



DESIGN MEMORANDUM NO. 11

SEPTEMBER 1983

**MERCED COUNTY STREAMS
California**

**LEVEE AND CHANNEL
IMPROVEMENTS**

FEATURE DESIGN MEMORANDUM

DRAFT

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

MERCED COUNTY STREAMS PROJECT
MERCED COUNTY STREAMS, CA

DESIGN MEMORANDUMS

No.	Date	Title	Approved
1	Mar 75	Hydrology DM	11 Sep 75
2	Mar 80	Phase I GDM/EIS	3 Feb 82
4	Sep 81	Real Estate DM - Castle and Bear Dams and Reservoirs	9 Mar 82
2	Oct 81	Phase II GDM	25 Jun 82
5	Nov 81	Feature DM - Castle Dam and Reservoir	25 Jun 82
6	Jan 82	Site Geology DM - Castle Dam and Reservoir	25 Jun 82
3	Nov 81	Concrete Materials DM	18 Sep 81
7	Aug 82	Feature DM - Bear Dam and Reservoir	11 Jun 83
8	Aug 82	Site Geology DM - Bear Dam and Reservoir	11 Jun 83
4A	Feb 82	Real Estate DM - Haystack Mountain Dam and Reservoir	25 Jun 82
9		Feature DM - Haystack Mountain Dam and Reservoir	
10		Site Geology DM - Haystack Mountain Dam and Reservoir	
11		Feature DM - Channel Improvements	

MERCED COUNTY STREAMS, CALIFORNIA
LEVEE & CHANNEL IMPROVEMENTS
D.M. No. 11

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DESIGN MEMORANDUM NO. 11

MERCED COUNTY STREAMS, FDM
LEVEE AND CHANNEL IMPROVEMENTS

PERTINENT DATA

1. GENERAL

Name	Merced County Streams, California
Authorization	Section 201 of the Flood Control Act of Dec. 1970 (PL 91-611, Sec. 201, 84 Stat 1824)
Purpose	Flood Control
Streams	Bear Creek Black Rascal Slough Black Rascal Creek Fahrens Creek Cottonwood Creek El Capitan Canal

2. PROJECT DESIGN FLOWS

Drainage Channel	9,000 cfs	(50 yr)
Bear Creek - E.S. Canal to Confluence with Black Rascal Slough	6,500 cfs	(25 yr)
Bear Creek - Confluence to Crocker Dam	2,200 cfs	(25 yr)
Black Rascal Slough	4,300 cfs	(25 yr)
Bear Creek - Crocker Dam to Confluence w/Black Rascal Creek	12,000 cfs	(SPF)
Black Rascal Creek - Confluence w/Bear Cr to Confluence w/Fahrens Cr	5,200 cfs	(SPF)
Black Rascal Creek - Confluence w/Fahrens to G Street	1,650 cfs	(SPF)
Fahrens Creek - Confluence w/Black Rascal Cr to Confluence w/Cottonwood Cr	5,700 cfs	(SPF)

Fahrens Creek - Confluence
w/Cottonwood Cr to Upstream
Terminus

5,200 cfs (SPF)

Cottonwood Creek

1,000 cfs (SPF)

El Capitan Canal

200 cfs (SPF)

3. LEVEE AND CHANNEL IMPROVEMENTS

	DRAINAGE CHANNEL	BEAR CREEK			BLK. RASCAL SLOUGH	BEAR CREEK	BLACK RASCAL CREEK		FAHRENS CREEK		COTTONWOOD CREEK	EL CAPITAN CANAL
	E.S. Bypass to E.S. Canal	E.S. Canal to Diversion Structure	Diversion Structure to Confluence	Confluence to Crocker Dam	Confluence to Crocker Dam	Above Crocker Dam	Bear Creek to Fahrens Ck.	Fahrens Ck. to "G" Street	Blk. Rascal Creek to Ctwd. Ck.	Above Cottonwood Creek	Fahrens Ck. to "G" Street	Blk. Rascal Creek to S.F. Ave
Length (Miles)	3.4	4.0	1.8	7.2	7.2	0.5	2.0	1.6	1.4	0.7	1.2	0.9
Levee Improvements:												
Length (Stream/Miles)	3.4 (1)	4.0	1.8	0.7	2.5 (1)	0.5	1.1					(4)
Average Ht. (Feet)	9	8	5	4	4	3	6					
Crown Width (Feet)	12	12	12	12	12	12	(3)					
Landside Slope	IV:2H	IV:2H	IV:2H	IV:2H	IV:2H	IV:2.25	IV:2.25					
Waterside Slope	IV:3H	IV:3H	IV:3H	IV:3H	IV:3H	IV:3H	IV:3H					
Stone Protection (Tons)	2700	1790		460	3420		2750	630		825	120	
Shaping and Surfacing of Existing Levees												
(Stream Miles)	3.4 (2)			5.2	2.5 (2)							
Channel Excavation:												
Length (Miles)	3.4	4.0	1.8	2.0	7.2	0.5	2.0	1.6	1.4	0.7	1.2	
Bottom Width (Feet)	20 to 340	125	110	40	40 to 70	225	120 to 225	20 to 25	120	120	10	
Average Depth (Feet)	9	4	8	12	12	11	9	10	10	10	11	

(1) Construct new left bank only.

(2) Modify existing right bank levee only.

(3) Bear Creek to Hwy. 99 - 12' both banks; Hwy. 99 to Santa Fe Drive - 12' on right bank, 20' on left bank.

(4) Existing levee crown to be raised - Sta. 5+00 to 32+50 left bank and Sta. 30+50 to Sta. 46+05 right bank.

4. MAJOR STRUCTURES

Drainage Channel	Sta 178+69	East Side Canal Weir
Bear Creek	Sta 0+47	Bear Creek Outlet to the East Side Canal
	Sta 31+30	Bear Creek Inlet to the Bypass
	Sta 212+24	Bear Creek Diversion Weir
	Sta 685+63	Existing Crocker Dam (Modify Wingwalls)
Black Rascal Slough	(Sta varies)	Gabion Drop Structures - 6 each
Black Rascal Creek	Sta 6+18	Concrete Rectangular Channel - 500 ft
Fahrens Creek	Sta 109+60	Concrete Drop Structure

5. MAJOR RELOCATIONS

Drainage Channel	Sta 178+69	East Side Canal Patrol Road Bridge
Bear Creek	Sta 146+65	Farm Road Bridge
	Sta 212+06	Bert Crane Road Bridge
	Sta 298+02	Farm Road Bridge
Black Rascal Creek	Sta 57+58	Santa Fe Avenue Bridge
	Sta 59+17	Santa Fe Drive Bridge
	Sta 135+90	R Street Culverts
	Sta 160+98	M Street Culverts
	Sta 190+25	G Street Culverts
		Cherokee, Parsons & McKee Culverts
Cottonwood Creek	Sta 29+75	M Street Bridge
	Sta 63+10	G Street Culverts

6. AFFECTED RAILROADS

Southern Pacific Railroad (Mainline)		Construct new box girder Br
Atchison, Topeka and Santa Fe Railroad	(Mainline) (Spur)	Construct new concrete slab Br Construct new T-rail Br

7. COSTS

First costs:	Federal	21,700,000
	Non-Federal	<u>13,800,000</u>
Total first cost		\$35,500,000
Annual costs:	Federal	1,848,300
	Non-Federal	<u>1,491,700</u>
Total annual costs		\$3,340,000