State of California
The Resources Agency
THE RECLAMATION BOARD

EMERGENCY LEVEE CONSTRUCTION ON THE
LEFT BANK SACRAMENTO RIVER NEAR
CLEAR CREEK

OPERATION AND MAINTENANCE MANUAL

January 1975
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## Exhibits

- **Exhibit A** - Location Map.
- **Exhibit B** - Memorandum of Acceptance by Department of Water Resources and Transfer to Reclamation Board.
- **Exhibit C** - Letter of Transfer to Department of Fish and Game.
Levee on Left Bank Sacramento River on Department of Fish and Game Property - Shasta County

Operation and Maintenance

Chapter I

Introduction

1. Purpose

The purpose of this manual is to define the operation and maintenance procedures to be used for the levee constructed by The Reclamation Board on the Department of Fish and Game property on the left bank of the Sacramento River in Shasta County. This manual is to be used by the maintaining agency as a basis for operating procedures and for all maintenance operations of the levee.

2. Project Authority

The State Reclamation Board, on June 28, 1974, adopted Resolution No. 74-11, which states:

"Whereas, the Reclamation Board has determined that a serious flood problem exists on the Sacramento River in the vicinity of Clear Creek approximately between River Mile 288 and 290; and

"Whereas, the Reclamation Board has determined that if the river is not stabilized as rapidly as possible in this reach, a permanent channel change will occur, causing severe damages to the Tobiasson and Nye subdivisions, the City of Redding sewer ponds and to valuable spawning beds; and

"Whereas, the Reclamation Board has determined that the J. F. Shea Company gravel extraction operation within the reach must be made independent of the river; and

"Whereas, the Reclamation Board has, after professional investigation and public hearing, adopted on May 31, 1974, a plan to stabilize the river to make the gravel extraction operation independent of the river as proposed by Mr. Amalio Gomez in the report entitled,
'Study of Physical and Hydraulic Changes, Sacramento River, Vicinity of Clear Creek, South of Redding, California'; and

"Whereas, the implementation of the adopted plan for remedial works, including the removal of islands in the river, will require the cooperation between the J. F. Shea Company and the California Department of Fish and Game; and

"Let It Be Further Resolved, that the California Department of Fish and Game is directed to construct, or cause to be constructed, that part of the remedial works described below:

"A permanent levee across the Department of Fish and Game lands, substantially to the alignment, grade and section indicated in the adopted plan. Variations from the specified alignment, grade and section will be permitted only if plans for such modifications are approved by the staff of the Reclamation Board. Permanent levee construction will be initiated within 60 days of the date of this resolution, unless an extension of time is approved by the staff of the Board. Permanent levee construction shall be completed by October 31, 1975;".

Emergency funds were obtained to allow the Reclamation Board to proceed with planning and construction of the levee.

3. Location

The constructed levee covered by this manual is located in Shasta County on the left bank of the Sacramento River approximately 5 miles southeasterly of the City of Redding and 2,000 feet upstream and northeasterly of the mouth of Clear Creek.

4. Description of the Levee

The constructed levee is 1,586 feet in length. It was constructed with a crown width of 20 feet, a waterward slope of 1 on 4 and a landward slope of 1 on 2. The elevation of the top of the levee at the upstream end is 439.64 feet, USGS Datum, and slopes to elevation 437.5 feet, USGS Datum at the downstream end.
5. Construction Data and Contractor

The levee was constructed on the Department of Fish and Game property on the left bank of the Sacramento River near Clear Creek under Specification No. 74-53, Contract No. C50158, Emergency Levee Construction on the Sacramento River near Clear Creek. The contractor was James L. Ferry and Son, Inc. The work started on September 18, 1974, and was completed on October 18, 1974.

6. Acceptance

The completed levee was accepted by the Department of Water Resources and transferred to The Reclamation Board by letter dated October 23, 1974.

The Reclamation Board, at its meeting of November 8, 1974, accepted the completed work from the Department of Water Resources. By letter dated November 13, 1974, the levee was turned over to the Department of Fish and Game for operation and maintenance.
Chapter II
Operation and Maintenance

7. **Inspection Procedure**

The Department of Water Resources, State of California, will make semiannual inspections of the completed levee and report its findings to the Department of Fish and Game and The Reclamation Board. Supervisory powers and duties of the Department of Water Resources are applicable to the levee maintained by the Department of Fish and Game.

The following procedure is used in inspecting the constructed levee maintained and operated by the Department of Fish and Game:

Personnel of the Department of Water Resources make a detailed inspection in the spring and fall of each year and make a report on any required maintenance. The inspection objectives are to determine if the following items of maintenance are being adhered to:

(1) That all brush, trees and obnoxious wild growth other than sod are removed from the levee crown and slopes.

(2) That all debris on the levee slope has been removed or burned during the appropriate season.

(3) That all burrowing animals have been exterminated.

(4) That all caves, sloughs, burrows, holes, slips or other damaged portions of the levee have been repaired.
(5) That no revetment work or riprap have been displaced, washed out or removed.

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

(7) That encroachments are not being erected on the levee which would hinder maintenance or travel by authorized maintenance and inspection vehicles.

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

Following the detailed inspection, a copy of the inspection report will be furnished to the Department of Fish and Game.

8. **General Rules and Procedures**

The general rules for maintenance and operation of the flood control works are as follows:

(1) The levee constructed by The Reclamation Board for local flood protection shall be continuously maintained in such a manner and operated at such times for such periods as may be necessary to prevent a change in the channel of the Sacramento River in this vicinity.

(2) The Department of Fish and Game, the responsible local agency, which furnished assurance that the levee will be maintained and operated in accordance with regulations as set forth by The Reclamation Board and Department of Water Resources.
(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 levee shall be permitted on the protective facilities.

(5) No improvement shall be passed over, under, or through the levee, nor shall any excavation or construction be permitted within the limits of the levee, nor shall any change be made in the levee without prior determination by the State Reclamation Board, or its authorized representative, that such improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facility. 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.

(6) The State Reclamation Board or its authorized representative shall have access at all times to all portions of the protective works.

(7) Maintenance measures or repairs which the State Reclamation Board deems necessary shall be promptly taken or made.

(8) The State Reclamation Board will furnish the Department of Fish and Game with an operation and maintenance manual for the authorized levee.
9. Care of Vegetation on the Levee

(1) A good growth of sod is the desired vegetative cover on the levee and should be encouraged by necessary maintenance practices.

(2) Brush, trees, and other wild obnoxious growth shall be cleared from the levee crown and slopes. This can be controlled by the use of proper herbicides. A strip of brush and small trees may be retained on the floodplain immediately next to the levee on the waterward side where necessary to prevent erosion and wavewash.

(3) Weeds, grasses and debris on the levee may be burned during the 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 extermination of burrowing animals. Burning permits shall be obtained from the proper local authority before burning is started.

10. Repairs to Levee Embankment

Fill needed to bring the levee section back to original cross section shall be placed in layers not exceeding 6 inches in thickness and compacted in accordance with the original specifications. The fill material shall be free from brush, roots, sod or other unsuitable material and be near optimum moisture content for compaction.

11. Depredations of Burrowing Animals

Burrowing animals such as muskrats, ground hogs, ground squirrels, moles and gophers found in the levee shall be exterminated after which the dens and runways should be opened up and backfilled with compacted material.
Memorandum

To: Mr. A. E. McCollam  
Chief Engineer and General Manager  
The Reclamation Board  
1416 Ninth Street, Room 335  
Sacramento, California 95814

From: Department of Water Resources

Date: OCT 23 1974

File No.: 

Subject: Specification No. 74-53  
Contract No. C50158  
Emergency Levee Construction on the Sacramento River near Clear Creek  
Acceptance of the Work

The work included in Contract No. C50158 for Emergency Levee Construction on the Sacramento River near Clear Creek, Shasta County was completed and I have accepted the work this date.

The accepted work is hereby transferred to the Reclamation Board.

Robert B. Jansen  
Deputy Director
Specification No. 74-53
Contract No. C50158
Emergency Levee Construction on the
Sacramento River near Clear Creek, Shasta County.
Transfer of Maintenance and Responsibility
of Completed Work

A precompletion inspection of the subject levee construc-
tion on the left bank of the Sacramento River was conducted
by the Department of Water Resources on October 18, 1974.
Attending the inspection and representing the Department of Fish
and Game were Messrs. Don Weidlein, Elton Bailey, Wayne Klein
and John Hayes.

The constructed work was found to be satisfactory and in
accordance with the contract plans and specifications and accepted
from the contractor as complete.

The Reclamation Board, at its meeting of November 8,
1974, accepted the completed work from the Department of Water
Resources and transferred the project to the Department of Fish
and Game for maintenance and operation. This memorandum will serve
as official notice of the transfer.

An Operation and Maintenance Manual will be prepared
and furnished. Until the manual is furnished, a copy of Part 208,
Chapter II of Title 33 of the Federal Register relating to main-
tenance and operation of flood control works is attached for your
guidance. A newly constructed levee requires careful observation
for the first two or three years and we, therefore, recommend
that frequent inspections of this levee be made during the coming
flood season.

A. E. McCollam
Chief Engineer and
General Manager

GLA RLM 4th
Encl

ccd C. Kauck
Chapter II—Corps of Engineers, War Department

PART 208—FLOOD CONTROL REGULATIONS

MAINTENANCE AND OPERATION OF FLOOD CONTROL WORKS

Pursuant to the provisions of section 2 of the Act of Congress approved June 23, 1917, (40 Stat. 583), and the regulations hereinafter prescribed to govern the management and operation of flood control works:

208.10 Local flood protection works; maintenance and operation of structures and lining of channels. General. (1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such an unimpaired condition as to prevent the occurrence of flooding. The maintenance and operation of said structures and facilities shall be assigned to one or more persons or agencies of the Federal Government in accordance with the regulations prescribed by the Secretary of War, as required by law, shall appoint a person or persons, 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 expense to the United States.

(2) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times, and in accordance with regulations which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the right-of-way for the project works.

(5) In no event shall be permitted over, under, through the walls, levies, improved channels or cutwaters, nor shall excavation or construction of permeable materials 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 War Department 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 in formation 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 and 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 consult with the District Engineer covering inspection, maintenance, and operation of the protective works.

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

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

(9) Appropriate measures shall be taken by local authorities to ensure that the activities of all local organizations operating on or about flood facilities connected with the protective works are coordinated with those of the Superintendent of the project during flood periods.

(10) The Department 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 these regulations.

(11) L.eaves.—(a) Maintenance. The Superintendent shall provide at all times such maintenance as may be required to prevent serviceability of the structures in Unity of fashion. Working parties shall be taken to promote the growth of sod, eliminate burrowing animals, and to provide for routine mowing of the grass and weeds, even dressing, deicing of deposits, and repairs of damaged caused by erosion or other forces. Where practicable, mowing shall be taken to retard bank erosion or washaways of levees or similar structures.

(12) No scavenging, sowing, or material losses of grass on levee cross sections has taken place.

(13) No activity has been observed on either the side of the levee or the river side of the levee which may affect the stability of the levee section.

(14) No scarping, saturated areas, or sand boils are occurring.

(15) No scraping or level has occurred which affects the stability of the wall or the water tightness.

(16) No trees exist on the levee or on the flood plain or on the river bank which may endanger the structure or hinder its functioning in time of flood.

(17) Trees may be permitted in time of flood in accordance with such regulations as may be established by the Chief of Engineers.

(18) Trees may be permitted in time of flood in accordance with such regulations as may be established by the Chief of Engineers.

(19) Trees may be permitted in time of flood in accordance with such regulations as may be established by the Chief of Engineers.

(20) Trees may be permitted in time of flood in accordance with such regulations as may be established by the Chief of Engineers.

(21) Trees may be permitted in time of flood in accordance with such regulations as may be established by the Chief of Engineers.

(22) Trees may be permitted in time of flood in accordance with such regulations as may be established by the Chief of Engineers.

(23) Trees may be permitted in time of flood in accordance with such regulations as may be established by the Chief of Engineers.

(24) Trees may be permitted in time of flood in accordance with such regulations as may be established by the Chief of Engineers.

(25) Trees may be permitted in time of flood in accordance with such regulations as may be established by the Chief of Engineers.
Drainage structures shall be examined, rolled, and trial operated at least once every 90 days. Where drainage structures are provided with stop logs or other emergency closures, the condition of the equipment shall be examined frequently 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, flanges, and hinged walls are in good condition.
(2) Inlet and outlet channels are open.
(3) Care is being exercised to prevent the accretion of debris and prevent the closure and heads of the drain structures and that the floors of the drain are built near the bottom level of the channel.
(4) Inspection is not occurring adjacent to the structure which may endanger its water tightness or stability.

Immediate steps will be taken to remove damages, replace missing or broken parts, or remedy adverse conditions discovered by such inspections.

(2) Operation. Whenever high water conditions impede, all gates will be inspected a short time before water rises to the invert of the pipe and all objects which may prevent closure of the gate shall be removed. Such objects shall be closely observed until it has been ascertained that they are securely closed. Manually operated gates and valves shall be closed before the forecasted high water level is reached.

(3) Maintenance. All drainage structures in service shall be inspected frequently during floods to ascertain whether seepage is taking place along the lines of their construction. Thoroughly checked. Immediate steps will be taken to correct any adverse condition.

(4) Miscellaneous items.

Closing these conditions, additional inspections shall be made by the Superintendent every 90 days to be certain that:

(1) No ports are missing.
(2) Metal parts are adequately covered with paint.
(3) All movable parts are in satisfactory working order.
(4) Proper closure can be made promptly when required.

(5) From the standpoint of local interests, upon completion of the project, closure structures will be examined frequently during flood periods to ascertain that no undue leakage is occurring and that the locks and gates are functioning properly. All entrances to Offices or dwelling shall not be allowed to lie up to closures or other devices for any purpose.

(1) Pumping and (2) Maintenance. Pumping plants shall be inspected by the Superintendent at intervals not to exceed 90 days. All pumps shall be tested at least once every 90 days. Mower tests of all equipment shall be made whenever an inspection is not made, unless otherwise instructed. All pumps shall be tested at least once every 90 days. Mower tests of all equipment shall be made whenever an inspection is not made, unless otherwise instructed. All pumps shall be tested at least once every 90 days. Mower tests of all equipment shall be made whenever an inspection is not made, unless otherwise instructed. All pumps shall be tested at least once every 90 days. Mower tests of all equipment shall be made whenever an inspection is not made, unless otherwise instructed.
COOPERATIVE AGREEMENT BETWEEN STATE OF CALIFORNIA,
DEPARTMENT OF FISH AND GAME, AND J. F. SHEA COMPANY, INC.
FOR MAINTENANCE OF A SECTION OF LEVEE ON SACRAMENTO RIVER

This Agreement, made and entered into at Sacramento, California, this

_______ day of _______________, 1974, by and between the STATE OF CALIFORNIA,
DEPARTMENT OF FISH AND GAME, hereinafter called the State, and the J. F. SHEA
COMPANY, INC., a Corporation, hereinafter called the Company.

WITNESSETH:

In consideration of the mutual benefits to be derived therefrom, the
parties hereby agree as follows:

1. The Company shall maintain a levee to be constructed by the State on
the State-owned real property as more particularly described in instrument recorded
in Volume 1133, Page 230 of the Official Records of Shasta County, State of California,
recorded August 29, 1972, a copy of which is hereby attached and made part hereof
by this reference. For purpose of this part, maintenance of said levee is defined
as follows:

A. Control of wild growth by the use of selective sprays and the
use of such sprays to be subject to the approval of State.
B. Grade crown roadway for access.
C. Maintain the levee to the constructed section and grade.
D. Perform work to the standards therefor of the State Reclamation
Board.
2. The Company will not be obligated to expend more than $500.00 actual and direct cost per year, non-cumulative, for the term hereof in the course of its performing such maintenance.

3. In the event the Company estimates cost to exceed $500.00 in any one year, the Company will immediately notify the State and inform the State of the basis thereof. The State will negotiate with the State Reclamation Board for funding as may be available for major levee repair, maintenance, or reconstruction work, but Company shall incur no cost nor be reimbursed therefor unless and until authorized in writing by the State to do so.

4. To the extent it may legally do so, the State agrees to indemnify and hold harmless the Company from any loss, damage, or liability that may result from the work performed hereunder.

5. Unless sooner terminated as herein provided, this agreement shall be for the term of five years commencing with the date hereof. This agreement may be terminated by either party giving written notice to the other party at least sixty (60) days next prior to the effective date of such termination.

6. All notices provided to be given, or which may be given, by either party to the other, shall be deemed to have been fully given when made in writing and deposited in the United States Mail, certified and postage prepaid, and addressed as follows:

   To the State at:  
   Department of Fish and Game  
   1416 Ninth Street  
   Sacramento, California  95814

   To the Company at:  
   J. F. Shea Co., Inc.  
   1290 Smith Road  
   Redding, California  96001
Nothing herein contained shall preclude the giving of any such written notice by personal service. The address to which notices shall be mailed as aforesaid to either party may be changed by written notice given by such party to the other, as hereinbefore provided.

IN WITNESS WHEREOF, this agreement has been executed by and on behalf of the parties hereto as of the day and year first above written.

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

By ____________________________

J. F. SHEA COMPANY, INC.

By ____________________________
This Agreement entered into this [day of] _2_ day of _October_ 1972, by and between the Department of Public Works, hereinafter called Transferor and the Department of Fish and Game, hereinafter called Transferee, with the approval of the Director of General Services,

WITNESSETH:

WHEREAS, Transferor has control and possession of the hereinafter described real property, and

WHEREAS, Transferee desires to acquire control and possession of said real property and Transferor is willing to transfer said control and possession;

NOW THEREFORE, pursuant to the provisions of Section 14673 of the Government Code of the State of California, Transferor hereby transfers unto Transferee and Transferee accepts the control and possession of the real property situated in the County of Shasta, State of California, described as follows:

That certain parcel of land conveyed to the State of California by deed from L. C. Smith, recorded September 17, 1958 in Book 577 of Official Records at page 133, Shasta County Records, described in said deed as follows:

"A portion of Section 30, T. 31 N., R. 4 W., M.D.M., described as follows:

Beginning at a concrete monument with an aluminum disk marked State of California, and from which the northeast corner of said Section 30 bears N. 28°16'44" E., 3779.03 feet;

thence, South 965.58 feet to a concrete monument with an aluminum disk marked State of California;

thence, S. 62°39'32" W., 2030 feet, more or less, to the east bank of the Sacramento River;

thence, along said east bank, northeasterly to a point which bears N. 65°56'14" W., 700 feet, more or less, from the Point of Beginning.

Containing 42.50 acres, more or less.

STATE OF CALIFORNIA - OFFICIAL BUSINESS
Document entitled to free recordation pursuant to Gov't Code Sec. 6103
Together with the right to locate and occupy a haul road easement which will be approximately 40 feet in width, and to construct therein a two-way roadway, suitable to serve a materials processing and removal operation, only across the lands of the grantor in the E. 1/2 of said Section 30 and the W. 1/2 of Section 29, T. 31 N., R. 4 W., N.D.R., from the above-described parcel to the end of Miles Lane or to the end of any county road which may be constructed in an East-West direction between Miles Lane and Smith Road."

IN CONSIDERATION for said transfer, Transferee agrees to pay Transferor the sum of $2,125.00.

IN WITNESS WHEREOF, the parties hereto have executed this agreement the date first above written.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
JAMES A. HOE, Director

JUN 26, 1972
By: [Signature]
County Clerk

APPROVED:
Director of General Services

By: [Signature]
Chief Land Agent Aug 17 1972

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

By: [Signature]
Executive Officer
Wildlife Conservation Board

[Amendment]