
- b. Accomplish all relocations and alterations of roads, streets, buildings, pipelines, utilities, bridges, and other structures (except rail-road facilities) made necessary by the construction work.
- c. Hold and save the United States free from damages due to the construction works.
- d. Maintain and operate all the works after completion, including the lower Calaveras River, in accordance with regulations prescribed by the Secretary of the Army.
- e. Prescribe and enforce regulations designed to prevent encroachment of any type that would impair the flood-control effectiveness of the works.
- f. House Document No. 576 further requires that Federal maintenance of the existing Stockton and Mormon Channel Project (Diverting Canal) for navigation be discontinued upon completion of the improvements recommended therein.

2-02. Assurances Provided by Local Interests. The Reclamation Board of the State of California, by letter dated 13 December 1963, advised the Sacramento District Engineer that the Mormon Slough Project was authorized by the State of California by Chapter 915 of the Statutes of 1963 and that the Reclamation Board would, upon request, give the required assurances to the Corps of Engineers under Chapter 1438 of the Statutes of 1963.

2-03. Acceptance by the State Reclamation Board. Responsibility for operating and maintaining the Mormon Slough Project, Unit No. 2, was officially accepted by the Reclamation Board of the State of California by letter dated 21 October 1968, see Exhibit G. The three pumping plants covered by this manual are a part of Unit No. 2 of the project.

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, as of 1 January 1962, Chapter II, Corps of Engineers, Department of the Army, Part 208 - Flood Control Regulations, Maintenance and Operation of Flood Control Works, 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 principal 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 mission. 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 Department of Water Resources, which is the State agency designated by the Director 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 protection projects for which such regulations are required by law. Section 208.10(a)(10) of the regulations reads 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 advice 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 mean the responsible State agency which provided the assurances for the project; the term "District Engineer" shall mean the District Engineer of the US Army Engineer District, Sacramento, or his authorized representative. The term "flood" shall mean any flow in Mormon Slough when the water surface reaches or exceeds the reading of 12.0 on the California Department of Water Resources Bellota gaging station located on the left bank about 1,400 feet upstream from the Escalon-Bellota Road. This gage reading corresponds to a streamflow of about 10,000 c.f.s. The term "right bank" or "left bank" shall 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 semiannual 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 the State Reclamation Board "As Constructed" drawings of the project works at the time they are transferred.
- b. Make periodic inspections of the project works and notify the State Reclamation Board 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.
- 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 to the extent permitted by existing law and regulations.

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 their 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 take whatever action is necessary under its own authority to remove the encroachment.

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 District Engineer sufficiently in advance of issuance to permit adequate study and consideration and determination of conditions to be embodied in the permit document.

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 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; drawings or prints of proposed improvements or alterations to the existing flood control works must be submitted for approval to the District Engineer 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 of 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 floodflow, 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) (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"

(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 floodflow in excess of a reading of 12.0 on the State Department of Water Resources gage located on the left bank of Mormon Slough about 1,400 feet upstream from the Escalon-Bellota Road.

(3) The suggested check lists and instructions shown in Exhibit I, Sheets 1 to 7 inclusive, are to be followed in each inspection to insure that no features of the protective system are overlooked. 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 3-07(h)(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. 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) Semiannual Report. The responsible State agency which provided the assurances shall submit within a 10-day period following 1 December and 1 June of each year, a semiannual 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 occurrences and behavior of the protective works, and flood-fighting activities during the period.

(c) Precipitation records from recording gages.

(d) Prosecutions for encroachment or trespass.

(e) Permits issued for right-of-way or use of right-of-way.

(f) Permits issued for improvements or construction within the project right-of-way.

(g) Maintenance measures taken; nature, date of construction, and date of removal of temporary repairs; date of permanent repairs.

(h) Fiscal statement of cost and maintenance and operation for the period.

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 semiannual 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 responsible State agency which provided the assurances for the project and the District Engineer of the US Army Engineer District, Sacramento. At the discretion of the responsible State agency, the report submitted pursuant to Chapter 1528, Statute

of 1947 by the Department of Water Resources may be considered to fulfill the requirements of paragraphs 3-07 1 above provided the report complies with all provisions of that paragraph and provided the State Reclamation Board so indicates in writing to the District Engineer.

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. Levees. The levees are subject to Flood Control Regulations which are more fully outlined in the Operation and Maintenance Manual, entitled, "Operation and Maintenance Manual for Mormon Slough Project - San Joaquin County, California, Part No. 1 - Levees and Channels, San Joaquin River to Bellota."

4-02. Structures. The pumping plants, sumps, and outlet channels are subject to the same Flood Control Regulations as the levees; therefore, the operation, maintenance and inspection of these features should be coordinated with that of the levees.

4-03. Pumping Plant.

a. Description. The Pumping Plants are described in paragraph 6-01 of this manual.

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

"(f) Pumping Plants (1) Maintenance. Pumping plants shall be inspected by the Superintendent at intervals not to exceed 30 days during flood seasons and 90 days during off-flood season to insure that all equipment is in order for instant use. At regular intervals, plant, buildings, and equipment, repainting as necessary, proper measures shall be taken to provide for cleaning and lubricating all machinery. Adequate supplies of lubricants for all types of machines shall be kept on hand at all times. All equipment, including switch gear, transformers, motors, pumps, valves, and gates shall be trialed 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 . . . Only skilled electricians and mechanics shall be employed on tests and repairs . . . Repairs requiring removal of equipment from the plant shall be made during off-flood seasons insofar as practicable."

c. Operation. Pertinent Requirements of the Code of Federal Regulations, Exhibit A, paragraph 208.10(f)(2) are quoted in part as follows:

"(f)(2) Operation . . . The operator shall be familiar with the equipment manufacturer's instructions and drawings and with the "Operating Instructions" for each station . . . Immediately upon final recession of floodwaters, the pumping station shall be thoroughly cleaned and equipment thoroughly inspected, oiled and greased. A record or log or pumping

plant operation shall be kept for each station, a copy of which shall be furnished the District Engineer following each flood season."

The frequency of visits by competent operators to check pumping operations will vary greatly and schedules will have to be flexible enough to meet changing conditions, from extreme emergency flood conditions where continuous duty of operator is warranted, to visits every 4 hours, 8 hours, or 24 hours.

SECTION V

OPERATION REGULATIONS

5-01. Objectives. The operational objectives of the pumping plants are to prevent flooding along the landside of the right bank levee of the Diverting Canal from interior drainage at times when the flood stage in the Diverting Canal limits or prevents flow through the gravity conduits.

5-02. Basis of Operation. Pumps at all three plants can be set to operate automatically throughout the year. Under automatic operation the pumps go on and off according to the water level in the landside sumps and are independent of the water level in the stream. The automatic operation sequences for each pump are as described in Section VI - Mechanical and Electrical Features. Each plant is provided with a reinforced concrete conduit designed to pass interior drainage from the landside to the waterside when the stream stage is low enough to permit gravity flow. These conduits have an automatic flapgate on the waterside end and a concrete gate well with slide headgate at the waterside crown edge. The slide gate serves as a positive shut off to be used for closure under emergency conditions such as an inoperative flapgate or fracture in the gravity conduit. All three plants will be manually operated until sufficient experience has been acquired to determine when the plants should be set for automatic operation.

5-03. Regulations. The following regulations are prescribed to accomplish the operational objectives in accordance with the foregoing basis of operation:

a. Automatic Operation. All pumps shall be set for automatic operation with the selector switch set in the automatic position. All gravity conduit slide headgates will be in the open position.

b. Emergency Operation. In the event of a failure of the automatic controls for the pumps, the operator shall control the pumps manually to effect an operation comparable to the automatic schedule outlined in paragraph 6-01(c). As mentioned above, in the event of a failure of the waterside flapgate on the gravity conduit to close or a fracture occurs in the gravity conduits, the slide headgate will be closed manually.

c. Development of Automatic Operation Schedule. During the first five years of operation an automatic pump schedule will be developed for each pumping plant by the State Reclamation Board for approval by the District Engineer and inclusion in this manual. The proposed initial settings of pump controllers shown in paragraph 6-01(c) may be modified to settings demonstrated by operation experience to be more suitable to actual pumping requirements. A revised automatic operation schedule will require approval of the District Engineer with the installation of additional pumps.

5-04. Operation Procedures Summary. Physical operations of the pumps and slide headgates to carry out the foregoing regulations are outlined below:

a. Pump Operations.

(1) Starting Pumps:

(a) Insure that pump suction bells are properly submerged as prescribed in paragraph 6-01(c) for pumping plants Nos. 1, 2, and 3, respectively.

(b) Make a physical check of pump, sump and trashrack structure and remove material that might interfere with operations or damage the pumps.

(c) Insure that the pumps are properly lubricated in accordance with manufacturer's recommendations. See Exhibit E. The pump bearings are lubricated by a combination manual and solenoid operated liquid oiler. All of the upper motor bearings and the lower motor bearings at pumping plant No. 2 are oil lubricated. The lower motor bearings at pumping plants No. 1 and No. 3 are grease lubricated with Jerk-type fittings.

(d) Control Sequence.

1. To start the pumps for manual operation, turn the applicable pump motor circuit breaker to the "on" position. Turn the H.O.A. switch to "H" or "hand" position. There is a short time delay (approximately 10 seconds) between the time the switch is turned on until the pump motor actually starts. There is also a 10-minute time delay before the second pump can be started after the first pump is started. If the switches to start the second pump are turned on prior to the elapse of the 10 minute delay period, the pump motor will not start until this time has passed.

2. To change from manual to automatic operations, it is necessary to stop the pump by turning the H.O.A. switch to "off" position. Then turn the H.O.A. switch to the "A" position. The pump will not start until the automatic float control setting calls for pumping

3. To stop the pumps, turn the H.O.A. switch to "off" position.

b. Slide Headgates.

(1) The slide headgates are manually operated by hand cranks which are stored in the pumphouses.

SECTION VI

MECHANICAL AND ELECTRICAL FEATURES

6-01. Description.

a. Pumping Plants.

(1) General. The pumping facilities consist of 3 pumping plants, with each having a collecting sump, 2 pumps with discharge lines through the levee above flood plane, a gravity drain with a slide gate on the riverside crown of levee, flap gates on all discharge lines, concrete sump with trashrack inlet and a metal housing over the pump motors and controls. The pumps are automatically controlled by float operated electrical switch controllers, which have sufficient contacts, etc., to operate the future pumps of each plant. The switch controllers have adjustable stages to control the starting and stopping of each pump at specific sump water surface elevations to suit the predetermined plan of operation in accordance with the estimated rainfall and runoff data. These stage settings can be changed easily to suit the conditions which operating experience may warrant.

(2) Drainage Pumps:

(a) Type: Each pump is a vertical, axial flow with submerged, open impeller, directly connected to a vertical electric motor. Pumps are designed to permit ready withdrawal of the entire pump, including the discharge elbow, housing and suction bell, through the opening in the floor at the motor base. The pumps are supported at the pumping plant structure deck.

(b) Technical data:

1. Plant No. 1. Layne & Bowler Pump Co , 1-stage, 12 LM bowls, 3600 gpm @ 13.3 ft., TDH curve D-18439-1, 14" O.D. discharge elbow and column pipe, 1-gal oil reservoir with combination manual and automatic oiler U.S. motor, 20 H.P., vertical hollow shaft, electric, 1170 rpm, 60 cycles, 3 phase, 460 volts, W.P.I. Class "B" insulation.

2. Plant No. 2. Layne & Bowler Pump Co., 1-stage, 24P36 bowls, 22,500 gpm @ 14.9 ft., TDH curve D-18440-1, 30" O.D. discharge elbow and column pipe, 1-gal oil reservoir with combination manual and automatic oiler. U.S. motor, 125 H.P., vertical hollow shaft, electric, 880 rpm, 60 cycles, 3 phase, 460-volts, W.P.I. Class "B" insulation.

3. Plant No. 3. Layne & Bowler Pump Co., 1-stage, 20P20 bowls, 9,000 gpm @ 15.3 ft., TDH curve D-18441-1, 20" O.D. discharge elbow and column pipe, 1-gal. oil reservoir with combination manual and automatic oiler U.S. motor, 50 H.P., vertical hollow shaft, electric, 880 rpm, 60 cycles, 3 phase, 460 volts, W.P.I. Class "B" insulation.

(c) Pump Operating Conditions: Two pumps are installed in each pumping plant. Provision is made for installation of a third pump in Pumping Plants No. 1 and 3, and a third and fourth pump in Pumping Plant No. 2 at some future date. One float-operated controller is installed in each plant to control the operation of the pumps in that plant. The float-operated controllers are designed to accommodate the presently installed and future pumps. The proposed initial setting of the pump controllers is as follows:

Pumping Plant No. 1

Pump No. 1 set to:
Start at W.S. Elev. 20.0
Stop at W.S. Elev. 18.0

Pump No. 2 set to:
Start at W.S. Elev. 22.5
Stop at W.S. Elev. 21.0

Pumping Plant No. 2

Pump No. 1 set to:
Start at W.S. Elev. 23.0
Stop at W.S. Elev. 21.5

Pump No. 2 set to:
Start at W.S. Elev. 24.0
Stop at W.S. Elev. 23.0

Pumping Plant No. 3

Pump No. 1 set to:
Start at W.S. Elev. 24.0
Stop at W.S. Elev. 23.5

Pump No. 2 set to:
Start at W.S. Elev. 25.3
Stop at W.S. Elev. 24.3

These settings may be changed when a need therefore is demonstrated by operation experience and after approval by the District Engineer is granted.

(d) Precipitation Gages. Two Fisher-Porter recording precipitation gages have been installed within the drainage basin of the Mormon Slough Project. One is located at Pumping Plant No. 2 and the other is located on the north side of Comstock Road one mile east of Waterloo. These gages shall be operated and maintained in accordance with the manufacturer's manuals which have been furnished the Superintendent.

6-02. Inspection.

a. General. Periodic inspections are required to detect incipient faults before serious damage takes place, therefore, the importance of making these inspections cannot be over emphasized. The frequency and extent of inspection required in a measure will be influenced by the conditions under which the equipment is required to operate including whether or not the particular operation is relatively continuous or periodic for the period concerned. Once each year the entire mechanical and electrical installation shall be given a thorough detailed inspection. The regular more frequent inspections are made to make certain that all parts of the equipment including controls are in operable condition and properly lubricated; that no parts are missing; that all painted surfaces are covered with adequate coats of protective paints; that there is no evidence of rust; and that the entire plant is in a clean and presentable condition. In order that no items of inspection will be overlooked, an inspection schedule listing all items requiring inspection shall be carried during the inspection as guide, check list and record. Exhibits included as part of this manual will serve as a guide and check list for conducting the inspections and preparation of reports.

b. Pumping Plant.

(1) Pumps.

(a) During periods of pumping operations, daily inspections should be made to ascertain that there is sufficient lubricant for the pump bearings and that the pump and motor are operating smoothly, and that there is no abnormal vibration of the assembly. The operator should be instructed to immediately shut off the pump, should an unusual noise or vibration develop, rather than wait to consult with someone else, inasmuch as by prompt action at the moment trouble first develops, serious damage to the pump may be prevented. Noise, vibration, etc., may be due to a worn or damaged bearing, loose anchors, obstruction in pump such as rocks, wood, etc., or other possible causes.

(b) Check the oil and grease lubricating pipes provided to carry the lubricant to the pump bearings and note any indication of leakage at any point with particular attention to the connection at the pump housing. Also, make note of any unusual noise that might indicate that the lubricant is not reaching the bearings. The grease seal packing rings on the pump drive shaft should be checked occasionally as they may become dry and harden to the extent of scoring the shaft and/or failing to adequately retain the lubricant. For location of the packing rings, refer to the applicable shop drawings. Occasionally, check the grease lubrication pipe which runs to the bottom of the pump suction bowl to insure that it has not been broken off or otherwise damaged.

(c) Inspect the anchors at the pump operating floor, and note any indication of movement of the pump units, and loose bolts.

(d) Inspect the discharge connections for signs of leakage at the couplings or vibration while the pump is operating. Check flap gates in the discharge lines, note any abnormal noise or sluggishness of movement in opening or closing. Also, check the discharge lines, including the accessible pipe connections and the air release and siphon breaker at the top of the levee.

(e) Inspect each pump drive shaft and couplings for alignment, and note any tendency for the shaft to vibrate, or any looseness in the couplings and connections. Worn shaft bearings will cause the shaft to vibrate, however, in some instances it may not be easily detected without the use of special instruments.

(f) Carefully inspect all metal work, and note any indications of rust, leakage when pump is operating, abnormal wear or other signs of deterioration.

(g) Insofar as practical, occasionally check the ability of the pump to deliver the required capacity and note any indication that the pump is in need of adjustment, suction lines restricted, or debris in the suction bell.

(2) Motors.

(a) Carefully inspect the motor to insure that it is being properly lubricated. Check to insure that the oil is at proper level especially as pertains to the pump motors. The oil level should be between the maximum-minimum markings on the site gage. (Check instructions on motor name plate and other manufacturer's data.) Note especially any leakage at the connections. Feel the bearing housings while the motor is operating and note any indication of abnormal heating at these points. Also note any unusual noise or vibration which would indicate that the bearings require attention and/or the unit is out of balance. Any clicking noise while the motor is running may be due to a cracked ball in the bearings, or some loose part and must be immediately corrected.

(b) Note any oil leaking by the oil seals, or any oil on the outside or inside of the motor housing.

(c) Check the motor for smoothness of operation under full load and note any abnormal noise or vibration of the assembly.

(d) Inspect the motor for signs of excessive temperature rise due to an apparent overload or other causes.

(e) Check the functioning of the motor controls especially when starting up under load.

(f) Check the motor base anchor bolts to insure tightness; also note, any indication that the motor base has shifted on its support. While checking the motor base also inspect the coupling connection at the juncture of the motor pump drive shaft, and note any indication of wear, looseness or start of fracture.

(g) Check supply of spare parts, if any, on hand and note need for re-painting or repair.

(h) Note collections of oil, dust or other material on or around the motor assembly which may constitute a possible fire hazard.

(i) When initially starting a motor after it has been previously removed and reinstalled, check for correct direction of rotation before applying load.

(3) Trashracks.

(a) Occasionally check the metal work and note any rust spots, need for painting or other maintenance.

(b) Note the presence of debris including rags, weeds, etc., which may be clogging the openings through the vertical bars. Also note the presence of debris in the collection sump, immediately upstream from the trashracks, which can be expected to move against the rack and which should be removed.

(4) Discharge Flap Gates.

(a) Inspect the metal work, and seals and note need for maintenance.

(b) Note any improper functionings of the gate, including any indication of leakage when closed, limited or sluggish travel when operating as well as any debris which may be present to foul the movement of the flap in opening or closing. Check looseness of hinge anchor bolts and hinge pin wear.

(c) Note need for painting or other maintenance.

(5) Pumping Plant Structure. At least once each year thoroughly inspect the entire structure and note need for painting or other maintenance required to restore to its original condition. Pay particular attention to junction of steel and concrete. (Persons should not be permitted in the pump sump or on the outside of the structure in front of the trashracks when the pumps are operating.)

c. Electrical System:

(1) Float Operated Controls.

(a) Check the controls for proper functioning. Insofar as practical, inspect the inside and outside of the float wells for any indication of debris which may interfere with the operation of the float, including possible restriction of water inlets.

(b) Inspect all metal work for indications of rusting, objectionable accumulation of dust, etc.

(c) Insure that the operating mechanism is properly lubricated and sealed. At least twice a year remove the cover and inspect the mechanism located therein for proper functioning, adequate lubrication and note any indications of water, dirt, etc., which may have accumulated.

(d) Insure that the base anchor bolts are secure and that float line is in true alignment with centerline of the float. Also, note any indication of wear or other deterioration of the line assembly including connections at float and driving unit. Occasionally inspect the float for possible damage.

(e) Check electrical wiring and connections from controller unit. Inspect mercury contacts and check all terminals for tightness. Use an electrician's insulated screwdriver suitable for the service to avoid injury to person making inspection.

(f) Transfer plugs shall be periodically transposed for manual alternation of pump programming to provide even wear on all pumping units during the operating season. Test plug provided shall also be operated to permit checking of float switch circuit continuity.

(2) Main Switchboard.

(a) The main switchboard panel, switches, instruments, and appurtenances should be kept clean and free from dust. Doors of all cabinets should be kept closed, and locked. Power supply should be "ON" at all times and pumping plant set for automatic operation during the pumping season.

(b) Check the switches and controls to insure that they are mechanically and electrically operable. Note especially any indication of sluggish operation.

(c) Note any of the instruments such as meters which are not registering properly.

(d) Note especially any indication of loose connections, insulation deterioration, unusual odors or mechanical failure within or around the switchboards.

(e) Note any failure of the controls on the respective panels to control the operation of the units for which they are intended.

(f) Note the need for cleaning or other maintenance and insure that the access is properly locked at all times except during necessary inspection and maintenance periods.

(g) Check pilot lights for correct operation. Check thermal overload resets. Check operation of float control system. Check operation of strip heaters.

(h) Circuit Breakers.

1. Air Type. The main points to be observed in the inspection of an air type circuit breaker are: condition of contacts, condition of arc-chutes, and whether the operating mechanism works freely yet is positive in closing, latching and tripping. The inspector should, while observing their condition, lubricate pins and bushings subject to wear, see that all others are in place, and that all bolts, nuts and set screws having to do with the breaker structure are set tight. Note also any evidence of heating, wipe off all the breaker bushings and check for cracked bushings.

2. Safety. Before approaching a circuit breaker for general inspection, sufficient precautions should be taken to guarantee the safety of the personnel and also prevent damage to the apparatus. The circuit breaker shall be de-energized by opening the breaker and also the disconnecting switch on the switchboard. The control circuit and closing source of power should be cleared to prevent damage or injury from mechanical operation.

(1) Starters.

1. Yearly inspection of all motor starters should be made at the beginning of the winter season, with partial inspection continuing at regular monthly intervals throughout the operating season.

2. Check all connections and note any that are not adequately secure.

3. Check the contact gap with the contactor fully open and note any need for adjustment or other attention.

(3) Miscellaneous.

(a) Note whether all light fixtures and controls are functioning properly and are clean. The flood light fixtures should be clean inside and out. Check the flood lights at night for proper adjustment.

(b) Inspect the circuit breakers and switches and note any indication that maintenance is required. Also, check adequacy of the number of spare fuses on hand.

(c) Periodic inspections at least every year should be made of the entire electrical system provided for operation of the main pumping units.

(d) Reliance for power to operate the electrical facilities is placed on the Utility Company. Any conditions noted in the inspection that may affect in any way the reliability of the power supply should be especially noted and brought to the attention of the Utility Company in writing or other accepted practice without delay.

d. Miscellaneous:

(1) Painting. At least once each year carefully inspect all painted surfaces and note need for repainting or other maintenance.

(2) Hazards.

(a) Check to insure that the proper warning notices are legible and properly posted.

(b) Check all access manholes and note any covers not in place or in need of maintenance.

(c) Insure that access gates provided to exclude unauthorized persons are kept adequately locked.

(d) Note presence of any grease or oil accumulations on floor which may contribute to a fire or slipping hazard.

(e) Inspect the concrete structure for signs of abnormal cracks or other conditions requiring maintenance.

(f) Be certain no tools, rags, etc., are left on oil switches, circuit breakers, motors or any other electrical equipment before applying power.

(3) Sump:

(a) Sumps shall be given visual inspection periodically for deposits of sediment that might tend to reduce the storage capacity. Any deposits shall be removed. Design storage capacity must be maintained.

(b) The sump shall be kept clean of debris, thistles, etc., that may be blown or worked through the trashrack.

(c) The areas draining into the pump sump shall be kept clean of debris, weeds, etc., that could wash against the trashracks or otherwise prevent efficient function of the drainage system as a whole.

6-03. Maintenance.

a. General. Since proper functioning of the pumping plants is vital to adequate operation, the equipment, controls and appurtenances must be continuously maintained in good operating condition. The subject of maintenance and procedures can only be briefly touched upon herein and should be expanded and improved upon as continued experience is gained in operation of the equipment, and as new improved procedures are developed to expeditiously and efficiently handle the special problem which may arise. All damaged or unserviceable parts shall be repaired or replaced, without delay. Before attempting major repair, the applicable contract plans, shop drawings, specifications, as well as catalogs, descriptive data and operating procedures supplied by the manufacturers of the equipment installed should be carefully reviewed. Certain specific points as pertains to the principal units are discussed below; however, full use shall be made of all pertinent technical data furnished with the respective units. For special points requiring maintenance, refer to the periodic inspection reports. Use high grade lubricants which are suitable for the service. In all instances lubricant specifications shall be in accordance with the equipment manufacturer's recommendations; or if none in accordance with best practice for the service. The lubricant schedule included as part of this manual will serve as a guide; however, before ordering lubricants for standard manufacturer's assemblies such as pumps and pump motors, a check should be made as to equipment and lubricant supplier's recommendations, not only to insure selection of the right type and grade, but also to take advantage of the most recent developments. Painting required should be performed in accordance with the original contract specifications. All necessary maintenance work shall be performed by skilled mechanics and electricians; where replacements are made the replacement parts shall be equal in quality to those originally installed or of suitable later improved design. Exhibits included as part of this manual will serve as guides and check lists for conducting the inspections, maintenance and preparation of reports.

b. Pumping Plant.

(1) Pumps.

(a) If excessive vibration or noise occurs when the pump is operating, the cause for which is not readily apparent, the operator shall immediately stop the pump inasmuch as prompt action may avoid serious damage to the pump. A relative sudden development of abnormal noise or vibration may be due to numerous causes such as bearing failure, loose anchors, or debris sucked into the pump. Consult with an authorized representative of the pump manufacturer. It is necessary to determine whether mechanical or hydraulic conditions are causing the trouble in order to determine what corrective action is required. Persons untrained in pump engineering and operation should not be engaged to "trouble shoot" concerning major problems relating to the pump unit itself.

(b) When installing, adjusting and performing general maintenance, make full use of the "Installation and Operating Instructions" prepared by the pump manufacturer for the pumps installed.

(c) The pumps are of relatively simple, rugged design and normally will require very little maintenance except for keeping the machinery clean and properly lubricated. Lubricants of the proper type and quality shall be used in each instance. However, use of more oil than called for by the manufacturer might result in waste. Careful and frequent inspections will in most instances reveal sources of possible trouble before they have had a chance to require a major repair operation to be performed. Insure that the grease and oil applications are functioning properly and that the lubricant is reaching the bearings.

(d) When it becomes necessary to pull or disassemble the pump unit to inspect, adjust and repair, all parts put back shall be thoroughly cleaned. At this time, the bearings should also be carefully cleaned including removal of the old lubricant. The points required to be lubricated and methods provided are indicated on the approved shop drawings. Lubricating is the most important phase of pump maintenance and should be checked daily (during periods of pumping operations) but the lubricant should only be added as required. It is not enough merely to apply the lubricant at the points provided as it must also be assured that the lubricant is reaching the bearings in each instance.

(e) Note location of oil seals provided for the pump bearings to prevent leakage of lubricant from the bearings and also to prevent foreign matter from entering the bearings. Excessive lubricant consumption requires replacement of seals. Replace the seals with new ones when the pump is disassembled for servicing or more frequently if required.

(f) In tightening bolted connections, use suitable size and proper type of wrench to avoid possible undesired overstressing of the threads and/or marring the heads of the bolts and nuts. When assembling the discharge line to the pump, tighten the bolts, each a little at a time to pull the seals together evenly and exercise care to insure against the possibility of pulling the pump out of line or throwing an undesired strain on the pump unit. After completing the assembly of the pump to the discharge line, carefully recheck the alignment of the pumping unit.

(g) A flap gate is installed at the end of each discharge pipe. These flap gates must be in proper operating condition at all times and any failure of this gate to operate properly shall be carefully investigated and the necessary maintenance performed without delay. Inspect those points noted on the inspection report and perform such maintenance as required. Give particular attention to the gate hinge bearing assembly and to the seals.

(b) The pump sump is protected by a trashrack; however, it is possible that rags, and other materials may work through which could wrap around and restrict the pump operation. Any debris noted within the inclosure which might clog or damage the pumps should be removed from the pump sump.

(i) Any rust spots noted during the inspection shall be carefully cleaned with a wire brush or other suitable means and repainted in accordance with the original specifications. Unpainted surfaces such as exposed shafting, etc., which have corroded shall be carefully cleaned and coated with waterproof grease or suitable rust preventative. This and similar maintenance not classed as an emergency should be performed once a year and during the non-operating period when most practical.

(2) Main Pump Motors.

(a) Carefully investigate all items noted on the inspection report and perform such maintenance as found to be required. Read "Manufacturer's Instructions" carefully before installing or operating. Refer to "Motor Name Plate" for proper instruction including bearing adjustment and type of lubricant. The motor is built to resist momentary upthrust. During reassembly of the motor special care shall be exercised to avoid damage to the lower bearing. Assure that the motor bearings are being adequately but not excessively lubricated at the points provided in each instance and that the lubricant is reaching the bearings. Refer to the data provided on the name plate of the motor in each instance as well as the applicable Manufacturer's Instruction sheet. Note for signs of any oil leakage around the oil reservoir or oil piping and feel the bearings to determine whether or not there is any indication of the bearing becoming overheated and if so, shut down the unit and see instructions on the name plate and other pertinent manufacturer's instructions. Change oil yearly or oftener depending on service conditions.

(b) When installing the pump motors, insure that the base when installed is level and that the connecting coupling is tight. When tightening the anchor bolts, tighten down the nuts gradually and uniform all around using a wrench of suitable size to permit adequate but not excessive tightening. Before installing shaft coupling, start motor and check to insure that the rotation is in the proper direction, as the pump unit must not be allowed to operate in reverse rotation.

(c) Should the motor pump unit remain idle for any extended length of time, occasionally make a start and short running tests to determine whether the unit including the starter and control are in proper operating condition. Any major repairs or adjustments must be performed only by skilled mechanics and/or electricians thoroughly experienced with the type of equipment involved.

(3) Trashracks.

(a) The trashracks are provided primarily to prevent debris from entering the pumping compartment that might otherwise tend to clog or damage the pumps. These racks should be kept free from debris. (Persons should not be permitted in the water in front of these trashracks when the pumps are operating.)

(b) When corrosion of the metal work occurs, it shall be thoroughly cleaned and painted.

(4) Flap Gates. Discharge pipe flap gates that have become unserviceable shall be replaced or repaired at the earliest practical date. Keep the hinges adequately lubricated as required to insure proper functioning.

(5) Pumping Plant Structure. At least once each year thoroughly inspect the entire structure and perform any required maintenance to restore to its original condition

c. Fire Protection. Refer to applicable provisions of "Recommended Good Practices of the National Board of Fire Underwriters", and applicable safety manuals. Fire extinguishers have not been provided, because their use would not be effective in preventing damage to machinery and electrical equipment by fire. Proper emphasis shall be directed to strictly enforce all fire prevention rules by frequent and careful inspections. No combustible materials shall be allowed to accumulate on or around the pumping plant. Any rags, paper, or other combustible materials containing oil, paint or cleaning fluid shall not be allowed to accumulate, not even for a period of one day. Oil and grease dripping or other undesired accumulations shall be promptly removed. During any welding operations be especially careful to remove or properly isolate any material that might ignite or be damaged by the welding procedure. Take prompt corrective action relative to any electrical equipment which shows signs of sparking. Approved fire prevention instructions and warnings shall be properly posted.

d. Electrical System.

(1) General. Give particular attention to the items listed on the inspection report and perform such maintenance required in accordance with the best standard practice for the service with due consideration of all safety precautions. Only qualified mechanics and electricians experienced in the type of equipment involved shall be allowed to perform such maintenance. Maintenance of the powerline is the responsibility of the Utility Company. A large percentage of electrical failures are due to mechanical failures. Generally, no simple device is available for locating the source of or analyzing a noise problem with the consequence that the action taken must depend primarily upon the judgment and experience of the maintenance personnel.

When cleaning any part of electrical equipment, use ample precautions to prevent explosions, fires or toxic conditions. Use only approved cleaners with relative low flash points.

(2) Main Switchboards.

(a) General. Main switchboards, panel boards, switches, controllers, and appurtenances shall be kept clean and free from dust preferably by blowing with dry compressed air if available. Care should be taken to insure that the air does not contain moisture. Air should not be used for cleaning instruments. Air in excess of 30 pounds should not be used on insulation or coils such as motors or solenoids. Doors of all cabinets shall be kept closed to exclude dust. Switches shall be kept mechanically and electrically operable at all times.

(b) Circuit Breakers. Periodically inspect, test, adjust and overhaul, if required, circuit breakers about once each year. Before attempting these or similar maintenance operations, first insure that power is disconnected from the board; also, consult the applicable catalogs and technical bulletins supplied by the manufacturer of the equipment for a detailed description of the unit and recommended procedures for operation and maintenance.

(c) Starters.

1. Carefully investigate all points noted on the inspection reports as requiring attention. Before removing cover to inspect or to adjust, make sure that disconnecting switch is open and control circuit is de-energized.

2. Insure that all parts are clean and move freely.

3. Any excess deposits should be removed from the inside surfaces of the arc boxes adjacent to the contacts, and any broken arc boxes should be replaced.

(d) Electrical Contacts.

1. Copper or Silver Contacts. If excessive heating is noticed during the inspection period, the most likely point of high resistance (and resultant heating) is where the movable tips make contacts with the stationary tips. If this condition is noticed, dress the contacts with a few strokes of a file. Since copper oxide has a very high resistance and forms on copper contacts rapidly at a high temperature, a few strokes with a file will remove the oxide and reduce the resistance to a low value again. It should be pointed out, however, that contact tips which have been roughened by ordinary service do not have to be kept smoothed so that they will carry the load. A roughened tip will carry current just as well as a smooth tip; however, if large projections should appear on a tip because of unusual arcing, they should be removed. Contacts plated with a small layer of silver should be cleaned,

with a clean cloth or brush dipped in cleaning fluid. After being cleaned polish the contacts with a clean dry cloth. The brown discoloration that is found on silver and silver-plated contacts is silver oxide which is a good conductor. It should be left alone unless the contacts must be cleaned for some other reason. When corroded, contacts should be cleaned with No 0000 sandpaper. This must be done very carefully so as not to remove too much of the silver plating. After the corrosion has been removed, polish the contacts with a clean, dry cloth making certain that all abrasive particles are removed and that the shape of the contact has not been changed. Silver-plated contacts that are badly burned or pitted should be replaced. In the event no replacement is on hand at the site, the contacts may be dressed with sandpaper until the burned or pitted spots are removed. If the burns or pits can not be removed by using sandpaper, then use a burnishing tool very carefully. In only extreme emergencies will the use of a file on silver-plated contacts be permitted. In no instance shall highly abrasive materials, such as emery cloth, heavy sandpaper or carborundum paper be used for surfacing relay contacts. In adjusting the contact pressure, refer to the manufacturer's recommendations and check by the spring balance or other approved methods. In case the contact pressure is below the minimum value required, adjust or install a new spring. Low pressure should be avoided to minimize possibility of excessive heating of the contacts. On multiple pole devices, the spring tension on all poles should be approximately the same and if one is considerably lower than the others, the spring should be replaced.

2. Avoid the use of lubricant on contacts or bearings of a contactor as oil quickly collects dust and unless parts are frequently cleaned, will interfere with the operation of the contactor.

3. Maintain the contact gap in accordance with the manufacturer's instructions.

4. Failure to close may be due to one of the following:

- a. Operating coil may be open-circuited.
- b. Lead wires to operating coil may be loose or disconnected.
- c. Excessive mechanical friction.
- d. Power off or voltage below normal.

5. Failure to open may be due to one of the following:

- a. Mechanical interference or friction.
- b. Welded contacts.
- c. Broken contact spring.

(e) Wiring Connections. All wiring connections in the rear of the switchboards shall be inspected yearly especially before the winter pumping season in order to insure that there are no loose contacts and that proper clearances are maintained. All parts of the panel board should be kept clean. Branch circuit breakers which are not normally required to be closed shall be kept in the "OFF" position. The bus voltage should be checked periodically for phase balance and especially after utility service has been restored following an outage.

(3) Miscellaneous.

(a) Lighting. The lighting circuits shall be maintained in operable condition at all times. Lamps which have burned out shall be replaced without delay. The lighting fixture shall be cleaned at least once a year, removing all dust and insects. Keep an adequate supply of fuses and light bulbs on hand at all times.

(b) Maintain all other electrical equipment clean, adequately lubricated and in proper operating condition at all times in accordance with best practice for the service, with particular attention to those items noted on the inspection report.

(4) Cleaning Electrical Equipment.

(a) Compressed Air. Air pressure used for cleaning electrical equipment should not exceed 30 p.s.i. When using compressed air certain precautions should be exercised as set forth in (2) above.

(b) Vacuum. This method of cleaning is especially applicable in removing copper dust and other waste materials.

(c) Solvent. If dry cloth or compressed air is not sufficient to remove gummed dirt or grease from electrical apparatus, use carbon tetrachloride as a solvent for cleaning. Moisten the cloth sparingly with carbon tetrachloride and wipe off the dirt from the parts to be cleaned. Be sure to have adequate ventilation and avoid inhaling the fumes. Never use gasoline, benzene or benzol for cleaning as these solvents are highly inflammable; their vapors are explosive, and may be corrosive or will dissolve certain types of insulation.

6-04. Records.

a. Procedures for inspection, maintenance, and testing of the pumping plant equipment and appurtenances shall include requirements set forth in this manual. Inspection Check List, Lubrication Schedule, and other descriptive material contained in Exhibit H, I & J of this manual will serve as a guide in meeting these requirements, and in the maintenance of required records and logs.

b. Maintenance card or cards should be kept for each major piece of equipment for recording a summary of test results, inspection and repairs, and any pertinent comments regarding the condition of the equipment. Such cards should be kept up to date and filed at an approved location so as to be readily available to those responsible for inspection, testing and maintenance. A data card should be prepared for each piece of equipment or component thereof consistent with the maintenance program breakdown to provide a record of project equipment. The data card records should indicate all name plate data and other historic information that would indicate, at least, but not necessarily be limited to, source of manufacture, physical characteristics, date of purchase, cost of procurement and list of spare parts available.

EXHIBIT A

Federal Flood Control Regulations

EXHIBIT A

(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:

(1) 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) **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.

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

(1) 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 30 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 necessity 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 opera-

tion 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 access 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 snag 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 effect 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. 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.

TITLE 33 - NAVIGATION AND
NAVIGABLE WATERS
(as of 1 January 1963)

Chapter 11 Corps of Engineers
Department of the Army
PART 308 - Flood Control Regulations
MAINTENANCE AND OPERATION OF FLOOD
CONTROL WORKS

AUTHORITY: §§208.10 issued under sec. 7, 58 Stat. 890; 33 U.S.C. 709. (Sec. 3, 49 Stat. 1871, as amended; 33 U.S.C. 791c) [S.F.R. 9599, Aug. 17, 1944]; 9 F.R. [10203, Aug. 23, 1944].

§ 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 material 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 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 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.

(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) Top 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) Top 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.

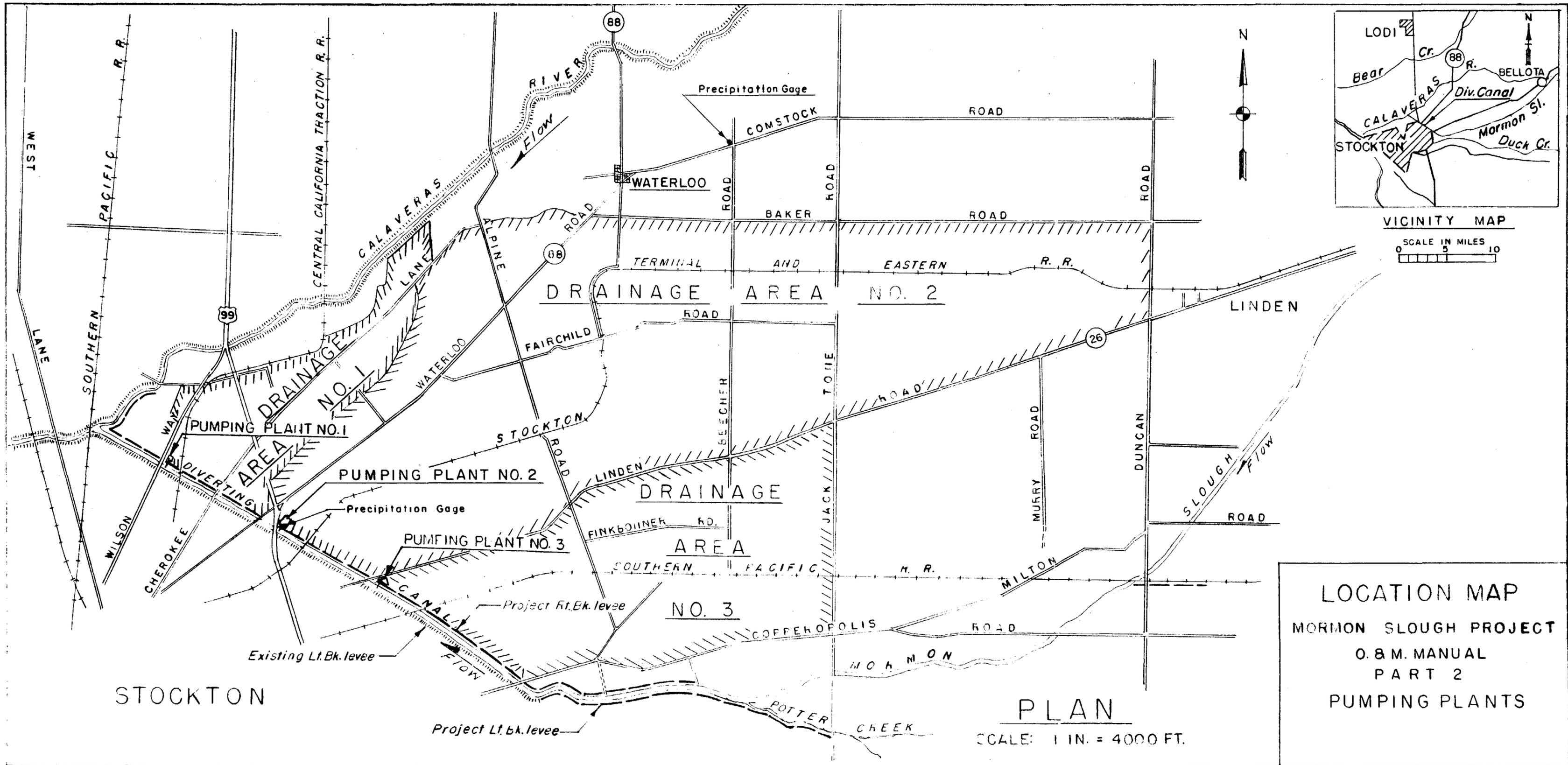
EXHIBIT B
Location Map
Mormon Slough Project
Part 2

EXHIBIT B

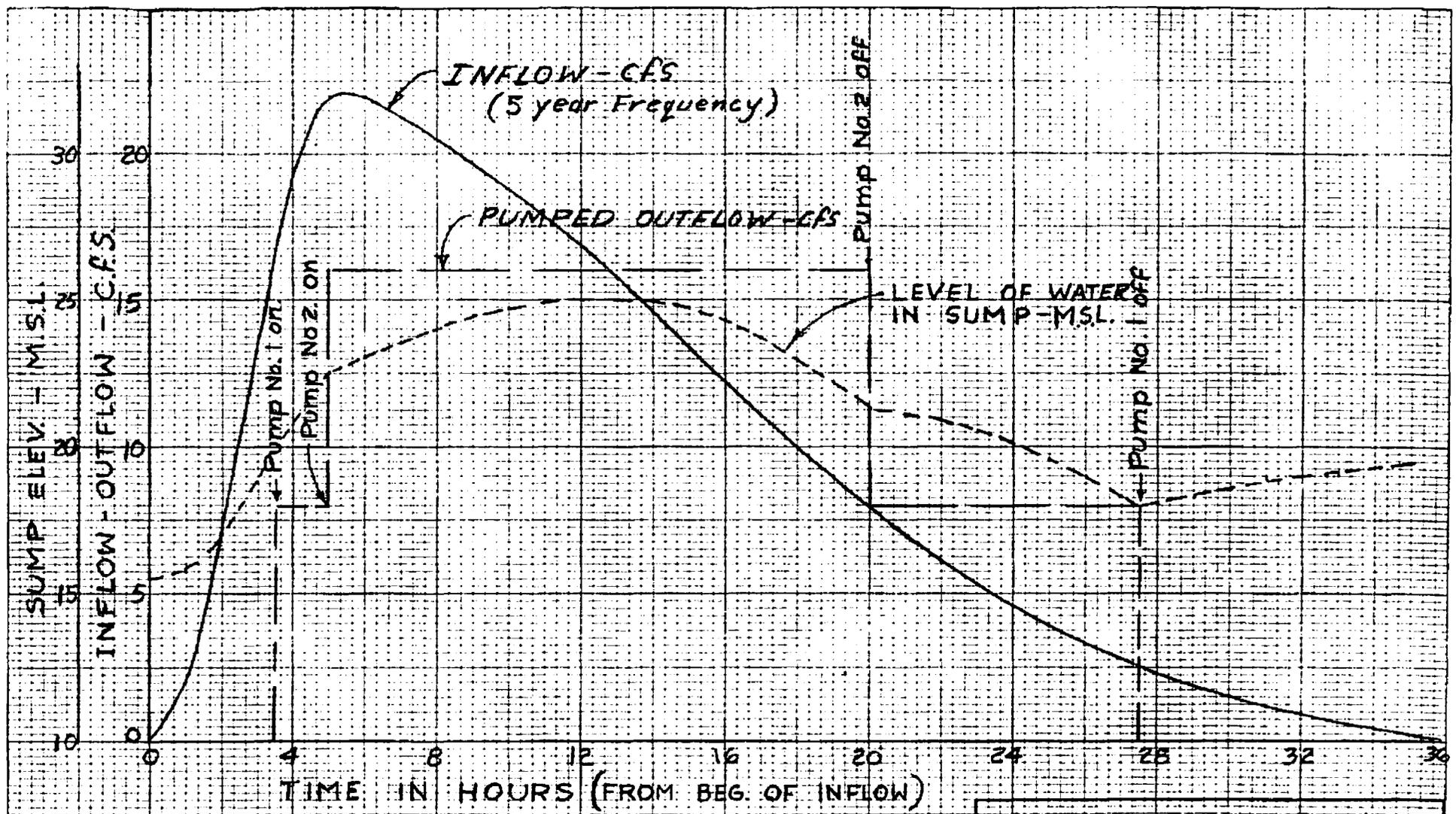
EXHIBIT C

Stage - Time - Flow Curves

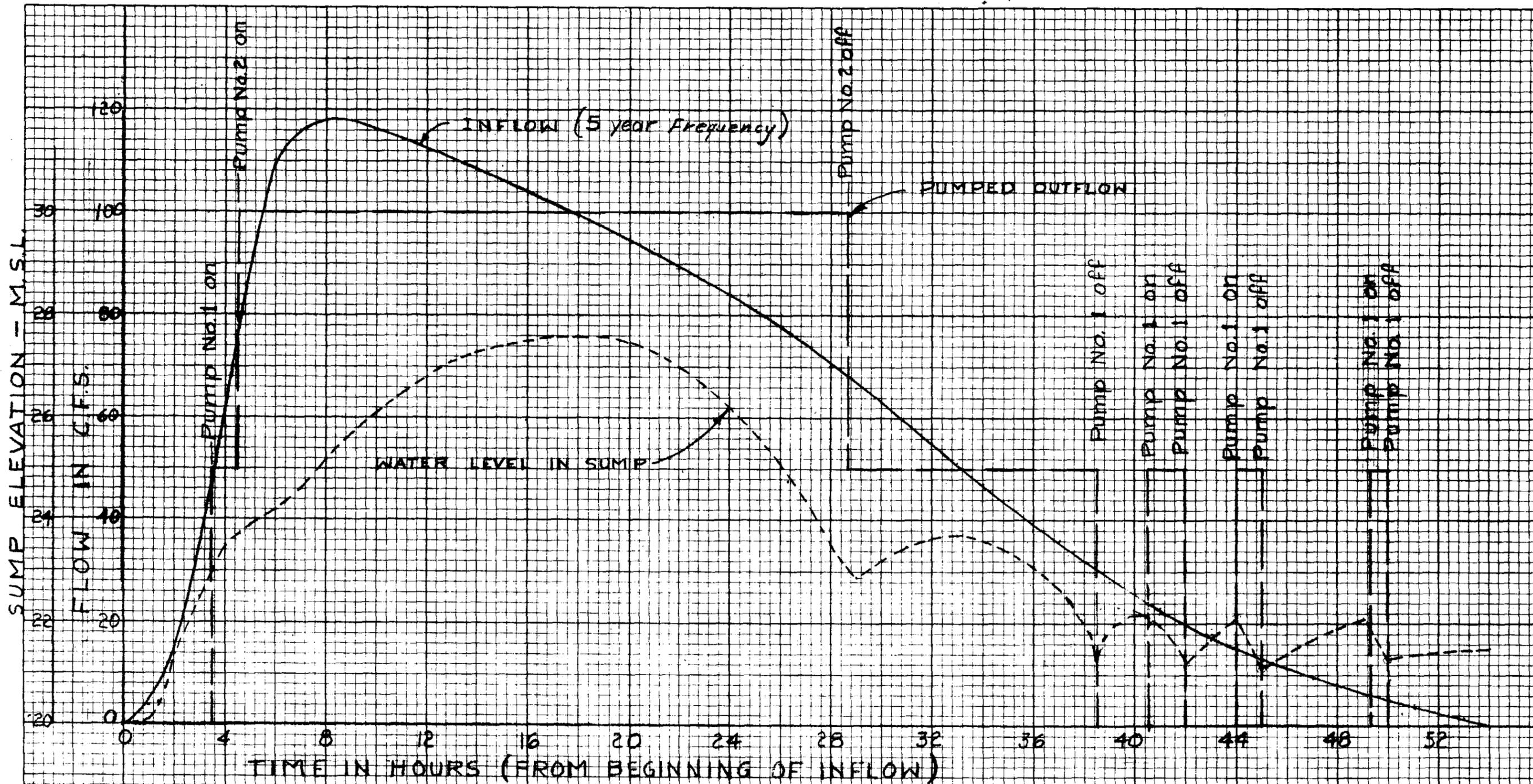
EXHIBIT C



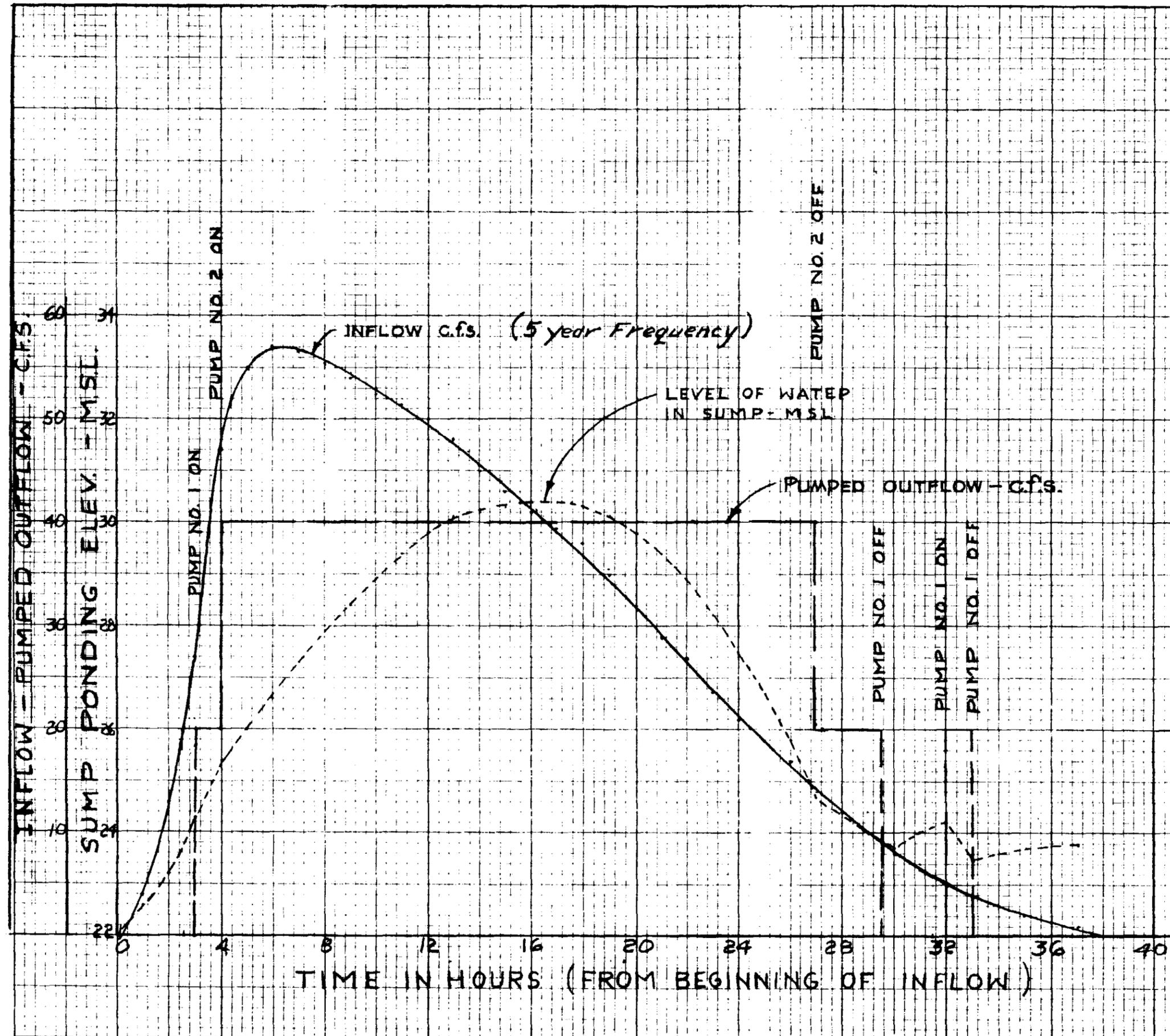
LOCATION MAP
 MORMON SLOUGH PROJECT
 O. & M. MANUAL
 PART 2
 PUMPING PLANTS



MORMON SLOUGH PROJECT
PUMPING PLANT No. 1
STAGE - TIME - FLOW CURVES
PREPARED BY: JRO

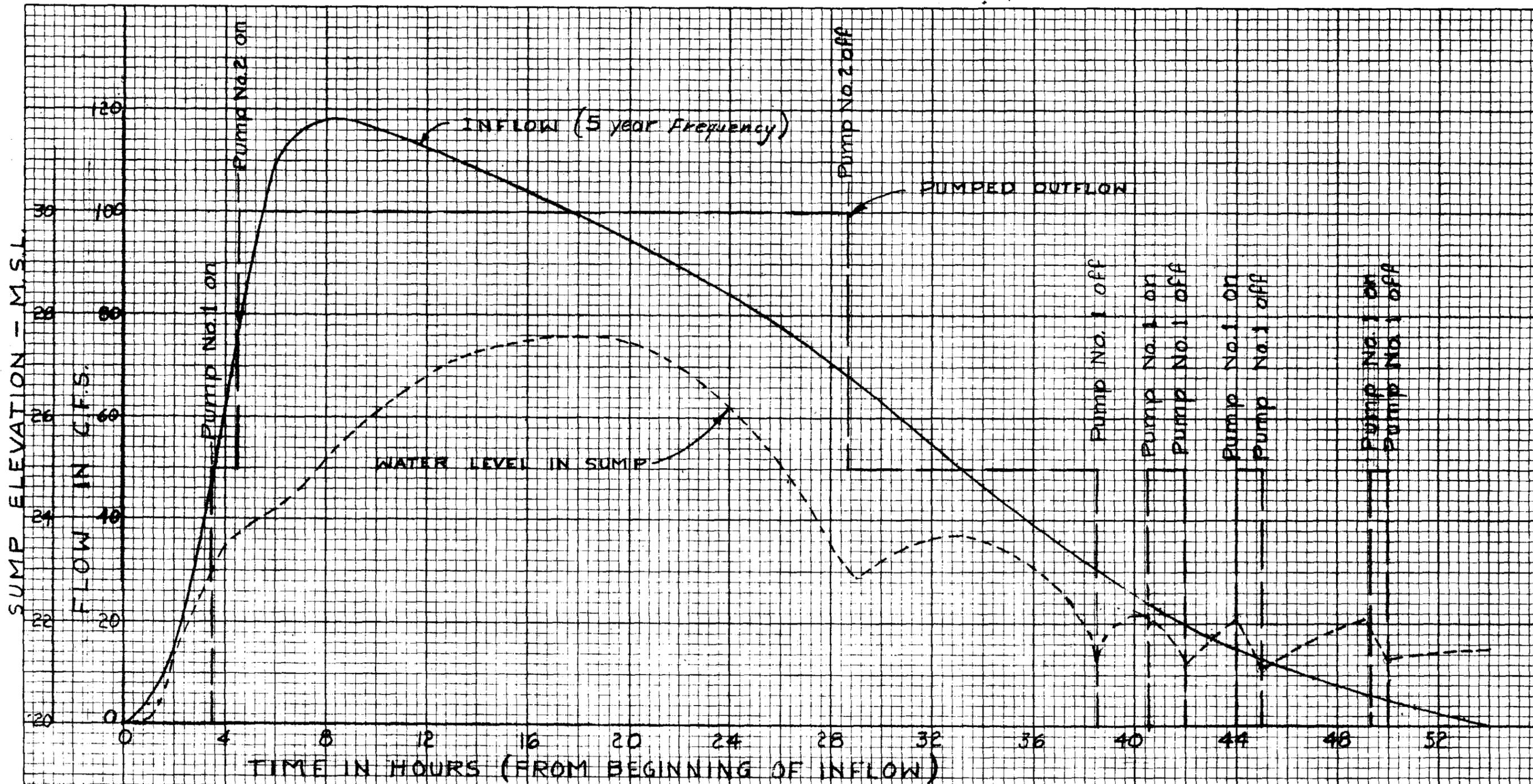


MORMON SLOUGH PROJECT
 PUMPING PLANT NO. 2
 (2 - 50 cfs pumps)
 STAGE 4 TIME & FLOW CURVES
 PREPARED BY: JRO

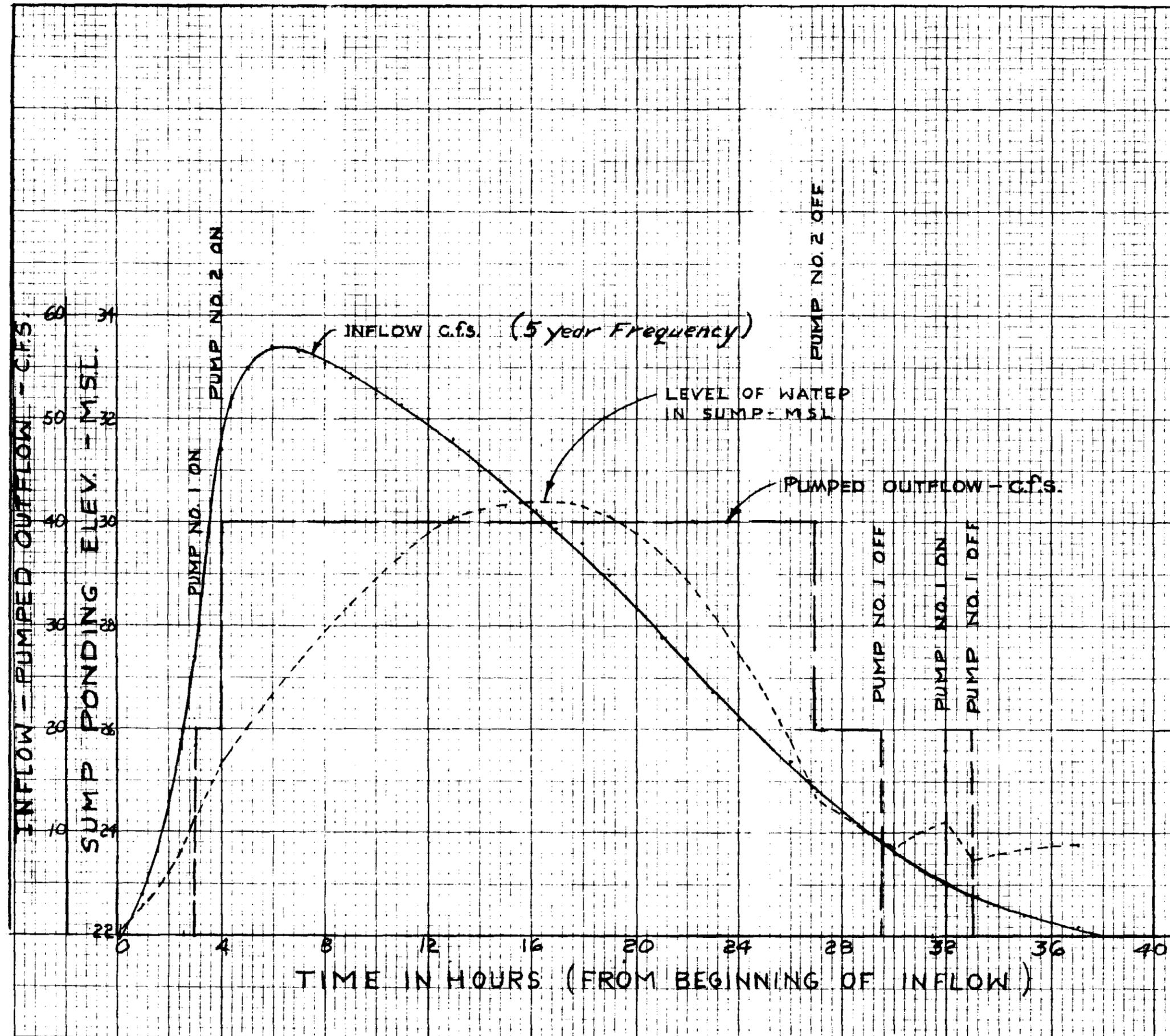


MORMON SLOUGH PROJECT
 PUMPING PLANT NO. 3
 STAGE Δ TIME Δ FLOW CURVES

PREPARED BY: JRC



MORMON SLOUGH PROJECT
 PUMPING PLANT NO. 2
 (2 - 50 cfs pumps)
 STAGE 4 TIME & FLOW CURVES
 PREPARED BY: JRO



MORMON SLOUGH PROJECT
 PUMPING PLANT NO. 3
 STAGE Δ TIME Δ FLOW CURVES

PREPARED BY: JRC

EXHIBIT D

"As Constructed" Drawings

EXHIBIT D

EXHIBIT D

"AS CONSTRUCTED" DRAWINGS

(See separate folder for following Contract Drawings - Specification No. 3356
Drawing File No. 3-4-147)

<u>File No.</u>	<u>Title</u>
147/24	Pumping Plant No. 1 - General Plan
147/25	Pumping Plant No. 1 - Plan and Sections
147/26	Pumping Plant No. 1 - Floor Plan and Sections
147/27	Pumping Plant No. 1 - Reinforcement Details
147/28	Pumping Plant No. 2 - General Plan
147/29	Pumping Plant No. 2 - Plan and Sections
147/30	Pumping Plant No. 2 - Floor Plan and Sections
147/31	Pumping Plant No. 2 - Reinforcement Details
147/32	Pumping Plant No. 3 - General Plan
147/33	Pumping Plant No. 3 - Plan and Sections
147/34	Pumping Plant No. 3 - Floor Plan and Sections
147/35	Pumping Plant No. 3 - Reinforcement Details
147/36	Pumping Plant - Miscellaneous Details
147/37	Electrical Plans and Details

EXHIBIT E

Manufacturer's Data

EXHIBIT E

EXHIBIT E

MANUFACTURERS DATA

(See Following Manufacturer's Data Under Separate Covers)

1. Handbook on installation and operation instructions for pumps and motors.
2. Operating instructions US Motors
3. Brochure No. 505 US Motors
4. Shop Drawings
 - a. Zinsco Elec. Prod. No. D-90245-1, Motor Control Centers
 - b. Zinsco Elec. Prod. No. D-90245-2, Wiring Diagrams Plant #1
 - c. Zinsco Elec. Prod. No. D-90245-3, Wiring Diagrams Plant #2
 - d. Zinsco Elec. Prod. No. D-90245-4, Wiring Diagrams Plant #3
 - e. Drawing, no number - Details of Lube System Layne & Bowler Pumps

MORMON SLOUGH MANUAL

EXHIBIT F

PHOTOGRAPHIC PRINTS OF STRUCTURES



FIGURE NO. 1
COLLECTING SUMP



FIGURE NO. 2
PUMP HOUSE

PUMPING PLANT NO. 1



FIGURE NO. 4
FLOAT CONTROLLER



FIGURE NO. 3
PUMPHOUSE INTERIOR

EXHIBIT F
PLATE II



FIGURE NO. 5
PUMP MOTOR

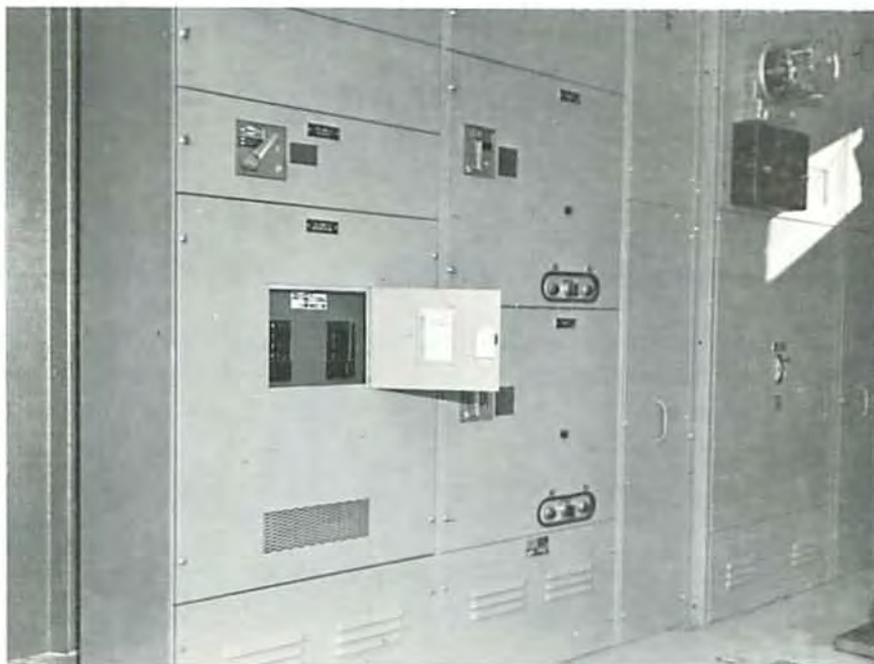


FIGURE NO. 6
PUMP CONTROL SWITCHES

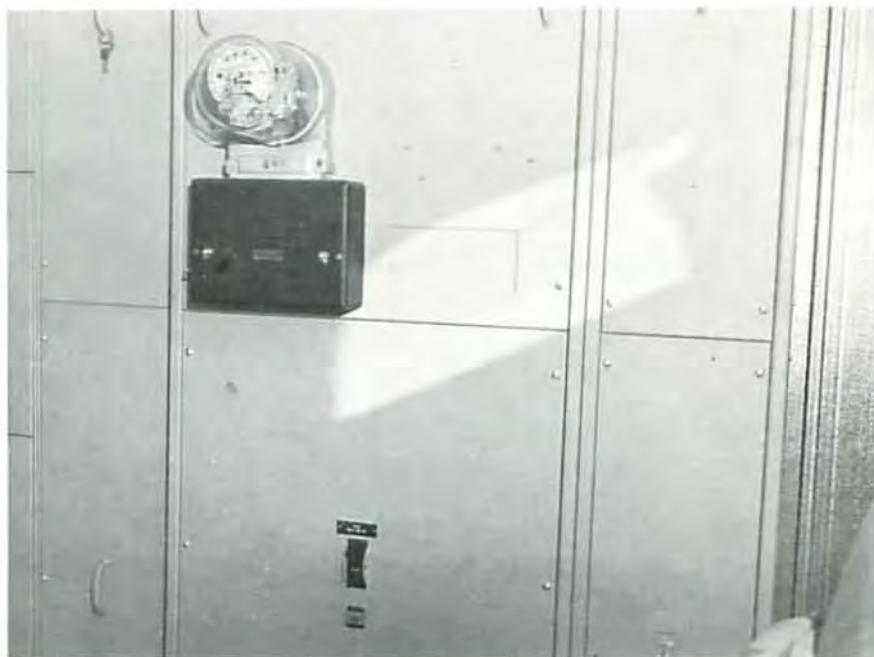


FIGURE NO. 7
MAIN CONTROL SWITCH

PUMPING PLANT NO. 1

FLOATWELL



FIGURE NO. 9
PUMP DISCHARGE FLEX CONNECTIONS

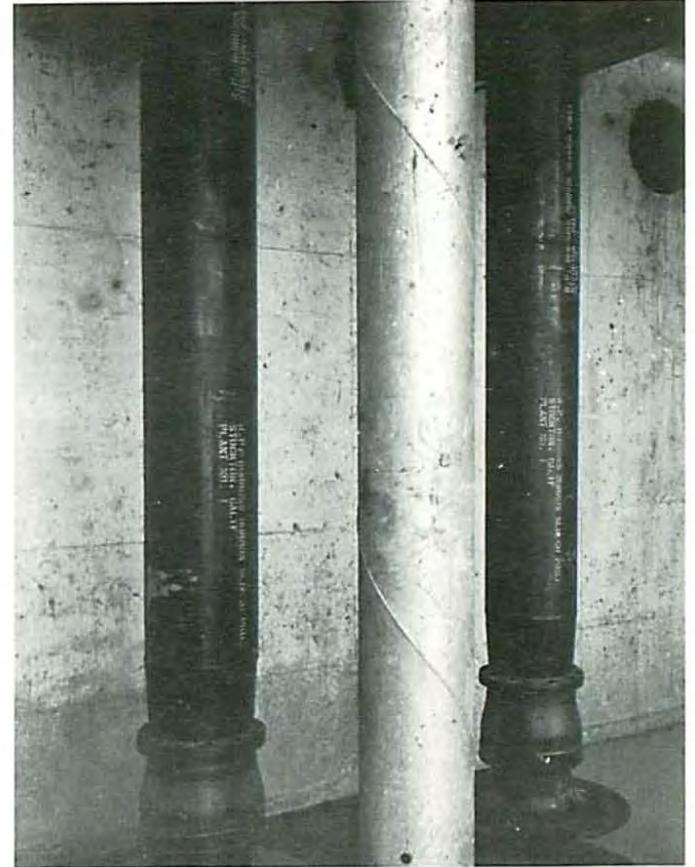


FIGURE NO. 8
PUMP COLUMNS & FLOAT WELL

EXHIBIT F
PLATE V



FIGURE NO. 10
SIPHON BREAKER HOUSING



FIGURE NO. 11
SIPHON BREAKER



FIGURE NO. 12
SLIDE GATE-GRAVITY DRAIN

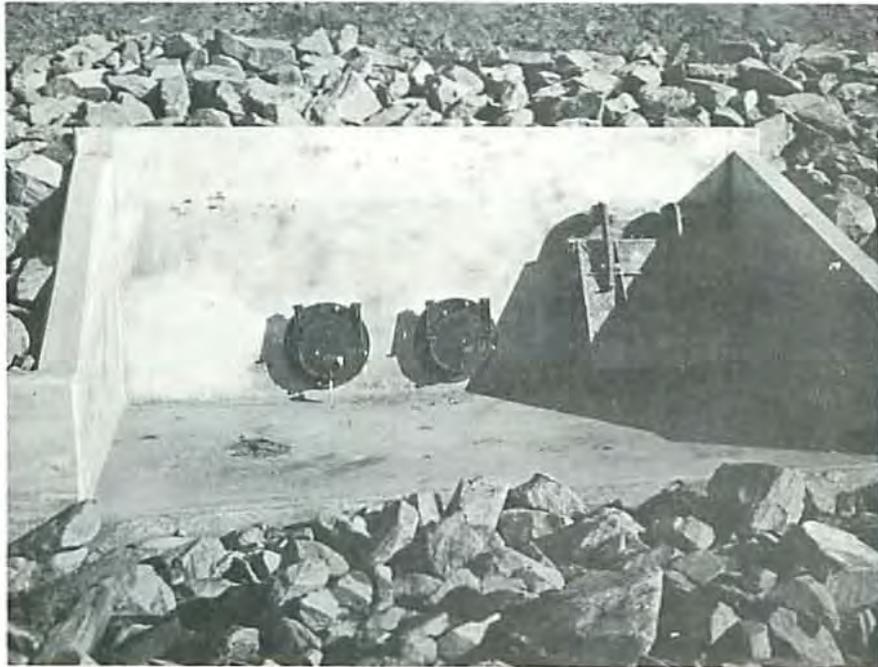


FIGURE NO. 13
FLAP GATES-DISCHARGE LINES



FIGURE NO. 14
COLLECTING SUMP 11-26-68



FIGURE NO. 15
COLLECTING SUMP 1-21-69

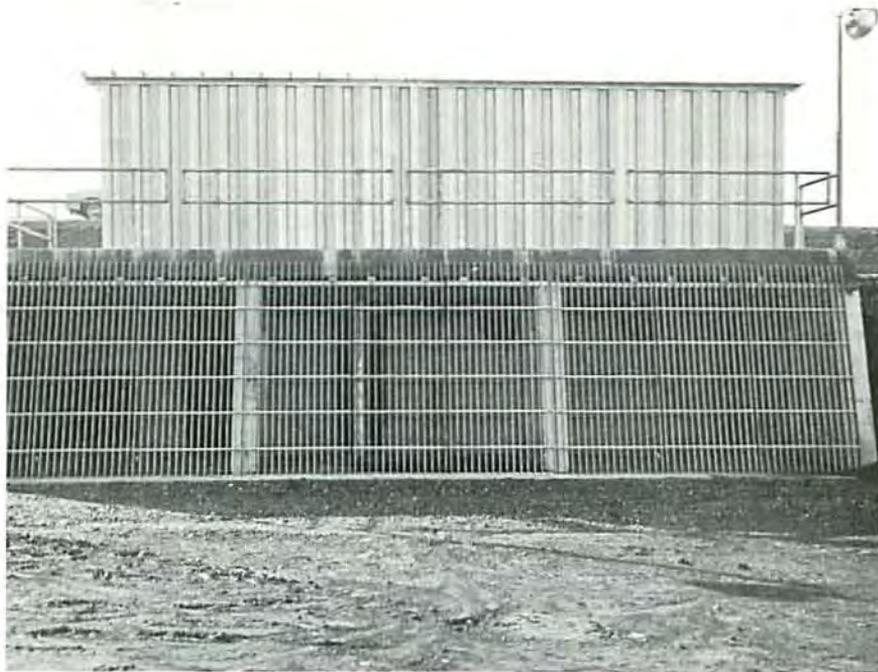


FIGURE NO. 16
TRASHRACK



FIGURE NO. 17
PUMPING PLANT



FIGURE NO. 18
TRASH RACK

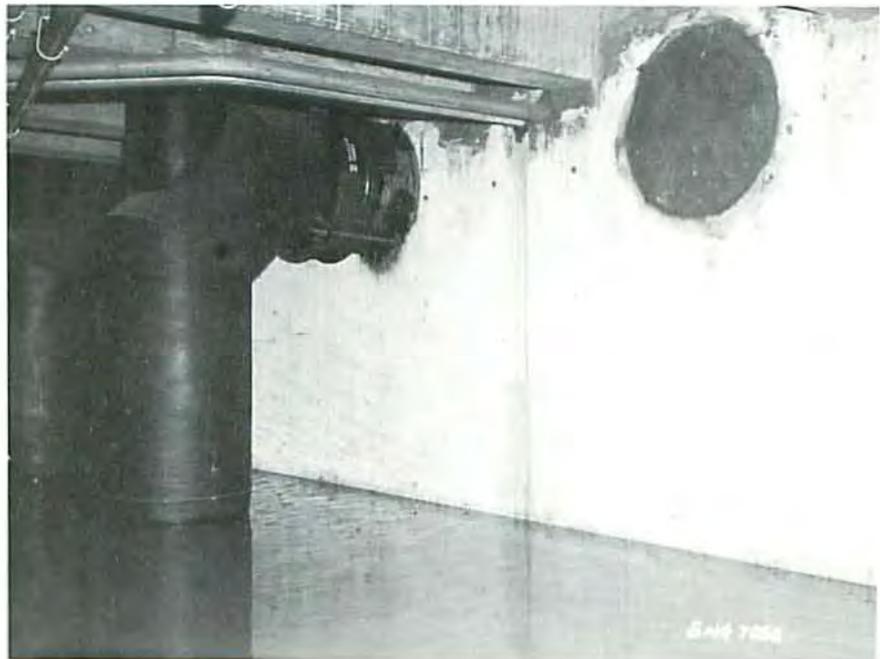


FIGURE NO. 19
DISCHARGE COLUMN



FIGURE NO. 20
SLIDE GATE-GRAVITY DRAIN

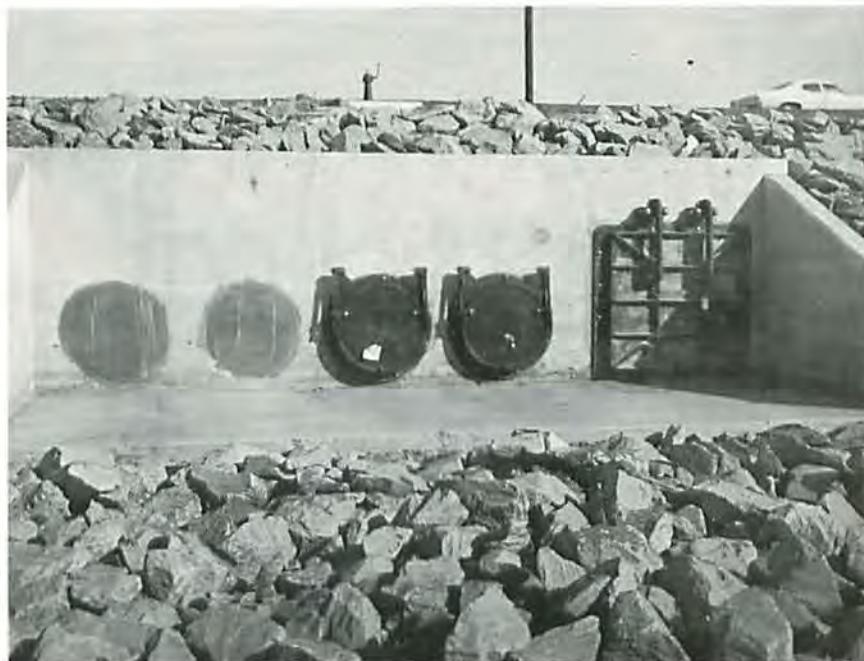


FIGURE NO. 21
DISCHARGE FLAP GATES



FIGURE NO. 22
SIPHON BREAKER HOUSING



FIGURE NO. 23
SIPHON BREAKER

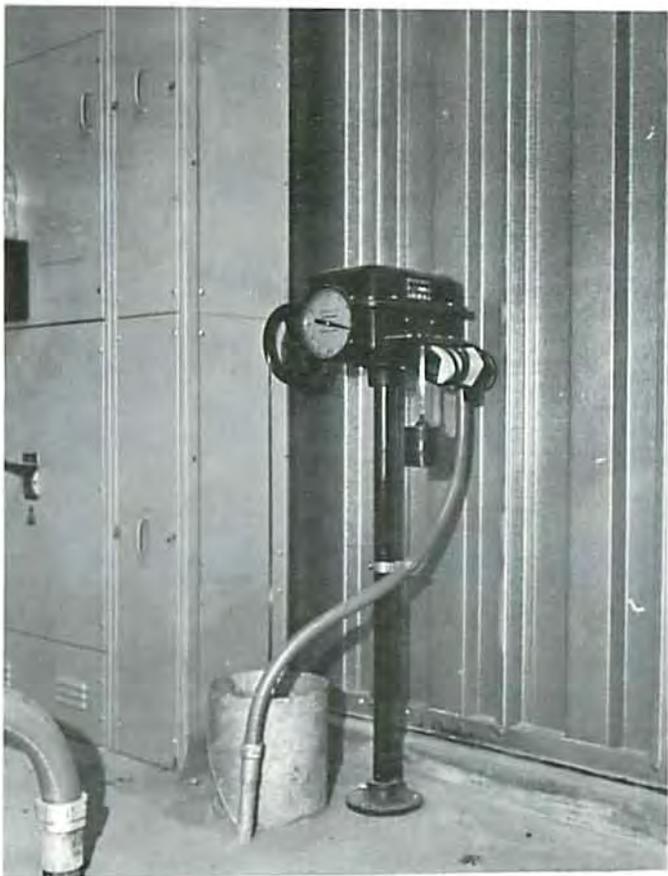


FIGURE NO. 25
FLOAT CONTROL

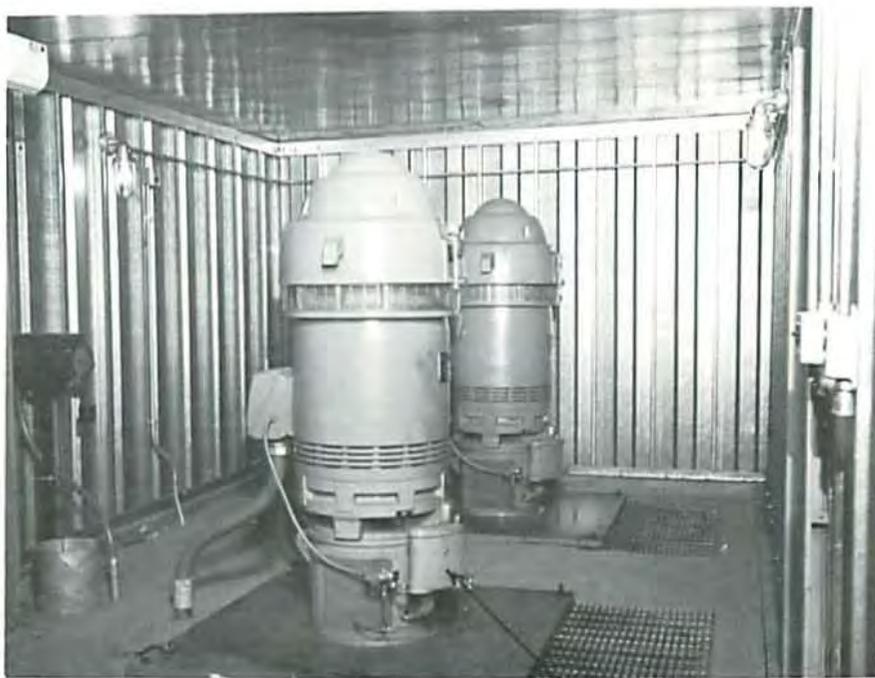


FIGURE NO. 24
PUMPS

AUTOMATIC
OILER

PUMPING PLANT NO. 2



FIGURE NO. 27
PUMP CONTROL SWITCHES

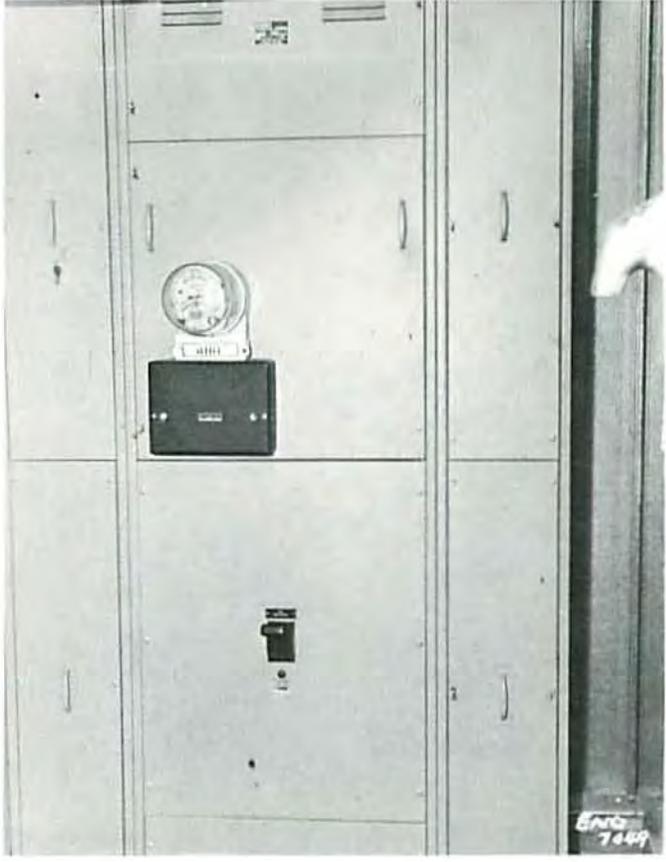


FIGURE NO. 26
MAIN SWITCH

EXHIBIT F
PLATE XIV

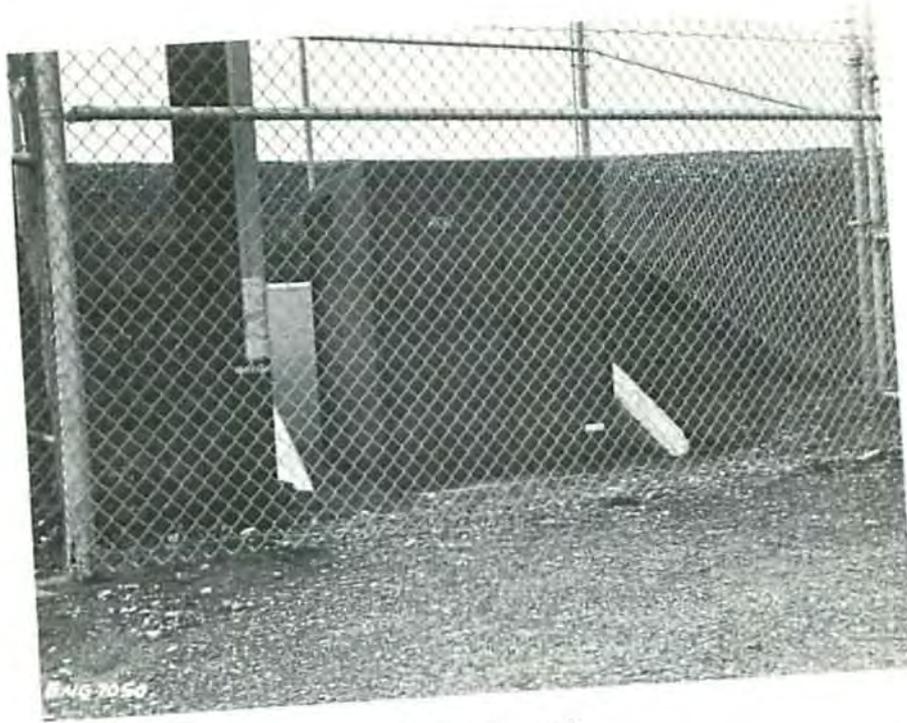


FIGURE NO. 28
TRANSFORMER

PUMPING PLANT NO. 2

EXHIBIT F
PLATE XV



FIGURE NO. 29
COLLECTING SUMP



FIGURE NO. 30
COLLECTING SUMP

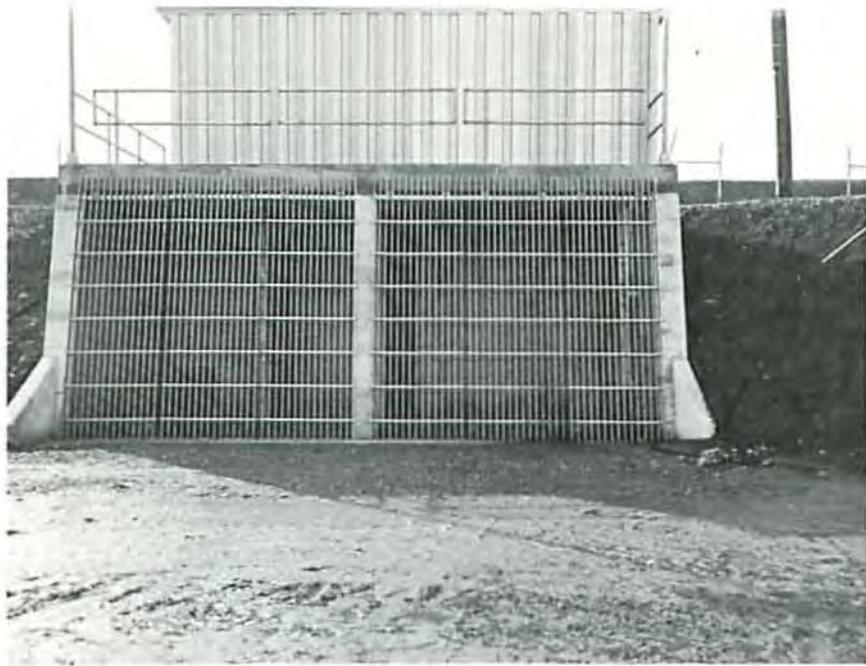


FIGURE NO. 31
TRASHRACK



FIGURE NO. 32
PUMPHOUSE



FIGURE NO. 33
SLIDE GATE-GRAVITY DRAIN



FIGURE NO. 34
FLAP GATES-DISCHARGE LINES



FIGURE NO. 35
SIPHON BREAKER HOUSING



FIGURE NO. 36
SIPHON BREAKER



FIGURE NO. 38
PUMP FLOAT CONTROL



FIGURE NO. 37
PUMPS

AUTOMATIC
OILER

PUMPING PLANT NO. 3

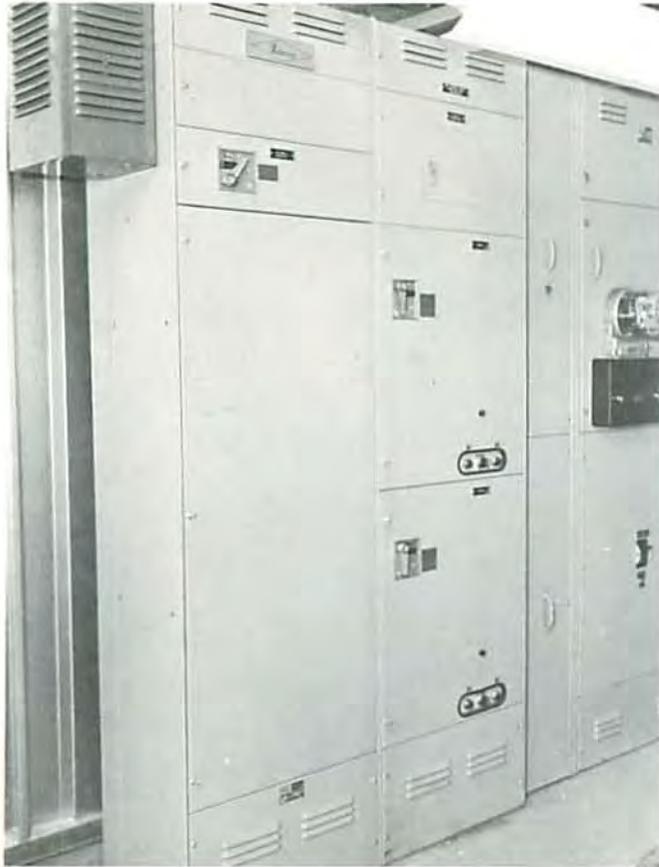


FIGURE NO. 40
PUMP CONTROL SWITCHES



FIGURE NO. 39
MAIN SWITCH

EXHIBIT F
PLATE XXI

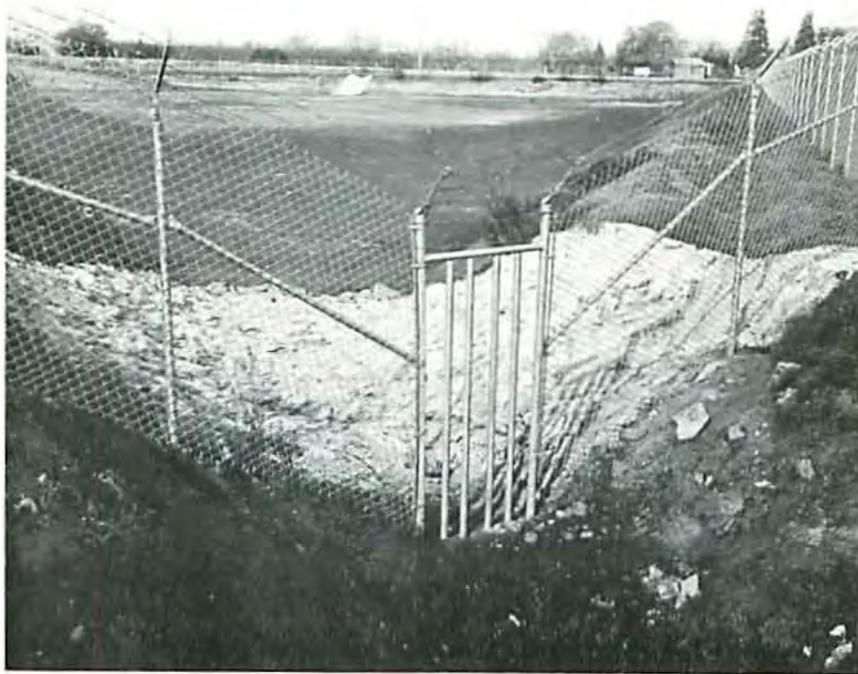


FIGURE NO. 41
TRASHRACK
ENTRANCE TO SUMP

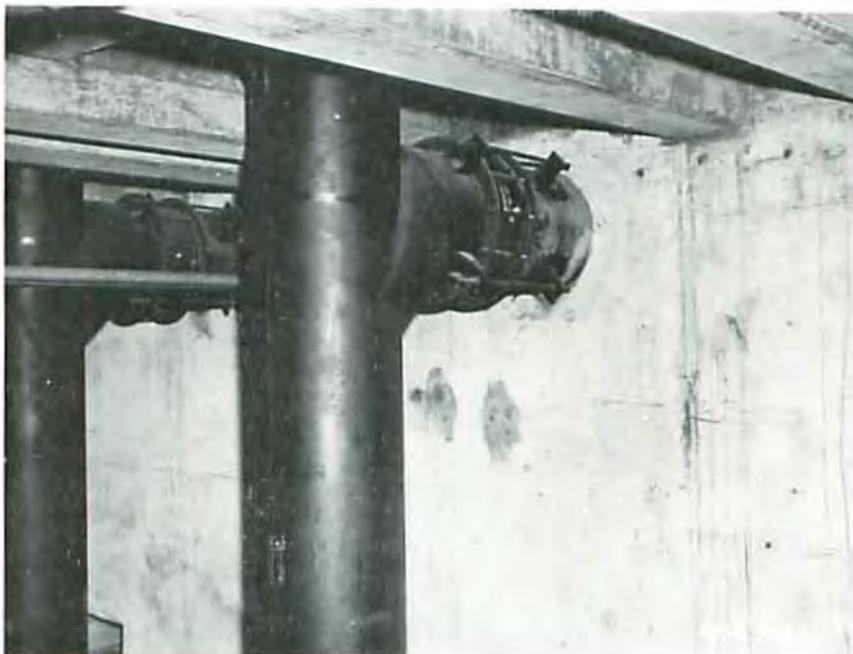


FIGURE NO. 42
PUMP DISCHARGE COLUMNS

EXHIBIT G

**Letter of Acceptance by
State Reclamation Board**

EXHIBIT G

SPEKO-F

19 August 1968

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

Gentlemen:

Reference is made to the joint inspection of 18 July 1968, made for the purpose of transferring a portion of the Mormon Slough Flood Control Project, Unit No. 2 (mouth of Diverting Canal to Jack Tone Road), to the State of California for operation and maintenance.

The flood control work, consisting of levee construction, channel improvement, placement of stone bank protection, and 3 interior drainage pumping plants on the Calaveras River, Stockton Diverting Canal, Mormon Slough and Tributaries, is listed on the attached tabulation. The work was completed on 15 August 1968, in accordance with specification No. 3356, Contract No. DACW05-68-C-0020, Drawing No. 3-4-147.

The work was performed under the general authority of the Flood Control Act of 23 October 1962 (Public Law 87-874, 87th Congress, 2nd Session).

The flood control work as described on the attached tabulation now meets the requirements of the Mormon Slough Flood Control Project. Therefore, said flood control work, together with the waterway banks contiguous thereto, are transferred to the State of California for operation and maintenance.

The maintenance work required under the provisions of the Mormon Slough Flood Control Project shall be performed in accordance with existing Flood Control Regulations, inclosed herewith, which have been prescribed

CERTIFIED MAIL

RETURN RECEIPT REQUESTED

*Mormon Slough
Part No. 1+2
Exhibit F/G*

19 August 1968

SPKKO-F
The Reclamation Board

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 Operations and Maintenance Manual covering this portion of work will be furnished your office at a later date.

Sincerely yours,

2 Incl
As stated

CRAWFORD YOUNG
Colonel, CE
District Engineer

Copy furnished:
DWR
~~OCE~~
~~SPD~~

- cc:
- ✓ Engrg Div (Lev & Chan)
- ✓ Engrg Div (Prog Dev Br)
- ✓ F & A Br (Cordano)
- ✓ Valley Res Ofc (2)
- ✓ Opns Br

JK
ROMPALA/blc

[Signature]
COLEMAN *McB*

[Signature]
HENSON

[Signature]
HART

[Signature]
YOUNG

[Signature]
21

LK

Marmion Slough
Part No. 1 & No. 2
Exhibit F/G

2
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

C
O
P
Y

The Reclamation Board
State of California

C
O
P
Y

OCT 21 1968
4130.50.102

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

Dear Sir:

Reference is made to your letter of August 19, 1968 concerning transfer to the State of California of the Mormon Slough Flood Control Project, Unit No. 2 (mouth of Diverting Canal to Jack Tone Road) for maintenance and operation.

This work was constructed in accordance with Specification No. 3356, Contract No. DACW05-68-C-0020, Drawing No. 3-4-147.

The Reclamation Board, at its meeting of September 6, 1968, 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 G

EXHIBIT H

Mechanical - Electrical Equipment

Lubrication Schedule

EXHIBIT H

EXHIBIT H

Mechanical-Electrical Equipment

Lubrication Schedule

PROJECT: Mormon Slough Pumping Plants Nos. 1, 2 & 3

<u>ITEM</u>	<u>LUBRICANT</u>	<u>PERIOD EVERY</u> (During pumping Operations)
-------------	------------------	--

1. Pumping Plant

Note: (Use manufacturers recommendations if different from that indicated below-See Name Plate Data)

a. *Pumps
(1) Drainage Pumps

Pump bearings

Chevron Duralith
EP-1

Check twice daily;
add as required.

b. *Main Pump Motor

Chevron OC-Turbine
Oil No. 9
(See name plate
data)

Check daily; add as
required. Change oil
at least twice yearly.

For oil use only oxidation corrosion inhibited turbine oil having a viscosity of 150 SSU at 100 degrees F and 45 SSU at 210 degrees F with motor standstill.

c. Flap Gates

Hinge

Waterproof Grease
W.P. No. 1

Apply to pin when
assembling and coat
outside after assembly.

Miscellaneous

Rust preventative
lubricant NO-OX-ID
type E

As required.

d. Water Surface Recorder Manufacturers
Recommendations

Note: (Use manufacturers recommendations if different from that indicated below)

*Check equipment and lubricant manufacturers recommendations.

<u>Item</u>	<u>Lubricant</u>	<u>Period Every</u> (During pumping Operations)
-------------	------------------	--

2. Electrical Equipment-General

Note: (Use manufacturers recommendations if different from that indicated below)

a. Switches	General Electric Co. Trancil oil	3 months
b. Switch hinge pins	Trancil oil with graphite	6 months
c. Relays	General Electric Special relay oil	6 months
d. Pushbutton stations	Petrolatum as required	6 months
e. <u>Motors</u>		
(1) Anti-friction bearings	Oil: Turbine oil No. 11 Grease: Chevron Duraplex Med	6 months Check when operating
(2) Ring bearings	Turbine Oil No. 15	6 months Check when operating
(3) Anti-friction	Bearings that are packed on 6 months or longer basis recommend Chevron Industrial grease Medium or equivalent	
f. Instrumentation	Manufacturers Recommendations	Manufacturers Recommendations
g. Cleaning solvent	"Stoddard" solvent or a mixture of car- bon tetrachloride and petroleum	6 months

(Note: When cleaning any part of electrical equipment, use ample precaution to prevent explosions and fires.)

3. General Notes

a. The above lubrication schedule is prepared as a general guide. It should be revised and expanded as experience is gained in the operation of the particular units of equipment. Refer to catalog data and manuals supplied with equipment for location of lubrication points and pertinent data.

b. When contracting for lubricants recommend using U. S. Government Military, Federal and ACMA specifications when available. Any reputable supplier of suitable lubricants can advise as to what specifications corresponds to branded products listed or recommended for a particular application, or if none, approved brands of other manufacturer. The brand names indicated are to facilitate identification only as to type and grade of lubricant recommended for a particular application, and is not intended to limit the procurement of lubricants to any one particular supplier.

c. Manufacture of lubricants specified above.

- (1) UNO - Union Oil Co.
- (2) NO-OX-ID - Dearborn Chemical Co.
- (3) Chevron - Standard Oil Co. of California
- (4) Tranoil - General Electric Co.
Special oil for electrical equipment.
- (5) RPM - Standard Oil Co. of California
- (6) "Stop-Rust" - The Delta Mfg. Co., Milwaukee, Wisconsin
- (7) Stoddard Solvent - Described in U. S. Bureau of Standards
as "Commercial Standard GS-3-28"

d. Electrical equipment shall be lubricated only when recommended by the equipment manufacturers or in accordance with best accepted practice for the service. Where lubrication is required, lubricate adequately but sparingly, wiping off any excess lubricant, as oily surfaces collect dust and may result in an arc between live parts.

e. The above schedule is provided as a general guide in the absence of specific recommendations from the manufacturer of the respective items of equipment. Use only the best grades of lubricants and of the type and in accordance with the manufacturer's recommendation where available. When in doubt, consult with one of the manufacturers of lubricants suitable for the service.

f. Daily checks pertain to actual operating periods. Check should also be made periodically during any extended periods when equipment is not operated.

g. Lubricant storage and handling. Lubricant reserves should be kept in closed containers and stored in a clean, well-ventilated, dry place. Lubricants shall be kept free from grit or other foreign material, at all times. When applying lubricant with a pressure grease gun, the fittings shall be wiped clean just before and just after the application.

EXHIBIT I

Mechanical-Electrical Equipment

Inspection Check List

EXHIBIT I

EXHIBIT I

Mechanical-Electrical Equipment

Inspection Check List

PROJECT: Mormon Slough Pumping Plants Nos. 1, 2 & 3

INSPECTOR: _____

DATE: _____

<u>ITEM</u>	<u>PERIOD</u>	<u>REMARKS</u>
1. <u>Pumping Plant</u>		
a. <u>Pumps</u>		
(1) <u>Lubrication</u>	Monthly-Daily when operating	
Adequacy		
Functioning of oiling system.		
Condition of lubrica- tion lines fittings; pipes, anchors; feed oiler; oil reservoir; oil level.		
Adequacy of supply of lubricant on hand.		
(2) <u>Functioning of Pump</u>		
Smoothness of operation unusual vibration and/or noise.	8 hours*	
Pump RPM		
Capacity		
Drive shaft vibration when running	Daily	
Bearing wear	Annually	

*During periods of pumping operations

<u>ITEM</u>	<u>PERIOD</u>	<u>REMARKS</u>
(3) <u>Adjustment</u>	Yearly	
Check Adjustment (See Pump Manual)		
Miscellaneous		
(4) <u>Condition of Pump</u>	Yearly	
Bearings		
Drive shaft		
Drive shaft connections		
Grease packing rings		
(5) <u>Pump anchorage</u>	Weekly*	
(6) Debris in pumping pit around pump suction	Daily*	
(7) <u>Discharge line</u>	6 months	
Discharge pipes		
Pipe couplings		
Flap gates		
Air reliefs		
(8) <u>Condition of metal work</u>	6 months	
(9) <u>Miscellaneous</u>		
b. <u>Pump Motors</u>		
(1) <u>Lubrication</u>		
Adequacy	Daily*	
Bearing temp., noise, vibration.	Daily*	
Functioning of bearing	8 hours*	
Lubricant piping, fittings	8 hours*	
Note signs of oil leak- age at any point	8 hours*	

*During periods of pumping operations.

<u>ITEM</u>	<u>PERIOD</u>	<u>REMARKS</u>
(2) <u>Motor Operation</u>		
Note any indication of excessive temperature rise under load	Daily*	
Abnormal vibration and/or noise	Daily*	
Check function of motor controls	Daily*	
Note any failure of motor to pull in throughout the load range	Daily*	
Inspect for moisture inside the motor housing	3 months	
Motor base anchorage	3 months	
(3) <u>Drive shaft & coupling</u>		
Inspect for functioning and condition	Monthly	
(4) Note accumulations of oil on or around the motor	Daily*	
(5) <u>Metal Work</u>		
Note rust spots wear & condition of paints	6 months	
(6) <u>Spare Parts</u>		
Adequacy of supply	6 months	
c. <u>Floatwells and house</u>		
Floatwells	Month	
House and appurtenances	Month	
Pump controller	Month	

*During periods of pumping operations.

<u>ITEM</u>	<u>PERIOD</u>	<u>REMARKS</u>
d. <u>Trashracks</u>		
Condition of metal work	Annually	
Anchorage	Annually	
Note debris in rack & pool that should be removed	Daily*	
e. <u>Flap Gates</u>		
Condition of seals	6 months	
Condition of metal work	6 months	
Functioning during operation	Daily	
Note any indication of leakage when closed	Daily*	
Miscellaneous		
f. <u>Pump Discharge Pipes</u>		
Air release pipes	6 months	
Miscellaneous	6 months	
2. <u>Electrical Systems</u>		
a. <u>Main Switch Board</u>		
(1) Inspect all equipment and note need for cleaning	Monthly	
(2) Check switches and controls to insure that they are mechanically operable	Monthly	
(Note indications of sluggish operation or sparking)		
(3) Report any failure of the controls to control the operation of the units for which they are intended	Daily*	
*During periods of pumping operations.		

<u>ITEM</u>	<u>PERIOD</u>	<u>REMARKS</u>
(4) Inspect relays, etc., making full use of manufacturers descriptive data	6 months	
(5) <u>Circuit Breakers</u>	6 months	
(a) Condition of oil		
(b) Condition of contacts		
(c) Functioning of the operating mechanism		
(d) Lubrication of pins and bushings		
(e) Tightness of bolts, nuts, cotters, etc.		
(f) Evidence of heating		
(g) Condition of bushings		
(h) Miscellaneous		
(6) <u>Starters</u>	6 months	
(a) Check all connections		
(b) Check to insure that all moving parts move freely		
(c) Check adjustment and condition of contact tips		
(d) Check functioning of start and stop buttons & overload relay		
(e) Miscellaneous		

<u>ITEM</u>	<u>PERIOD</u>	<u>REMARKS</u>
(7) <u>Contactors</u>	6 Months	
(a) Check for proper functioning, including opening and closing operation		
(b) Inspect contacts		
(c) Check adjustment of contact gap		
(d) Check contact pressure		
(e) Miscellaneous		
b. <u>Miscellaneous</u>	6 Months	
(1) <u>Lighting System</u>		
(a) Check light fixtures and controls for proper functioning		
(b) Check adjustment of floodlight	Every month	
(c) Inspect circuit breakers	Every month	
(d) Check supply of fuses and light bulbs on hand	Every month	
(2) <u>Pump Motor Controls</u>		
Check the entire electric system provided for operating the main pumping units	Yearly	
(3) <u>Power Supply</u>		
Generally inspect the Power Co.'s transmission line installations in the vicinity of the pumping plant	Monthly	

<u>ITEM</u>	<u>PERIOD</u>	<u>REMARKS</u>
(4) <u>Miscellaneous</u>		
(a) <u>Fire Protection Equipment</u>		
Note any possible fire hazards in and around the pumping plant and other installations		
(b) <u>Pumping Plant Structure</u>		
Note need for policing the area around the pumping plant and other installations	Monthly	
Painting: Check all metal work and note rust spots need for painting or other maintenance	Annually	
Hazards: Check all covers to insure that they are in place	Monthly	
Miscellaneous		

NOTE:

1. The period indicated is to serve as a general guide. (More frequent inspections shall be made if operating experience and type of service for a particular period justifies.)
2. Under "Remarks" briefly indicate maintenance, adjustment, required and other pertinent remarks.
3. When required maintenance has been completed, indicate date and initial.
4. Daily inspections are applicable only to periods of pumping operations; and when pumps are operating continuously during flood conditions should be made at least once every 8-hour shift.

EXHIBIT J

**Sample Log Form, Recording and
Reporting Operation of Pumping
Plant During Flood Period**

SAMPLE LOG FORM FOR RECORDING AND REPORTING
OPERATION OF PUMPING PLANT DURING EXTREME EMERGENCY FLOOD CONDITIONS

DATE: _____ PLANT: _____ SUPERINTENDENT: _____

Pump No.	Start			Stop			Remarks*
	Time	Water Level		Time	Water Level		
		Sump	River		Sump	River	

*Brief note under Remarks with reference to more detailed comments on an attached sheet. Service interruptions, if any: abnormal high temperature of motor; abnormal noise; improper functioning of automatic controls and appurtenances, including time duration and cause. This form should be used only when operators are on duty continuously.

SAMPLE LOG FORM FOR RECORDING AND REPORTING
OPERATION OF PUMPING PLANT DURING PERIODIC VISITS

DATE: _____ PLANT: _____ SUPERINTENDENT: _____

Pump No.	Time	Pump Operating (yes - no)	Water Level		Remarks*
			Sump	River	

*Brief note under Remarks with reference to more detailed comments on attached sheet describing any unusual or abnormal conditions observed.

OPERATION OF AUXILIARY EQUIPMENT AND MISCELLANEOUS
PLANT FACILITIES DURING PERIODIC VISITS

DATE: _____ PLANT: _____ SUPERINTENDENT _____

Item No.	Description	Time	Remarks*
1.	Pump controller and indicator		
2.	Main switchboard		
3.	Flapgates in pump discharge lines		
4.	Trashracks		
5.	Slide gates in discharge conduits		
6.	Power supply		
7.	Lighting		
8.	Miscellaneous		

*Brief note under Remarks and reference to more detailed comments on an attached sheet with appropriate cross references. See EXHIBITS 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. This form should also be used for recording applicable comments on unusual occurrences when operators are on duty continuously.

(Attachment for Sheet 1 of EXHIBIT J)
OPERATION OF PUMPING PLANT DURING EXTREME EMERGENCY FLOOD CONDITIONS

DATE: _____ PLANT: _____ SUPERINTENDENT: _____

Pump No.	Time	Remarks (Reference Sheet 1 of Exhibit J)

(Attachment for Sheet 2 or 3 of EXHIBIT J)
OPERATION OF PLANT DURING PERIODIC VISITS

DATE: _____ PLANT: _____ SUPERINTENDENT: _____

Item No.	Time	Remarks (Reference Sheet 2 or 3 of Exhibit J)

By Act of California Legislature, Chapter 1438 of the Statutes of 1963 (California Water Code Section 12657), the Reclamation Board is authorized to give assurances satisfactory to the Secretary of the Army that the local cooperation required by Section 3 of the Act of Congress, approved December 22, 1944 (Public Law 534, 78th Congress, Second Session), and Section 2 of the Act of Congress, approved August 18, 1941 (Public Law 228, 77th Congress, First Session), will be furnished by the State in connection with the Mormon Slough Project.

Section 3 of Public Law 534 and Section 2 of Public Law 228 provide that the authorization for any flood control project requiring local cooperation shall expire five years from the date on which local interests are notified in writing by the War Department of the requirements of local cooperation, unless said interests shall, within said time, furnish assurances satisfactory to the Secretary of War that the required cooperation will be furnished. The Reclamation Board was notified by the District Engineer, Sacramento District, by letter dated 25 March 1966 of the requirements of local cooperation.

By Resolution adopted by the State Reclamation Board at its meeting of 7 July 1966, the General Manager of the Reclamation Board was authorized to furnish the required assurances to the Corps of Engineers in accordance with the requirements in House Document No. 576 as set forth above in accordance with this authorization.

Mr. A. E. McCollam, General Manager of the Reclamation Board, by letter dated 7 July 1966, has furnished the required assurances. A review of the assurances discloses that they comply with the requirements of the authorizing act and with the recommendations of the Chief of Engineers.

In view of the foregoing facts, it is concluded that: (1) the Reclamation Board has been authorized by the Legislature to give the assurances; (2) the Legislature has provided adequate funds and has authorized the project; and (3) the Reclamation Board has, in accordance with Public Law 534, furnished the assurances within five years of the date of notification by the Secretary of the Army of the requirements of local cooperation. The assurances, as given, are therefore considered legally and financially adequate.

Dated

9 August 1966

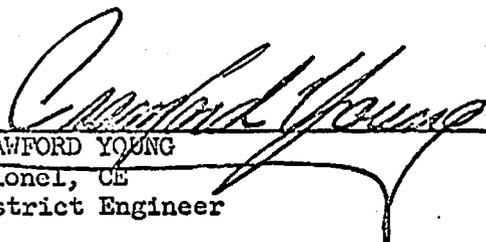


H. BOYD ADDISON, Attorney, Real Estate Division
U. S. Army Engineer District, Sacramento
Corps of Engineers

I hereby accept said assurances.

Dated

15 August 1966



CRAWFORD YOUNG
Colonel, CE
District Engineer

MEMORANDUM OPINION OF ASSURANCES

Mormon Slough Project, Calaveras River, California

Public Law 87-874, approved 23 October 1962, authorized a project for flood protection on Mormon Slough, Calaveras River, California, substantially in accordance with the recommendations of the Chief of Engineers in House Document numbered 576, 87th Congress, Second Session.

The Chief of Engineers, in said House Document numbered 576, recommended construction of the project at an estimated total cost of \$3,460,000 of which \$1,960,000 would be the federal cost of construction, and \$1,500,000 non-federal costs for lands, easements, rights-of-way and relocations, provided that prior to construction local interests give assurances satisfactory to the Secretary of the Army and that they would, without cost to the United States:

- a. furnish all lands, easements, and rights-of-way, including spoil disposal areas, necessary for construction of the works;
- b. accomplish all relocations and alterations of roads, streets, buildings, pipelines, utilities, bridges, and other structures (except railroad facilities) made necessary by the construction work;
- c. hold and save the United States free from damages due to the construction works;
- d. maintain and operate all the works after completion, including the lower Calaveras River, in accordance with regulations prescribed by the Secretary of the Army; and
- e. prescribe and enforce regulations designed to prevent encroachment of any type that would impair the flood control effectiveness of the works.

By Act of the California Legislature, Chapter 915 of the Statutes of 1963 (California Water Code Section 12648.6), the Mormon Slough Channel Improvement Project was adopted and authorized substantially in accordance with the recommendations of the Chief of Engineers in House Document No. 576, 87th Congress, at the estimated State cost of \$2,260,000.

The following items have been included in Budget Acts enacted by the California Legislature:

- a. Item 396 (f), Chapter 2 of 1964 Budget Act (authorized \$65,000)
- b. Item 308 (e), Chapter 757 of 1965 Budget Act (authorized \$1,230,395)
- c. Item 353 (e), Chapter 2 of 1966 Budget Act (authorized \$1,999,817)

THE RECLAMATION BOARD

RESOURCES BUILDING, 1416 9TH STREET • SACRAMENTO 95814

STANLEY W. KRONICK, *President*
J. J. MADIGAN, *Vice President*
WALLACE McCORMACK, *Secretary*
GEORGE W. NICKEL, JR.
HAROLD J. O'BANION
H. TERRILL SARTAIN
DONALD L. WEILER
COL. A. E. McCOLLAM, *General Manager*

July 7, 1966

Refer to:

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

Dear Sir:

Reference is made to the authorized Mormon Slough-Calaveras River Project, California, and to your letter of 25 March 1966 requesting that the State Reclamation Board furnish you the assurances of local cooperation as required by Federal law.

This will inform you that the Reclamation Board, at its meeting on July 7, authorized the General Manager to furnish you with the required assurances for the project. The Reclamation Board, for the State of California, under the authority granted it under Chapter 1438 of the Statutes of 1963, hereby furnishes the following assurances to you with respect to the Mormon Slough-Calaveras River Project.

The Board will, without cost to the United States:

- a) Furnish all lands, easements and rights of way, including spoil-disposal areas, necessary for construction of the works;
- b) Accomplish all relocations and alterations of roads, streets, buildings, pipelines, utilities, bridges and other structures, (except railroad facilities) made necessary by the construction work;
- c) Hold and save the United States free from damages due to the construction works;
- d) Maintain and operate all the works after completion, including the lower Calaveras River, in accordance with regulations prescribed by the Secretary of the Army;

U. S. Corps of Engineers

-2-

July 7, 1966

e) Prescribe and enforce regulations designed to prevent encroachment of any type that would impair the flood-control effectiveness of the work.

Attached to this letter you will find a certified copy of the Board's resolution which authorizes the General Manager to to furnish to you the required assurances.

Very truly yours,

A. E. McCollam

A. E. MCCOLLAM
General Manager

ENC.

of the Army

RESOLUTION ADOPTED BY THE STATE RECLAMATION BOARD
AT ITS MEETING OF JULY 7, 1966

WHEREAS, the Mormon Slough, Calaveras River Project was authorized by the Flood Control Act of 1962 substantially in accordance with the recommendations of the Chief of Engineers as outlined in House Document No. 576, 87th Congress, Second Session; and

WHEREAS, House Document No. 576, the authorizing document, requires that prior to construction local interests give assurances satisfactory to the Secretary of the Army that they will without cost to the United States:

a) Furnish all lands, easements and rights of way, including spoil-disposal areas, necessary for construction of the works;

b) Accomplish all relocations and alterations of roads, streets, buildings, pipelines, utilities, bridges and other structures (except railroad facilities) made necessary by the construction work;

c) Hold and save the United States free from damages due to the construction works;

d) Maintain and operate all the works after completion, including the lower Calaveras River, in accordance with regulations prescribed by the Secretary of the Army;

e) Prescribe and enforce regulations designed to prevent encroachment of any type that would impair the flood-control effectiveness of the work; and

WHEREAS, the Legislature of the State of California authorized the Mormon Slough Channel Improvement Project on the Calaveras River substantially in accordance with the recommendations contained in House Document No. 576 by the enactment of Chapter 215 of the

WHEREAS, the Legislature of the State of California authorized the Reclamation Board of the State of California to give the required assurances to the Corps of Engineers under Chapter 1438 of the Statutes of 1963;

NOW, THEREFORE BE IT RESOLVED that the Reclamation Board of the State of California shall furnish the necessary assurances to the Corps of Engineers on the Mormon Slough Calaveras River Project and will without cost to the United States:

- a) Furnish all lands, easements and rights of way, including spoil-disposal areas, necessary for construction of the works;
- b) Accomplish all relocations and alterations of roads, streets, buildings, pipelines, utilities, bridges and other structures (except railroad facilities) made necessary by the construction work;
- c) Hold and save the United States free from damages due to the construction works;
- d) Maintain and operate all the works after completion, including the lower Calaveras River, in accordance with regulations prescribed by the Secretary of the Army;
- e) Prescribe and enforce regulations designed to prevent encroachment of any type that would impair the flood-control effectiveness of the work; and

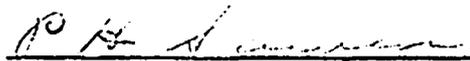
BE IT FURTHER RESOLVED that the General Manager of the Reclamation Board of the State of California is authorized to furnish the required assurances to the Corps of Engineers in accordance with the requirements set forth in House Document No.

STATE OF CALIFORNIA)
COUNTY OF SACRAMENTO) ss.
Office of The Reclamation Board)

I, P. H. SERVEN, Chief, Administrative Services of The Reclamation Board, do hereby certify that the foregoing is a true and correct copy of a resolution adopted by the Reclamation Board at the meeting of said Board held on July 7, 1966.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of The Reclamation Board this 7th day of July, 1966.

(SEAL)



P. H. SERVEN
Chief, Administrative Services
The Reclamation Board