

OPERATION AND MAINTENANCE PLAN
Ferro Channel, Beardsley Watershed
Ventura County, CA

This document supplements the Operation and Maintenance Agreement signed by the USDA, Natural Resources Conservation Service and Ventura County Public Work (hereafter “Sponsor”) dated May 31, 1979, and adds the Ferro Channel Improvement to the covered Project Measures. It may be revised by mutual consent of all signatory parties.

This plan defines responsibilities for operating, inspecting, and maintaining Ferro Channel (hereafter “Project”). These responsibilities shall remain in effect for the project life of 20 years from the date the structure is determined complete by NRCS (June 30, 2023). After the expiration of this O&M Plan, the Sponsors may continue to be liable until the structure is removed or modified to eliminate potential hazards.

Description of the Project:

This project consists of the construction of approximately 1,700 linear feet of a widened and deepened rock lined channel that will replace the existing earthen trapezoidal Ferro Ditch. The new channel also includes a floodgate that will be placed between the adjacent field and the box culvert that conveys storm water flows from the field ditch to the Los Angeles Avenue Drain.

Project Objectives:

1. Expand and armor the existing channel so that it can contain the 50-year flood plus design freeboard or the 100-year flood with 1 foot of freeboard (whichever is greater), while minimizing the need for future maintenance.
2. Replace the rock lined settling basin at the bottom of the Ferro Ditch Debris Basin.
3. Provide safe and reliable access to the Ferro Debris Basin in storm events up to 100- year peak flows.
4. Provide a hydraulically efficient connection to the Los Angeles Avenue Drain by placing a concrete lined transition structure and RC Open Channel between the rock lined portion of the channel and the Box Culvert downstream.
5. Maintain safe off-road conditions within the Caltrans right of way for S.R. 118, as well as provide a clear path from S.R. 118 to the Ferro Debris Basin along the access roads.
6. To mitigate the backflow onto farming operation by installing a flap gate.

(Source: August 2019 NRCS Design Review Report)

Estimated Annual O&M Costs:

The Sponsor is responsible for financing the operation and maintenance activities for this Project. Funds for these activities will be obtained from the annual Benefit Assessment Program for the Watershed Protection District which covers costs of flood control services including Operations and Maintenance activities, and Flood Damage Repair Reserves. It is estimated that the average annual cost of maintenance will be at least \$80,300 for this Project.

Estimated annual O&M costs are as follows:

Activity	Cost
Sediment management:	\$19,000
Vegetation management:	\$17,000
Structures maintenance:	
Minor Repairs	\$37,000.00 (includes \$4,000 for fencing)
Major Repairs	\$TBD every year
Sub-total Annual budget:	\$73,000
Maintenance Oversight	
10% of annual cost	\$7,300 (specialists such as Engineers or Biologists)
<i>Total Estimated Annual Budget</i>	<i>\$80,300 + Major Repair Costs</i>

Operation:

The Sponsor will be responsible for all operations activities.

Maintenance:

It is the responsibility of the Sponsor to ensure that the following maintenance items, as a minimum, are addressed at least annually.

Sediment Management:

Prior to rainy season (in the fall), the Ferro Ditch channel, its stilling basin and all appurtenances functioning to get storm flow into the channel shall be inspected for sediment, debris and trash accumulation. Any accumulation of the sediment, debris or trash shall be kept clear of the storm water flow. Any sediment accumulated in excess of the original design shall be removed, as would any trash and debris. Annual routine maintenance activities include removal of any excess debris or sediment buildup or vegetation, trash, or any other objects interfering with the flow of storm waters.

Vegetation Management

Routine maintenance primarily comprises periodic removal or prevention of all vegetation along all portions of the facility. Vegetation is controlled primarily by post-emergent herbicide application or mechanical (mowing/tracking earthen slopes) methods. Pre-emergent products may be used on access roads. Flow obstructing materials (sediment, vegetative and other debris, trash, etc.) would be removed in the channel, transition structures, and concrete box to maintain conveyance capacity and subdrain system clear of any obstructions.

Structures Maintenance:

The Ferro Ditch Improvement Structures consists of the following structures:

1. Stilling Basin: Rock Riprap Lined (approximately 80' x 60')
2. Stilling Basin Outfall: Concrete Cut-Off Wall
3. Rock Riprap Lined Trapezoidal Channel: approximately 1500 LF; includes a 6" Thick Concrete Cap

4. Concrete Transition Structure (downstream of Rock Lined Section): 30 LF of Reinforced Concrete
5. Concrete Rectangular Channel (downstream of Transition Structure): 35 LF of Reinforced Concrete
6. Concrete Flared End Section (between Transition Structure and Box Conduit): a 36" Flap gate and Reinforced Concrete section that outfalls into the RC Rectangular Channel.
7. Concrete Box Conduit (at S.R. 118): 15 LF of Reinforced Concrete
8. Flood Wall (along S.R. 118): 40' Long x 6' Tall with a 3' x 4' Flap Gate and a 12" Diameter Flap Gate.
9. 2 x Vehicle Access Routes: approx. 3,600 Total LF. 16' Wide x 6" Thick Crushed Miscellaneous Base (CMB)
10. Safety Fence: 5' Tall Chain link with 2-18' Wide Gated Entrances.



Figure 1: Stilling Basin and Rock Lined Channel with 2 Vehicle Access Routes (looking downstream)



Figure 2: Concrete Transition and Box Conduit (downstream end of Ferro Channel at State Route 118)



Figure 3: Flood Wall with Flap Gates (along State Route 118)

Road base resurfacing, fence and gate repair, and signage maintenance also occur regularly or as needed. Repair or reconstruction to the original design specifications would occur if the facility were damaged by storm flows or accidents.

Maintenance personnel shall thoroughly inspect all structures and appurtenances to ensure that they are physically sound. Any damage to such structures shall be repaired as soon as practical. Concrete Condition must correspond to the original design. Inspect for cracks, holes, spalling, undermining, gouges, exposed rebar and other damage. Concrete Work shall be carried out according to the Environmental Best Management Practices. Control of gopher/ground squirrel populations shall be in accordance with the District's Integrated Pest Management Program. Remove any obscene, racist, or gang related graffiti from the Concrete structures.

Personnel:

All personnel involved in conducting inspections and performing O&M activities shall be properly trained and equipped. At least once every 5 years, the Sponsor will notify NRCS at least 5 working days before any planned inspections of the Project. NRCS personnel may accompany the Sponsor if resources are available.

Records:

The Sponsor shall maintain the following records in a permanent file at the office: a record of all significant actions taken; the cost of performance and completion dates; as-built drawings; permits; and related material. Copies of all inspection reports shall be provided to NRCS within 60 days of report completion.

Violations:

If NRCS determines that the Sponsor has failed to comply with the provisions of this O&M Plan, the Sponsor agrees to reimburse the Federal government for the financial assistance provided for the installation of the Project. The Federal government also shall have the right to take any further action it deems necessary as per the O&M Agreement.

This action was authorized at an official meeting of the Sponsor, Ventura County Watershed Protection District, on:

Location: _____

Attest: _____

Date: _____

Title: **Secretary, Ventura County Watershed Protection District**

By: _____

Date: _____

Title: **Director, Ventura County Watershed Protection District**

NRCS Concurrence:

By: _____

Date: _____

Title: **State Conservationist, NRCS California**