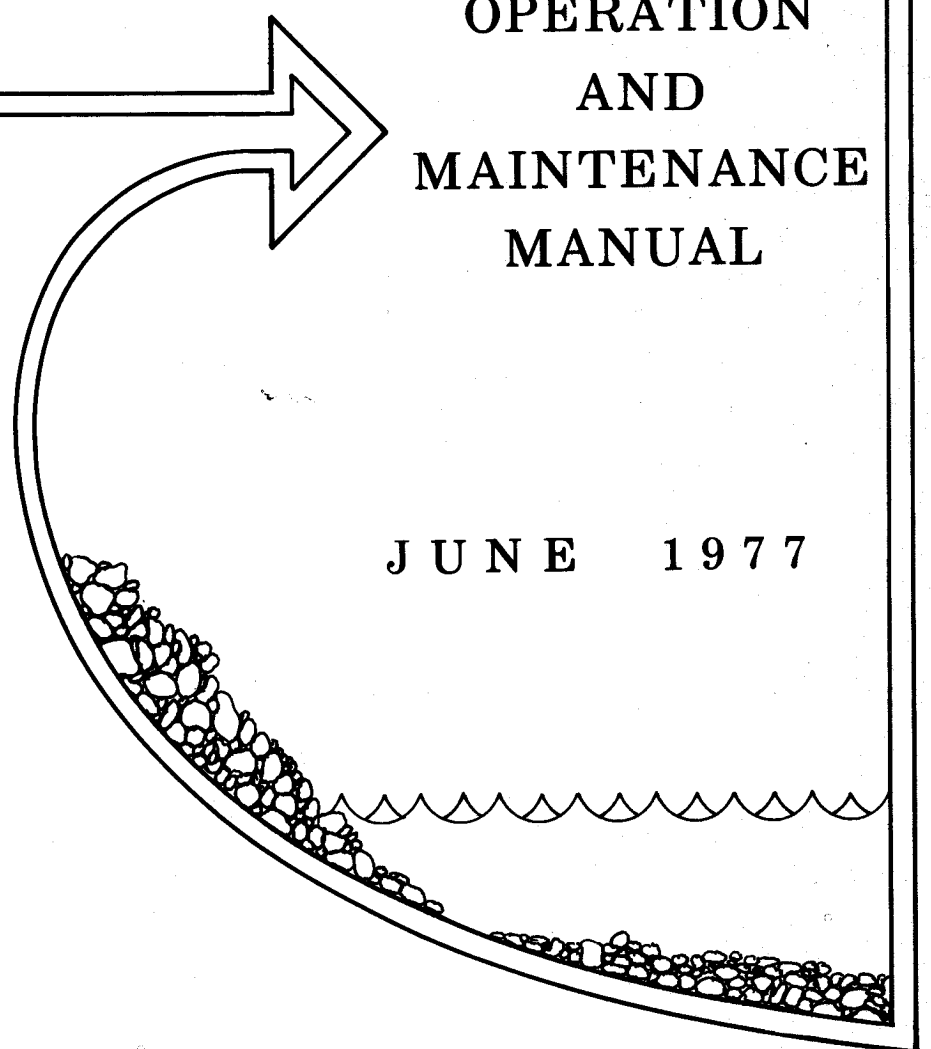
ALAMEDA CREEK FLOOD PROTECTION CHANNEL

OPERATION AND MAINTENANCE MANUAL

JUNE 1977



U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO
CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA

FOREWORD

This manual* has been prepared by the District Engineer, U.S. Army Engineer District Corps of Engineers, San Francisco, California.

It is to be used as a guide by the Alameda County personnel responsible for maintenance and operation of the Alameda Creek Flood Control Project.

In content it agrees with SPN OM 500-1-1 "Natural Disaster Activities" published by the San Francisco District.** The latest edition of that manual is to be used to supplement the information in this manual.

Maintenance in accordance with this manual is necessary to assure the proper functioning of the improved channel and the continuation of its benefits.

H. A. FLERTZHEIM, JR.
Colonel, CE
District Engineer

Date: 8 June 1977

*Development of the marsh in Pond 3 is still the responsibility of the Corps of Engineers. At a future date, a supplement to this manual will be issued, describing the maintenance procedures to be followed by the County.

** Copies furnished Alameda County Flood Control and Water Conservation District with this manual.

OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA

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INTRODUCTION

1. Assurances of Local Cooperation

Continuous operation and maintenance by local interests of the federally financed features of the Alameda Creek Flood Control Project is agreed to in paragraph d. of the excerpted copy of the Board of Supervisors of the Alameda County Flood Control and Water Conservation District, State of California, Resolution No. 5937 dated 26 May 1964, shown on page 2. This resolution was made in compliance with the requirements of Sec. 3 of H.R. 8455, Public Law No. 738, 74th Congress, 2nd Session, Chapter 688 (the Flood Control Act of 22 June 1936), excerpts of which read as follows: "---no money---shall be expended---until---responsible local agencies have given assurances---that they will---maintain and operate all the works after completion in accordance with regulations---."

THE FOLLOWING RESOLUTION WAS ADOPTED:

WHEREAS, the San Francisco District Engineer, Corps of Engineers, U.S. Army, has advised this Board that the Corps of Engineers Design Memorandum on Alameda Creek, Alameda County, California, for Flood Control and Allied Purposes has been substantially completed; and

WHEREAS, flood control on Alameda Creek is vitally necessary for the protection of life and property and for the future growth and development of substantial areas in Alameda County; and

WHEREAS, the San Francisco District Engineer, Corps of Engineers, U.S. Army, has requested an expression in the form of a resolution of this Board indicating the willingness of local interests to meet the conditions of local cooperation on said project; and

WHEREAS, by Resolution No. 4450 adopted on May 31, 1961, this Board had set forth its intention to meet the conditions of local cooperation in connection with the project on Alameda Creek; and

WHEREAS, said conditions of local cooperation has been modified as hereinafter specified;

NOW, THEREFORE, BE IT RESOLVED that Resolution No. 4450 is hereby recinded; and

BE IT FURTHER RESOLVED that it is the policy and intent of the Board of Supervisors of the Alameda County Flood Control and Water Conservation District to take any and all actions within the Board's power to meet said conditions of local cooperation on the said project on Alameda Creek for flood control and allied purposes, as follows:

a. Provide without cost to the United States all lands, easements, and rights-of-way necessary for construction of the project;

b. Hold and save the United States free from damage due to the construction works;

c. Relocate all highway bridges, and approaches thereto, and utilities necessary for the construction and maintenance of the project;

d. Maintain and operate the completed works for flood control in accordance with regulations prescribed by the Secretary of the Army;

e. Prevent any encroachment on flood channels and ponding areas which would decrease the effectiveness of the project for flood control; and

f. Adjust all claims regarding water rights which might be affected by the project.

2. Regulations

Federal regulations controlling operation and maintenance on this project are: (1) - Title 33, Part 208, Section 10 of the "Code of Federal Regulations" as approved by the Secretary of the Army in accordance with authority contained in Section 3 of the Flood Control Act of 22 June 1936 (Public Law No. 738, H.R. 8455) as amended and supplemented and (2) - Dept. of the Army Engineering Regulation "ER1130-2-339 INSPECTION OF LOCAL FLOOD CONTROL PROJECTS.

A copy of (1) above is to be found on the following two pages and a copy of (2) above is to be found included as Exhibit N.

County compliance with Title 33 regulations (hereinafter referred to as "the regulations") as applicable, is required.

3. Project Authorization

This project was originally authorized as the "Alameda Creek Channel Improvement in Coastal Plain" in the Flood Control Act of 1962, Public Law 87-874 as part of the "Alameda Creek Flood Control Project" which document also includes authorization for construction of the Arroyo Del Valle reservoir which is an integral part of the overall flood control plan. It was authorized in accordance with the recommendations of the Chief of Engineers in Senate Document 128, 87th Congress.

4. Project Description

The Alameda Creek Flood Control Project lies entirely within the County of Alameda in California.

Alameda Creek Channel Improvement consisted of straightening and widening and in part riprapping Alameda Creek across the coastal plain, a distance of approximately 12 miles. From the upstream (eastern) end of Niles Canyon in the city of Fremont it extends westward along the original channel to a point just west of the Bay Area Rapid Transit District bridge. From that bridge to a point 900 feet upstream of Decoto Road it has been realigned through a gravel pit area. From Decoto Road to 1,900 feet upstream of the Nimitz Freeway crossing, the original creek is followed except that the meanders are eliminated and the resulting oxbows filled in. From that point on downstream the improved channel leaves the original Alameda Creek bed to follow natural drainage channels southwest toward Newark Boulevard. At Newark Boulevard the channel follows old Patterson Creek westerly to Coyote Hills. From this point on the new channel runs through Coyote Hills Slough for a distance of 2-1/2 miles ending at San Francisco Bay. From station 205+00 westerly the levee is offset from the trapezoidal channel to give a berm on each side about 75 feet wide. This berm is flooded at high tide.

Title 33—Navigation and Navigable Waters

Chapter II—Corps of Engineers

Part 208—Flood Control Regulations

Sec.

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

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

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

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

(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the 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 representatives shall have access at all times to all portions of the protective works.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(d) *Drainage structures*—(1) *Maintenance.* Adequate measures shall be taken to insure that inlet and outlet channels

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

(i) 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:

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

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

(i) The channel or floodway is clear of debris, weeds, and wild growth;

(ii) The channel or floodway is not being restricted by the depositing of waste materials, building of unauthorized structures or other encroachments;

(iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;

(iv) Banks are not being damaged by rain or wave wash, and that no sloughing of banks has occurred;

(v) Riprap sections and deflection dikes and walls are in good condition;

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

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

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

(h) *Miscellaneous facilities* — (1) *Maintenance.* Miscellaneous structures and facilities constructed as a part of the protective works and other structures and facilities which function as a part of, or affect the efficient functioning of the protective works, shall be periodically inspected by the Superintendent and appropriate maintenance measures taken. Damaged or unserviceable parts shall be repaired or replaced without delay. Areas used for ponding in connection with pumping plants or for temporary storage of interior run-off during flood periods shall not be allowed to become filled with silt, debris, or dumped material. The Superintendent shall take proper steps to prevent restriction of bridge openings and, where practicable, shall provide for temporary raising during floods of bridges which restrict channel capacities during high flows.

(2) *Operation.* Miscellaneous facilities shall be operated to prevent or reduce flooding during periods of high water. 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.

(Sec. 3, 49 Stat. 1571, as amended; 33 U. S. C. 701c) [9 F. R. 9999, 10203]

The improved channel conducts the drainage from a 700 (±) square mile area.

One railroad bridge and three vehicle bridges have been reconstructed to span the widened creek. Two new vehicle bridges have been built to provide private access to gravel mining areas severed by the realigned channel. Another railroad bridge has been built to carry the wide gauge double-tracks of the Bay Area Rapid Transit District over the improved creek. Five other bridges (two of which are railroad structures) have required no modification but have been provided riprap protection or concrete wall construction integral with the design channel opening.

Levee protection is provided from approximate Station 13+50 to Dry Creek. The channel is in cut above Dry Creek except through the gravel pit area where high levees are required. Riprap protection is provided on the side slopes above Station 195+00, and bottom riprap is provided upstream of Mission Boulevard. In the reach from Decoto Road to the upper Southern Pacific Transportation Company railroad bridge, seven stone erosion control sills have been placed to flatten the channel gradient to provide a positive control over streambed erosion.

A reinforced concrete drop structure is located at the Western Pacific Railroad bridge (Sta. 520+06.8) to control a channel invert grade drop of 25% (±). Two inflatable rubber dams have been installed at Sta. 492+00 and Sta. 521+28 by the Alameda County Water District to augment groundwater recharge.

Dry Creek is a tributary entering the main Alameda Creek channel at Station 341+68(R). It is protected with riprap from its confluence with the main channel to Alvarado-Niles Road Bridge 1,700'± upstream.

Beautification aspects of this project consist of landscaping with permanent irrigation systems at all vehicle road crossings and all but one railroad crossing and of water-truck irrigation on the levee backslopes and toes all within the right-of-way. Also, special plantings are provided within the levee freeboard zone to a distance of 8 feet downslope from the top of the service roads.

Recreation features (to be maintained by the East Bay Regional Park District) consist of staging and parking areas with associated landscaping, an equestrian trail on the north service-road and a paved bicycle path on the south service-road.

The Del Valle Reservoir element of the project as authorized (see Section 3) consists of Federal cost participation with the State of California in the design, construction, maintenance and operation of Del Valle Dam and Reservoir. The dam is located approximately 5 miles south

of Livermore in "Arroyo Del Valle," a tributary of Alameda Creek. The dam is located approximately 22 miles upstream of the upper end of the channel improvement portion of the project.

5. Protection Provided

The Alameda Creek flood control project is designed to provide "Standard Project Flood" 1/ protection for the metropolitan areas of Union City, Fremont and Newark and to prevent inundation of agricultural areas, railroads and highways. Due to the rapid change of land use from rural to urban the value of the protection is increasing continuously.

The peak flows adopted for the Standard Project Flood are 51,000 cubic feet per second upstream of the confluence with Dry Creek and 52,000 cubic feet per second from Dry Creek to the channel mouth at San Francisco Bay.

Protection from flooding due to local drainage behind the levees is provided by an extensive gravity drainage system of open ditches ending in culverts to convey storm-water through the levee and into the channel. There are no storm-water pump stations.

CONSTRUCTION HISTORY

6. Preface

The original project survey was authorized and funded by the U.S. Congress in 1949. After completion of the survey and the survey report the general and feature design memoranda were prepared. Construction was begun in 1965.

Due to the size and complexity of the project the construction work was carried out mainly in stages or contract "Units" numbered 1 through 12 with supplementary work being done by way of other contracts as required.

Beautification and recreation installations were made mainly in "Phases," numbered I and II with completion of the work being carried out in Contract Units 11 and 12.

7. Federal Contracts

Brief descriptions of Corps of Engineers non-interim construction contracts follow:

1/ "Standard Project Flood," protection is based on the most severe conditions expected.

Unit No. 1
(Contract No. CIVENG-65-259)

Construction work on this contract was started in April and completed in December of 1965. The work consisted of construction of levee bases, retaining dikes, displacement fills and drainage structures between Station 11+85 and 125+00 and of excavation between Stations 147+00 and 237+00.

Levee construction was limited to the placement of the base and retaining dikes. These dikes were placed on the north and south edges of each levee base.

Unit No. 2
(Contract No. CIVENG-66-211)

Construction work on this contract was started in April of 1966; completed in May of 1968. The work consisted of channel excavation, construction of levees, berms and drainage structures; modification of culverts;, placement of riprap protection and the erection of fences and barricades. All channel work was between Stations 130+00 and 405+00. It also included work on Dry Creek.

Unit No. 3
(Contract No. CIVENG-66-228)

Construction work on this contract was begun in May and completed in October of 1966. The work consisted of channel dredging between Stations 23+80 and 129+00 and placement of dredged material in the first set of retention dikes. The construction of dikes for retention of the second "lift" of dredge material was also accomplished.

Southern Pacific Railroad Bridge Replacement
(Contract No. DACW07-68-C-0004)

This is the Southern Pacific Transportation Company bridge which crosses the channel at Station 257+05 between Newark Boulevard and Alvarado Boulevard. Work on this contract was started in August of 1967 and completed in October of 1968. It consisted of the construction and removal of a shoofly with six drainage culverts; the removal of the existing trestle; the construction of a new embankment with three new culverts and the construction of the new reinforced concrete bridge together with related work such as the Lowry Road underpass.

Unit No. 4
(Contract No. DACW07-68-C-0024)

Construction work on this contract was begun in September and completed in November of 1967. It consisted of the construction of a retaining and cross-dike system from Station 27+80 to Station 124+80 for future dredged levee-base containment six to eight feet deep.

Unit No. 5
(Contract No. DACW07-69-C-0002)

Construction was started on this contract in July and completed in October of 1968. The work consisted of channel excavation from Station 449+00 to Station 461+50; channel fill and compaction from Station 461+50 to Station 473+00 and channel bottom excavation from Station 473+00 to Station 492+15. It included channel excavation for the Jamieson Avenue and P.C.&A. bridges preparatory to their construction by local interests.

Unit No. 6
(Contract No. DACW07-69-C-0008)

Construction work on this contract was started in August and completed in November of 1968. The work consisted of channel dredging from Station 20+00 to Station 148+20 for the placement of 250,000+ C.Y. of material between containment dikes. Also included was construction of a system of levee-base dike enclosures and cross dikes.

Unit No. 7
(Contract No. DACW07-69-C-0053)

Construction work on this contract was started in June 1969 and completed in October of 1971. The work consisted of the following items:

-Construction of a concrete drop structure from Station 518+12 to 521+15; levees with additional riprap protection for the remaining channel between Stations 512+75 and 522+15 and the construction of BART bridge piers and footings. Completion Date - October 1969.

-Channel construction work between Stations 403+50 and 517+00; completion of levee closures between Stations 136+70 and 144+10(L) and Stations 232+90 and 240+90(L) and completion of levees, Station 133+75 to Station 149+00(R). Completion Date - October 1970.

-Channel construction from Station 521+65 to Station 577+00. Completion Date - October 1971.

Phase I-Area Planting and Recreation Facilities
(Contract No. DACW07-72-C-0038)

Work on this contract was started in May and completed in November of 1972. It consisted of landscaping and the construction of irrigation systems, trails, ramps and parking facilities from Newark Blvd. upstream to Station 574+00+.

Unit No. 8
(Contract No. DACW07-72C-0032)

Work on this contract was started in March and completed in November of 1972. It consisted of a levee closure from Station 342+(R) to 345+(R) and channel construction with related work from Stations 575+50 to 611+10. The related work included riprap placement, seeding and the construction of service roads and fourteen drainage structures.

Phase II-Area Planting and Recreation Facilities
(Contract No. DACW07-73C-0060)

Work on this contract was started in April and completed in August of 1973. It consisted of landscaping and the construction of irrigation systems on the right side of the channel from the Dry Creek confluence upstream to Decoto Rd and from Station 574+00 upstream to the end of Niles Canyon Staging Area(L). It also included the construction of hiking trails, equestrian trails, trail ramps under bridges, picnic areas and other miscellaneous related work.

Unit No. 9
(Contract No. DACW07-73C-0019)

Work on this contract was started in August of 1972 and completed in August of 1973. It consisted of the construction of berms in 1972 and the buildup of levees in the year 1973 from Station 11+50 to Coyote Hills. It also included the removal of the drainage structure and twelve settlement gages at Station 91+05(R) and bedrock in way of the new channel from Station 129+25 to 131+50(L).

Unit No. 10
(Contract No. DACW07-73-C-0073)

Work on this contract was started in January of 1973 and completed in May of 1974. It consisted of dredging approximately 700,000 cubic yards of material between Stations 0+00 and 160+00 with placement in Pond #3 disposal area.

Erosion Control Sills
(Contract No. DACW07-75-C-0021)

Work on this contract was started in August and completed in October of 1974. It consisted of the construction of the three erosion control sills at Stations 412+00, 432+00 and 452+00 (identified as sills No. 1, 2, and 3 respectively).

Unit No. 11
(Contract No. DACW07-74-C-0076)

Work on this contract was started in July and completed in November of 1974. It consisted of levee construction work from the Bay to Coyote Hills including buildup and shaping; excavation of a 7,915-foot long ditch for conducting drainage from Plummer Slough on the north through the Station 157+80±(R) drainage structure; modification of drainage structures at Stations 148+00±(L) and 151+80(R); building of the Newark Staging Area; construction of a manhole at Station 609+00(L); constructing an 18" storm drain and construction of gravel surfaced roads.

Unit No. 12
(Contract No. DACW07-75-C-0061)

Work on this contract was started in June and completed in November of 1975. It consisted of completion of all unfinished elements as follows:

Construction of the last four (numbers 4, 5, 6 and 7) of the series of seven erosion control sills; construction of trail ramps and service roads; breaching of the existing bayside dike and construction of a slough to convert the former Leslie Salt Company's Pond No. 3 into a salt water marsh;

Completion of construction on the two staging areas and the three parking areas and completion of all landscaping;

Repair work on formerly constructed service roads and on drainage structures at Stations 518+35(L), 518+60(L) and 568+38(R) and replacement of plantings from Station 218+00 to 574+00;

Grading of the channel bottom between Stations 460+00 and 575+00 and silt removal between Stations 152+50 and 310+00(±);

Landscaping of the channel reach between Coyote Hills and Newark Boulevard.

8. Non-Federal Work

In compliance with the provisions of the Flood Control Act of 1936 and the applicable County of Alameda resolution, separate work has been completed and paid for by the County.

Included in this work was the acquisition of all project rights-of-way for construction, removal and/or relocation of numerous utility service lines, replacement of the Newark Boulevard, Alvarado Boulevard and Decoto Road (Bell Ranch) bridges, and construction of the Jamieson Road Bridge and the Pacific Cement and Aggregate bridge.

CHANNEL DESCRIPTIONS[1/]

9. The Main Channel

a. Point of Origin

The point of origin (Station (0+00) for stations on Alameda Creek is located at the intersection of coordinates 1,526,830 East and 390,210 North, which plane grid coordinates are based on the State of California System, (Lambert Conformal Projection) Zone III, California as described in Special Publication No. 253, published by the U.S. Coast and Geodetic Survey. All elevations referred to are based on datum of mean sea level.

b. The Channel Bottom

The channel bottom width varies from 400 feet at Station 0+00 to 130 feet at Station 611+50. The bottom rises approximately 75 feet in 11.5± miles.

c. The Levees

Levees are constructed on both banks except from Station 0+00 to 11+50± (the bay outlet) and those places where the channel is in cut. They are designed with a three-foot freeboard above design water surface with a minimum number of changes in the top slope. Service roads are 12' wide and consist of a 6" mineral aggregate surface course on compacted fill. From Station 16+00 to Station 604+00± the left half of the left service road is a bituminous seal-coated bicycle path.

From Station 11+50 to Coyote Hills the velocities are relatively low. The levees receive their protection in that reach by virtue of cohesive clay surfaces and from there to Newark Blvd. by virtue of sandy clay surfaces. Both are further protected by a grass covering. From just below Newark Boulevard at Station 182+00± to the upstream end of the project the levees are protected by riprap.

10. The Dry Creek Tributary

Dry Creek enters Alameda Creek from the north at Station 341+68(R). Its channel has been improved from Alameda Creek to Alvarado-Niles Road Bridge. The channel bottom width varies from 15 feet at Station 11+02 to 12 feet at the bridge. The gradient is approximately 15 feet in a length of 1,700 feet. The levee side slopes are protected by 18-inch riprap. The levee service roads are constructed similar to those which parallel the main channel.

1/ All further channel details are shown on the inclosed set of drawings and the drawings listed in Exhibit "J".

CHANNEL MAINTENANCE

11. Preface

A well organized inspection schedule is an indispensible part of the channel maintenance program. A comprehensive check list such as Exhibit A is to be used during the inspection to ascertain that no feature is overlooked. Post flood-season inspections of channel bottom and levee are to be made directly following each flood season to allow time for completion of maintenance work before start of the next flood season. Pre-flood-season inspections are to be made preceding each flood season to insure operability of the channel and to insure that deficiencies noted during the post-flood season inspections have been corrected.

Action for correction of deficiencies is to be taken immediately upon discovery.

Structural damage to any bridge is to be reported immediately to the owner.

12. Maintenance Measures

Maintenance is to be carried out in accordance with the regulations (Title 33).

In addition to maintenance procedures described in the regulations the following maintenance measures are to be taken:

-The channel is to be excavated as frequently as necessary to insure that the channel will contain the design flow. Therefore, as a minimum, sediment is to be removed down to original channel design grade and cross section everywhere along the channel where it threatens to reach a maximum allowable cross sectional average deposition depth of 2.5 feet over the bottom width of the channel. Permanent ranges for channel cross sections are to be established and surveyed at least once each three years to provide an estimate of channel aggradation. If it is visually apparent that significant aggradation is occuring, the channel is to be surveyed more frequently.

Eroded areas beneath structures are to be cleared of debris and loose material down to firm undisturbed earth. The eroded areas are then to be filled with concrete or riprap properly designed to prevent future erosion.

-Displaced riprap is to be replaced so that the channel is brought to design grade. It is to be replaced as soon as practicable after the recession of flood water.

-All repairs are to be made in accordance with approved engineering standards and by qualified personnel.

-The grade of the levees should be checked to be sure that settlement or sloughing has not materially lowered their protective height. In all

cases where the levee grades settle below the design elevations by more than one foot, fill material similar to that used in the original construction is to be placed and compacted to obtain design grade. All objectionable material is to be removed, the levee surface scarified to a depth of approximately six inches, and the new fill placed and compacted in layers. Where service roads have settled and are to be repaired, gravel that is salvagable may be removed, stockpiled and reused.

-Debris is to be removed when it collects in an amount sufficient to cause damage to riprap or to any structure, to cause erosion, or to restrict the channel.

-Surfaces of the levee roads and access roads are to be maintained in original condition. All holes, soft areas and damaged road surfaces are to be repaired annually. Bituminous surfaces are to be cleaned down to firm undisturbed material and then patched or completely replaced, as required, with like materials thoroughly bonded to the undisturbed asphalt.

-Levee Vegetation

Ornamental trees and shrubs: Care for these plantings is covered under Section 32.

Area surrounding ornamental trees and shrubs (a zone 15 feet wide): All growth except grasses is to be removed from these zones and regrowth prevented. Grasses are to be cut or mowed to prevent interference with ornamental plantings and to reduce fire hazard. Cuttings are to be removed from the project area.

Channel bottom, berms and berm slopes in the downstream end of the channel subject to tidal action: All wild growth except flexible grasses and pickleweed is to be cut as close to the ground as possible and cuttings are to be removed. Stumps and stubble are to be sprayed or painted with a herbicide.

-Channel Side-slopes: Except for landscape plantings and for wild growth which is allowed as described below, the channel side-slopes are to be kept clear. Grasses are to be mowed as close to the ground as possible. Volunteer plants other than grasses and pickleweed are to be removed before they are four feet high except as follows: clusters - not more than ten feet average diameter and spaced no closer together than fifty feet edge to edge and single plants - no closer than thirty feet to any other plant may be allowed to remain uncut. Cuttings are to be removed from the project area.

Selection and use of herbicides and pesticides is to be made in compliance with applicable Federal, State and local regulations. Special notice should be taken of EPA's guidelines on the handling, use and disposal of pesticides.

-Post High Water Inspection: An inspection is to be made after each streamflow exceeding 5,000 cfs. If scour debris or sedimentation endanger the integrity of the channel, emergency repairs are to be undertaken.

OPERATION AND MAINTENANCE OF INTERIOR DRAINAGE

13. Description

Sixty-three drainage structures are installed through the levees at strategic locations to pass interior drainage into the project channel. Each is designed to function adequately under its design load.

Nine are fitted with flap-gates and slide-gates with lifting devices (see sheet #1 of Exhibit C for listing).

One is fitted with only a slide-gate to permit diversion of part of the channel flow to old Alameda Creek (see sheet 4 of Exhibit C).

Twenty-nine are fitted with only the flap-gate (see sheet 2 of Exhibit C for listing).

The remaining twenty-four are storm-drains without gates (see sheet 3 of Exhibit C for listing).

14. Operation

Slide-gates are to be kept in a fully open position during both flood and non-flood seasons. They are to be closed only to prevent backflooding caused by a malfunctioning flap gate and to facilitate flap gate maintenance.

Flap-gates function automatically and require no manual operation except during maintenance.

The slide-gate lifts are operable with hand-crank or gasoline-driven portable wrenches which are stored in the ACFC & WCD field office. For further operating instructions see the regulations, paragraph (d), (2).

15. Maintenance

The drainage structures are to be maintained so that they do not leak, or show erosion, damage or corrosion and so that they function properly.

a. Inspection

Each drainage structure is to be inspected early enough in the season to allow time for repair or maintenance before the onset of the rain season.

Flap-gate Inspection

- Inspect entire gate for corrosion - especially the machined faces.
- Close the gate and check the alignment and seating.
- Inspect the adjustable pivot points for damaged studs and for any stiff, binding action.
- Inspect the assembly bolts and pivot lugs for corrosion and shearing.
- Inspect for trash and sediment deposit that interferes or might interfere with the movement of the gate and flow of water.

Slide-gate and Gate-lift Inspection

- With gate open, inspect surfaces, frames and machined seating faces for corrosion.
- With gate closed, inspect guides and gate stem (especially the threads) for corrosion.
- Check clearance between seating faces and check adjustment of wedges for fit and check them for damage. Check for dried grease and foreign material which may be carried into the threads of the lift-nuts.
- Check for ease and freedom of operation of the gate-lifts and leave the gate in a full-open position.
- In addition, whenever high water conditions impend, all gates are to be inspected before water reaches the inverts. Objects which might prevent closure of the gates are to be removed.

b. Preliminary Preparation

Before repair of corroded surfaces the surface grease and oil is to be removed with solvent.

Corrosion is to be repaired with gates in place.

Wedging devices have been shop-adjusted and are therefore not to be removed.

Before cleaning and painting operations, all machined surfaces are to be protected with masking tape and the tape removed when the work is completed.

During the maintenance and repair work the stream and tide water is to be diverted. Where there is a multiple structure it may be diverted through gates other than the one being worked on.

c. Cleaning and Painting

Clean the corroded areas (except slide gate lift, galvanized and stainless-steel parts) by scraping, scaling and chipping to remove the bulk of the coating. Follow this with wire brushing to remove residues. Apply three coats of tar-base paint conforming to MIL-C-18480A. A special primer is to be used under the tar-base paint only if and as recommended by the manufacturer. The material is to be heavily applied by brush at a coverage rate of approximately 80 square feet per gallon to give a total dry film thickness of at least 40 mils for the completed coating. The paint shall not be thinned unless recommended by the manufacturer. Brushed strokes shall be at right angles to those of the preceding coat. Application and drying time between coats shall be as recommended by the coating manufacturer. Field painting shall be performed under dry conditions and within the atmospheric temperature ranges recommended by the paint manufacturer.

Corroded areas on slide-gate lifts are to be cleaned by wire brushing. The cleaned areas are to be given two coats of black machinery enamel. If recommended by the paint manufacturer, a suitable primecoat shall first be applied.

The corroded areas of all galvanized parts such as ladders, fencing and grating are to be cleaned by wire brushing after which two coats of red lead primer are to be applied conforming to Federal Specification TT-P-86e and AM-4, "Paint, Red-Lead-Base, Ready-Mixed," Type 1 and followed by a finish-coat of aluminum paint which is to consist of aluminum paste conforming to Federal Specification TT-P-320b, Type II, "Pigment Aluminum, Powder and Paste, for Paint"; Class 2(B); and varnish conforming to Federal Specification TT-V-119 and AM-2, "Varnish, Spar, Phenolic-Resin," thinner compatible with the varnish. The paste, thinner and vehicle are to be field-mixed according to the written instructions of the paint manufacturer.

Wooden gate-well covers are to be maintained in original condition or replaced in kind as necessary.

d. Lubrication

Lubrication shall be performed at least once every 90 days as follows: The machined faces of the flap gates shall be cleaned and greased with a water resistant grease such as Conoco's "All-Purpose Superlube" or Texaco's "Multi-Fax Heavy Duty No. 2," or Shell Oil Company's "Alvania No. 1," "Lubriplate No. AAA," or equal.

The pivot points and lifting links are to be lubricated with a penetrating oil while moving the gate back and forth. Gates equipped with grease fittings shall be lubricated by applying the above specified grease through the fittings under pressure. Should the gates bind or be frozen they are to be disassembled and the bolts, studs and bronze bushings cleaned and lubricated with the same grease as used for the machined faces. Any broken or worn-out bolts, studs and bushings are to be replaced. Where steel bolts and studs are to be replaced, the replacement fittings material shall be stainless steel within the AISI 300 Series.

The seating faces and wedging surfaces of slide gates are to be cleaned and greased using the same type of grease as specified for machined surfaces. Clean threaded portion of gate stem and oil the threads lightly. If binding occurs during operation of slide gate it is probably due to excess dried grease or foreign material carried into the threads of the lift nut. If serious binding occurs remove the threaded stem from the lift nut and clean the threaded interior. To permit visual inspection and maintenance of the entire length of the threaded stem it will be necessary to remove the stem-cover (on gate lifts so-equipped) and the lift pedestal. The lifts have been factory lubricated with a water-resistant grease designed to stay pliable and not dry out over long periods and wide temperature ranges. Pressure-grease the lift through the grease fittings. For best results, the input shafts of the lift shall be turned 3 or 4 times and grease applied to each fitting after each turn. This will insure adequate lubrication of all parts. Over-lubrication is impossible. Grease with the same grease as specified for the machined surfaces. If the slide gate shows signs of binding or looseness of operation due to improper setting of wedges, the wedges are to be adjusted in accordance with manufacturer instructions.

e. Miscellaneous Repairs

Clean out debris and sediment which may obstruct operation of gates or flow of water. Repair any scoured earth embankment or riprap areas with the same material as original. Damaged surfaces in corrugated pipes are to be cleaned and coated with suitable bituminous paint.

16. Post High Water Inspection and Restoration

After each storm which inundates the drainage structures an inspection is to be made and maintenance is to be performed to insure that:

- All inlet and outlet structures are free of any debris or deposition that might interfere with the free flow of water;
- All flap-gates and slide-gates are free of debris and deposition that would inhibit their functioning;
- All flap-gates and slide-gates are in good mechanical condition and function properly;
- All gate-wells are clear of debris and sediment that might interfere with gate functions and water flow;
- All pipes (including those without gates or controls) are free of debris that could inhibit or prevent efficient operation;

ALAMEDA COUNTY WATER DISTRICT RESPONSIBILITY

The Alameda County Water District is a permittee of the Alameda County Flood Control and Water Conservation District. Operation and maintenance of any gates, valves, structures and dams affecting this flood control channel shall conform to this document regardless of their ownership. The Alameda County Flood Control and Water Conservation District will insure that the provisions of this manual are complied with and will take such steps as are needed to attain that end.

17. Water Diversion Systems

Four water diversion systems supply water to four abandoned gravel pits for groundwater recharge. Another is designed to divert 40 c.f.s. maximum to old Alameda Creek for riparian rights.

For flood-season security and water control four of the five systems are equipped with slide-gates and lifts and one system is equipped with a gate valve (see Exhibit C, Sheet 4 for complete descriptions).

Operation: The slide-gates and the gate valve are to be kept closed except when being used to divert water.

Maintenance: For maintenance of these systems the Water District should be advised annually to follow the same general procedure as outlined in Section 15 and for post-flood inspection and restoration as outlined in Section 16.

18. Fabridams

The Fabridams are located at Stations 492+00 and 521+50 and are designed to collapse automatically during high water. The dams are to be operated and maintained in accordance with the manufacturer's maintenance and operating instructions to insure that they will collapse as designed. In the event of failure of automatic features, the dams are to be manually deflated as rapidly as possible.

19. Temporary Dams

Construction: These dams are not to be constructed of material taken from within the project right-of-way and are not to be constructed before 15 April of any year. They are to be constructed according to Item 9 of Exhibit J, Sheet 4 with emphasis on building a low sill at the center of the dam.

Removal and Maintenance: Prior to 15 November of each year the dams shall have been removed to design channel grade and materials removed from the project right-of-way. Also any displaced riprap and all other damage to the channel shall have been repaired before that date.

WATER SUPPLY PUMPING SYSTEMS

20. General Description

There are three pumping systems on the project which must be maintained in good working order. Two of these are for irrigation and the the third for supply to the drinking fountain in the New Haven Staging area.

One of the irrigation pumps is located at Station 522+25(R) next to the Shinn pit. The other is in the approximate center of the New Haven Staging Area. The pump for the drinking fountain takes water from the same well as the New Haven area irrigation pump.

The irrigation pump at Station 522+25(R) draws water from the abandoned Shinn gravel pit pond by way of a strainer-fitted 3" suction

hose. The irrigation pump is a 3"x3" centifugal self-priming Barnes Pump Co. Mod. 17M Ser. 19CCC/42/22397 pump with a capacity of 60 GPM under a 135-foot head. It is powered by a four-cycle Wisconsin gasoline engine, Mod. AENLD, Ser. 5041583. The discharge line is a 4-inch galvanized steel line with two flexible joints, a pressure vacuum breaker assembly in a locked concrete box and a blow-off valve on the inner slope of the levee (see Exh. J, Sh 2, Item 11).

The irrigation pump in the New Haven Staging Area draws water from a 12-inch well directly below the pump. The pump is a Jacuzzi, Model 5MC8B3, WHP1900 T129A deep-well turbine with a 5H.P. 3Ph, 220/440 volt 50-60 cycle type SCU, Frame 254-4 electric motor, Ser. 2416389. The pump discharges into a 4-inch valved steel line. The 4-inch line is reduced to two inches to accommodate a pressure vacuum breaker system. It then increases to a 2-1/2-inch diameter irrigation line (see Exh. J, Sh. 2, Item 13).

The pump for the drinking water fountain is a Berkeley Pump Co. Model D3-50, Serial No. 7330619, 1/2 H.P. jet pump with a 65 GPH, 40 p.s.i. discharge pressure at the 70-foot installed jet depth. The jet is installed in the 12-inch New Haven Area irrigation pump casing and the pump discharges into a 40 gallon, 20 to 40 p.s.i. pressure tank adjacent to the pump and to the New Haven Staging Area drinking fountain.

The above described pumps are enclosed in locked sheet-metal sheds which are to also be included in the maintenance program.

21. Operation and Maintenance

For instruction on operation and maintenance of the pumping systems refer to page 5 of this manual, (paragraph (f), (1) and (2) of the regulations) and to the manufacturer's catalogues and manuals pertaining to the specific equipment.

THE OPERATION AND MAINTENANCE SUPERINTENDENT

22. Authority

The office of Superintendent and its function is a mandatory requirement as stated in the regulations (Title 33).

23. Duties

The duties of the Superintendent are as provided in the regulations and as follows:

Weather Forecasts: The Superintendent is to keep posted on weather forecasts so that flood fight forces can be mobilized in time. Also, the Superintendent is to utilize raingage observers in the headwaters of the basin to keep him informed on precipitation and the possibility of flooding.

Training of Key Personnel: Key personnel should be trained to sufficiently carry out field inspections (see par. 15 and 25) perform regular maintenance work and handle the problems of flood control in a quick and orderly manner. The Superintendent should have the name, address, and telephone number of each key man and of each of a reasonable number of substitutes. Also the key-men should have this information on their subordinates. The organization of key-men should include a substitute who can act in the absence of the Superintendent and enough section foremen with leadership qualities to lead maintenance patrol work of the entire levee.

The Semi-Annual Report: Paragraph (a), (6) of the regulations cites the mandatory requirement for submittal of a semi-annual report by the Superintendent to the District Engineer, Attn: Emergency Operation Planner," covering inspection, maintenance and operation of --- the project."

The report is to be submitted within the ten-day periods prior to the first day of May and the first day of November of each year. It is to include dated and signed copies of all field inspection reports (see Exhibits A and B) made over the period being reported on.

In addition to the completed field inspection report forms, the report is to contain all additional pertinent information including dates and descriptions of proposed and completed temporary and permanent repairs.

SUGGESTED METHODS OF COMBATING FLOOD AND OTHER DAMAGE

24. General Statement

Most of the methods described here are based on years of experience with the problems that arise during floods. However, they are not intended to restrict the Superintendent or others concerned to a rigid set of rules for every condition that may arise. If problems arise that are not covered by these suggestions and the Superintendent is in doubt about procedure, he is to consult the District Engineer, U.S. Army Engineer District, San Francisco, California, meanwhile following standard flood control procedure as nearly as possible. It is better to be overprepared for a flood fight than to find at the last moment that preparations were inadequate. Confidence of the protected parties is a valuable asset that should not be lost through inefficient operation of the protection system in time of emergency.

Earthen levees: The integrity of any earthen levee is threatened whenever there is water against it. The danger increases with the height of the water, the duration of the flood and the intensities of current and wave actions. A well-constructed levee of proper section, if well maintained and not overtopped, should hold throughout any major flood. However, an accident may result in a break. Foundation troubles may result in sand boils or a sinking levee and the use of unsatisfactory local materials can result in slides. However, failures can be prevented if prompt action is taken and correct emergency treatment is used. Wave-washout is to be expected whenever the levee is exposed to a wide stretch of open water and it can be a threat if not repaired.

Premeditated damage: The Superintendent is to guard continually against premeditated damage (vandalism).

Personnel of the Corps of Engineers, U.S. Army, whether military or civilian, are not vested with any civil police authority in performance of their engineering duties and they are not to assume 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. In the event that local law enforcement agencies prove inadequate, local interests, as provided by law, can request the aid of State forces and the aid of Federal troops if additional support becomes necessary.

25. Field Inspection

Personnel under the supervision of the Superintendent are to perform 90-calendar-day periodic inspections of the project to determine the condition of all of the various components of the project and any repair or replacement required.

The first inspection of each year is to be made well in advance of the flood season so that required repairs may be completed before the floods. Thereafter periodic inspections are to be made before and after every high water period during the flood season (see sections 12, 15a and 16 above) and, otherwise, throughout the year at intervals not to exceed ninety days.

In addition inspections are to be made after every earthquake within 200 miles with a Richter magnitude of 5 or above. Inspections are also required after smaller earthquakes if specific reports of damage are received.

Copies of forms such as Exhibits A and B are to be filled out during each inspection. They are to be used to implement required repairs and to prepare the semi-annual report to the District Engineer, San Francisco District Corps of Engineers. Particular attention is to be paid to the following:

- Condition of the main channel noting obstacles, dikes, debris, etc. that will substantially reduce capacity or create sufficient turbulence to scour channel bottom or banks.

- Condition of levees and any recent repairs.

- Condition of structures, culverts, flap and slide gates. (See Section 15.)

- Condition of access and service roads, especially to areas where problems are likely to develop.

- Availability of emergency supplies (quantity, location, condition).

- Communications with operating personnel (telephone, radio).

- Availability of personnel on short notice (operators, labor, etc).

26. Preliminary Repair Work

Because the water level rises and falls very rapidly on this project, the amount of work that can be accomplished after the water level starts to rise and before it reaches the maximum for that flood is minimal. Therefore, it is imperative that the project be kept in condition to accept design floods during the flood season. Work that requires a temporary weakening of any levee, bank or structure should not be undertaken during the period from November through March. Repair work during this period should be confined to emergency repair of damaged areas.

27. Disaster Relief

It is the responsibility of local, state and municipal authorities, supported by and/or working 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 in extreme cases where local resources are clearly inadequate to cope with the situation.

28. Flood Fight

If after preliminary organization and precautions a flood fight is necessary, the following procedures may be adopted.

Sand Boils: These are danger spots and are serious. The common system for 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 discharging from the boil (see Exhibit D). 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 material are observed a sack sub-levee may be built around the entire nest of boils high enough so that none of the boils will discharge with enough force to displace any material.

Wave Wash: The Superintendent and Sector Foreman should examine the levee well before and during flood flows to find sites of probable wave washing.

Supplies of rolled bagging material and filled sacks are to be held in readiness on wooden pallets.

A well sodded slope should withstand flood flows of an hour duration.

During periods of high wind and high water an ample labor force should be on standby. Experienced men should be assigned to watch for signs of erosion.

When it is necessary to protect the slope it may be done in accord with Exhibit E or F, whichever is appropriate.

Scours: Areas of high current velocities should be watched for slope-scours, especially pipe and structure penetrations.

The standard method of retarding scour-erosion is to construct a mat of stakes and brush over the eroding area. An approved method is to drive stakes of appropriate size and wire the brush (or lumber if brush is not at hand) in place and weighting it all down with sacks of gravel or stone.

29. Levee Topping

The levees are to be continuously maintained at designed grade. If, through accident or neglect, any area is found to be below grade at flood time, either sack topping or lumber and sack topping are to be placed in accord with Exhibits G and H, respectively.

30. Transportation

When equipment must be moved over roads that have become impassable due to mud or sand, passage may be provided by laying a plank road or by laying sheet steel or wire mats.

31. Liaison with District Engineer, Corps of Engineers and Use of Government Plant

It is the overall objective of the Corps of Engineers to insure the integrity of its flood control works. Therefore it is necessary, especially during emergencies, that liaison be maintained between locally responsible parties and the Corps of Engineers so that if an emergency arises that is clearly beyond the capabilities of local interests, the Corps of Engineers may assist. The District Engineer, U.S. Army Engineer District, San Francisco, California, is authorized to use or loan Government property and plant in cases of emergency where life or property is in danger where no suitable other equipment is available provided that such action is without detriment to the Government. However, no assistance by the Government will be given unless it is requested by the locally responsible party and local capabilities have been exhausted.

RECREATION AND BEAUTIFICATION

32. Recreational Areas

General Description: The recreation areas as shown on the project drawings, consist of the Newark Blvd., New Haven and Niles Canyon staging areas, the Beard Rd., Decoto Rd. and Jamieson Rd. parking areas, a bicycle path and a bridle path.

Maintenance

General: Recreation areas are maintained by the East Bay Regional Parks District under the direction of the Alameda County Flood Control and Water Conservation District.

Plantings: All plantings in recreation areas are to be watered, weeded, cultivated, sprayed, pruned and replaced as necessary to keep them healthy and attractive. That portion of paragraph 12 dealing with herbicides and pesticides is applicable.

Pruning is to be limited to the minimun that is necessary to remove injured limbs and branches and to shape the trees and shrubs for best serving the purpose for which they were planted. All cuts shall be made flush, leaving no stubs. Cuts over one inch in diameter shall be painted with an approved wound dressing. In all instances, good pruning practices should be followed as described in Sunset Pruning Handbook and Shade Tree Pruning and Tree Preservation Bulletin No. 4 by the National Park Service.

Other features: Fences, parking stalls, bicycle paths and the bridle path are to be kept in good repair and irrigation systems in functioning condition. Sanitary facilities, picnic facilities and drinking fountains are to be kept neat, clean and functioning.

33. Non-Recreational Landscaping

General Description

Levees are landscaped from the foothills at the upper limit of the project, to Coyote Hills at Station 125+00. With proper maintenance and care the plantings within this area will in time become a dominant feature forming a park-like open space within residential and commercial areas. The last paragraph of Section 12 dealing with herbicides and pesticides is applicable.

Maintenance

(1) The area between the right-of-way line and the outer levee toe was planted with large plants to act as a screen. These plants will have a minimum effect on levee maintenance practices. Therefore, plants should be allowed to keep their low branches and to grow dense.

(2) The area between the outer levee toe and the top edge adjacent to the service roadway has been planted with trees and shrubs. The trees in the upper one-third of the slope are to be pruned up to a clearance of 10 feet above the level of the levee road. This is to be done by gradually removing the lower branches as the tree develops.

(3) Grass and weed growth that is a fire hazard or unsightly is to be cut and removed from the project. Also it is to be kept mowed and removed from under all plantings and at crossroads.

(4) The trees planted in the top seven slope-feet of the levee on the water side should be trunk-trimmed to allow 10 feet of vertical clearance for passage of maintenance vehicles on the service road.

(5) Channel bottom, berms and berm slopes: All growth except flexible grasses and pickleweed is to be cut flush with the ground and removed from the channel. The stumps and stubble are to be sprayed or painted with herbicide to prevent further regrowth.

(6) Inside channel slopes: All wild growth over four feet in height is to be cut flush with the surface and growth under four feet is to be removed so that individual plants left are spaced at least thirty feet apart. When plants are left in clusters the clusters are to be not more than ten feet in diameter and spaced at least fifty feet apart. Stumps or stubbles resulting from cutting are to be sprayed or painted with herbicide to prevent regrowth. Also, for guidance in approximate finished condition required see Exhibits "O", "P", and "Q".

(7) There is to be no cutting of vegetation or use of herbicides during the primary nesting season of wildlife, i.e., 1 April to 1 August.

ALAMEDA 1555

ALAMEDA CREEK
OPERATION & MAINTENANCE
INSPECTION AND REPORT CHECKLIST

Period: By:
From: To: Date:

Item	Check*	Item	Check*
Levees		**Mechanical**	
1. Service Roads		25. Drainpipes	
2. Bridle Trails		26. Flapgates	
3. Bicycle Paths		27. Slidegates	
4. Access Roads		28. Gate Lifts	
5. Riprap		29. Gate Wells	
6. Slope Erosion		30. Gatewell Fence Enclosures	
7. Animal Burrows		31. Gatewell Gratings	
8. Sandboils and Seepage		32. Vertical Ladders	
9. Right-of-Way		33. Pumps	
10. Detrimental Growth		34. Electrical	
11. Barricade		35. Power Wrenches	
12. Fencing		36. Other	
13. Signs		**Recreation Areas**	
14. Plantings		37. Plantings	
15. Drop Structure		38. Irrigation Systems	
16. Other		39. Parking Facilities	
Channel Bottom		40. Picnic Facilities	
17. Siltation		41. Toilets	
18. Erosion		42. Drinking Water Systems	
19. Trash		43. Access Roads	
20. Riprap		44. Trash	
21. Drop Structure		45. Other	
22. Fabridams			
23. Temporary Dams			
24. Other			

Comments:

---

* √ = No maintenance work required.
x = Maintenance required (see appended sheet for explanation).

NOTE: THIS SHEET IS AN EXAMPLE AND IS NOT TO BE FILLED OUT OR REMOVED FROM THE MANUAL.

Exhibit A

ALAMEDA CREEK
OPERATION AND MAINTENANCE
MAINTENANCE DESCRIPTION

Item:_____ (from Exhibit A)
Signature:
Date:

Description of Damage

Maintenance Performed

Precautions Taken Against Further Like Damage

Discussion

NOTE: THIS SHEET IS AN EXAMPLE AND IS NOT TO
TO BE FILLED OUT OR REMOVED FROM MANUAL.

Exhibit B

ALAMEDA 159

TABLE OF ALAMEDA CREEK DRAINAGE STRUCTURES

DOUBLE-GATED [Flap-gate (except as noted) & Lift-gate] DRAINAGE STRUCTURES

Station	Bank	Mat'l	Conduits		Gate Equipment Armco Model Nos.		
			No.	Size	Lift	Slidegate	Flapgate
148+00	L	CMP	4	48"	CPE12	50-10C	20C
151+80	R	"	3	"	"	"	"
221+40	L	RCP	8	60"	"	"	"
278+50	R	"	1	18"	CPE2	20-10C	"
291+67	L	"	1	24"	"	"	"
302+65	L	"	1	48"	CPE12	50-10C	"
365+58	R	"	3	72"	CPE12	50-10C	"
423+30	R	"	3	48"	CPE4	"	"
			DRY CREEK TRIBUTARY				
4+30	L	RCP	3	60"	CPE12	50-10C	20C

Exhibit C

Sh 1 of 4

FLAP GATED DRAINAGE STRUCTURES
(Armco Model 20-C)
(Except as Shown)

Station	Bank	Mat'l	Conduits No.	Conduits Size	Comments
356+16.32	R	RCP	1	24"	36" M.H. Landward of levee
361+00	R	"	1	15"	" " "
369+85	R	"	1	30"	Waterman, Mod. F-10
517+60	L	RCP	1	27"	
518+60	L	"	1	24"	Flatback Flapgate
518+90.6	L	Perforated	1	6"	Subdrain outlets at drop structure wall
518+90.6	R	"	1	"	" " "
518+96	L	"	1	"	" " "
"	R	"	1	"	" " "
519+20	L	"	1	8"	" " "
"	R	"	1	"	" " "
519+35	R	RCP	1	24"	" " "
"	L	Perforated	1	6"	" " "
"	R	"	1	"	" " "
519+49	L	"	1	8"	" " "
"	R	"	1	"	" " "
519+54.2	L	"	1	"	" " "
"	R	"	1	"	" " "
519+90.8	L	"	1	"	" " "
"	R	"	1	"	" " "
520+32.5	L	"	1	6"	" " "
"	R	"	1	"	" " "
520+38±	L	"	1	"	" " "
"	R	"	1	"	" " "
553+09	R	CMP	1	18"	With drop inlet
553+70	R	"	1	18"	
553+80	R	"	1	18"	
574+65	R	RCP	1	15"	
577+00	R	CMP	1	24"	(Waterman)

ALAMEDA 1561

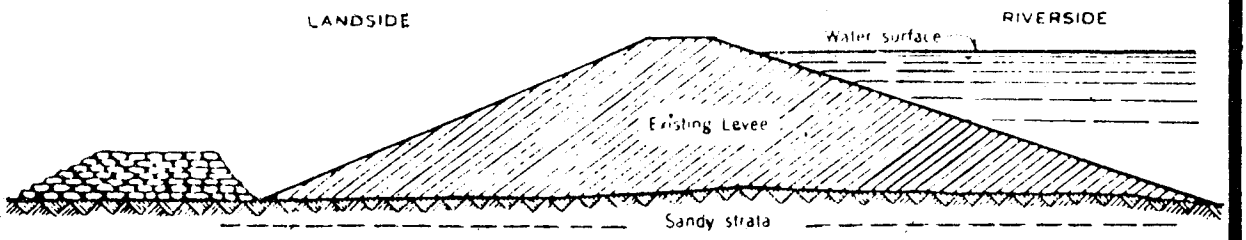
STORM DRAINS
(No Gates)

Station	Bank	Conduits No.	Conduits Size	Mat'l	Comments
218+00 to 219+00	L	3	48"	RCP	Culvert under Newark Blvd. bridge approach (L)
224+50	R	1	12"	CMP	
278+50	R	1	18"	RCP	
291+67	L	1	24"	"	
302+65	L	1	48"	"	
356+15	R	1	24"	"	
361+00	R	1	15"	"	
365+58	R	3	72"	"	
385+35	R	1	27"	"	
396+35	R	1	42"	"	
452+55	L	1	15"	"	
474+25	L	1	18"	"	Abandoned
513+60	L	1	24"	"	
517+60	L	1	27"	"	
518+60	L	1	24"	"	
570+00	R	1	10"	"	
574+65	R	1	15"	"	
574+70	L	1	12"	CIP	
579+70	L	1	10"	Steel	
579+90	L	1	10"	CMP	Blind flange over channel end
582+62	R	1	36"	"	
583+00	R	1	42"	RCP	Head-wall under bridge
583+78	R	1	18"	CMP	
585+81	L	1	36"	RCP	
591+24	L	1	48"	CMP	
594+73	L	1	16"	"	
596+62	R	1	18"	"	
597+68	R	1	18"	"	
599+12	R	1	12"	"	
600+70	L	1	12"	"	
603+21	R	1	18"	"	
605+70	L	1	18"	"	
607+03	R	1	18"	"	
608+53	R	1	18"	"	

DIVERSION STRUCTURES
(Slidegate Lift Model - Armco CPE-2)

For Water Diversion To:	Station	Conduits Mat'l	No.	Size	Slide Gate Armco Model No.
Old Alameda Creek	322+18(R)	Conc.	2	36"	20-10C
"T-1" Pit	495+00(L)	Steel	1	42"	Flatback 50-10C
Shinn Pit 1/	532+04(R)	RCP	3	36"	"
Kaiser Pit No. 1	552+55(L)	"	1	42"	"
Bunting Pit 2/ & 3/	561+20(L)	Steel	1	8"-10"-12"-18"	None

1/ Fitted with Armco Model 20C flapgate.
2/ System is fitted with a valve on the channel intake for security when not in operation.
3/ All systems are gavity flow except the Bunting Pit diversion system which is operated by a portable pump.

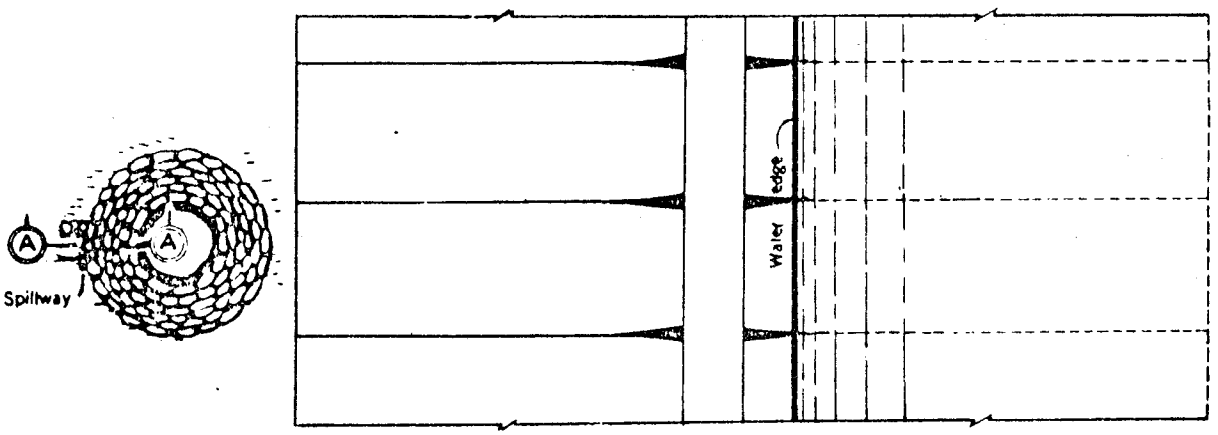


Note

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

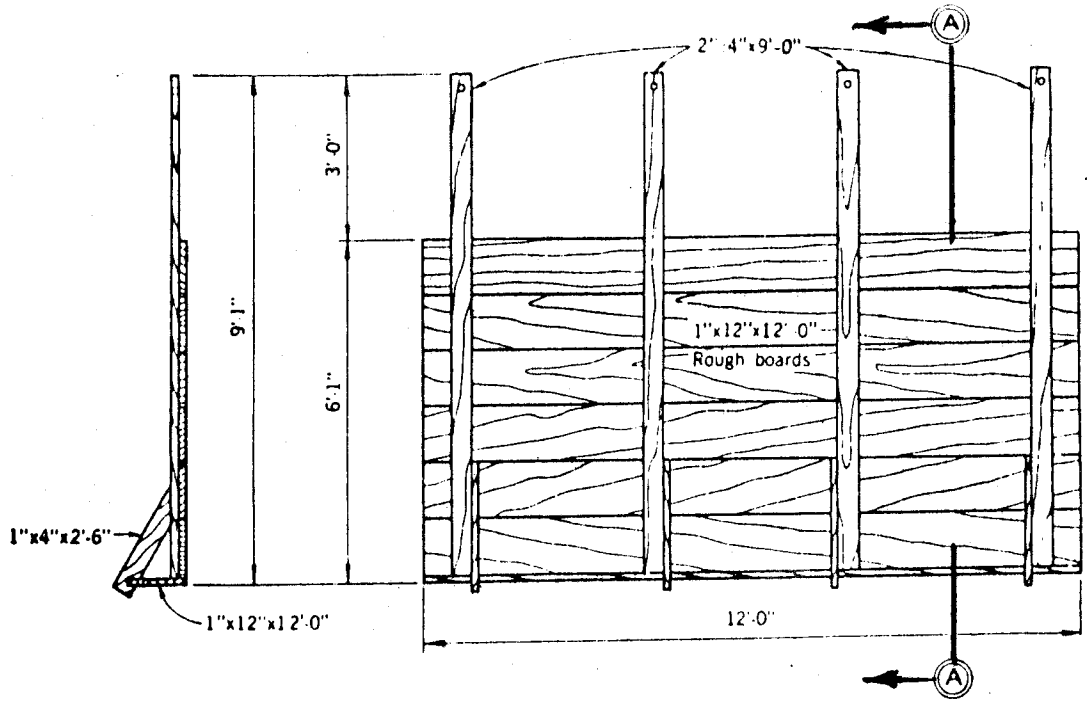
Do not sack boil which does not put out material.
Height of sack loop or ring should be only sufficient to create enough head to slow down flow through boil so that no more material is displaced and boil runs clear.
Never attempt to completely stop flow through boil.

FLOOD EMERGENCY CONSTRUCTION

CONTROL OF SAND BOILS

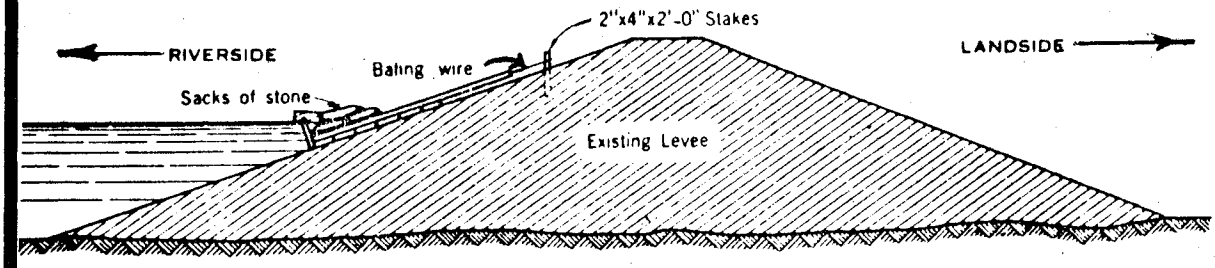
U.S. ARMY ENGINEER DISTRICT SAN FRANCISCO
CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA

Exhibit D



SECTION "A-A"

PLAN



SECTION

BILL OF MATERIAL FOR 100 FEET
LUMBER
56 pieces 1"x12"x12'-0" 32 pieces 1"x4"x2'-6" 32 pieces 2"x4"x9'-0" * 32 pieces 2"x4"x2'-0" * (Sharpened)
WIRE
200' baling wire
NAILS
4½ lbs. 8d nails

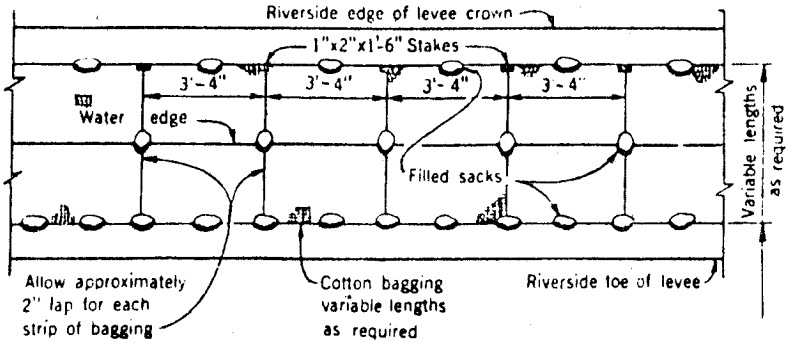
FLOOD EMERGENCY CONSTRUCTION

MOVABLE WAVE WASH PROTECTION

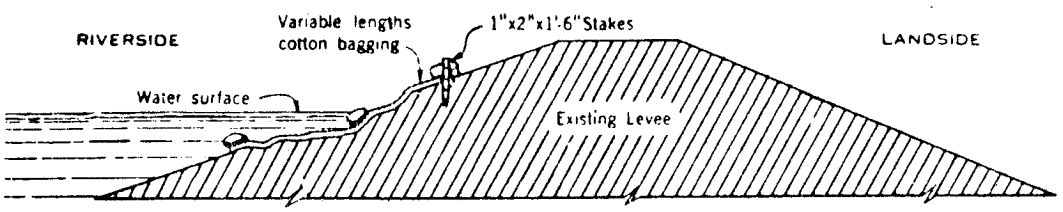
U.S. ARMY ENGINEER DISTRICT SAN FRANCISCO
CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA

EXHIBIT E

ALAMEDA 157



PLAN



SECTION

Note:

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

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

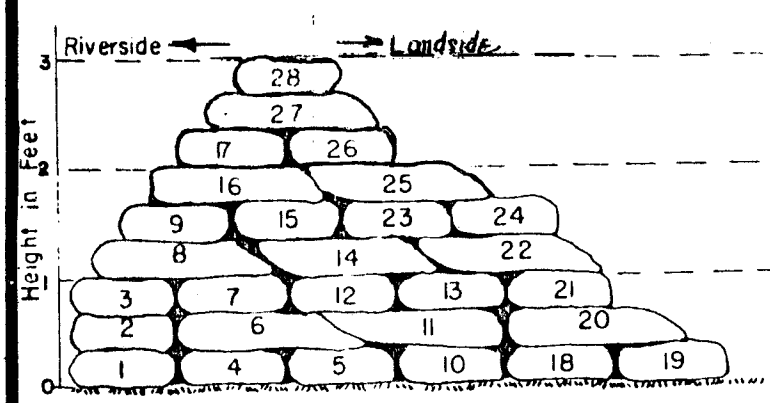
FLOOD EMERGENCY CONSTRUCTION

WAVE WASH PROTECTION

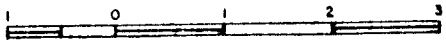
U.S. ARMY ENGINEER DISTRICT SAN FRANCISCO
CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA

EXHIBIT F

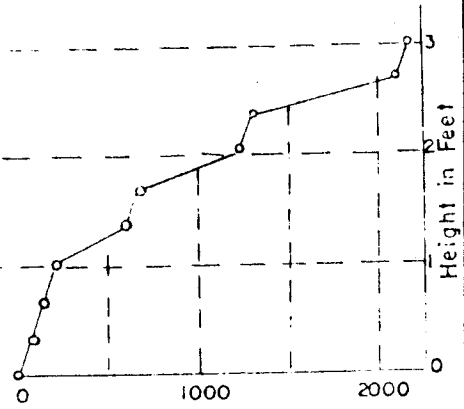
ALAMEDA 1569



SANDBAG LEVEE CROSS SECTION



Scale in feet



Minimum per 100 Feet of Levee.

NUMBER OF SANDBAGS

Notes:

1. Entire base to be cleared and scarified.
2. Best material for filling sandbags is a fine sand or coarse silt. Avoid, as much as possible, the use of coarse gravel and heavy clays.
3. Fill sandbags 1/2 to 2/3 full, 50 to 60 pounds, and leave enough flap to turn under. Do not tie.
4. Numbers shown on the sandbags are for the general order of placing the sandbags to give the highest protection with the minimum number of sandbags.
5. When bags are placed, flatten out and fill voids by mashing bags with feet and vigorously tramping each course of the levee section. Provide a levee section as impervious to water as possible. Alternate direction of sacks and stagger joints wherever practical.
6. The above section is based upon an average in-place sandbag section of 4" x 12" x 18".

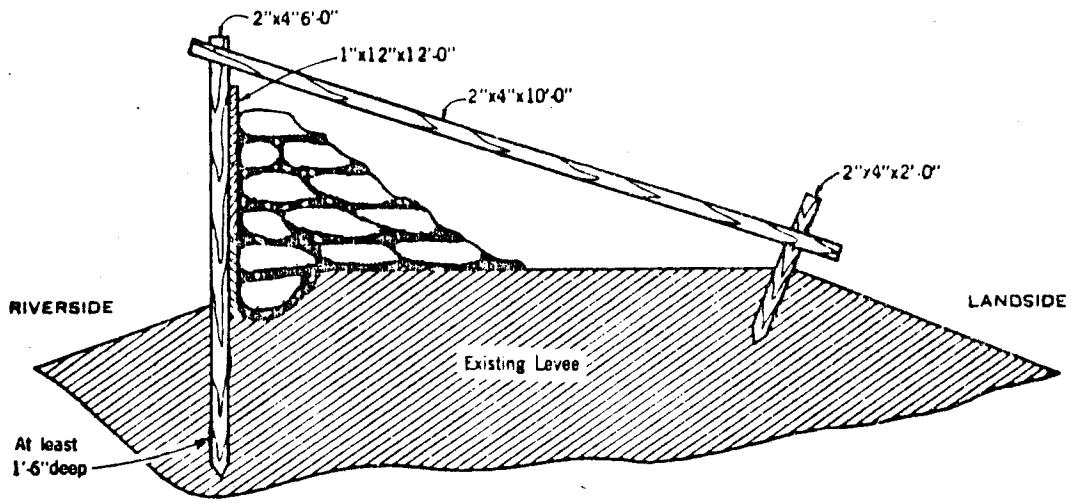
FLOOD EMERGENCY CONSTRUCTION

SACK TOPPING

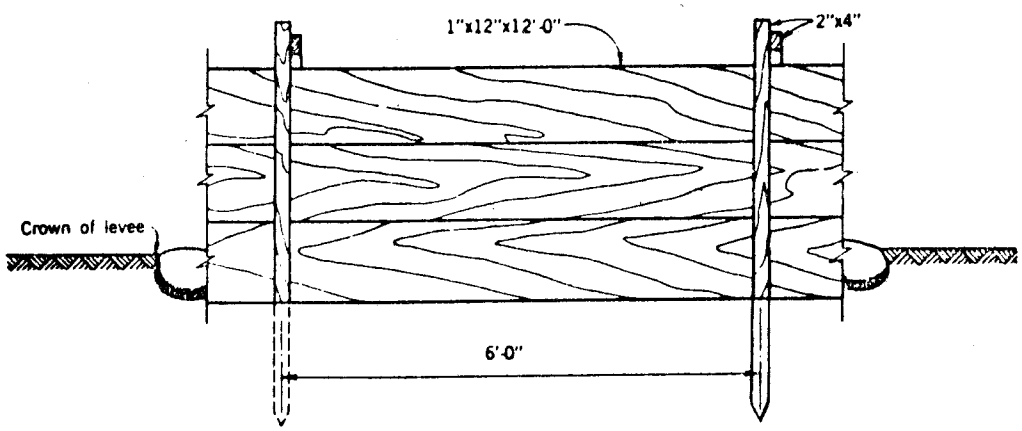
U S ARMY ENGINEER DISTRICT SAN FRANCISCO
CORPS OF ENGINEERS
SAN FRANCISCO CALIFORNIA

EXHIBIT G

ALAMEDA 1571



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

FLOOD EMERGENCY CONSTRUCTION

LUMBER AND SACK TOPPING

U.S. ARMY ENGINEER DISTRICT SAN FRANCISCO
CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA

EXHIBIT H

DRAWING LIST
FOR CONSTRUCTION CONTRACTS BY THE CORPS OF ENGINEERS

DRAWING SET				CONTRACT			
Item	Title	File No.	Shts	Number	Contractor	Contract Awarded	Accepted by COE
1.	Chan. Impr., Unit 1	63-45-19	33	CIVENG-65-259	Eugene Luhr & Co.	5 Apr 65	14 Dec 65
2.	Chan. Impr., Unit 2	63-45-22	39	CIVENG-66-211	Granite Constr Co.	19 Apr 66	8 May 68
3.	Chan. Impr., Unit 3	63-45-24	20	CIVENG-66-228	Hyd Dredging Co.,Ltd	6 May 66	14 Oct 66
4.	S.P.T. Co. R/R Bridge Relocation	63-38-1&3	8	DACW07-68-C-0004	S.P.T. Company	23 Aug 67	26 Mar 70
5.	S.P.T. Co. R/R Relocation	63-45-29	33	DACW07-68-C-0015	Holms, Thomas & Holms-Clair, Inc.	29 Aug 67	27 May 69
6.	Chan. Impr., Unit 4	63-45-34	6	DACW07-68-C-0024	Eugene Luhr & Co.	21 Sep 67	14 Dec 67
7.	Chan. Impr., Unit 5	63-45-36	10	DACW07-69-C-0002	G&T Constr. Co.	9 Jul 68	9 Oct 68
8.	Chan. Impr., Unit 6	63-45-27	24	DACW07-69-C-0008	Shellmaker Inc.	2 Aug 68	27 Nov 68
9.	Chan. Impr., Unit 7	63-45-39	39	DACW07-69-C-0053	Eugene Luhr & Co.	18 Jun 69	15 Oct 71

Exhibit J
Sh 1 of 4

DRAWING LIST
FOR CONSTRUCTION CONTRACTS BY THE CORPS OF ENGINEERS
(Cont'd)

DRAWING SET				CONTRACT				
Item	Title	File No.	Shts	Number	Contractor		Contract Awarded	Accepted By COE
10.	Chan. Impr., Unit 8	63-45-42	12	DACW07-72-C-0032	Eugene Luhr & Co.		6 Mar 72	10 Nov 72
11.	Phase I Area Planting	63-34-8	36	DACW07-72-0038	Collishaw Corp.	1/	19 Apr 72	5 Nov 72
12.	Chan. Impr., Unit 9	63-45-43	16	DACW07-72-C-0019	R&D Watson, Inc.		10 Aug 72	31 Oct 73
13.	Phase II Area Planting	63-34-11	17	DACW07-73-C-0060	Sibbald Constr. Inc.	1/	8 Mar 73	4 Dec 75
14.	Chan. Impr., Unit 10	63-45-44	12	DACW07-73-C-0073	Shellmaker, Inc.		22 Jun 73	9 Aug 74
15.	Chan. Impr., Unit 11	63-45-47	33	DACW07-74-C-0076	R&D Watson, Inc.		27 Jun 74	25 Nov 74
16.	Chan. Impr., Erosion Control Sills	63-45-49	17	DACW07-75-C-0021	Oscar Holms, Inc.		29 Aug 74	29 Oct 74
17.	Chan. Impr., Unit 12	63-45-51	54	DACW07-75-C-0061	Al Blasi, Inc.	1/	5 Jun 75	15 Nov 75
								2/

1/ Contract included two-year maintenance extension on plantings.
2/ Total construction time-approximately 112 months of which 32 months was standby.

Exhibit J
Sh 2 of 4

ALAMEDA 1575

SHOP DRAWINGS

Slidegate Installation Drawings

1. 18" Dia., Model 20-10C, Spigot-Back — Armco Dwg No. 2A18/7'-9"
2. 24" Dia., Model 20-10C, Spigot Back — Armco Dwg No. 2A24/10'-3"
3. 48" Dia., Model 50-10C, Flatback — Armco Dwg No. 2-5234
4. 60" Dia., Model 50-10C, Spigot Back — Armco Dwg No. 25121
5. 60" Dia., Model 50-10C, Flatback — Armco Dwg No. 2-5233

Flapgate Installation Drawings

6. 18" Dia., Model 20C — Armco Dwg No. 20C-18
7. 24" " " " " " " " 24
8. 48" " " " " " " " 48
9. 60" " " " " " " " 60
10. 72" " " " " " " " 72

Note: For further information see Manufacturers Operation and Maintenance pamphlets and catalogues.

DRAWING LIST
1/ FOR MAJOR CONSTRUCTION CONTRACTS BY OTHER AGENCIES

DRAWING SET

ITEM	PLAN SUBJECT	FILE NO.	SHTS	CONTRACTING AGENCY
1.	Fabridam at Alameda Creek Station 521	419-C	25	Alameda County Water District
2.	Fabridam No. 2 at Alameda Creek Station 492	73-33-C-4	16	" " " "
3.	Fabridam No. 2 at Alameda Creek Station 492	75-4-C-1	2	" " " "
4.	Newark Blvd. Bridge	CA-6	14	Alameda County Flood Control & Water Conservation District
5.	Patterson Bridge	CA-7	15	" " " "
6.	Bell Ranch Bridge	CA-8	15	" " " "
7.	Jamieson Avenue Bridge	Job 6962	12	Besco, Rhodes & Jamieson
8.	P. C. & A. Bridge	None	6	P. C. & A. Corp.
9.	Dike Location & Construction and Stockpile Sites	2/	7	Alameda County Water District

1/ For unlisted information on work by other agencies, contact Alameda County Flood Control and Water Conservation District Engineer-Manager.

2/ 75-48-B, 75-48-B-1 thru 3, 75-61-B, 75-55-B and 76-1-B.

Exhibit J
Sh 4 of 4

ALAMEDA CREEK

RESUME OF RESOLUTIONS

Resolution Number	By	Date	Subject
-	-	(1949	Survey authorized by Congress)
16	1/	22 Jun 50	Local assurances after review report authorization by Committee on Public Works of the U.S. Senate
62845	1/	20 Mar 52	Right-of-Entry authorization
	2/	18 Nov 52	Agreement to maintain channels of tributaries in Livermore and Amador Valleys
65150	1/	2 Dec 52	Assurances for clearing in the Livermore and Amador Valleys
70191	1/	2 Mar 54	Urging completion of 1949 authorized survey
894	1/	13 Mar 56	Agreement for soils investigation
1236	1/	4 Sep 56	Agreement for clearing near Fremont
2430	1/	12 Aug 58	Agreement for construction west of Niles Canyon
10	3/	8 Aug 58	Local assurances of cooperation
2565	2/	30 Sep 58	Assurances - Right-of-Entry, Zone 7
2986	2/	29 Feb 60	Agreement with findings in survey report started in 1949
30	3/	15 Feb 60	Urges action in Zone 7, Livermore area
	4/	8 Mar 60	City of Fremont urges action on survey report
	1/&3/	21 Mar 60	Urging completion of review report and increase in capacity of Del Valley Dam to provide for flood control
518		1960	Urging completion of survey report review
611		9 Feb 61	Urging Congress to appropriate funds for Alameda Creek

ALAMEDA CREEK

RESUME' OF RESOLUTIONS
(Cont'd)

Resolution Number	By	Date	Subject
158-61	6/	21 Jan 61	Urging top priority to Alameda Creek project
	5/	7 Feb 62	Urging expediting of survey report
	7/	4 Sep 62	Urging expediting of survey report
5937	1/	26 May 64	Cancels and rescinds Resolution #4450 (local assurances)
108025	8/	2 Jul 64	Notice of hearing for DeSilva Gravel Pit on Arroyo Road
6015	1/	28 Jul 64	Urging funding by Congress for FY65 construction
6175	1/	1965	Authorizing purchase of Patterson property
6238		2 Mar 65	Certification of Rights-of-Way for 1st contract from San Francisco Bay to Newark Blvd., Fremont, California
6678	1/	25 Jan 66	Urging completion of survey of San Francisco Bay and urging development of a small craft harbor to be built by East Bay Regional Parks District at Aquatic Park
66-038	9/	25 Jan 66	Hayward support of small craft navigation project
1632	4/	25 Jan 66	Fremont support of small craft navigation project
6841	1/	29 Mar 66	Grants Right-of-Way from bay to Dry Creek, Fremont for Unit #2 construction
7086	1/	23 Aug 66	Bell Ranch Bridge Bid acceptance
U.S. Senate Document		26 Jan 67	- U.S. 90th Congress resolution to review Alameda Creek funding and benefits

ALAMEDA CREEK

RESUME OF RESOLUTIONS
(Cont'd)

Resolution Number	By	Date	Subject
7361	1/	21 Mar 67	Certification of Right-of-Way between Stations 398+00 and 423+50± Fremont for 1967 construction season
7652	1/	18 Jul 67	Certification of Right-of-Way between Station 41+57 and Station 90+55 Fremont for Southern Pacific railroad relocation
2022	4/	7 Nov 67	Urging funding support for East Bay Regional Parks District plan for development of trails and facilities
3078	10/	2 Apr 67	Declaring intent to develop, operate and maintain hiking, bicycle and horse trails between Coyote Hills Park and Mission Blvd.
8030	1/	30 Apr 68	Certificate of Right-of-Way between Decoto Road and WP R/R Bridge
8609	1/	17 Jan 69	Certificate of Right-of-Way between Station 520+00 and Station 577+00
92-048	11/	3 May 72	Establishes equalization charges (meters)
10325	1/	20 Feb 73	Execution of above agreement change
	1/	28 Feb 72	Mod 2 on Interior Maint. Agreement
Congress of U.S. Ltr,		30 May 73	Subject: Review study of Upper Basin
		11 Apr 74	U.S. House of Rep., Wash., to study Senate Document 128, 87th Congress with reference to Upper Basin improvements. "Alameda Creek, Upper Basin, California - 12126"

FOOTNOTES:

1/ The Board of Supervisor, Alameda County Flood Control and Water Conservation District
2/ Eastern Alameda County Soil Conservation District
3/ Board of Directors, Zone #7, ACFCWCD
4/ Fremont City Council
5/ Newark City Council
6/ Union City Council
7/ Santa Clara County Board of Supervisors
8/ Board of Supervisors, County of Alameda
9/ Hayward City Council
10/ East Bay Regional Parks District
11/ Alameda County Water District

ALAMEDA 1581

APPURTENANCE LOCATIONS

Left Bank		Right Bank	
Sta	Description	Sta	Description
		11+60	D.S. End of Svc Rd w/Turnaround
15+90	D.S. Term of Svc Rd w/Turnaround		
		32+00	Passing Area
35+00	Passing Area		
		40+00 to 50+00	Special Planting Area
		51+00	Passing Area
57+00	Passing Area		
	Sta. 60+00(R) to 66+00(L): 6" Stl Pipe Xing (Bittern Line) w/Cathodic Protection Box in Each Berm		
		70+00	Passing Area
77+00	Passing Area		
		89+80	Turnaround
93+75	Tide Gage		
	Sta. 93+78: 16" Rubber Pipe Across Channel		
98+80 to 94+60	36" Stl Pipe & 30" Stl Pipe		
93+80	S.W. Intake Facility		
		94+00	30" Stl Pipe (Leslie Salt Co. Intake Line)
94+80	Turnaround		
		95+00	16" Pump Facil on R/W Line
95+00	Power Pole Inside of R/W		
	Sta. 95+00(L) to 101+00(R) Overhead Powerline		
		101+00	Power Pole Inside of R/W
		110+00	Passing Area
117+00	Passing Area		
		123+60	Turnaround
141+00	D.S. Term of Drainage Ditch		
148+00	Drng Str. 4-48" CMP w/Headwall		

153+50 Turnaround

156+55 12" Abandoned Pipe (Plugged)

172+00 12" Abandoned Pipe

189+75 Transformer Tower Inside of R/W (PG&E)

204+00 U.S. Terminal of the 75' Berm

218+50 3-48" CMP Drn Under Newark Blvd.

221+40 8-60" RCP Drng Str w/Headwall

236+50 U.S. Terminal of Drng Ditch

243+40 Turnaround

253+40 Turnaround

256+50 Turnaround

267+40 Turnaround

151+80 Drng Str, 3-48" CMP w/Headwall

155+00 Turnaround

159+50± 12" Abandoned Pipe (Plugged)

175+10 12" Abandoned Pipe

189+50 8" Stl Oil Line Across Channel

193+70 Turnaround

204+00 U.S. Terminal of the 75' Berm

204+29.29 D.S. end of Newark Staging Area

218+13 U.S. end of Newark Staging Area

219+65 20" Stl Gas Line (Capped w/conc)

224+50 12" CMP Drn Under Lowrey Road

278+50 1-18" RCP Drain

290+10 Power Pole

Sta. 291+00 Patterson Bridge (w/Utilities Attached Water, Gas, Electric & PT&T)

291+67 1-24" RCP Drain

299+70 Turnaround

Sta. 301+60(L) to 303+80(R) Nimitz Fwy Crossing

302+40 Turnaround

302+65 48" RCP Drain

303+00 Turnaround

305+50 Turnaround

311+00 Gaging Station

323+40 Turnaround

324+95 Turnaround

337+10± Abandoned Sewer (Plugged)

340+90 Turnaround

341+00 Turnaround

343+00 Entrance to Dry Creek

4+30(L) on Dry Creek 3-60" RCP Drng Str

356+16 1-24" RCP Drng Str

361+00 1-15" RCP " "

365+58 3-72" RCP " "

369+85 1-30" RCP " "

371+40 Turnaround

385+00 1-27" RCP Drain

Sta. 394+50(R) to 395+10, Decoto Road Bridge Crossing

396+35 1-42" RCP Drain

Sta. 412+00 Erosion Control Sill #1

416+56 Turnaround

417+25 Turnaround

423+30 3-48" RCP Drng Str w/Headwall

Sta. 432+00 Erosion Control Sill #2

ALAMEDA 1583

Sta. 435+70 Jameison Avenue Bridge Crossing

Sta. 452+00 Erosion Control Sill #3

452+55 1-15" RCP Drain

460+75 Turnaround

461+25 Turnaround

Sta. 472+00 Erosion Control Sill #4

474+25 18" RCP Storm Drain

Sta. 477+70 Pac Conc & Agg Company Haul-road Crossing

Sta. 490+00± 8" Stl Water Disch Line (P.C.A.)

491+15 Turnaround

491+15 Turnaround

Sta. 492+00 Fabridam Across Channel

492+25 30" Pipe to Fabridam

495+00 1-42" Steel "T-1" Pit
Intake Str

513+60 1-24" RCP Drain

517+60 1-27" RCP Drain

*Sta. 518+00 to 521+50 Drop Structure

518+60 1-24" RCP Drain

Sta. 521+28 Fabridam Across Channel

532+04 3-36" RCP Shinn Pit
Intake Str

549+35 "I" Street Access to
Service Road

Sta. 549+36 Erosion Control Sill #5

551+50 1-10" Bunting Pit
Intake Str

552+55 1-42" Kaiser Pit
Intake Str

553+09 18" CMP Storm Drn
w/Flapgate

553+70 18" CMP Storm Drain w/Flapgate & Drp Inlt

553+80 18" CMP Storm Drain

555+50 Turnaround

Sta. 561+00 Erosion Control Sill #6

570+00 1-10" RCP Drain

Sta. 572+66 Erosion Control Sill #7

Sta. 573+90 PT&T Underground Cable Crossing

574+00 to 577+00 4" HP Gas Line, NW Side of Svc Rd

574+40 Turnaround

574+58 Turnaround

574+65 15" RCP Drain

574+70 1-12" CIP

Sta. 574+98.91 S.P. R/R Crossing

577+00 24" CMP Storm Drain

579+70 1-10" Stl Pipe

579+90 1-10" CMP Storm Drain

580+40 72" Stl Pipe Riser in Bank

Sta. 580+50(L) to 582+60±(R) 24" Water Line Encased in Conc

580+82.17 1-1/2" SH Pipe Riser NW of Svc Rd

Sta. 581+00(L) to 583+20(R) Mission Blvd Bridge Crossing

Sta. 581+66(L) to 582+70(R) Riprap Key Under Mission Blvd Bridge

582+62 1-30" CMP Storm Drain

583+00 1-42" RCP Drain

583+78 1-18" RCP Drain

Sta. 586+00 Riprap Key Across Channel

585+81 1-36" RCP Storm Drain

591+24 1-48" CMP Storm Drain

594+73 1-16" CMP Drain

600+70 1-12" CMP Drain

605+70 1-18" CMP Drain

610+75 Turnaround

596+62 1-18" CMP Storm Drain

597+68 1-18" CMP Storm Drain

599+12 1-12" CMP Storm Drain

603+21 1-18" CMP Storm Drain

607+03 1-18" CMP Storm Drain

608+53 1-18" CMP Storm Drain

*For list of drains in Drop Structure see Exhibit C, Sheet 2 of 4

ALAMEDA 1587

RESUME' OF IRRIGATION

AREA	STATION	BANK	1/ ORIGINAL DRAWING
STRUCTURAL AREAS WITH STARTING IRRIGATION ONLY (TRUCK SUPPLIED)			
Coyote Hills to below Newark Blvd.	125+00 - 212+50	L&R	C
Above Newark Blvd. to below Alvarado Blvd.	224+50 - 284+80	L&R	A
Above Nimitz Freeway to Beard Road	310+20 - 342+60	L&R	A
Dry Creek	0+00 - 12+82	R	A
Beard Road to below Decoto Road	342+60 - 388+80	L	A
Above Decoto Road to below Jamieson Road	342+60 - 429+80	L&R	A
Above Jamieson Road to below P.C.&A. Bridge	442+50 - 473+60	L&R	A
Above P.C.&A Bridge to B.A.R.T. Crossing	485+75 - 509+50	L&R	A
Above W.P. R/R Crossing to below S.P. R/R Crossing	512+10 -	L&R	A
Dry Creek	0+00 - 12+82	L	B
Dry Creek to below Decoto Road	343+00 - 388+80	R	B
Below Stanley Bridge to end of Project	587+90 - 611+10	L&R	B

AREA	STATION	BANK	1/ DWG.	WATER SOURCE	METER STATION
STRUCTURAL AREAS WITH PERMANENT IRRIGATION					
Newark Blvd. Area	212+50 to 224+50	L&R	C	ACWD	219+00(R)
Alvarado Blvd. & Nimitz Freeway Bridge Area	284+80 to 310+20	L&R	A&C	ACWD	291+00±L&A
Dry Creek	12+82 to 17+25±	L&R	B&C	ACWD	17+25±(L)
Decoto Road Area	388+80 to 400+80	L&R	A&C	ACWD	394+00(R) & (L)
Jamieson Road Area	429+00 to 443+00	L	A&C	ACWD	435+60±(L)
Jamieson Road Area	429+00 to 436+00	R	A&C	ACWD	435+60±(L)
P.C.&A. Bridge Area	473+60 to 485+75	L&R	A&C	ACWD	"
B.A.R.T. & W.P. R/R Crossing Area	509+50 to 521+10	L&R	B	ACWD	Pump (Shinn Pit)
S.P. R/R Crossing to Stanley Bridge Area	574+00 to 597+00±	L&R	B	Citizens Util. Co.	596+00±(L&R)
Stanley Bridge to Niles Canyon Staging Area	599+00 to 603+00±	L	B	"	"
New Haven Staging Area		R	B	ACWD	Well in Area
Beard Road Parking Area		L	A	ACWD	Beard Rd.(L)
Decoto Road Parking Area		R	A	ACWD	395+00(R)
Jamieson Road Parking Area		L	A	ACWD	435+60±(L)
Niles Canyon Staging Area		L	B	ACWD	606+00±(L)

1/ A = Phase I Area Planting and Recreation Facilities
B = Phase II Area Planting and Recreation Facilities
C = Alameda Creek Channel Improvements, Unit No. 12

COE Dwg No.	No. of Sheets
63-34-8	36
63-34-11	17
63-45-51	54

Exhibit M
Sh 2 of 2

DEPARTMENT OF THE ARMY
Office of the Chief of Engineers
Washington, D. C. 20314

DAEN-CWO-M

Regulation
No. 1130-2-339

29 October 1973

Project Operations
INSPECTION OF LOCAL FLOOD PROTECTION PROJECTS
(Reports Control Symbol DAEN-CWO-40)

1. Purpose. The purposes of this regulation are to provide guidance for the inspection of local protection projects and to standardize reporting procedures for those projects on which maintenance by local interests is considered to be deficient. This regulation will help to insure effective operation of local flood protection projects by providing for the inspection of such projects to see that they are being maintained by local interests as required and are in good working order.

2. Applicability. This regulation is applicable to all Divisions and Districts having civil works responsibilities.

3. References.

a. Title 33, Code of Federal Regulations, Chapter 2, Part 208, Flood Control Regulations.

b. ER 1150-2-301, Policies and Procedures.

c. ER 1130-2-335, Levee Maintenance Standards and Procedures.

4. Basic Policy. Division and District Engineers will keep informed as to the operation and maintenance of local flood protection projects to insure that essential maintenance work is performed and that the project structures and facilities will operate as intended. To this end, a schedule of timely inspections will be initiated that will permit local interests to be advised of existing maintenance deficiencies and allow for required corrective work to be accomplished prior to anticipated flood seasons.

5. Inspection Criteria.

a. To provide a uniform inspection criteria, the questions in Appendix B pinpointing common deficiencies are to be applied to each project or project feature as appropriate. This list of questions is not all inclusive, but will serve as a general inspection guide.

b. The maintenance of local flood protection projects shall be considered deficient when the local responsible agency has not fulfilled its maintenance obligation in accordance with the requirements of Part 208.10, Title 33, CFR. Minor deficiencies that will not significantly affect the attainment of project benefits need not be reported unless the local responsible agency indicates that it does not intend to fulfill its obligation to correct the deficiencies or is unable to fulfill its responsibility for maintenance.

6. Reports. Reports on local flood protection projects where maintenance is considered to be deficient will be submitted annually on ENG Form 4390. The areas of deficiencies are to be indicated by a checkmark in the appropriate column. (The appropriate questions in Appendix B will be used as a guide in determining adequate maintenance.) Details of the deficiencies will be contained in the inspector's report and the correspondence with local interests, copies of which are to be submitted with the report form. Special problems or conditions will be noted under remarks column or footnoted. Negative reports will be submitted. This report has been assigned Reports Control Symbol DAEN-CWO-40 and will be submitted to HQDA (DAEN-CWO-M) WASH DC 20314 prior to 31 December.

FOR THE CHIEF OF ENGINEERS:

RUSSELL J. LAMP
Colonel, Corps of Engineers
Executive

2 Appendixes
APP A - ENG Form 4390-R
APP B - Inspection Guide

LOCAL PROTECTION PROJECTS (Local Maintenance Responsibility) CONSIDERED DEFICIENT AS OF DECEMBER 19____ (ER 1130-2-339)																						REPORTS CONTROL SYMBOL (DAEN-CWO-40)
PROJECT	READINESS FOR FLOOD EMERGENCY	LOCAL MAINTENANCE PROGRAM	DEFICIENT IN MAINTENANCE OF									DEFICIENT IN CONTROL OF							LOCAL INTEREST NOTIFIED OF EXISTING DEFN.	ESTIMATED COST		REMARKS
			FLOODWALLS	LEVEE SECTION AND GRADE	LEVEE CROWN ROADWAYS & GATES	REVETTED AREAS	DRAINAGE STRUCTURES	PUMPING PLANTS	PONDING AREAS	CHANNELS & FLOODWAYS	CLOSURE STRUCTURES	ENCROACHMENT & TRESPASS	WILD GROWTH	BURROWING ANIMALS	GRAZING					RESTORING PROJECT TO SATISFACTORY CONDITION ($000's)	ANNUAL MAINTENANCE ($000's)	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

ENG FORM 1 JUL 73 4390-R REPLACES ENG FORM 4390-R (Test) WHICH IS OBSOLETE.

FOR ILLUSTRATION PURPOSES ONLY
(Local reproduction authorized - blank masters available from local FMO)

APPENDIX B

Inspection Guide

1. Readiness for Flood Emergency:

a. Has an organization with legal responsibility been established and a superintendent appointed who is responsible for flood fighting operations?

b. Is there a published flood fighting plan and is an appropriate supply of sandbags, tools and other flood fighting equipment readily available for an emergency?

c. Are key personnel trained in flood fighting techniques and use of equipment?

2. Maintenance Program:

a. Has a superintendent been designated who is responsible for operation and maintenance of the project?

b. Is there a published program for inspection and maintenance of the project and project features?

c. Are inspections being made in accordance with the requirements of Title 33, Code of Federal Regulations, Part 208, "Flood Control Regulations"?

d. Are inspection reports submitted by local interests as required by existing regulations?

e. Is the Operation and Maintenance manual furnished by the Corps readily available to the superintendent, and do his current instructions to maintenance personnel reflect the guidance furnished in the manual?

3. Maintenance of Floodwalls:

a. Is there any evidence of seepage, saturated areas or boils that might affect the stability of the structure?

b. Are there any signs of undue settlement that may affect the stability or watertightness of the structure?

c. Are there any bank caving conditions riverward of the floodwall which might endanger the stability of the structure?

d. Has the concrete suffered cracking, spalling or deterioration to an extent that may affect the stability or watertightness of the structure?

e. If applicable, have the local responsible interests taken any measures to correct the above conditions?

f. Are trees or other growths which might jeopardize the stability or watertightness of the structure removed at regular intervals?

g. Is debris or trash allowed to accummulate adjacent to the floodwall? Is care being exercised to insure that fires are not built adjacent to the floodwalls?

4. Maintenance of Levees:

a. Is the levee being maintained to the design section?

b. Is there any evidence of seepage, saturated areas or boils that might affect the stability of the levee?

c. Have necessary repairs been made to cracks, erosion, or other damages to levee slopes?

d. Are there any indications of wave-wash damage or scouring?

e. Are there any indications of slides or sloughs developing?

f. Is sod cover on levees being encouraged?

g. Is sod cover mowed regularly?

h. Is sod or other desirable cover fertilized and reseeded as necessary?

5. Maintenance of Levee Crowns, Roadways and Gates:

a. Is the levee crown at design grade and is it shaped for proper drainage?

b. Is undesirable growth permitted on levee crown?

c. Are there any obstructions to vehicular passage along the crown of the levee?

d. Are access roads to and on the levee properly maintained?

e. Are access ramps properly maintained?

f. Is unauthorized vehicular traffic permitted on the levee?

g. Are cattle guards and gates in good condition?

h. Are keys to locked gates readily available to authorized personnel?

6. Maintenance of Revetted Areas:

a. Have damaged or subsided areas been repaired?

b. Is riprap material sound, e.g., not cracked or weathered?

c. Is bedding and/or bank material beneath riprap exposed or disturbed?

d. Are there any areas where riprap or revetment work have been displaced, washed out or removed?

e. Are the revetted areas being kept clear of undesirable growth.

7. Maintenance of Drainage Structures:

a. Are headwalls being kept in a reasonable state of repair, e.g., no cracks, spalling or deterioration that will affect to stability of the structure?

b. Are flap gates, manually operated gates and valves in good repair and operating condition?.

c. Are pipes through levee in serviceable condition, e.g., metal sound, no rust holes, no settled sections, no evidence of piping or subsidence?

d. Are toe drain systems and pressure relief wells in good working order?

e. Are inlet and outlet channels clear of growth and debris?

f. Has riprap around drainage structures been displaced?

g. Is there any erosion that might endanger the stability or watertightness of the structure?

8. Maintenance of Pumping Plants:

a. Is all pumping equipment operable?

b. Is pumping equipment being properly maintained?

c. Is the regular inspection, testing and lubrication program being followed?

d. Are adequate supplies of lubricants and fuel available for gasoline and diesel powered equipment?

e. Is emergency lighting and communication equipment operable and being properly maintained?

f. Are all switch gear, transformers, motor, valves, gates, etc. operable and being properly maintained?

g. Is electrical wiring in a satisfactory condition?

h. Are buildings being adequately maintained?

i. Is the operating room and sump clean?

j. Is corrosion mitigation equipment operable and being used?

k. Are operating manuals readily available?

l. Are operating personnel properly trained to operate and maintain the equipment?

m. Are operating logs being maintained and furnished the District Engineer?

9. Maintenance of Ponding Areas:

a. Is the capacity of ponding areas being reduced by the accummulation of silt and other deposits?

b. Are ponding areas being kept clear of undesirable growth?

c. Are fills and/or structures that reduce the capacity of ponding areas permitted?

d. Are inlet and outlet channels kept clear of debris and undesirable growth?

10. Maintenance of Channels and Floodways:

a. Is the carrying capacity of the channel or floodway reduced by sand and silt deposits, or by undesirable growth or debris?

b. Are tributary channels clear of debris and other materials that might jeopardize proper operation of the project under flood conditions?

c. Are debris basins, check dams, and related structures properly maintained?

d. Is the dumping of trash and debris allowed?

e. Are there any unauthorized structures or encroachments obstructing the channel or floodway?

f. Are banks being damaged by wave wash, sloughing, etc?

g. Have necessary repairs been made to eroded areas?

11. Maintenance of Closure Structures:

a. Are all moving parts of gated closure structures in good working order?

b. Are stop-log units readily accessible when required for closure?

c. Do stop-log units fit and are brackets in good condition?

d. Are stop-log units properly stored and maintained?

e. Is sufficient material on hand for erection of sandbag closures? Is material readily accessible?

f. Can closure be made promptly when necessary?

g. Is there a program for trial erection of closure structures? Is this program being carried out?

12. Control of Encroachment and Trespass:

a. Have unauthorized structures through, over or adjacent to the project been permitted?

b. Is there any unauthorized excavation within the project rights-of-way?

c. Have agricultural activities been permitted to encroach on the project rights-of-way?

d. Is unauthorized vehicular traffic permitted on the levees?

e. Are boundaries properly identified?

13. Control of Wild Growth:

a. Have trees and undesirable growth been cleared from the levees and along side floodwalls?

b. Has undesirable wild growth been cleared from the channels or floodways?

c. Does brush cover or other growth interfere with inspection?

d. Is sod cover on levees being encouraged?

e. Is there any unauthorized burning of grass and weed?

f. Is sod cover mowed regularly?

g. Is sod or other desirable cover fertilized and reseeded as necessary?

14. Control of Burrowing Animals:

a. Is there an effective program for control of burrowing animals?

b. Are animal burrows properly filled and compacted?

15. Control of Grazing:

a. Are fences and cattle guards kept in repair?

b. Are measures being taken to prevent overgrazing?

c. Is there any unauthorized grazing?

d. Have cattle trails, etc. been resodded?

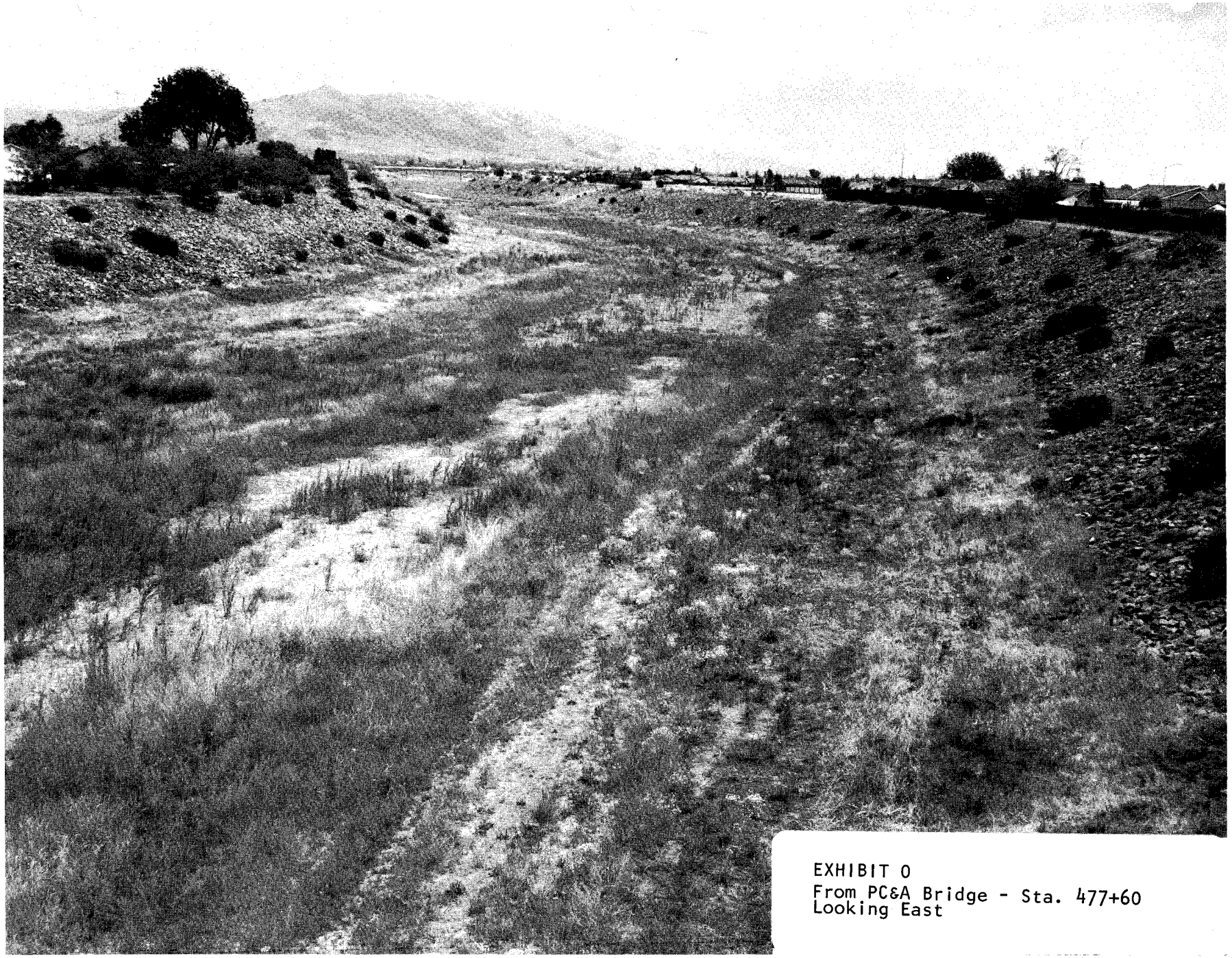
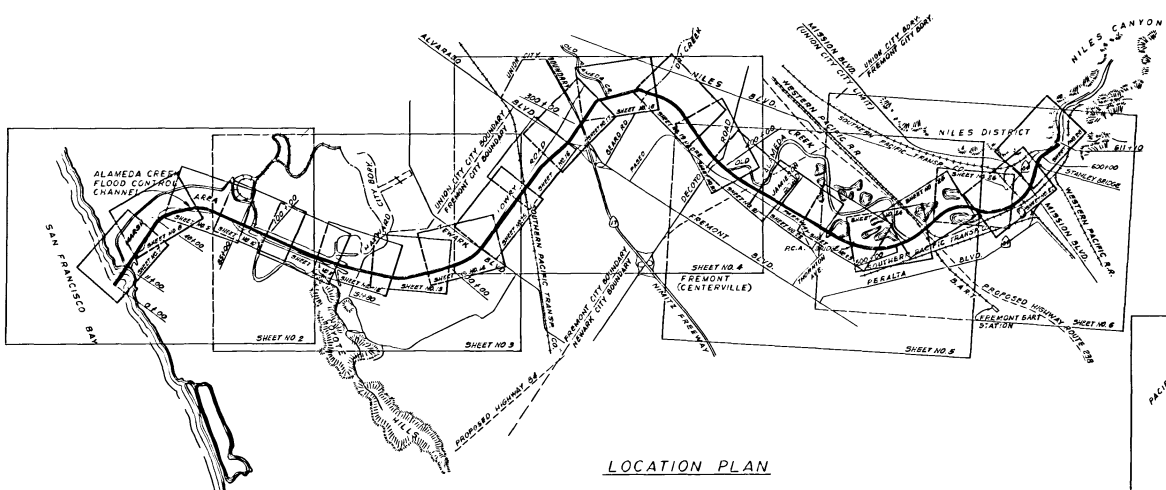


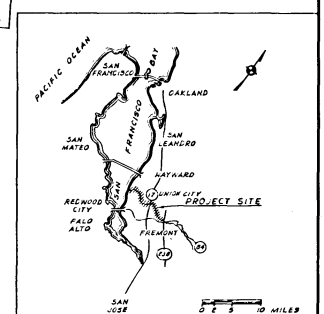
EXHIBIT O
From PC&A Bridge - Sta. 477+60
Looking East

EXHIBIT P
From PC&A Bridge - Sta. 477+60
Looking East

ALAMEDA 1603



LOCATION PLAN



VICINITY MAP

LIST OF DRAWINGS

DWG. NO.	SHT NO	TITLE OF DRAWINGS
63-45-52	1	VICINITY MAP, LOCATION PLAN AND SCHEDULE OF DRAWINGS
	2	LOCATION PLAN - STA. 0+00 TO STA. 85+00
	3	LOCATION PLAN - STA. 85+00 TO STA. 230+00
	4	LOCATION PLAN - STA. 230+00 TO STA. 339+00
	5	LOCATION PLAN - STA. 338+00 TO STA. 497+50
	6	LOCATION PLAN - STA. 497+50 TO STA. 598+00
	7	PLAN AND PROFILE - STA. 0+00 TO STA. 25+00
	8	- STA. 25+00 TO STA. 58+00
	9	- STA. 58+00 TO STA. 80+00
	10	- STA. 80+00 TO STA. 105+00
	11	- STA. 105+00 TO STA. 135+00
	12	- STA. 135+00 TO STA. 160+00
	13	- STA. 160+00 TO STA. 190+00
	14	- STA. 190+00 TO STA. 220+00
	15	- STA. 220+00 TO STA. 250+00
	16	- STA. 250+00 TO STA. 279+00
	17	- STA. 279+00 TO STA. 309+00
	18	- STA. 309+00 TO STA. 340+00
	19	- STA. 340+00 TO STA. 370+00
	20	- STA. 370+00 TO STA. 398+00
	21	- STA. 398+00 TO STA. 426+00
63-45-52	22	PLAN AND PROFILE - STA. 426+00 TO STA. 434+00
	23	- STA. 434+00 TO STA. 465+00
	24	- STA. 465+00 TO STA. 509+50
	25	- STA. 509+50 TO STA. 534+50
	26	- STA. 534+50 TO STA. 559+50
	27	- STA. 559+50 TO STA. 589+00
	28	- STA. 589+00 TO STA. 611+10
	29	- DRY CREEK

REFERENCES

NO.	DRAWING - SET TITLE	FILE NO.	SHTS
1.	ALAMEDA CREEK CHANNEL IMPROVEMENTS, UNIT NO.1	63-45-19	33
2.	UNIT NO. 2	63-45-22	40
3.	UNIT NO. 3	63-45-24	38
4.	S.P.T. COMPANY R/R BRIDGE RELOCATION	63-38-1 & 3	8
5.	S.P.T. COMPANY R/R RELOCATION	63-45-29	38
6.	ALAMEDA CREEK CHANNEL IMPROVEMENTS, UNIT NO. 4	63-45-34	9
7.	UNIT NO. 5	63-45-36	10
8.	UNIT NO. 6	63-45-37	24
9.	UNIT NO. 7	63-45-38	41
10.	UNIT NO. 8	63-45-48	13
11.	ALAMEDA CREEK AREA PLANTING, PHASE I	63-24-8	38
12.	ALAMEDA CREEK CHANNEL IMPROVEMENTS, UNIT NO. 9	63-45-45	16
13.	ALAMEDA CREEK AREA PLANTING, PHASE II	63-24-11	17
14.	ALAMEDA CREEK CHANNEL IMPROVEMENTS, UNIT NO.10	63-45-46	17
15.	UNIT NO. 11	63-45-47	33
16.	ALAMEDA CREEK CHANNEL IMPROVEMENTS, EROSION CONTROL SILLS	63-45-49	17
17.	ALAMEDA CREEK CHANNEL IMPROVEMENTS, UNIT NO.12	63-45-51	54
18.	FABRIDAM AT ALAMEDA CREEK STATION 531 (FABRIDAM #1)	ACMC-81C	28
19.	FABRIDAM NO.2 ALAMEDA CREEK STATION 498	ACMD 73-33-C-4	18
20.		ACMD 15-4-C-1	2
21.	NEWARK R.R.R. BRIDGE	ACFC(MCD.)A-6	6
22.	PATTERSON BRIDGE	ACFC(MCD.)A-7	18
23.	DELL KAMLA BRIDGE	ACFC(MCD.)A-8	18
24.	JAMIESON AVE. BRIDGE, DESCO RHODE & JAMIESON	JOB 6862	12
25.	P.G.&E. BRIDGE	GITARD C6	8

FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT

ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS VICINITY MAP, LOCATION PLAN AND SCHEDULE OF DRAWINGS

IN 28 SHEET

SHEET NO. 1

U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS

DRAWN: KY

FILE NO.

CHECKED: F. Shields

63-45-52

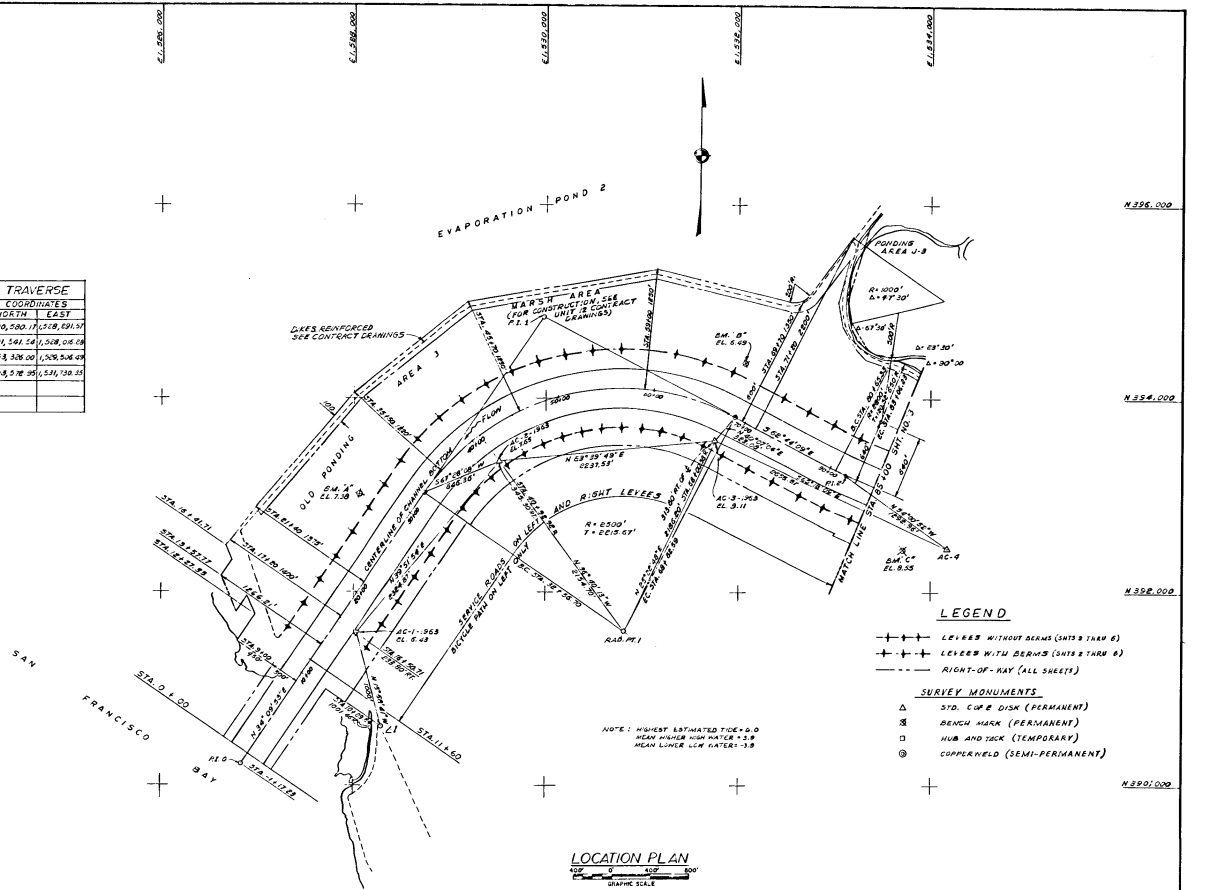
ALAMEDA 1605

PROJECT CENTERLINE		
LOCATION	COORDINATES NORTH	EAST
P.I. - 0	390,610.00	1,528,830.00
P.I. - 1	394,635.20	1,529,169.00
P.I. - 2	395,883.30	1,533,097.00

CONTROL TRAVERSE		
MONUMENT	COORDINATES NORTH	EAST
℄ 1	390,580.17	1,528,691.57
AC - 1	391,591.58	1,528,018.19
AC - 2	395,328.00	1,529,548.69
AC - 3	396,078.95	1,531,730.35

VERTICAL CONTROL			
BENCH MARK	ELEVATION M.S.L.	STATION	CHANNEL ℄ OFFSET
B.M. "A"	7.38	68 + 46±	245'± RT.
B.M. "B"	6.49	67 + 08±	245'± RT.
B.M. "C"	8.33	30 + 00±	245'± LT.

NOTE
BENCH MARKS ARE 5" PIPE SET IN 4" CASING



LOCATION PLAN
400' 0 400' 800'
GRAPHIC SCALE

LEGEND

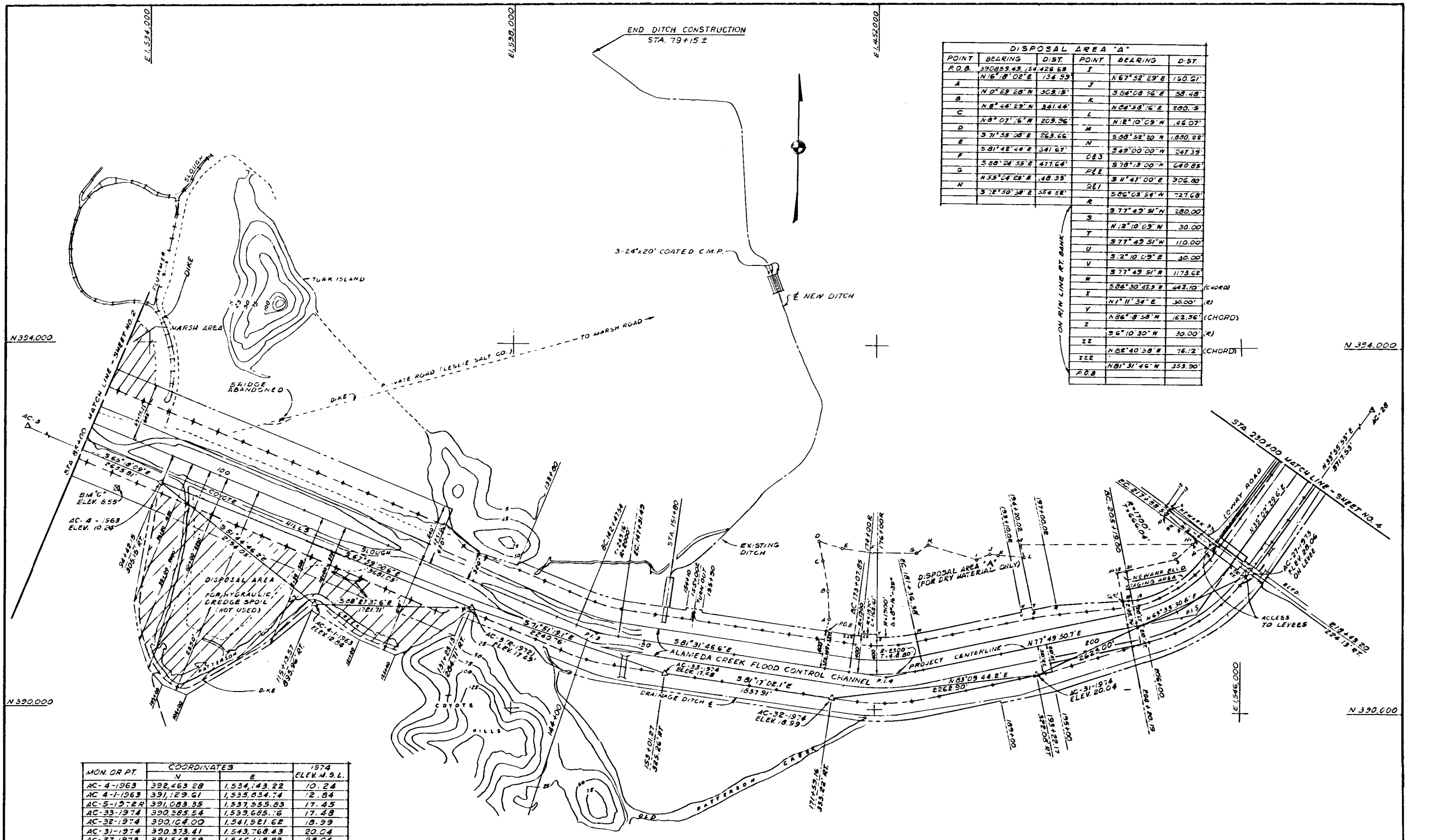
- LEVEES WITHOUT BERMS (SHTS 8 THRU 6)
- LEVEES WITH BERMS (SHTS 8 THRU 6)
- RIGHT-OF-WAY (ALL SHEETS)

SURVEY MONUMENTS

- △ STD. C&E DISK (PERMANENT)
- ⊠ BENCH MARK (PERMANENT)
- □ HUB AND TACK (TEMPORARY)
- ◎ COPPERWELD (SEMI-PERMANENT)

FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
LOCATION PLAN
STA. 0+00 TO STA. 85+00

IN 28 SHEETS SHEET NO. 2
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN AT FILE NO. 63-45-52
CHECKED



DISPOSAL AREA "A"		
POINT	BEARING	DIST.
P.O.B.	390859.45, 154:426 65	
	N16°18'02"E	134.99'
A		
	N 0°29'28"W	309.15'
B		
	N 8°44'29"W	341.44'
C		
	N 8°07'16"W	209.96'
D		
	S 71°55'08"E	263.66'
E		
	S 81°42'44"E	341.67'
F		
	S 88°24'55"E	477.64'
G		
	N 55°04'25"E	148.33'
H		
	S 72°50'38"E	554 52'
I		
	N 67°52'29"E	160.61'
J		
	S 84°08'56"E	58.48'
K		
	N 84°58'16"E	280.15'
L		
	N 12°10'09"W	146.07'
M		
	S 88°52'20"W	1,880.22'
N		
	S 49°00'00"W	247.39'
O℄3		
	S 78°13'00"W	640.85'
P℄2		
	S 11°47'00"E	306.80'
Q℄1		
	S 86°03'54"W	727.68'
R		
	S 77°49'51"W	280.00'
S		
	N 12°10'09"W	30.00'
T		
	S 77°49'51"W	110.00'
U		
	S 12°10'09"E	30.00'
V		
	S 77°49'51"W	1173.62'
W		
	S 84°30'42.9"W	442.10' (CHORD)
X		
	N 1°11'34"E	30.00' (R)
Y		
	N 86°18'58"W	162.56' (CHORD)
Z		
	S 6°10'30"W	30.00' (R)
ZZ		
	N 82°40'38"W	76.12' (CHORD)
ZZZ		
	N 81°31'46"W	353.90'
P.O.B.		

ON R/W LINE RT. BANK (R to P.O.B.)

MON. OR PT.	COORDINATES N	COORDINATES E	1974 ELEV. M.S.L.
AC-4-1963	392,463.28	1,534,143.22	10.24
AC 4-1-1963	391,129.61	1,535,834.74	12.84
AC-5-1972R	391,083.35	1,537,555.83	17.45
AC-33-1974	390,385.54	1,539,685.16	17.48
AC-32-1974	390,104.00	1,541,521.62	18.99
AC-31-1974	390,373.41	1,543,768.43	20.04
AC-27-1973	391,542.28	1,546,118.82	28.06
P.I. 3	390,827.00	1,538,929.00	
P.I. 4	390,350.00	1,542,132.00	
P.I. 5	391,080.94	1,545,521.54	

LOCATION PLAN

GRAPHIC SCALE

FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT

ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS

LOCATION PLAN

STA. 85+00 TO STA. 230+00

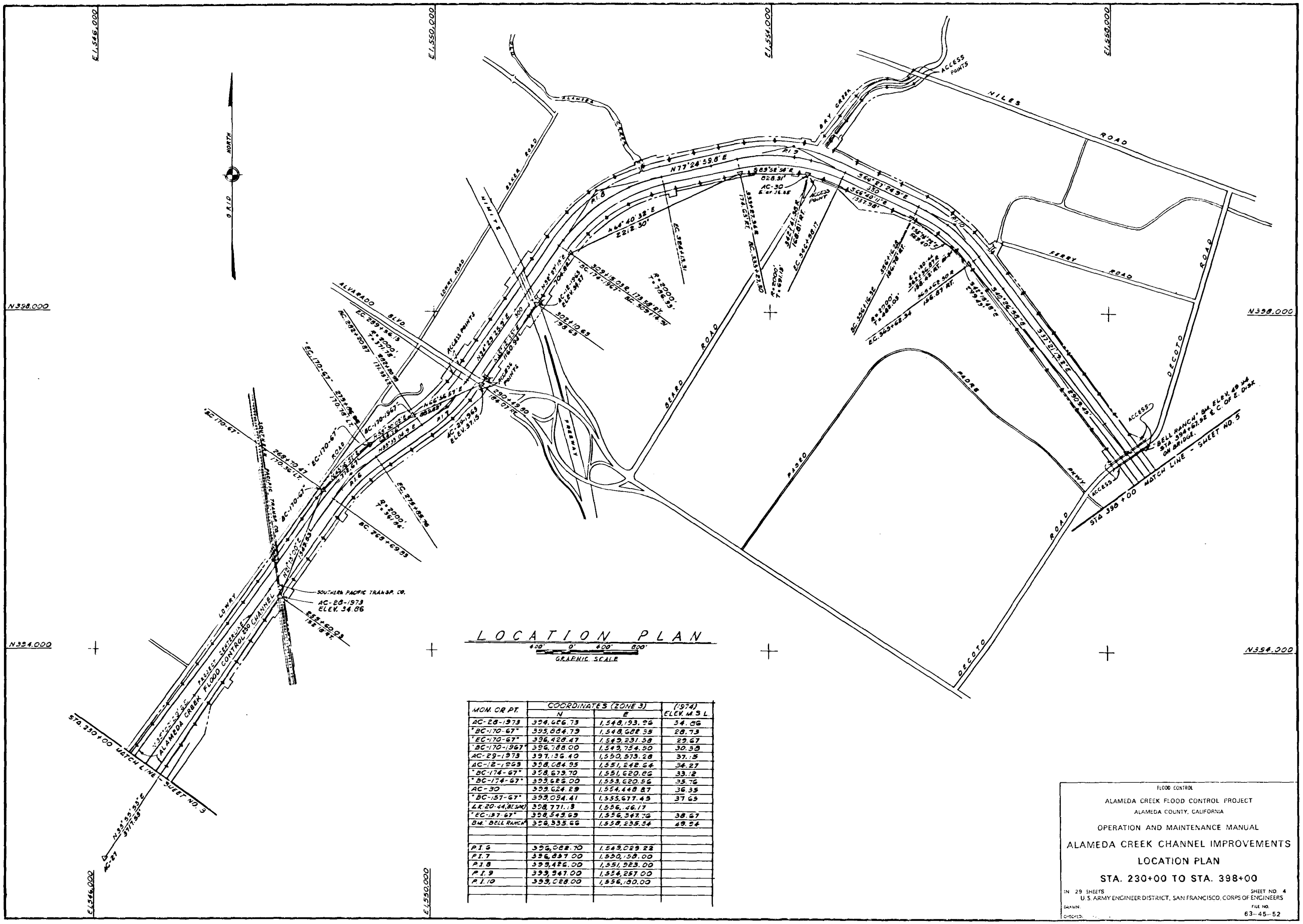
IN 29 SHEETS — SHEET NO. 3

U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS

DRAWN:

CHECKED: F. Thiess

FILE NO. 63-45-52



MON. OR PT.	COORDINATES (ZONE 3) N	COORDINATES (ZONE 3) E	(1974) ELEV. M.S.L.
AC-28-1973	394,626.73	1,548,193.96	34.86
"BC-170-67"	395,884.79	1,548,682.35	28.73
"EC-170-67"	396,428.47	1,549,231.38	29.67
"BC-170-1967"	396,788.00	1,549,754.50	30.38
AC-29-1973	397,136.40	1,550,573.28	37.15
AC-12-1969	398,084.95	1,551,242.64	34.27
"BC-174-67"	398,679.70	1,551,620.86	33.12
"BC-174-67"	399,626.00	1,553,620.56	35.76
AC-30	399,624.29	1,554,448.87	36.35
"BC-157-67"	399,094.41	1,555,677.45	37.65
LK 20-44 (BT. SPK)	398,771.13	1,556,.46.17	
"EC-157-67"	398,549.69	1,556,347.76	38.67
BM. "BELL RANCH"	396,335.66	1,558,235.34	49.94
P.I. 6	396,082.70	1,549,029.22	
P.I. 7	396,897.00	1,550,158.00	
P.I. 8	399,426.00	1,551,923.00	
P.I. 9	399,947.00	1,554,257.00	
P.I. 10	399,028.00	1,556,180.00	

FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS

LOCATION PLAN

STA. 230+00 TO STA. 398+00

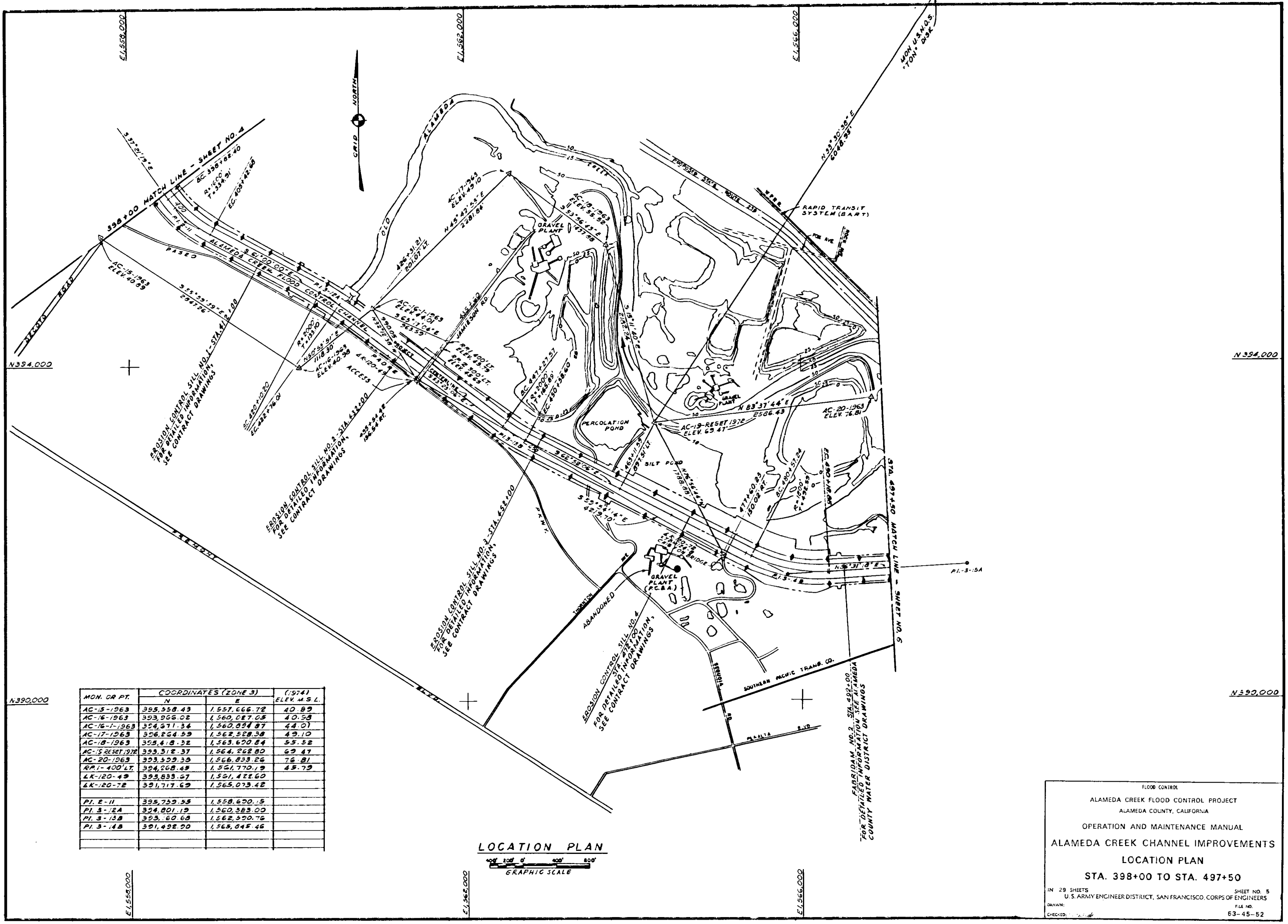
IN 29 SHEETS — SHEET NO. 4

U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS

DRAWN: — FILE NO. 63-45-52

CHECKED:

ALAMEDA 1611



MON. OR PT.	COORDINATES (ZONE 3) N	COORDINATES (ZONE 3) E	(1974) ELEV. M.S.L.
AC-15-1963	395,558.43	1,557,666.72	40.89
AC-16-1963	393,966.02	1,560,027.05	40.98
AC-16-1-1963	394,671.34	1,560,694 87	44.01
AC-17-1963	396,264.59	1,562,528.38	49.10
AC-18-1963	395,418.32	1,563,690.84	55.52
AC-19 RESET 1972	393,312.37	1,564,262.80	69.47
AC-20-1963	393,599.38	1,566,833.26	76.81
RP.1-400'LT.	394,268.45	1,561,770.19	45.79
LK-120-49	393,833.67	1,561,422.60	
LK-120-72	391,717.69	1,565,073.42	
PI. 2-11	395,739.55	1,558,690.15	
PI. 3-12A	394,801.19	1,560,383.00	
PI. 3-13B	393,160.68	1,562,590.76	
PI. 3-14B	391,492.90	1,565,845.46	

FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT

ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS

LOCATION PLAN

STA. 398+00 TO STA. 497+50

IN 29 SHEETS SHEET NO. 5

U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS

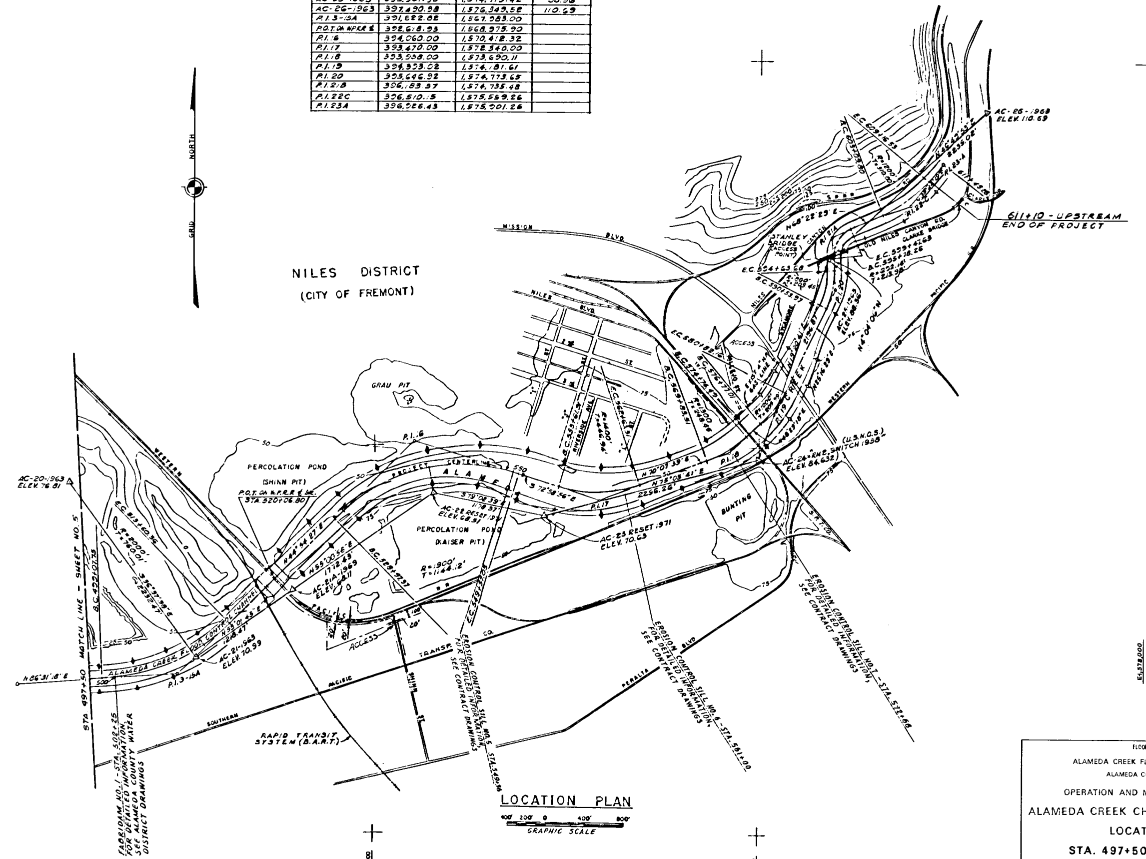
DRAWN:

CHECKED:

FILE NO. 63-45-52

ALAMEDA 1613

MON. OR PT.	COORDINATES N	COORDINATES E	ELEV. M.S.L.
AC-20-1963	393,599.38	1,566,833.26	76.81
AC-21-1963	391,807.75	1,568,165.17	70.99
AC-21A-1969	392,506.13	1,569,163.64	68.11
AC-22-RESET 1971	393,322.36	1,570,615.81	68.51
AC-23-RESET 1971	393,298.41	1,571,772.70	70.63
AC-24 SWITCH RM 2 1958 U.S.N.O.S.	393,889.06	1,573,991.70	[84.632] 1973 LIST
AC-25-1963	395,961.90	1,574,719.42	88.36
AC-26-1963	397,490.98	1,576,349.52	110.69
P.I. 3-15A	391,622.82	1,567,983.00	
P.O.T. ON WPRR ℄	392,618.93	1,568,975.90	
P.I. 16	394,060.00	1,570,412.32	
P.I. 17	393,470.00	1,572,340.00	
P.I. 18	393,958.00	1,573,690.11	
P.I. 19	394,393.02	1,574,181.61	
P.I. 20	395,646.92	1,574,773.65	
P.I. 21B	396,183.57	1,574,735.48	
P.I. 22C	396,510.15	1,575,559.26	
P.I. 23A	396,926.43	1,575,901.26	



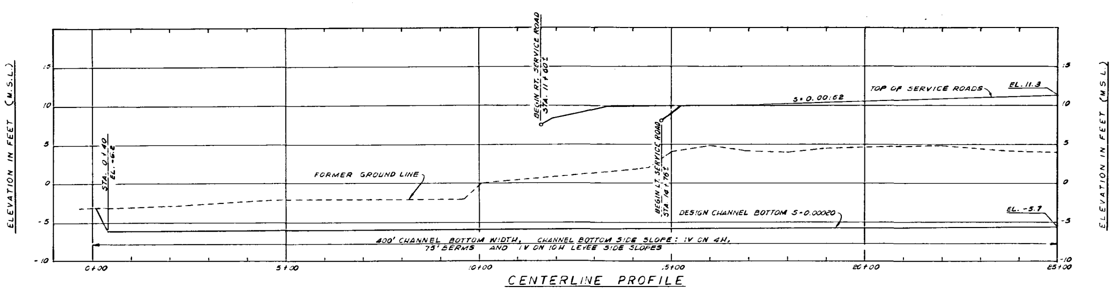
LOCATION PLAN

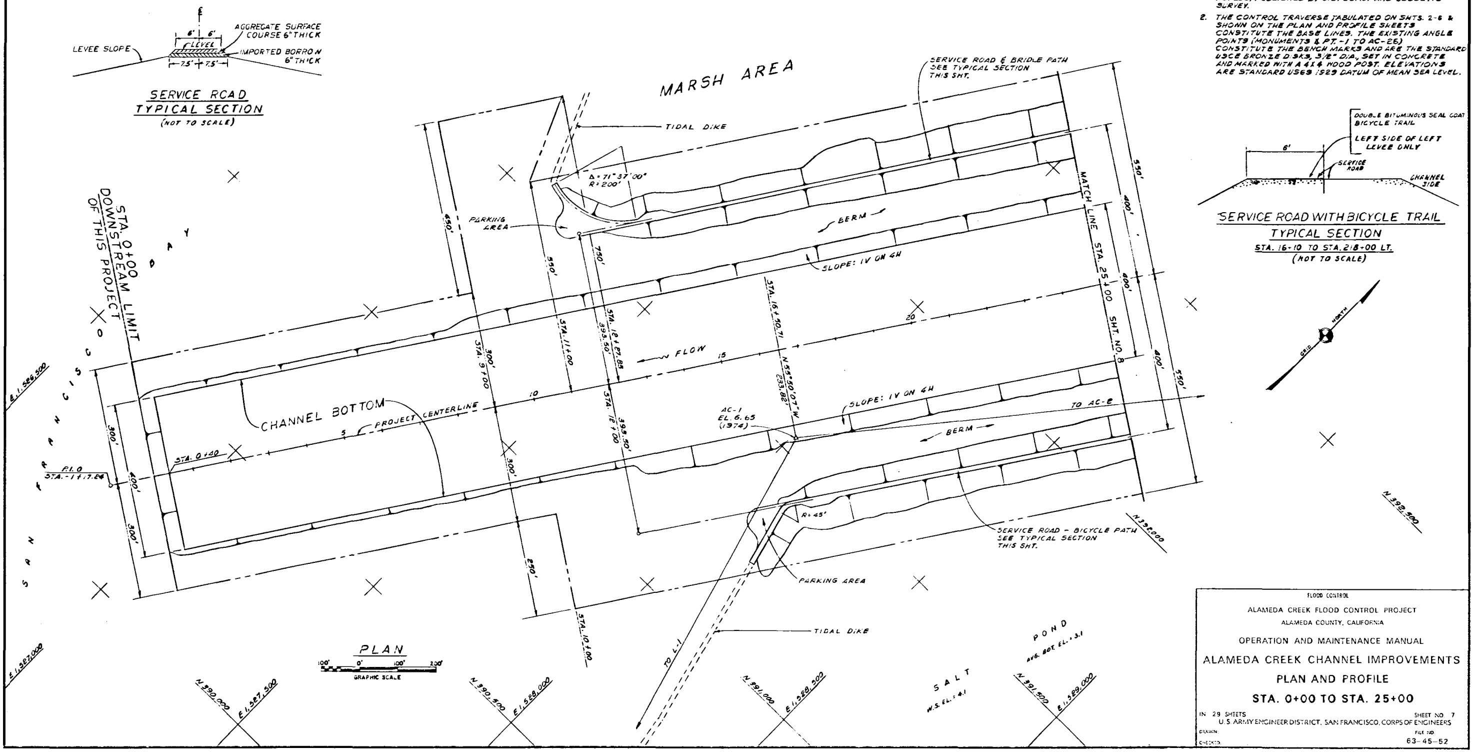
400' 200' 0 400' 800'
GRAPHIC SCALE

FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
LOCATION PLAN
STA. 497+50 TO STA. 611+10

IN 29 SHEETS | SHEET NO. 6
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN: A
CHECKED: F. Thiene
FILE NO. 63-45-52

ALAMEDA 1615





LEGEND

(FOR SHEETS 7 THRU 29)

- RIGHT OF WAY BOUNDARY LINE
- UNIMPROVED ROADS
- FENCE LINES
- STRUCTURES
- CULVERT
- TREES
- POWER POLES
- PUMP
- EL. 6.95 — ELEVATION OF MONUMENT
- Δ (1974) — C. OF E. MONUMENT AND YEAR LAST CHECKED

GENERAL NOTES

1. PLANE GRID, BEARINGS AND COORDINATES ARE BASED ON THE STATE OF CALIFORNIA. COORDINATE SYSTEM (LAMBERT CONFORMAL PROJECTION) ZONE III CALIFORNIA, AS DESCRIBED IN SPECIAL PUBLICATION NO. 253, PUBLISHED BY U.S. COAST AND GEODETIC SURVEY.
2. THE CONTROL TRAVERSE TABULATED ON SHTS. 2-6 & SHOWN ON THE PLAN AND PROFILE SHEETS CONSTITUTE THE BASE LINES. THE EXISTING ANGLE POINTS (MONUMENTS & PT. -1 TO AC-26) CONSTITUTE THE BENCH MARKS AND ARE THE STANDARD USCE BRONZE DISKS, 3½" DIA., SET IN CONCRETE AND MARKED WITH A 4X4 WOOD POST. ELEVATIONS ARE STANDARD USGS 1929 DATUM OF MEAN SEA LEVEL.

FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT

ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS

PLAN AND PROFILE

STA. 0+00 TO STA. 25+00

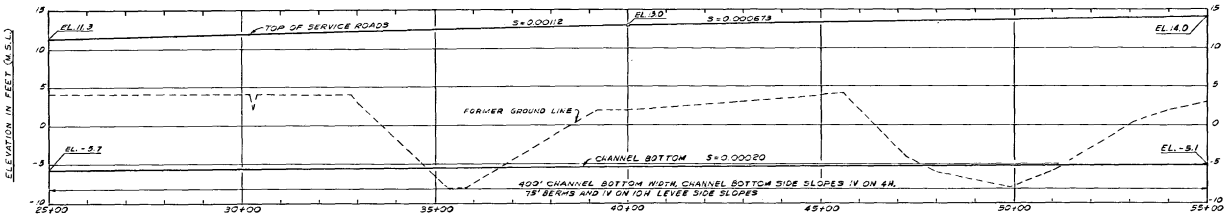
IN 29 SHEETS — SHEET NO. 7

U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS

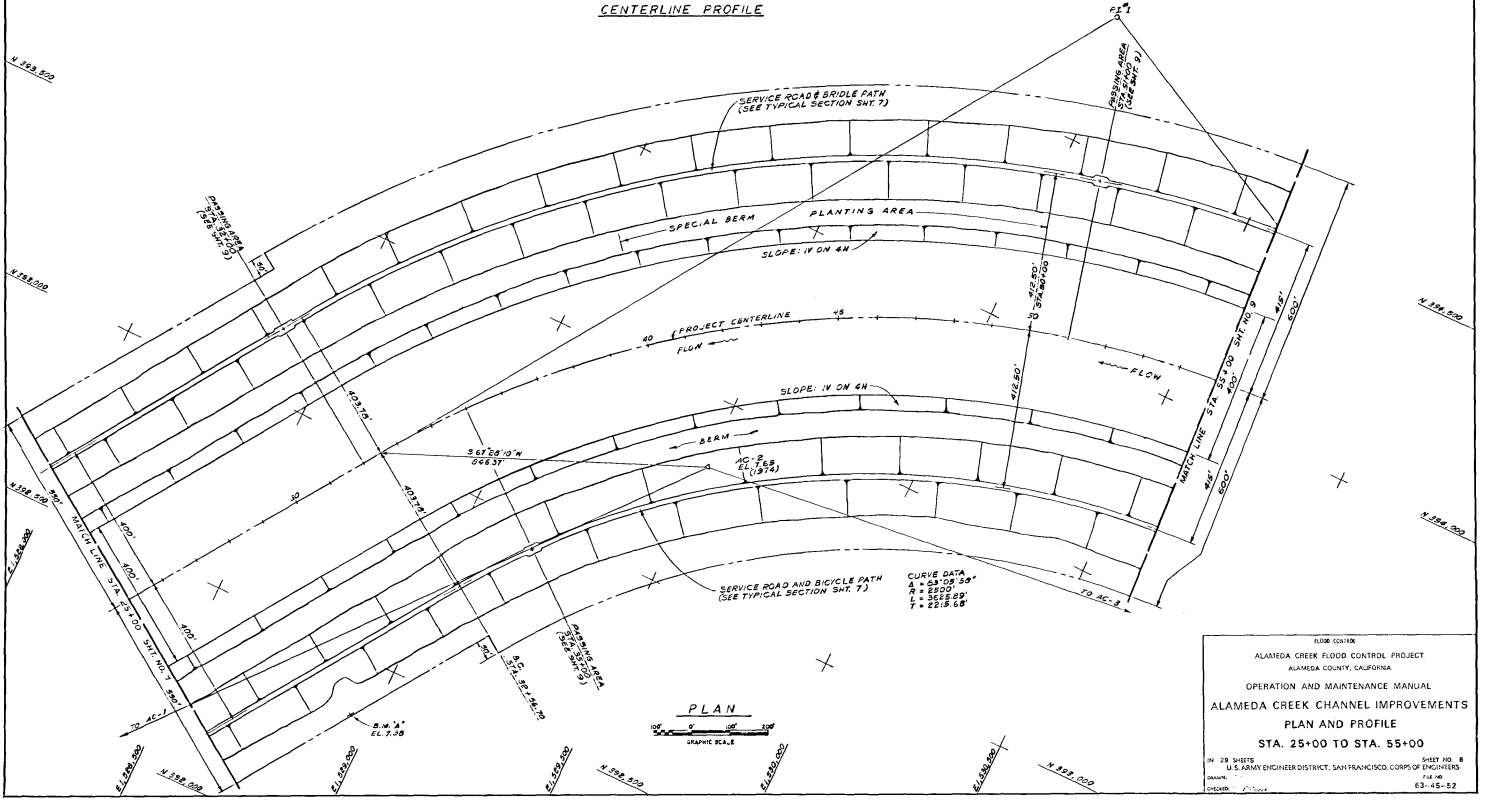
DRAWN: — FILE NO. 63-45-52

CHECKED:

ALAMEDA 1617

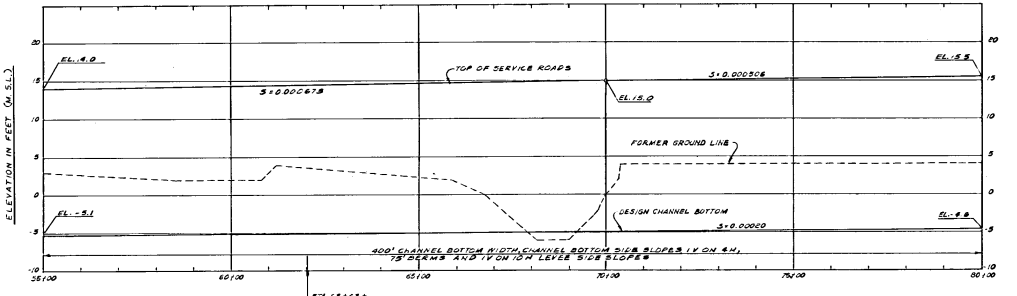


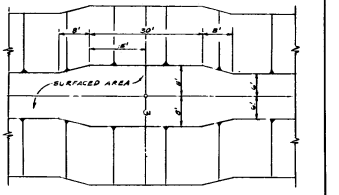
CENTERLINE PROFILE



FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PROFILE
STA. 25+00 TO STA. 55+00
IN 29 SHEETS
SHEET NO. 8
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN
FILE NO.
CHECKED
63-45-52

ALAMEDA 1619





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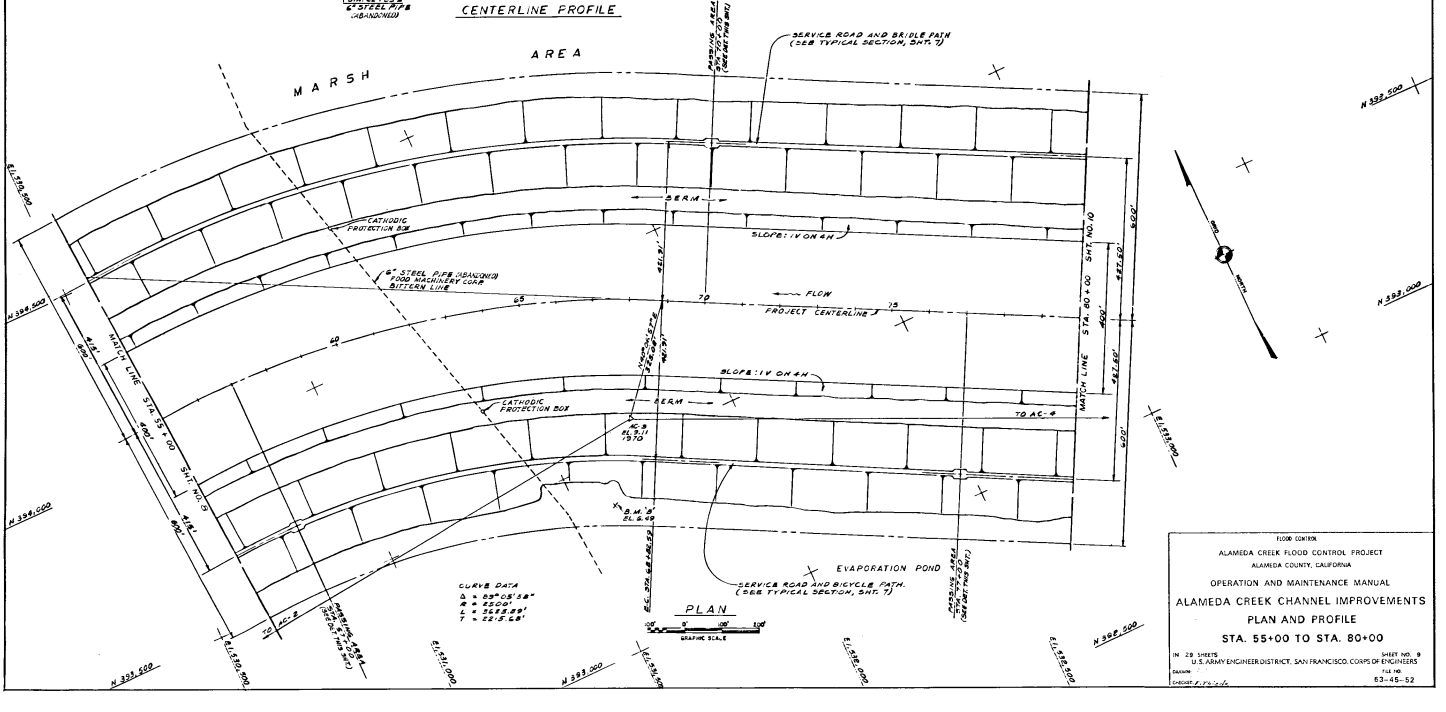
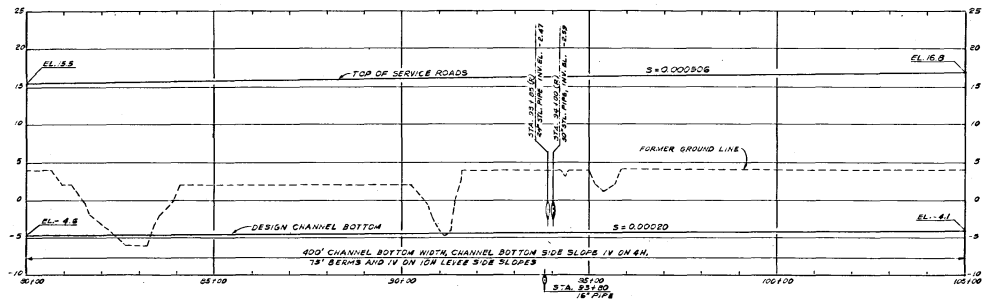


FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PLOT
STA. 55+00 TO STA. 80+00
IN 29 SHEETS SHEET NO. 9
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DESIGN
DRAWN
CHECKED
FILE NO.
63-45-52

ALAMEDA 1621



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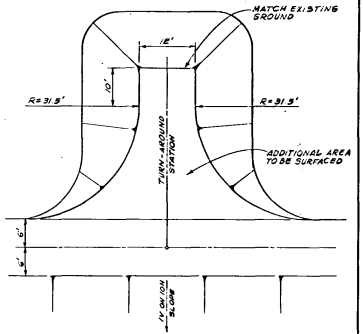
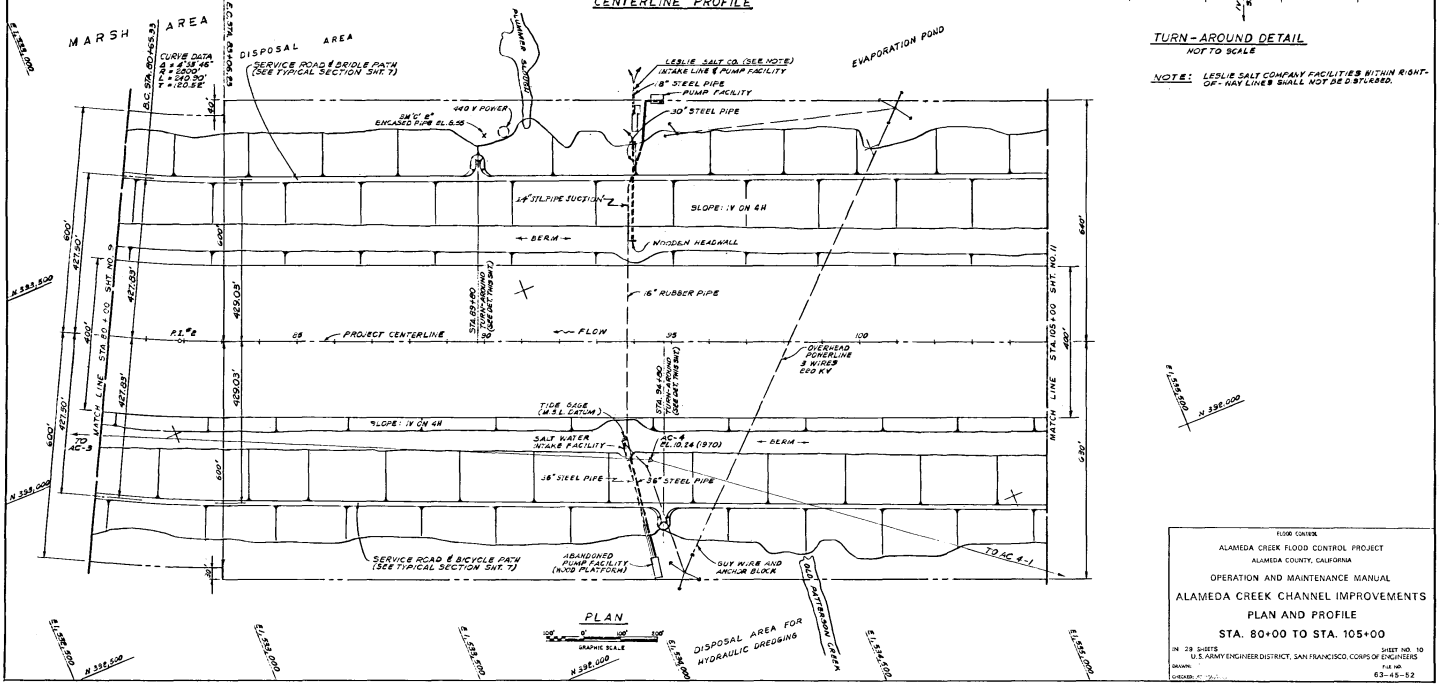


TURN-AROUND DETAIL
NOT TO SCALE

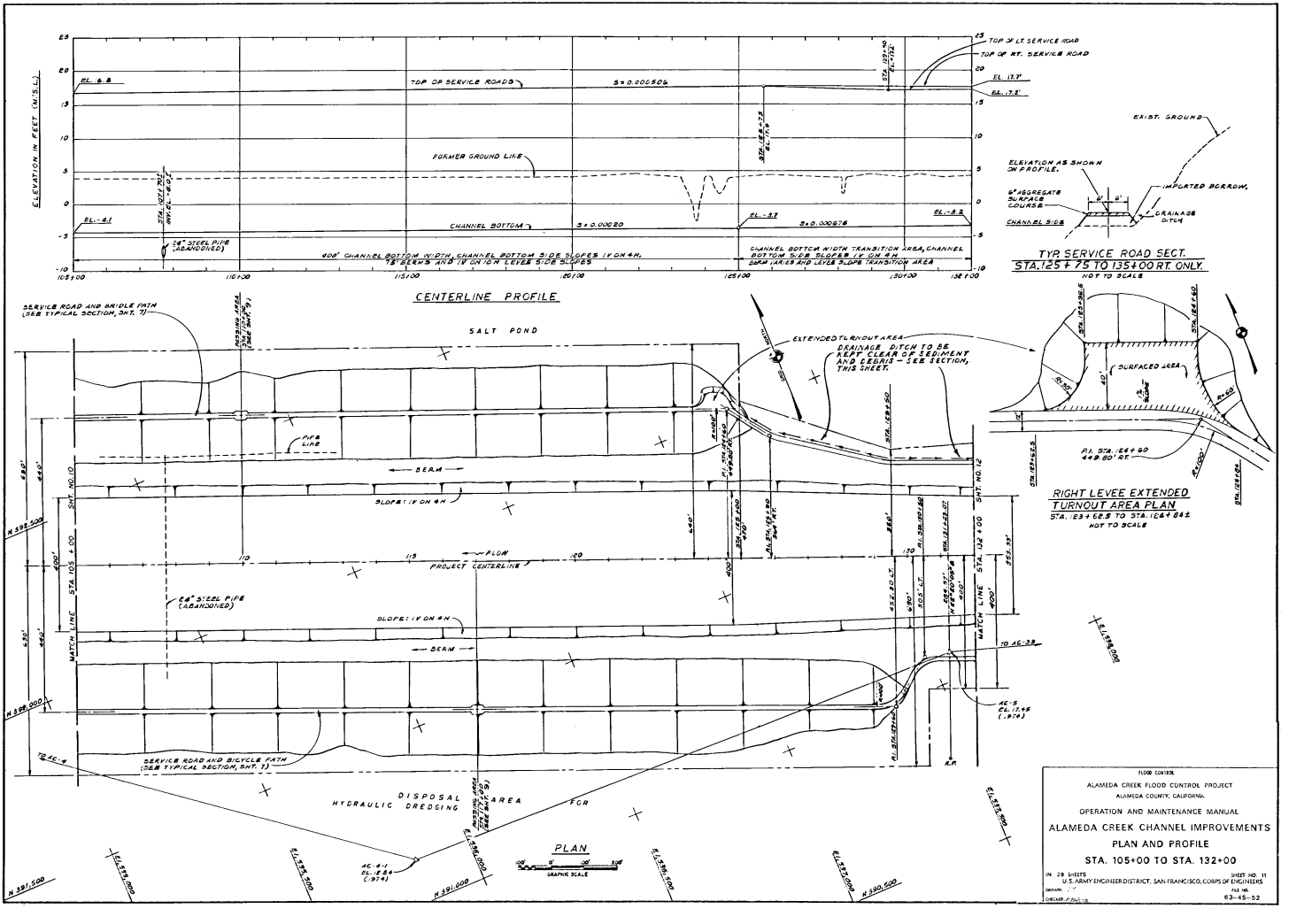
NOTE: LESLIE SALT COMPANY FACILITIES WITHIN RIGHT-OF-WAY LINES SHALL NOT BE DISTURBED.



PLAN
GRAPHIC SCALE

FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PROFILE
STA. 80+00 TO STA. 105+00
IN 28 SHEETS
SHEET NO. 10
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN:
FILE NO.
63-45-52
CHECKED:

ALAMEDA 1623



FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT

ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS

PLAN AND PROFILE

STA. 105+00 TO STA. 132+00

IN 29 SHEETS

SHEET NO. 11

U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS

DRAWN

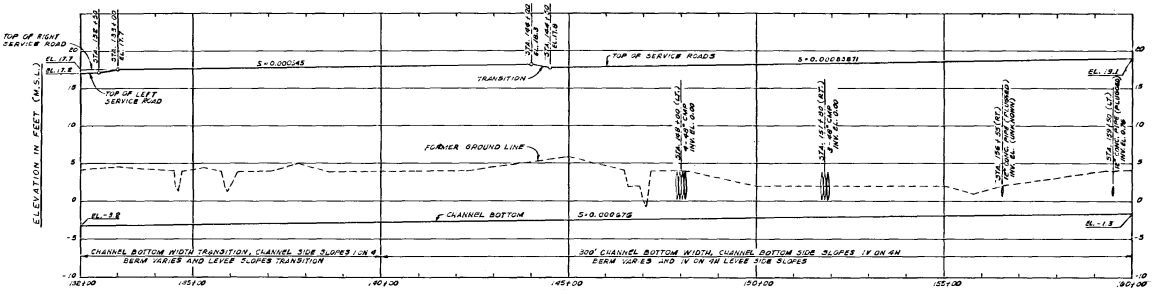
TRACED

CHECKED

FILE NO.

63-45-52

ALAMEDA 1625



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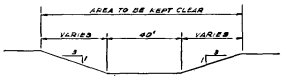
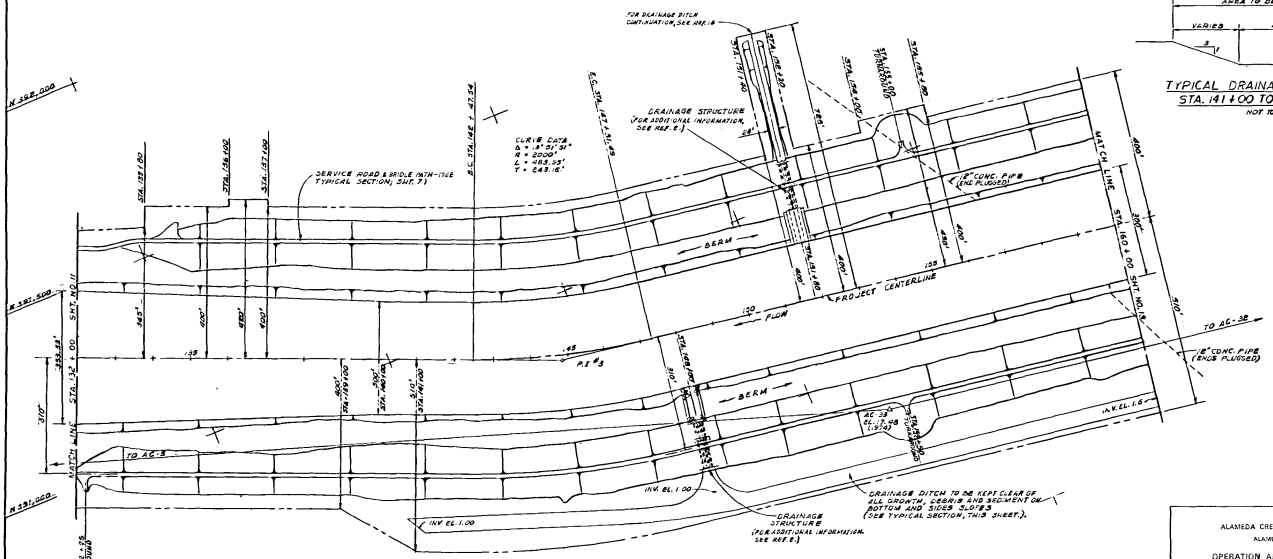


TYPICAL DRAINAGE DITCH SECTION
STA. 141+00 TO STA. 218+10 LT.
NOT TO SCALE

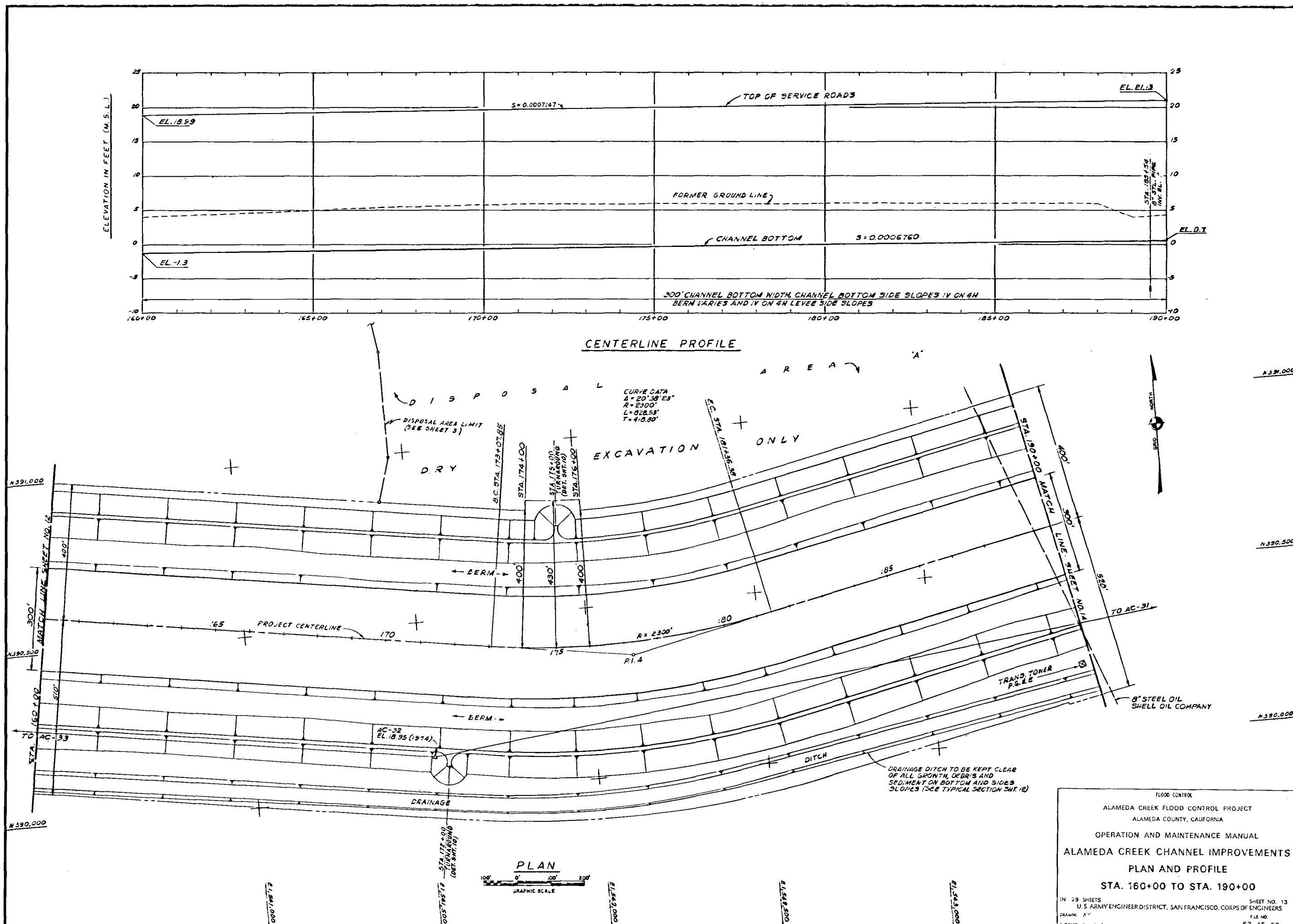


PLAN

GRAPHIC SCALE

FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PROFILE
STA. 132+00 TO STA. 160+00
IN 29 SHEETS
SHEET NO. 12
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN: F.T.
CHECKED: P.T.+L.L.
FILE NO. 63-45-12

ALAMEDA 1627



FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT

ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS

PLAN AND PROFILE

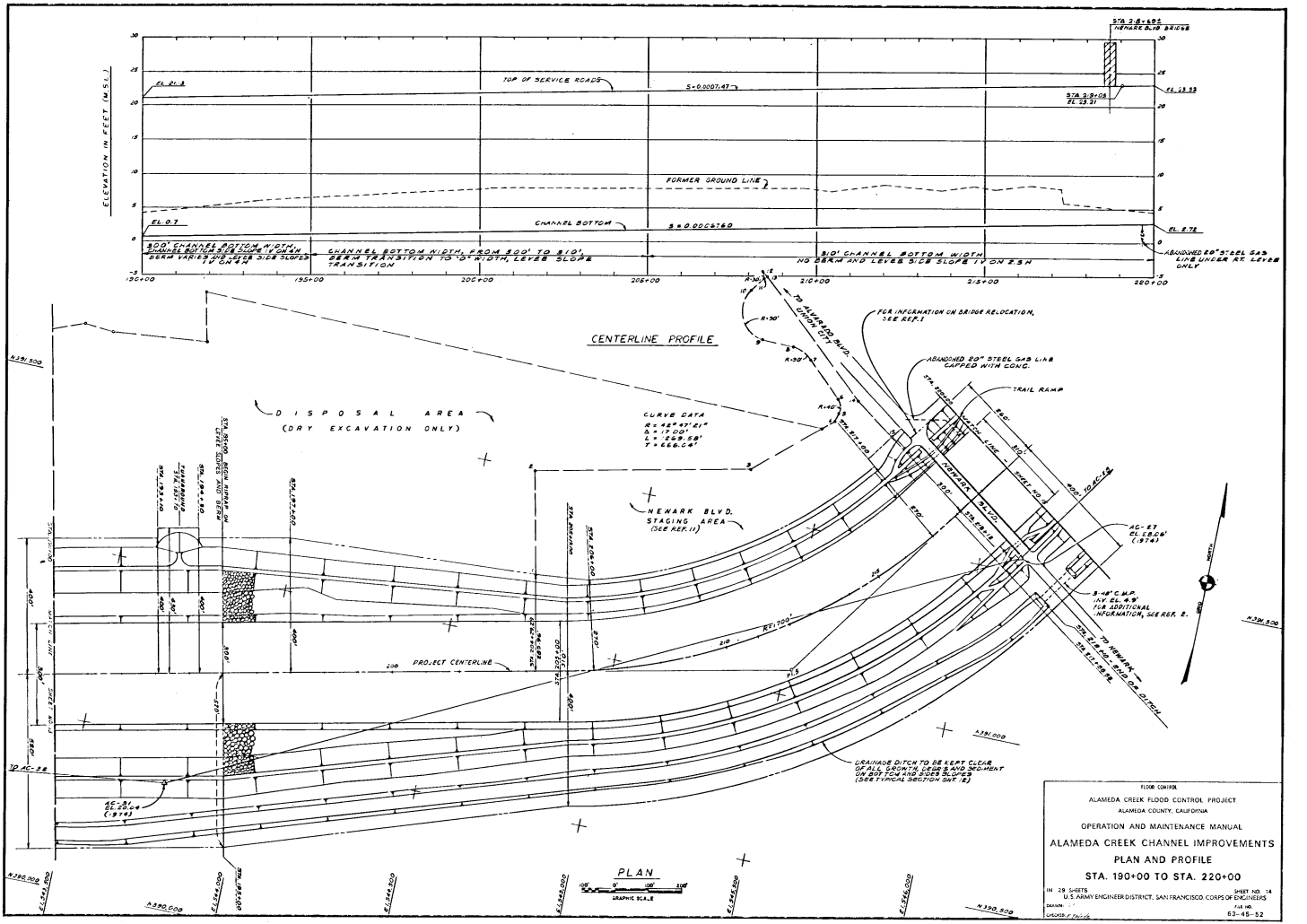
STA. 160+00 TO STA. 190+00

IN 29 SHEETS — SHEET NO. 13

U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS

FILE NO. 63-45-52

ALAMEDA 1629



FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT

ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS

PLAN AND PROFILE

STA. 190+00 TO STA. 220+00

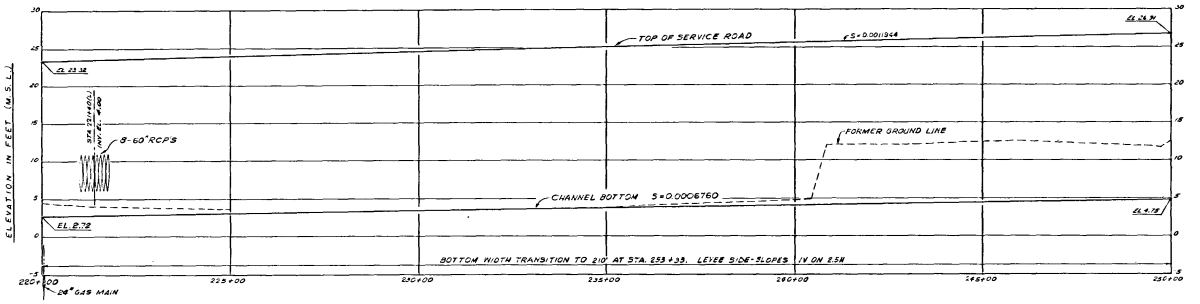
IN 29 SHEETS — SHEET NO. 14

U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS

DRAWN: — FILE NO. 63-45-52

CHECKED: —

ALAMEDA 1631



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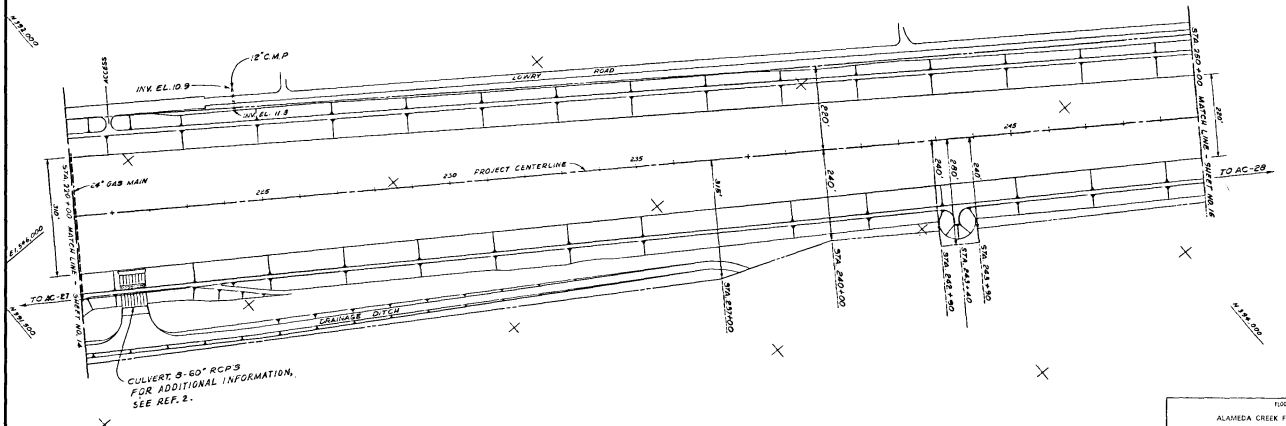
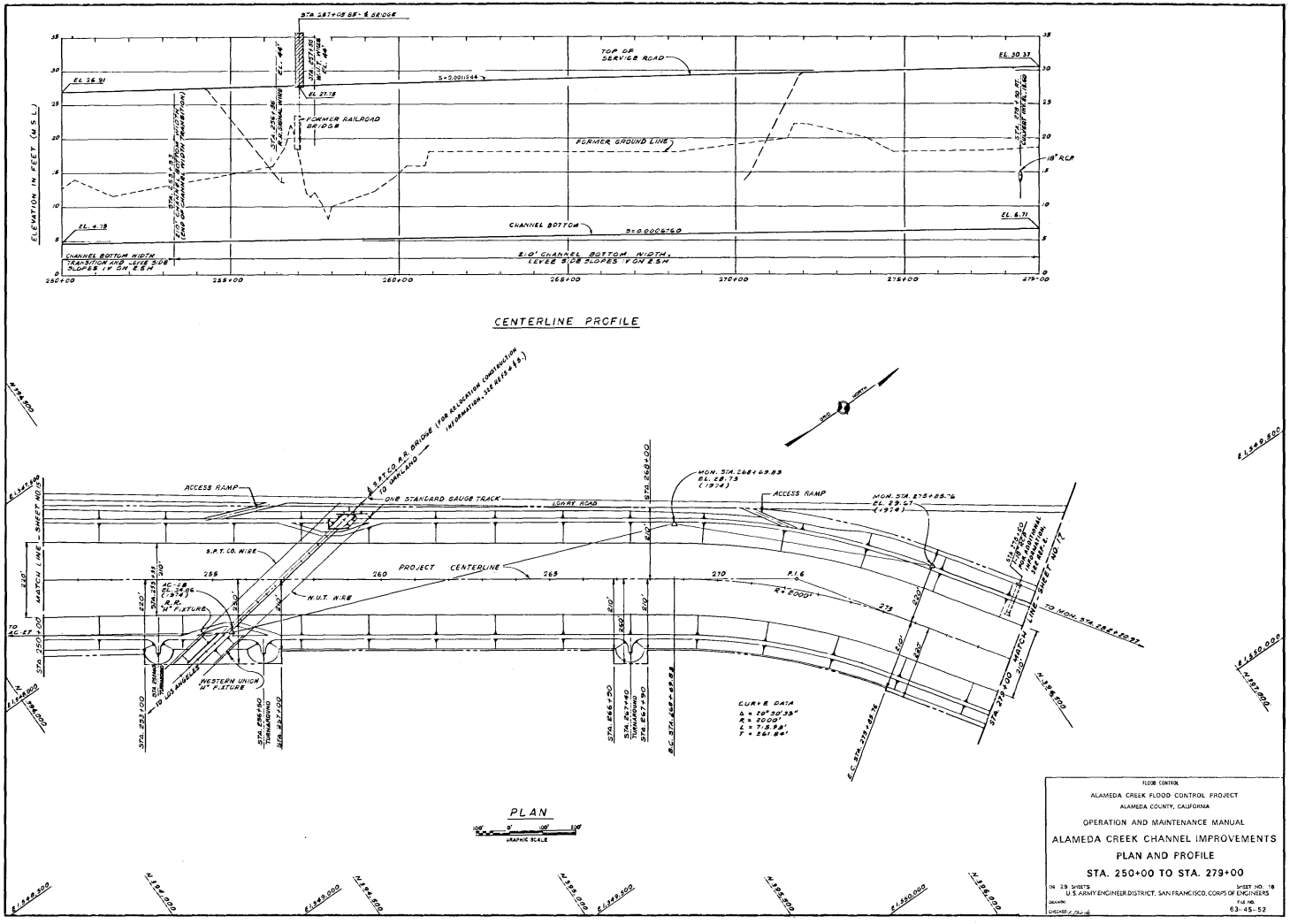


PLAN

GRAPHIC SCALE

FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PROFILE
STA. 220+00 TO STA. 250+00
IN 28 SHEETS
SHEET NO. 15
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
FILE NO.
DRAWN
TRACED
DESIGNED
CHECKED
63-45-52

ALAMEDA 1633



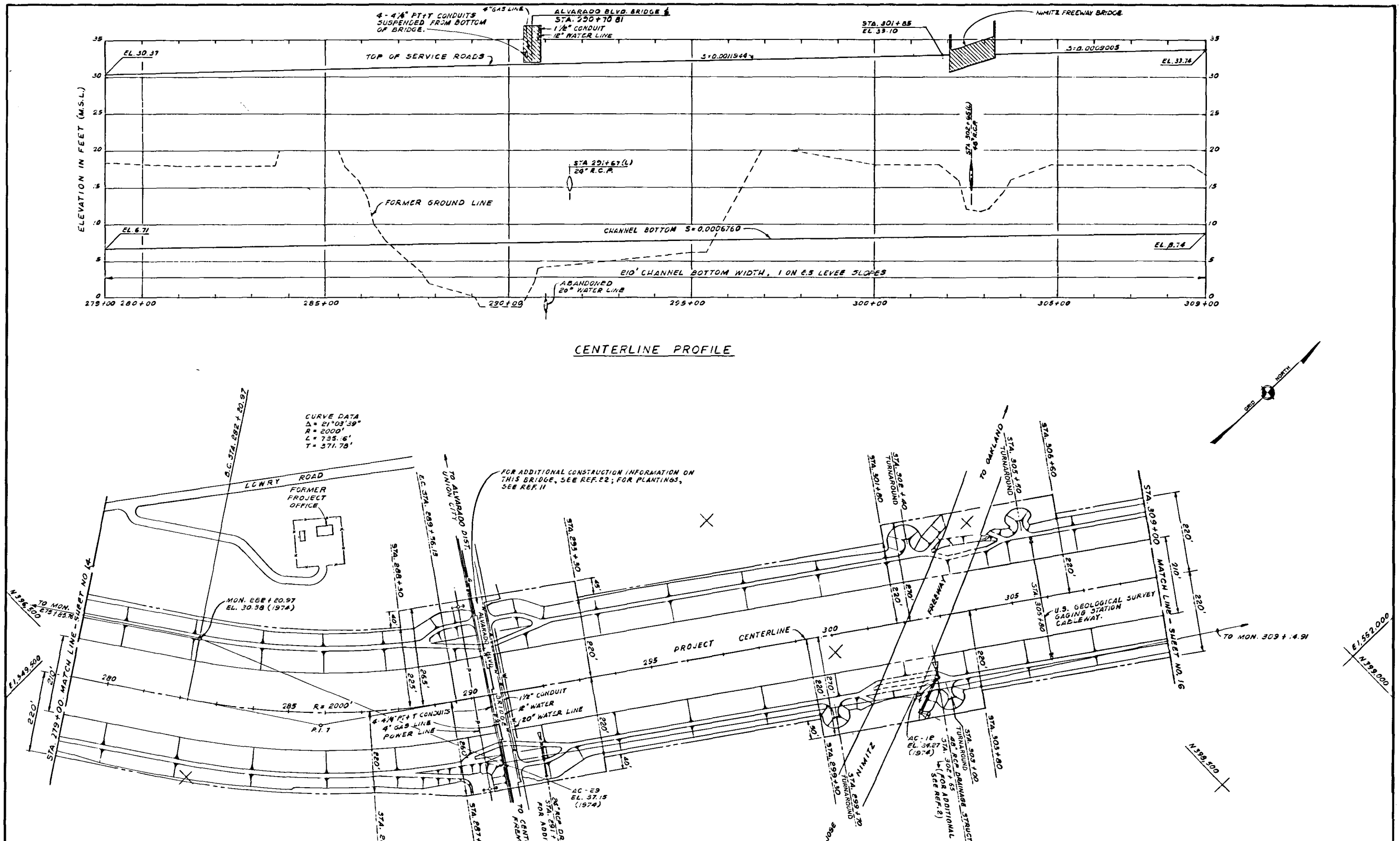
CENTERLINE PROFILE

PLAN

GRAPHIC SCALE

FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PROFILE
STA. 250+00 TO STA. 279+00
IN 29 SHEETS
SHEET NO. 18
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN
CHECKED 7-24-46
FILE NO. 63-45-52

ALAMEDA 1635



FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT

ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS

PLAN AND PROFILE

STA. 279+00 TO STA. 309+00

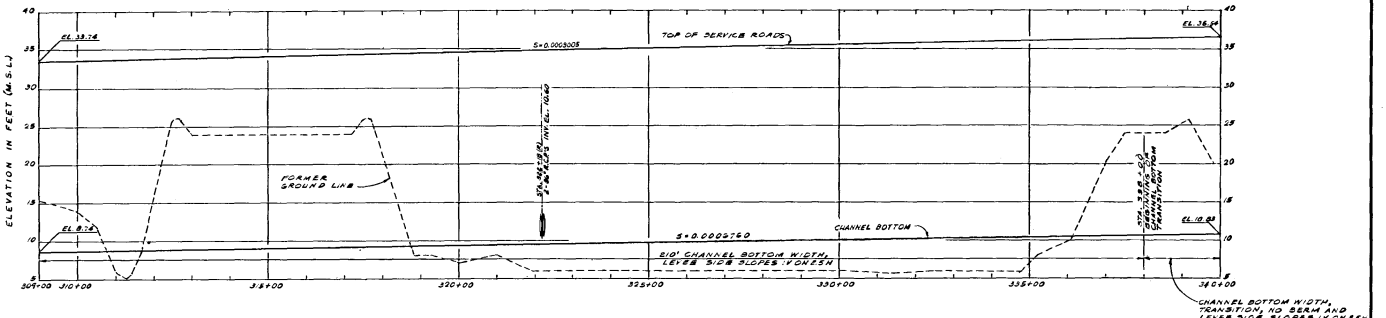
IN 29 SHEETS — SHEET NO. 17

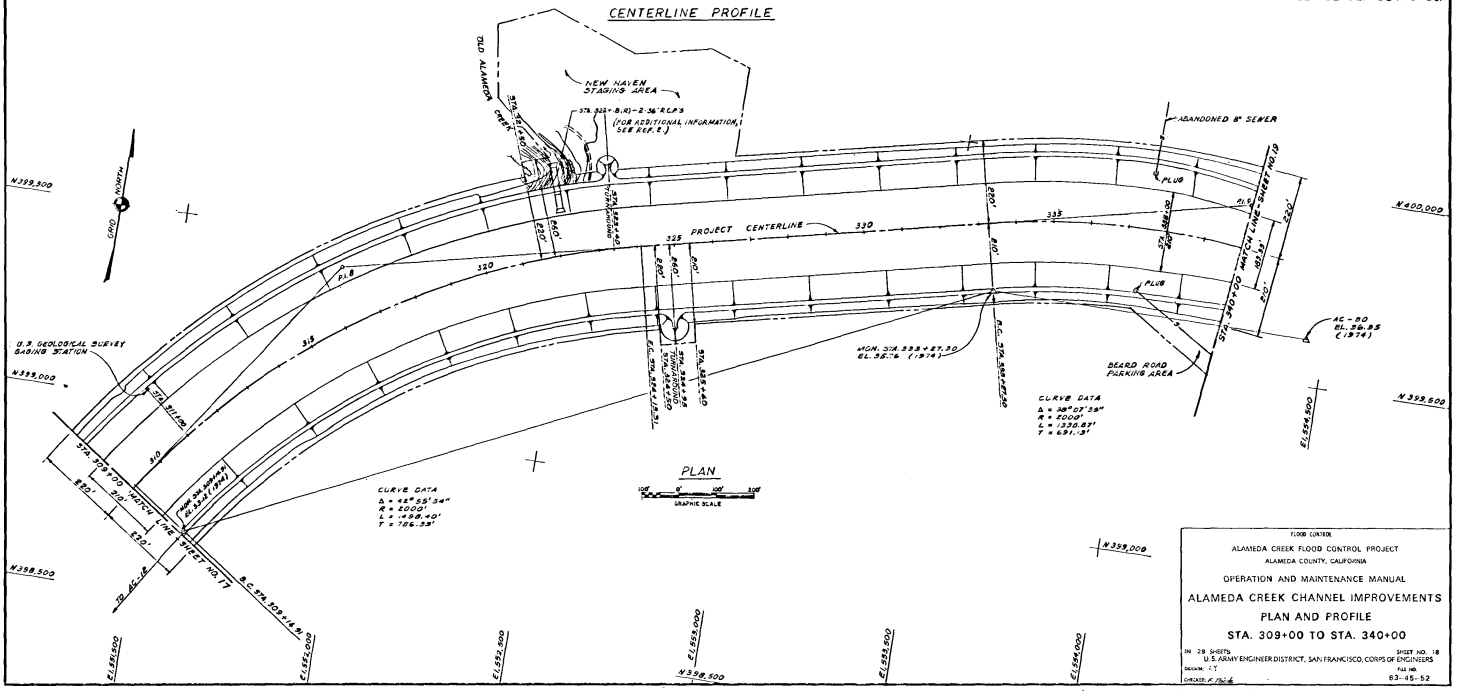
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS

DRAWN: — FILE NO. 63-45-52

CHECKED: F. Thiede

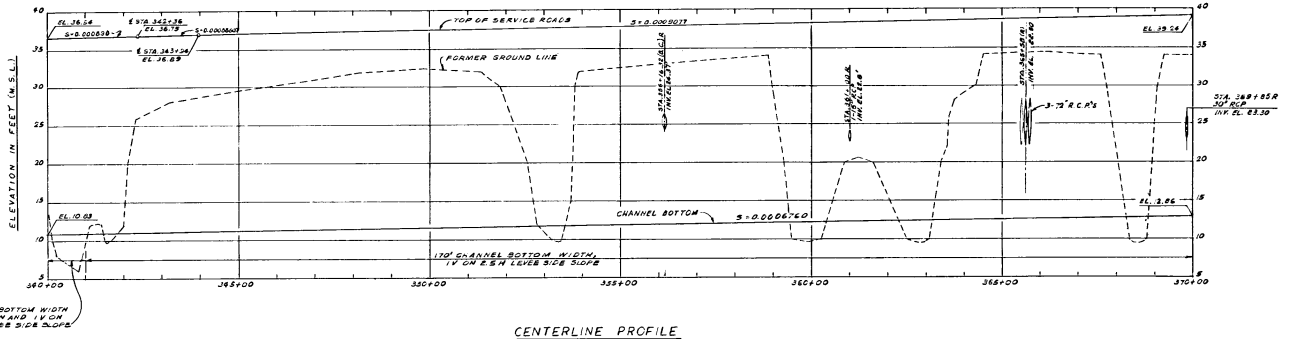
ALAMEDA 1637





FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PROFILE
STA. 309+00 TO STA. 340+00
IN 28 SHEETS
SHEET NO. 18
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN: J.T.
FILE NO.
CHECKED: F. Hall
63-45-52

ALAMEDA 1639



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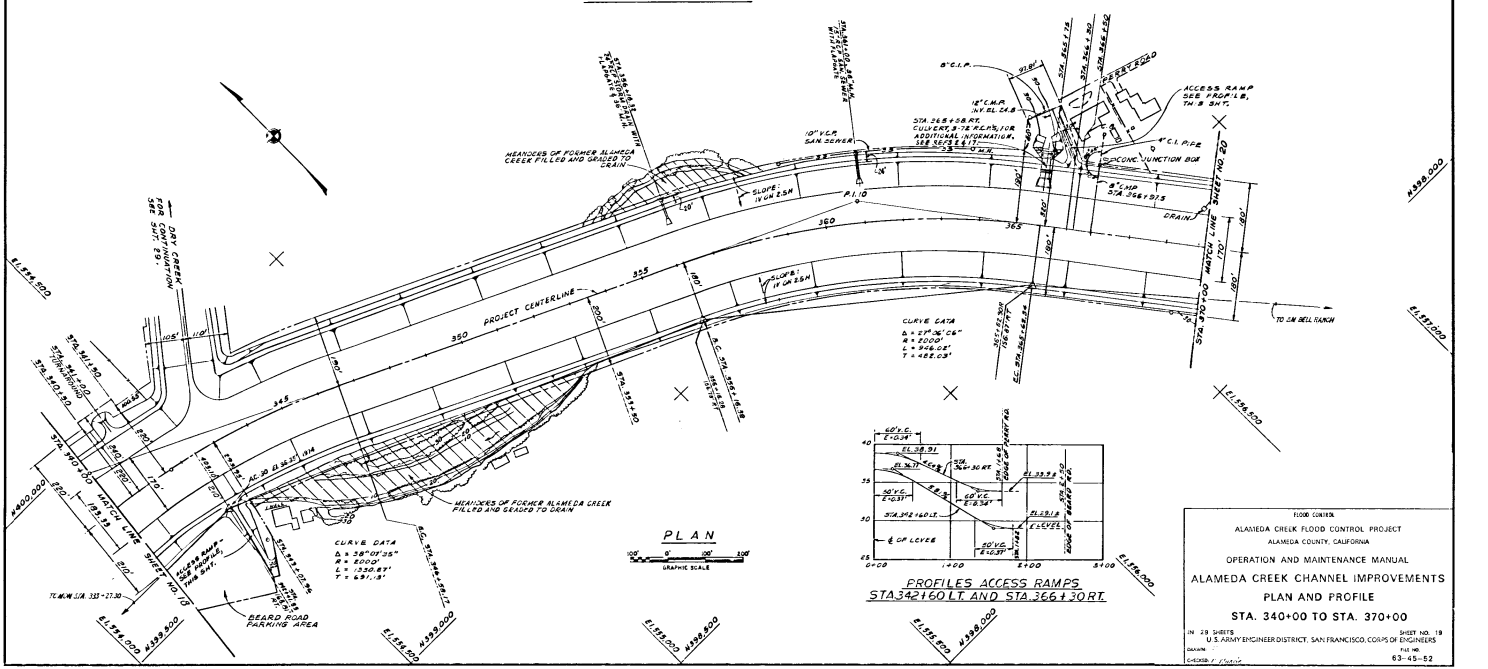


PLAN

GRAPHIC SCALE 0 100' 200'

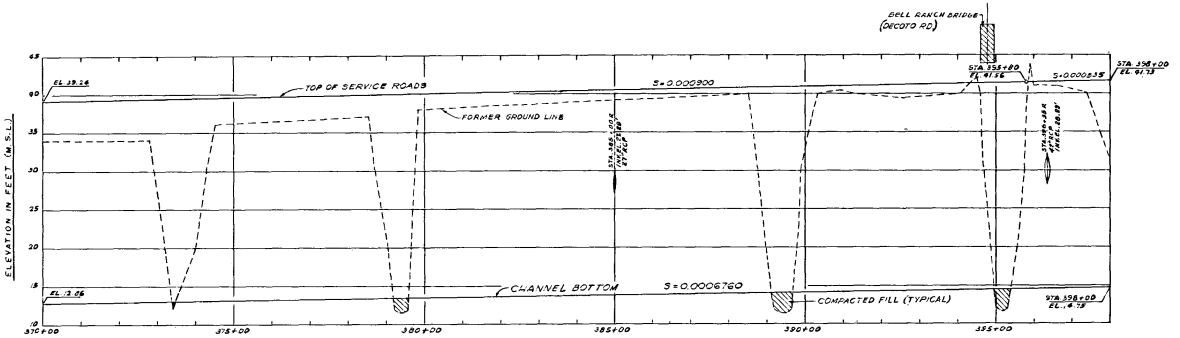
PROFILES ACCESS RAMPS
STA 342+60 LT. AND STA. 366+30 RT.

FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PROFILE
STA. 340+00 TO STA. 370+00

IN 28 SHEETS
SHEET NO. 19
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN
CHECKED
FILE NO. 63-45-52

ALAMEDA 1641



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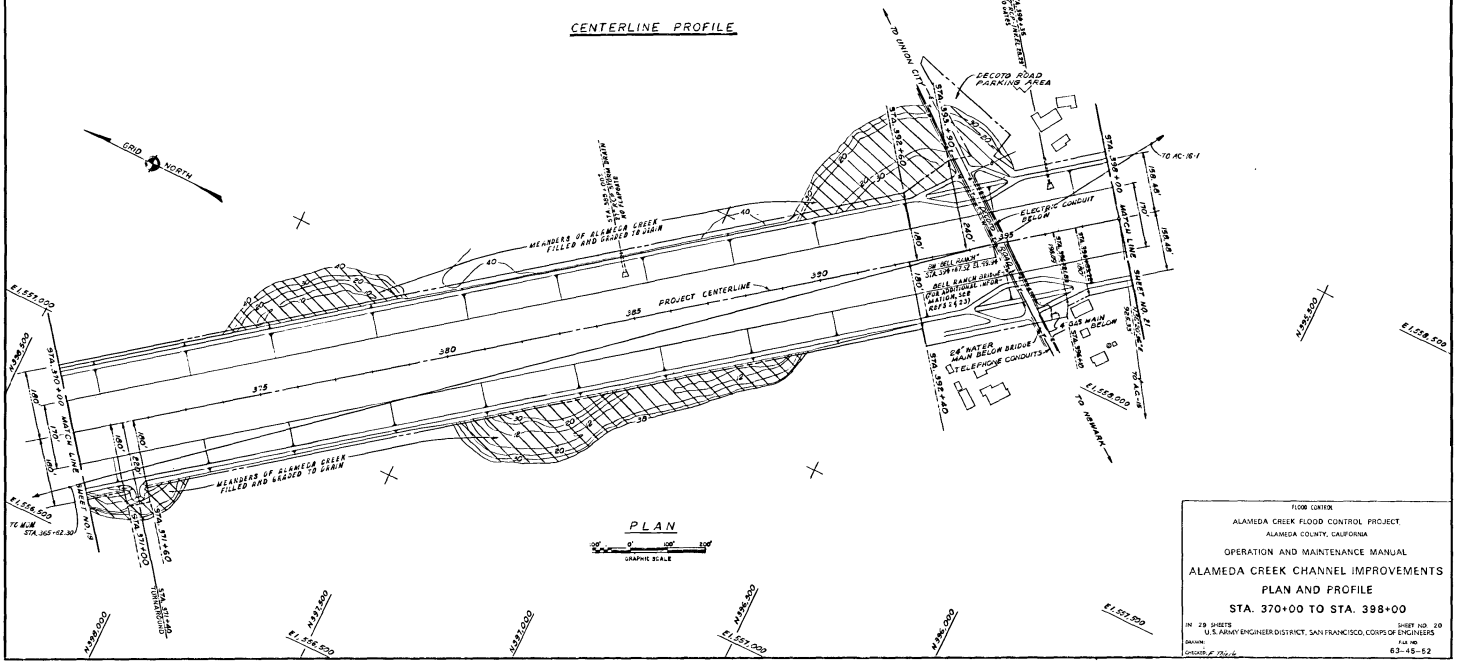
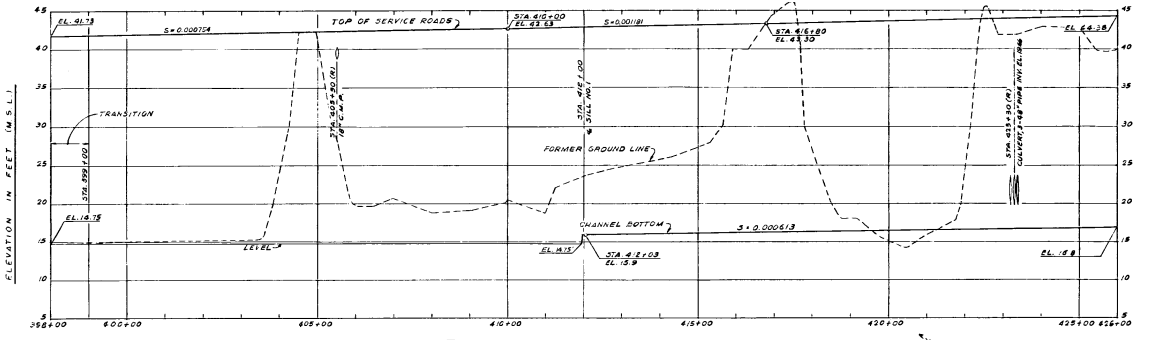
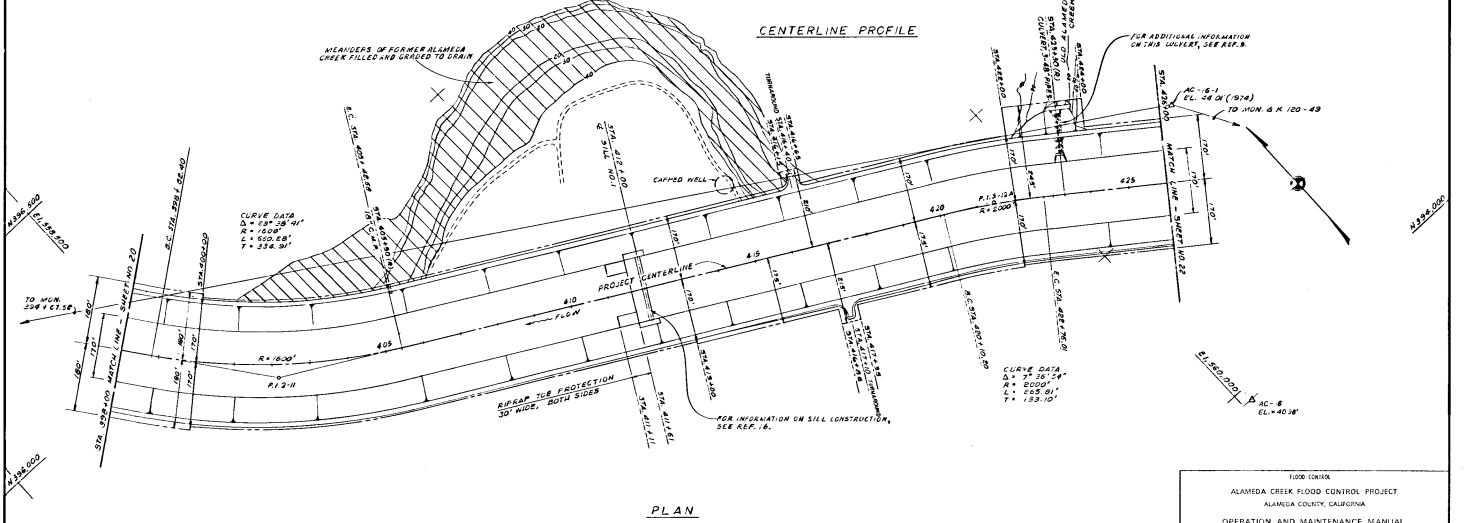


FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT,
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PROFILE
STA. 370+00 TO STA. 398+00
IN 29 SHEETS
SHEET NO. 20
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
APPROVED
FILE NO.
63-45-52

ALAMEDA 1643





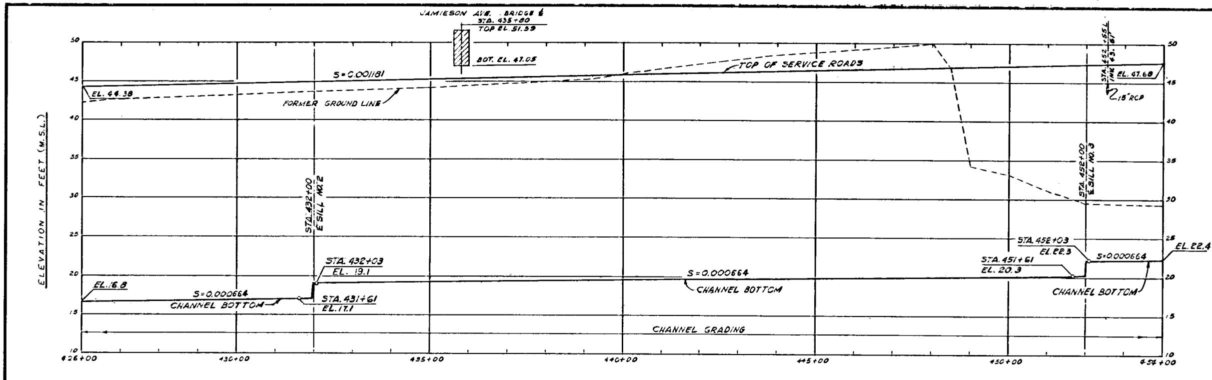
PLAN

GRAPHIC SCALE

FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PROFILE
STA. 398+00 TO STA. 426+00

IN 29 SHEETS
SHEET NO. 21
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN
TRACED
CHECKED
APPROVED
FILE NO.
63-45-52

ALAMEDA 1645



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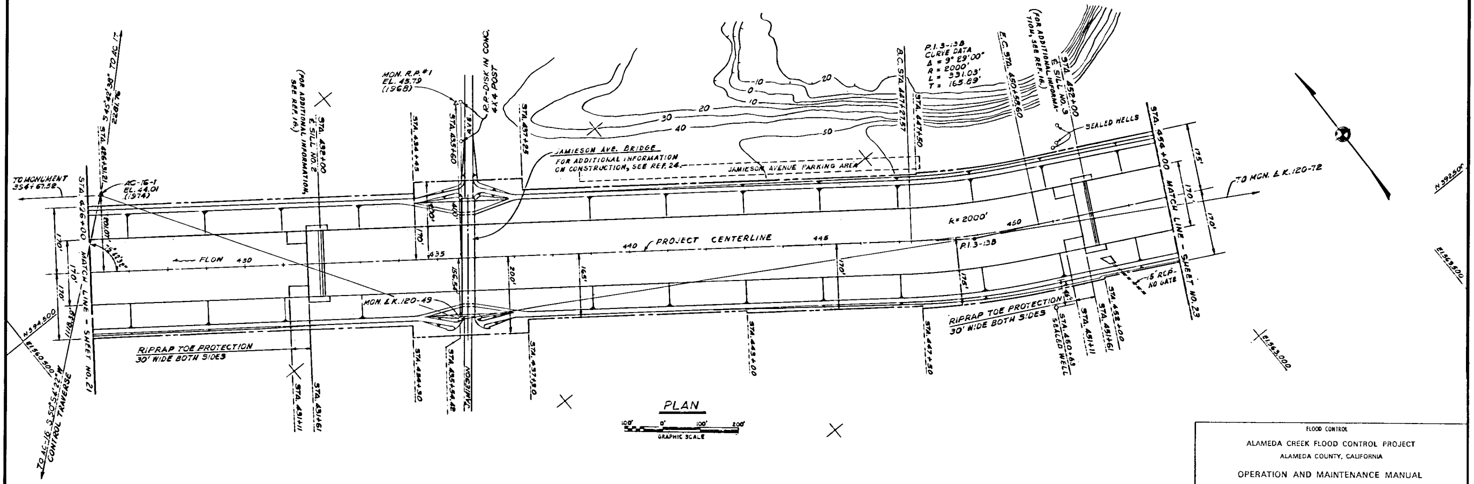


PLAN

FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT

ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS

PLAN AND PROFILE

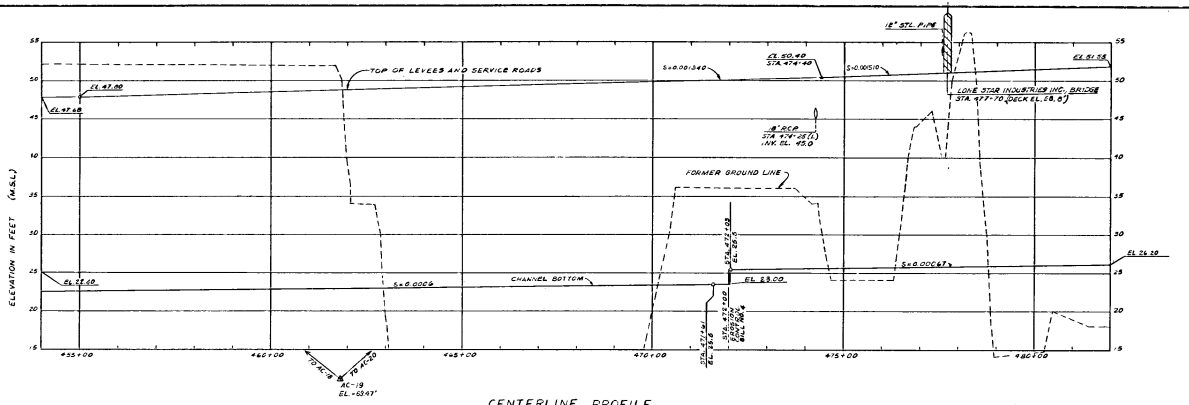
STA. 426+00 TO STA. 454+00

IN 29 SHEETS — SHEET NO. 22

U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS

FILE NO. 63-45-52

ALAMEDA 1647



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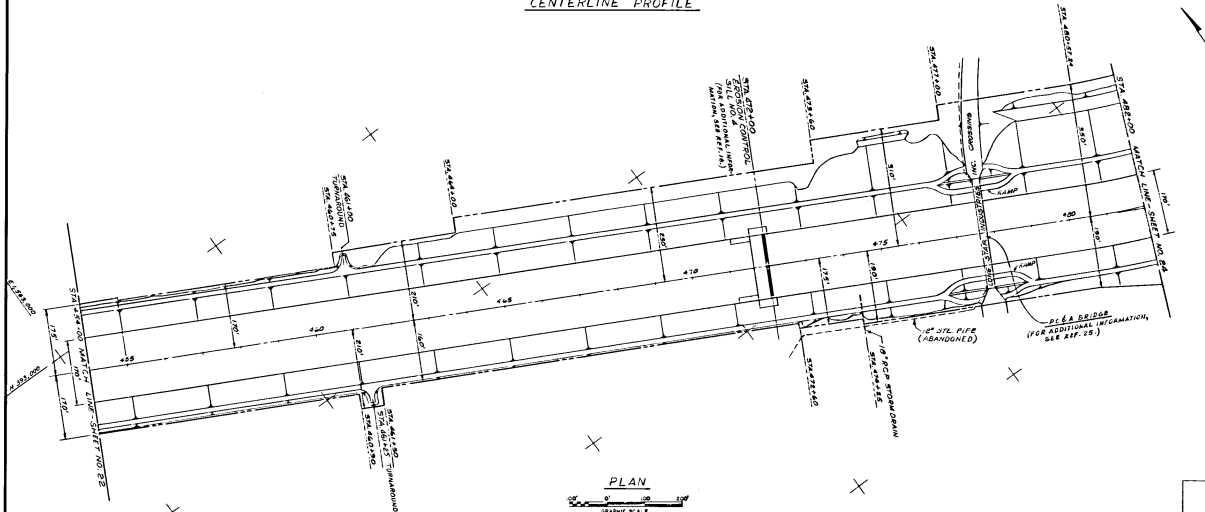


PLAN

GRAPHIC SCALE

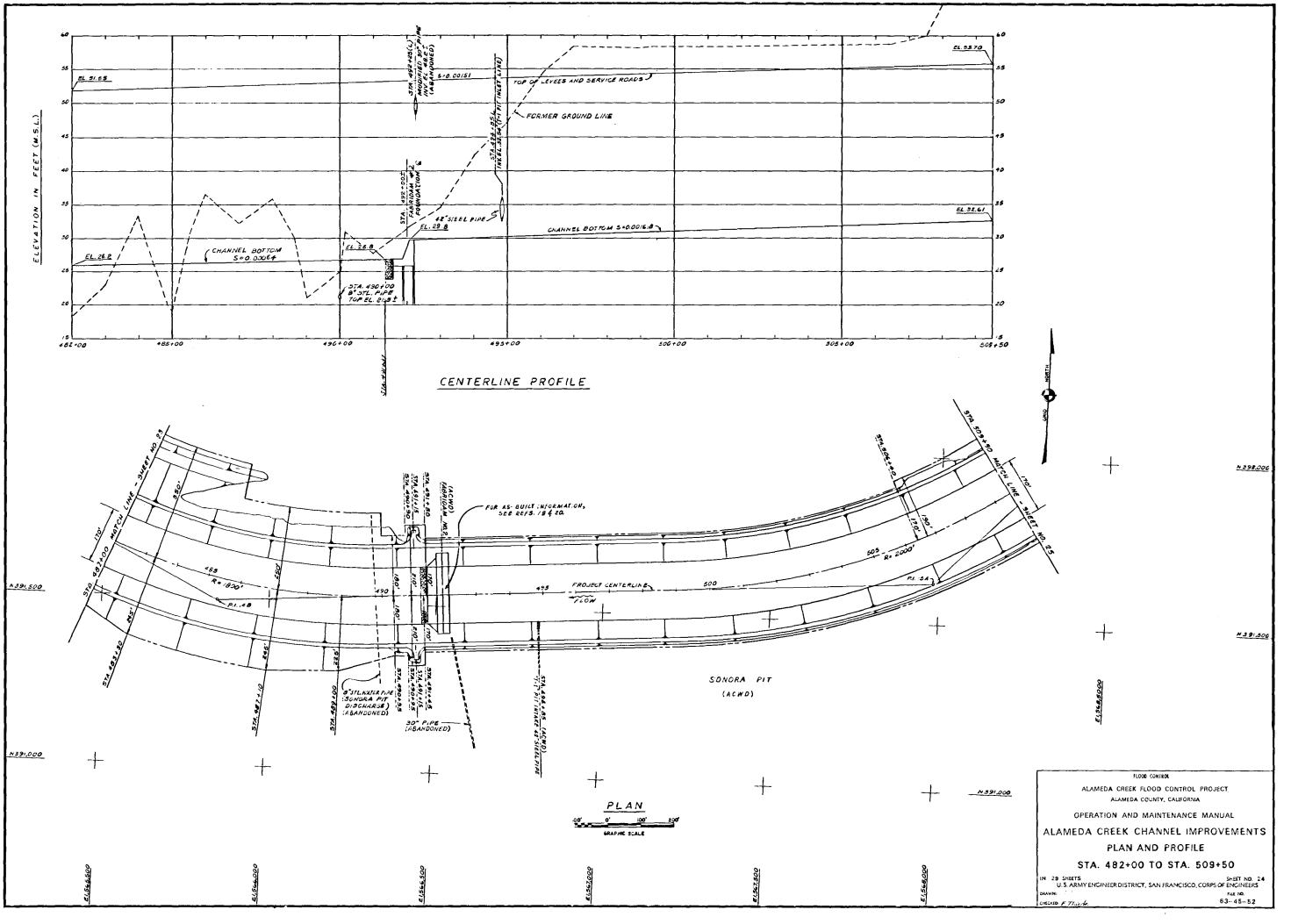
FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

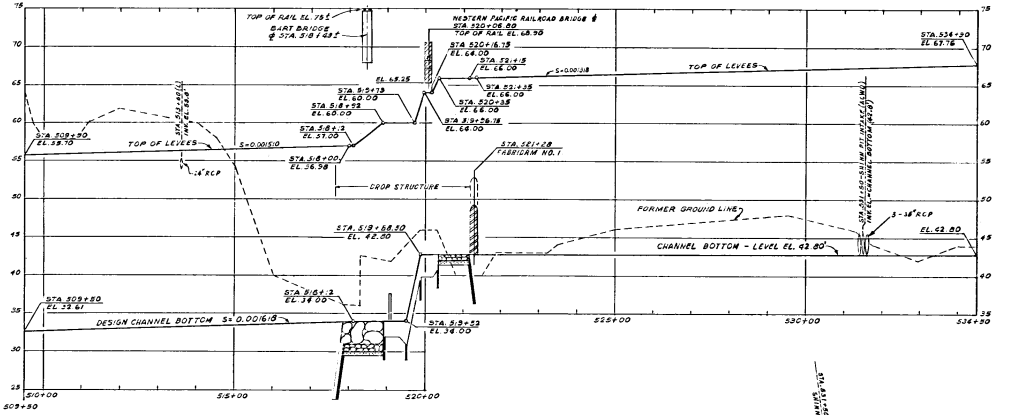
ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PROFILE
STA. 454+00 TO STA. 482+00

IN 29 SHEETS SHEET NO. 23
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN:
CHECKED: J. Tisdale
FILE NO.
63-45-52

ALAMEDA 1949



ALAMEDA 1651



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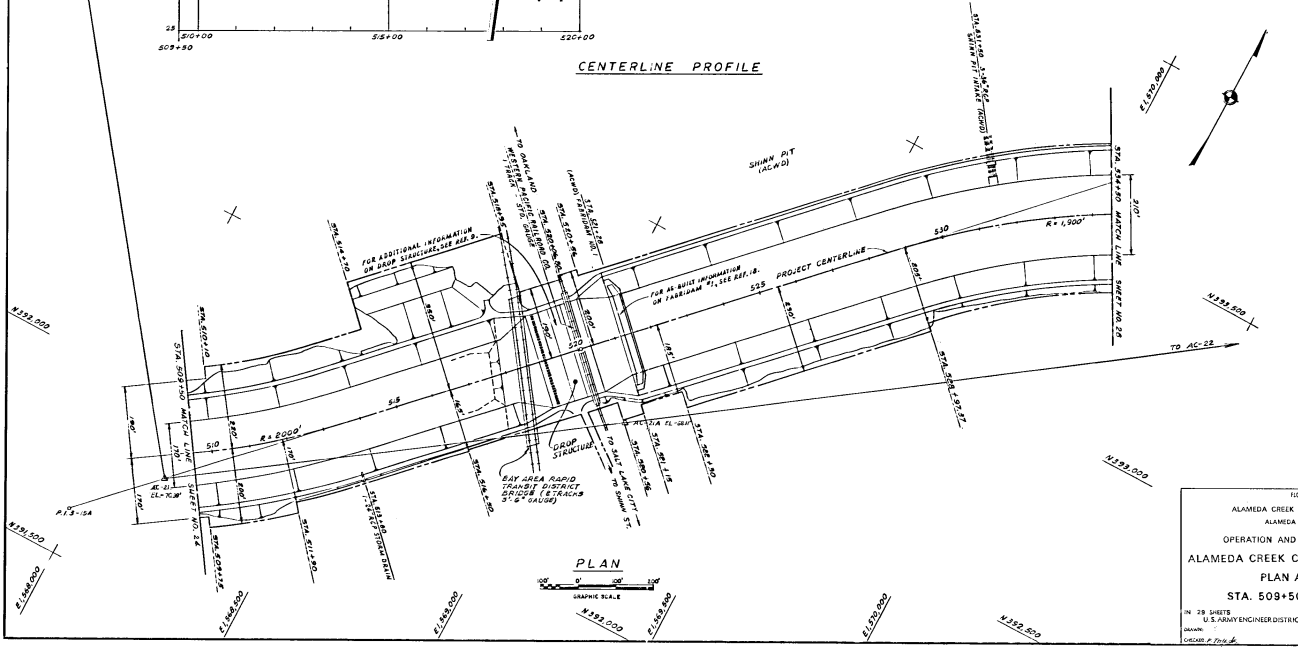


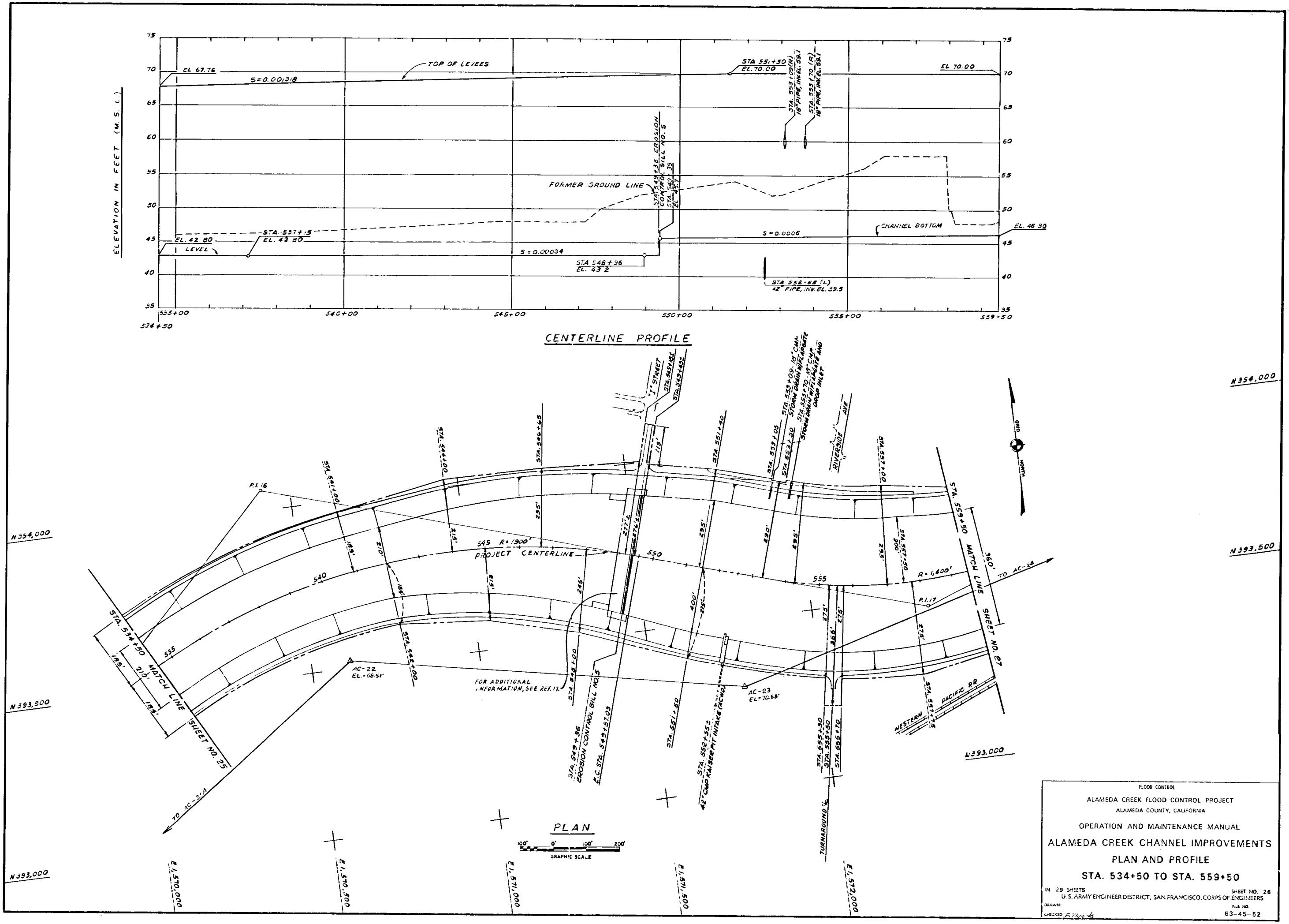
PLAN

GRAPHIC SCALE 100' 0 100' 200'

FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT,
ALAMEDA COUNTY, CALIFORNIA
OPERATION AND MAINTENANCE MANUAL
ALAMEDA CREEK CHANNEL IMPROVEMENTS
PLAN AND PROFILE
STA. 509+50 TO STA. 534+50

IN 29 SHEETS SHEET NO. 25
U. S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN: F.S. NO. 63-45-52
CHECKED

ALAMEDA 1653



FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT

ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS

PLAN AND PROFILE

STA. 534+50 TO STA. 559+50

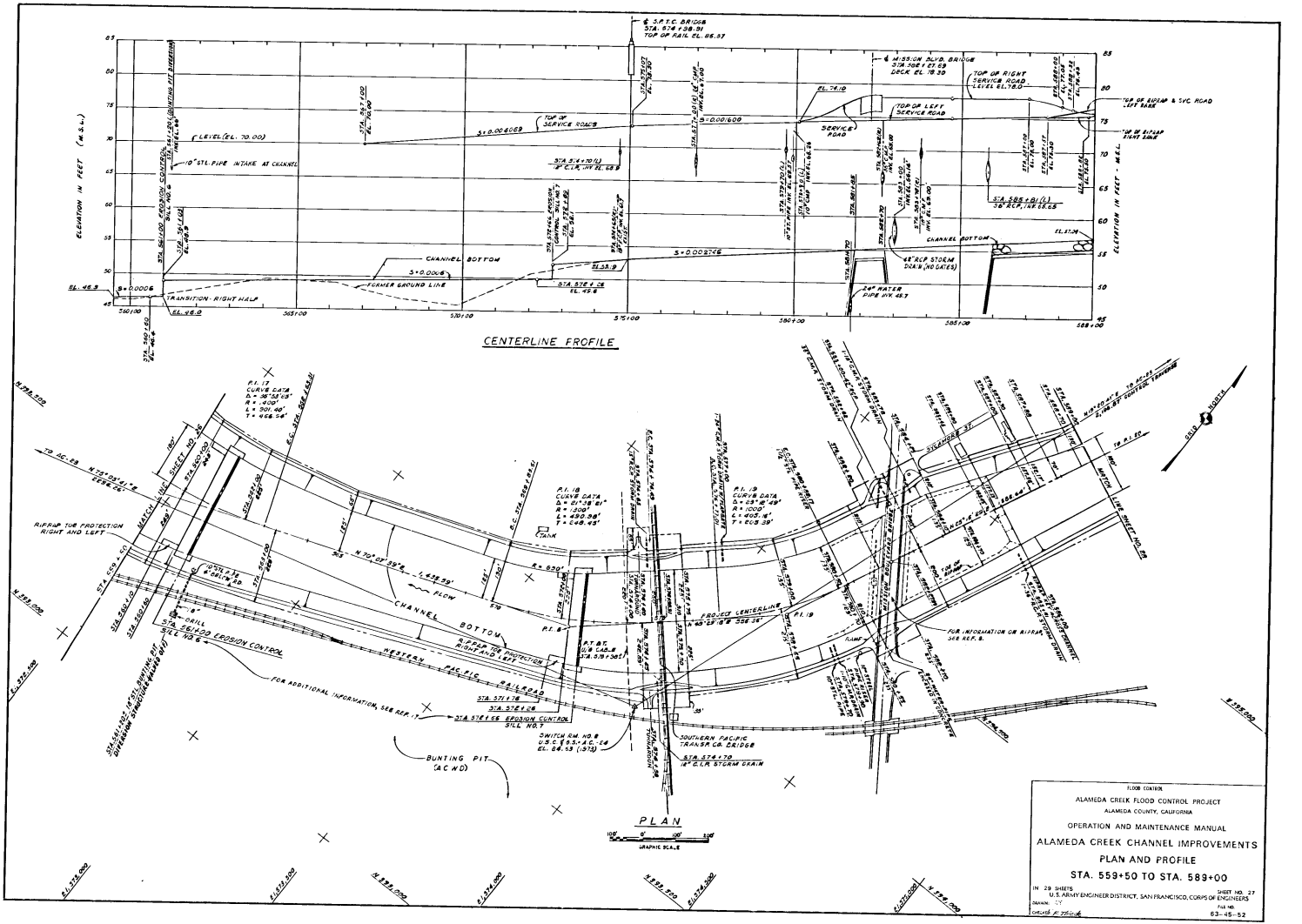
IN 29 SHEETS — SHEET NO. 26

U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS

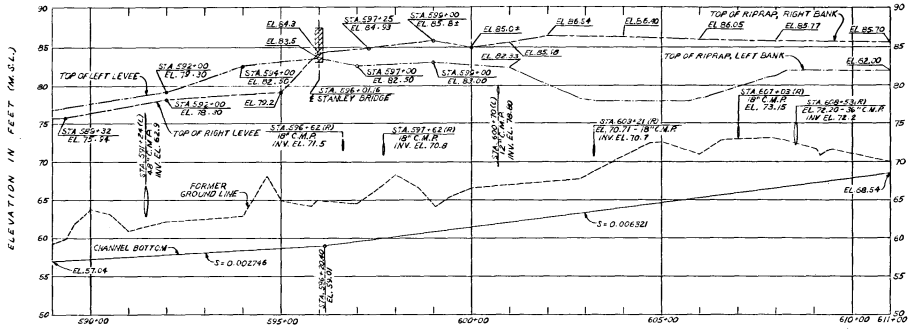
DRAWN: — FILE NO.

CHECKED: — 63-45-52

ALAMEDA 1655



ALAMEDA 1657



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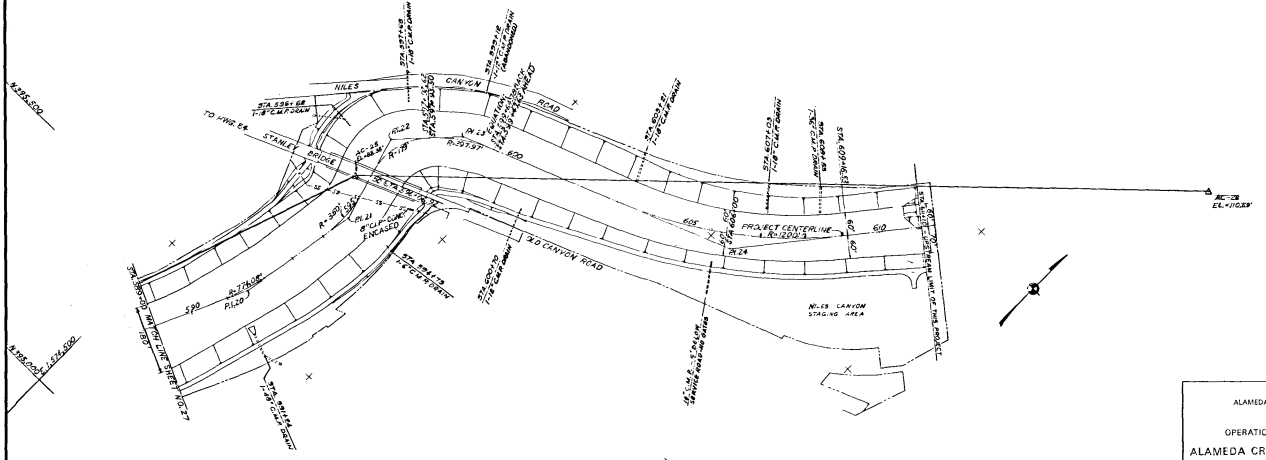


PLAN

GRAPHIC SCALE

FLOOD CONTROL

ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

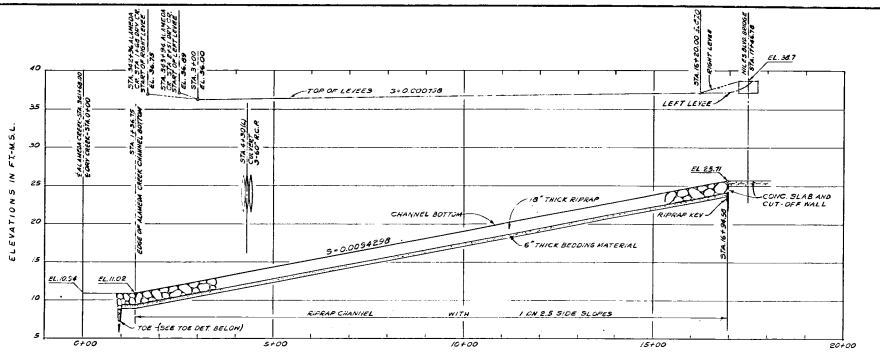
ALAMEDA CREEK CHANNEL IMPROVEMENTS

PLAN AND PROFILE

STA. 589+00 TO STA. 611+10

IN 28 SHEETS SHEET NO. 28
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN: AT FILE NO.
CHECKED: 63-45-52

ALAMEDA 1659



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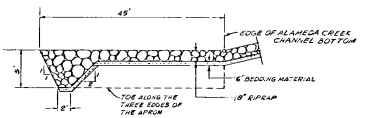
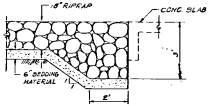
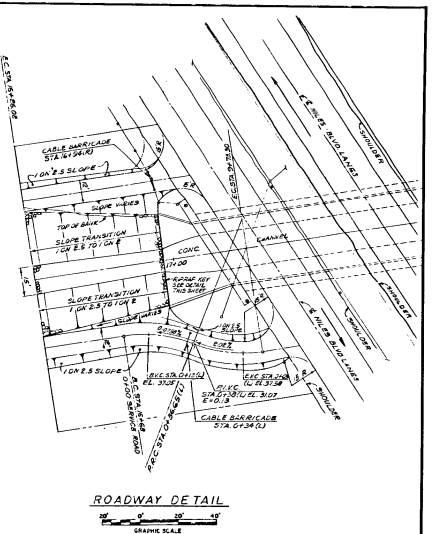


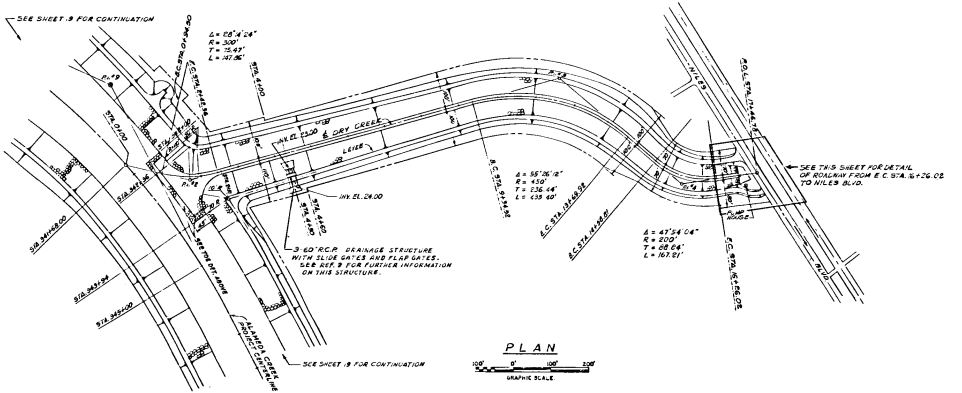
TOE DETAIL
NOT TO SCALE



RIPRAP KEY DETAIL
NOT TO SCALE



ROADWAY DETAIL
GRAPHIC SCALE



PLAN
GRAPHIC SCALE

FLOOD CONTROL
ALAMEDA CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL

ALAMEDA CREEK CHANNEL IMPROVEMENTS

PLAN AND PROFILE

DRY CREEK

IN 29 SHEETS — SHEET NO. 29
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS
DRAWN: — FILE NO. 63-45-52
TRACED: — CHECKED: —