HYDRAULIC MODEL STUDY OF
GALINDO CREEK SIDE CHANNEL
WASTEWAY
CONTRA COSTA CANAL
CENTRAL VALLEY PROJECT, CALIFORNIA
Hydraulic Laboratory Report No. Hyd-213
INTRODUCTION

Hydraulic model studies of the Galinoo Creek sidechannel wasteway of the Contra Costa Canal in the Central Valley Project of California were performed in the Hydraulic Laboratory in Denver in September 1939. The report was not completed at that time due to more urgent work in the laboratory.

The prototype sidechannel wasteway, Figure 1, starts at canal station 1726+07.42 and is 25 feet long on an 80-foot radius horizontal curve. The purpose of the wasteway is to prevent the overtopping of the canal banks. The sidechannel wasteway discharges into a tunnel and finally into a stilling-pool before entering into the wasteway canal. The principle purpose of the model study was to determine whether the capacity of the sidechannel wasteway was adequate.

THE MODEL

A 1:6 scale model of the sidechannel wasteway was constructed and located in a model channel previously used to determine losses for flow around piers in wash overchutes for the Coachella Canal. The sideslopes of the model canal were 1-1/2:1, whereas those of the Contra Costa Canal are 1-1/4:1. The discrepancy was thought to be insignificant in regard to the general operation of the sidechannel. It was also considered unnecessary to reproduce the slight channel curvature to determine the approximate dimensions of the sidechannel.
OPERATION OF THE ORIGINAL DESIGN

Operation of the original design showed the sidechannel to be inadequate. The spillway crest was nearly 100 percent submerged over its entire length (Figures 2 and 3). The head on the crest was 0.486 feet prototype, making the upstream canal water surface elevation 101.236. With the top of the canal lining at elevation 101.25, there was practically no freeboard.

OPERATION OF DESIGN B

To prevent submergence of the wasteway crest, the bottom sidechannel was lowered 6 inches prototype. For this case there was practically no submergence (Design B, Figures 2 and 3). The discharge coefficient was increased from 2.85 to 3.48 for the maximum discharge conditions, and the upstream canal water surface was lowered to elevation 101.175.

OPERATION OF DESIGN C

Lowering the bottom of the sidechannel 4 inches more eliminated all submergence but the discharge coefficient was increased only slightly to 3.53 with the canal water surface at elevation 101.172. The water surfaces in the sidechannel for this condition are shown as Design C, Figures 2 and 3.

CONCLUSIONS AND RECOMMENDATIONS

Due to the small hydraulic improvement encountered in the latter Design C and the satisfactory operation of the sidechannel for the intermediate floor position, Design B with the sidechannel floor located 6 inches below the original design is recommended. The recommended design is shown as Figure 1.
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FIGURE 1

PLAN

PROFILE

MIRROR VIEW SECTION A-A

SECTION B-B

SECTION of BARREL

SECTION C-C

SECTION D-D

SECTION E-E

SECTION K-K

SECTION G-G

SECTION H-H

SECTION J-J

SECTION F-F

SECTION OF BARREL

HYDRAULIC PROPERTIES

ESTIMATED QUANTITIES

Concrete.. . . . . 36 Cu Yds.

Reinforcement... 2356 Lbs.

NOTES

All reinforcement shall be placed so that the centers of bars in the outer layer will be 2 diameters from the center of the bar section. Stuffing elevations and radii shown on Profile refer to invert of section.

Base of entire structure to be placed on undisturbed natural foundation or thoroughly compacted fill.

Thickness of concrete to vary uniformly between dimensions shown.

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

CENIGRAL VALLEY PROJECT-CALIFORNIA

DELTA DIVISION

CONTRA COSTA CANAL - STA. 1726+67.42

GALINDO CREEK WASTEWAY

AND SIDE CHANNEL SPILLWAY

Designated by Design of Engineers. June 25, 1939...

CIVIL ENGINEERING DIVISION... 8

CONTRA COSTA CANAL ECONOMY.

GALINDO CREEK WASTEWAY

AND SIDE CHANNEL SPILLWAY

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CONTRA COSTA CANAL ECONOMY.
A. WATER SURFACE ALONG SIDE CHANNEL CENTER-LINE

Top of canal lining El. 101.25-

B. WATER SURFACE OVER SPILLWAY CREST

EXPLANATION

BOTTOM SYMBOL DESCRIPTION CREST COEF.
A. Original design 2.65  CENTRAL VALLEY PROJECT-CALIF.
B. Bottom 6" lower 3.48  CONTRA COSTA CANAL
C. Bottom 10" lower 3.63  GALINDO CREEK SIDE
  CHANNEL WASTEWAY
  LONGITUDINAL WATER
  SURFACE PROFILES
FIGURE 3

STATION 0 + 50

STATION 6 + 50

STATION 12 + 50

STATION 18 + 50

STATION 23 + 50

EXPLANATION

BOTTOM SYMBOL DESCRIPTION CREST COEFF.
A -- Original design 2.85
B --- Bottom 6" lower 3.48
C ----- Bottom 10" lower 3.53

CENTRAL VALLEY PROJECT - CALIF.
CONTRA COSTA CANAL
GALINDO CREEK SIDE CHANNEL WASTEWAY
SECTIONAL WATER SURFACE PROFILES