COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)

DETAILED DESIGN CALCULATIONS

PROVINCE : BALOCHISTAN

SUBPROJECT : LASBELA

LINING OF MINOR NO. 1
(R.C.C. PIPE CHANNEL)

DESIGN DISCHARGE = 6.51 Cs.

Proposed dia. of R.C.C. pipe = 21"

Slope = 1:190

Value of 'n' = 0.017

Discharge = $\frac{0.463}{0.017} \times d^{8/3} \times S^{1/2}$

$d^{8/3}$ = $1.75^{8/3}$ = 4.45

$S^{1/2}$ = 1/190 = 0.725

Discharge = $\frac{0.463}{0.017} \times 4.45 \times 0.725$

= 8.79 Cs.

Designed for 0.81 d

$d = \frac{6.51 \times 0.017}{0.458 \times (0.0725)^{3/8}}$ = 1.57 ft x 12 = Say 21"

$V = 1.486/n \; R^{2/3} \; S^{1/2}$ = $1.486/0.017 \; (0452) \; d^{2/3} \; (0.0725)$

= 4.14 ft/sec.

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)

DETAILED DESIGN CALCULATIONS

PROVINCE: BALOCHISTAN

SUBPROJECT: LASBELA

LINING OF MINOR NO. 4

Reach RD. 17 + 300 to RD. 19 + 800

Designed discharge = 12.62 Cusecs

Proposed 'B' = 1.50 ft.

Proposed 'D' = 1.33 ft.

Area = $\frac{1.5+5.5}{2}$ x 1.33 = 4.66 sft.

W.P. = $1.5+2 \times 1.33 \times 3.25^{1/4}$ = 6.30 ft.

Side slope = 1.5:1

R = 4.66/6.30 = 0.74

$R^{2/3}$ = $0.74^{2/3}$ = 0.818

Slope = 11n 500

S = 0.0447

Type of Lining = 1:2:4 (P.C.C.)

Value of 'n' = 0.020

V = $\frac{1.486}{0.020}$ x 0.818 x 0.0447

= 2.72 / Sec.

Discharge = 4.66 x 2.72 = 12.68 Cusecs o.k.

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING HYDRAULIC DATA OF MAJOR LINED CHANNEL

PROVINCE: SINDH

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
6.	Khanwahan Minor	RD. 11+500 to RD. 15+000	36.7	1 IN5000	5.1	2.8	0.018	1:1	Concrete (1:2:4)	
		RD. 15+000 to RD. 19+200	30.59	-do-	4.8	2.6	-do-	-do-	-do-	
		RD. 19+200 to RD. 24+430	25.42	1 IN4500	4.3	2.4	-do-	-do-	-do-	
		RD. 24+430 to RD. 30+500	19.64	-do-	3.8	2.2	-do-	-do-	-do-	
		RD. 30+500 to RD. 33+595	15.02	-do-	3.4	2.0	-do-	-do-	-do-	
		RD. 33+595 to RD. 37+240	10.40	1 IN4000	2.6	1.8	-do-	-do-	-do-	
		RD. 37+240 to RD. 42+000	8.20	-do-	2.5	1.6	-do-	-do-	-do-	
		RD. 42+000 to RD. 43+285	5.67	1 IN3300	2.2	1.4	-do-	-do-	-do-	
		RD. 43+285 to RD. 46+435	3.52	-do-	1.5	1.2	-do-	-do-	-do-	
		RD. 46+435 to RD. 49+950	1.21	-do-	1.5	1.0	-do-	-do-	-do-	

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING HYDRAULIC DATA OF MAJOR LINED CHANNEL

PROVINCE: SINDH

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
7.	New Keti Minor	RD. 0+000 to RD. 3+866	12.58	1 IN4000	3.3	1.8	0.018	1:1	Concrete (1:2:4)	
		RD. 3+866 to RD. 9+186	9.17	-do-	3.0	1.6	-do-	-do-	-do-	
		RD. 9+186 to RD. 11+766	6.66	-do-	2.7	1.4	-do-	-do-	-do-	
		RD. 11+766 to RD. 15+186	3.03	-do-	1.4	1.2	-do-	-do-	-do-	
8.	Sial Minor	RD. 0+000 to RD. 0+460	21.36	1 IN5000	1.10	3.36	-do-	-do-	-do-	
		RD. 0+460 to RD. 4+000	17.85	-do-	1.00	3.10	-do-	-do-	-do-	
		RD. 4+000 to RD. 5+000	13.92	-do-	1.00	2.80	-do-	-do-	-do-	
		RD. 5+000 to RD. 5+200	11.66	-do-	1.00	2.60	-do-	-do-	-do-	
		RD. 5+200 to RD. 9+150	4.51	1 IN10000	0.50	2.30	-do-	-do-	-do-	

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING HYDRAULIC DATA OF MAJOR LINED CHANNEL

PROVINCE: SINDH

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
1.	Mohio Minior	RD. 0+000 to RD. 8+000	18.0	1 IN5500	4.0	2.0	0.018	1:1	Concrete (1:2:4)	
		RD. 8+000 to RD. 16+500	17.0	1 IN5000	3.0	1.8	0.018	1:1	"	
		RD. 16+500 to RD. 22+900	17.0	1 IN4500	2.5	1.5	0.018	1:1	"	
2.	Dewan Minor	RD. 0+000 to RD. 9+500	30.00	1 IN5500	5.0	2.5	0.018	1.5:1	"	
		RD. 9+500 to RD. 19+500	18.25	1 IN4500	3.75	2.0	0.018	"	"	
		RD. 19+500 to RD. 27+650	13.0	1 IN3500	2.5	1.8	0.018	"	"	
		RD. 27+650 to RD. 28+200	12.50	-do-	2.0	1.5	0.018	"	"	
3.	Keti Old Minor	RD. 0+000 to RD. 0+500	17.90	1 IN3846	1.5	2.75	0.018	1:1	"	
		RD. 0+500 to RD. 6+000	10.36	1 IN3650	1.5	2.10	0.018	1:1	"	
		RD. 6+000 to RD. 9+650	3.90	1 IN3610	1.0	1.53	0.018	1:1	"	

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING HYDRAULIC DATA OF MAJOR LINED CHANNEL

PROVINCE: SINDH

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
4.	Detha Minor	RD. 0+000 to RD. 10+400	33.02	1 IN4630	2.0	3.55	0.018	1:1	Concrete (1:2:4)	
		RD. 10+400 to RD. 22+000	21.08	-do-	1.5	3.10	-do-	-do-	-do-	
		RD. 22+000 to RD. 27+000	7.88	-do-	1.5	2.0	-do-	-do-	-do-	
		RD. 27+000 to RD. 32+350	2.7	-do-	1.5	1.2	-do-	-do-	-do-	
5.	Larik Minor	RD. 0+000 to RD. 4+200	32.58	1 IN5000	2.50	3.4-	-do-	-do-	-do-	
		RD. 4+200 to RD. 8+633	24.92	-do-	2.50	3.0	-do-	-do-	-do-	
		RD. 8+633 to RD. 16+950	18.80	1 IN4444	1.75	2.8	-do-	-do-	-do-	
		RD. 16+950 to RD. 22+900	12.09	1 IN4761	1.50	2.4	-do-	-do-	-do-	
		RD. 22+900 to RD. 27+024	5.59	1 IN4580	1.00	1.85	-do-	-do-	-do-	

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING HYDRAULIC DATA OF MAJOR LINED CHANNEL

PROVINCE: SINDH

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
11.	Let Minor	RD. 28+000 to RD. 31+250	32.75	1 IN5000	5.7	2.5	0.018	1:1	Concrete (1:2:4)	
		RD. 31+250 to RD. 33+510	25.51	-do-	5.2	2.3	-do-	-do-	-do-	
		RD. 33+510 to RD. 38+133	21.05	-do-	5.0	2.10	-do-	-do-	-do-	
		RD. 38+133 to RD. 42+857	16.21	-do-	4.5	1.9	-do-	-do-	-do-	
		RD. 42+857 to RD. 48+149	10.15	-do-	3.3	1.7	-do-	-do-	-do-	
		RD. 48+149 to RD. 51+245	5.44	-do-	2.0	1.5	-do-	-do-	-do-	
		RD. 51+245 to RD. 56+365	3.51	-do-	1.6	1.3	-do-	-do-	-do-	
		RD. 56+365 to RD. 58+900	1.97	-do-	1.2	1.1	-do-	-do-	-do-	

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING HYDRAULIC DATA OF MAJOR LINED CHANNEL

PROVINCE: N.W.F.

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
1.	Warsak Lift Canal	39 + 200 to 54 + 900	172	0.000225	8.6	4.30	0.016	1.5:1	c.c. (1:3:6)	
		54 + 900 to 63 + 000	158	-do-	8.1	4.20	-do-	-do-	-do-	
		63 + 000 to 65 + 000	148	-do-	7.9	4.10	-do-	-do-	-do-	
		65 + 000 to 67 + 000	136	-do-	7.5	4.00	-do-	-do-	-do-	
		67 + 000 to 70 + 300	130	-do-	7.5	3.90	-do-	-do-	-do-	
2.	-do-	101 + 100 to 112 + 300	95	0.00025	6.50	3.4	-do-	-do-	-do-	
		112 + 300 to 114 + 200	87	0.00025	6.30	3.3	-do-	-do-	-do-	
		114 + 200 to 122 + 000	63	0.00025	6.10	2.8	-do-	-do-	-do-	

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING HYDRAULIC DATA OF MAJOR LINED CHANNEL

PROVINCE: SINDH

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
9.	Abji Minor	RD. 0+000 to RD. 3+000	36.92	1 IN5000	4.4	3.00	0.018	1:1	Concrete (1:2:4)	
		RD. 3+000 to RD. 7+088	34.94	-do-	6.5	2.4	-do-	-do-	-do-	
		RD. 7+088 to RD. 17+000	30.92	-do-	6.3	2.3	-do-	-do-	-do-	
		RD. 17+000 to RD. 25+300	26.28	1 IN4500	6.00	2.1	-do-	-do-	-do-	
		RD. 25+300 to RD. 28+000	21.09	-do-	5.7	1.9	-do-	-do-	-do-	
		RD. 28+000 to RD. 29+953	21.09	-do-	5.7	1.9	-do-	-do-	-do-	
		RD. 29+953 to RD. 36+578	15.83	-do-	5.1	1.7	-do-	-do-	-do-	
		RD. 36+578 to RD. 37+800	10.74	-do-	4.3	1.5	-do-	-do-	-do-	
		RD. 37+800 to RD. 41+200	6.58	1 IN4000	3.1	1.3	-do-	-do-	-do-	
		RD. 41+200 to RD. 44+600	2.18	-do-	1.1	1.1	-do-	-do-	-do-	

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING HYDRAULIC DATA OF MAJOR LINED CHANNEL

PROVINCE: SINDH

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
10.	Darbello Minor	RD. 35+050 to RD. 37+850	35.61	1 IN7000	5.4	2.8	0.018	1:1	Concrete (1:2:4)	
		RD. 37+850 to RD. 40+100	29.31	-do-	5.1	2.6	-do-	-do-	-do-	
		RD. 40+100 to RD. 44+200	24.77	1 IN6000	4.90	2.4	-do-	-do-	-do-	
		RD. 44+200 to RD. 51+100	20.48	-do-	4.70	2.2	-do-	-do-	-do-	
		RD. 51+100 to RD. 54+200	16.90	-do-	4.20	2.0	-do-	-do-	-do-	
		RD. 54+200 to RD. 57+300	11.55	-do-	3.7	1.8	-do-	-do-	-do-	
		RD. 57+300 to RD. 59+600	6.93	-do-	2.6	1.6	-do-	-do-	-do-	
		RD. 59+600 to RD. 61+000	3.5	1 IN5800	1.5	1.4	-do-	-do-	-do-	
		RD. 61+000 to RD. 66+000	1.19	-do-	1.5	1.2	-do-	-do-	-do-	

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING HYDRAULIC DATA OF MAJOR LINED CHANNEL

PROVINCE: BALOCHISTAN

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
1.	Minor No. 1	RD. 0+000 to RD. 0+150	14	1:145	1.0	1.1	0.018	–	–	Open Channel
		RD. 0+150 to RD. 0+800	6.51	1:190		Dia of Pipe = 1.75	0.017	–	Pipe	
		RD. 0+800 to RD. 2+100	4.22	1:190		=1.5	0.017	–	Pipe	
		RD. 2+100 to RD. 4+900	1.68	1:325		=1.5	0.017	–	Pipe	
		RD. 4+900 to RD. 7+600	1.68	1:300		=1.5	0.017	–	Pipe	
2.	Minor No. 3	RD. 0+00 to RD. 0+300	14	1:200	1.0	1.20	0.018	1.5:1	c.c 1:2:4	
		RD. 0+300 to RD. 3+00	11.14	-do-	1.0	1.10	-do-	-do-	-do-	
		RD. 3+000 to RD. 5+500	8.19	1:165	1.0	0.90	-do-	-do-	-do-	
		RD. 5+500 to RD. 9+800	4.96	1:260	0.5	0.90	-do-	-do-	-do-	

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING HYDRAULIC DATA OF MAJOR LINED CHANNEL

PROVINCE: BALOCHISTAN

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
3.	Minor No. 4	RD. 0+000 to RD. 0+125	39	1:417	2.0	1.92	0.018	1.5:1	c.c. 1:2:4	
		RD. 0+125 to RD. 2+500	39	1:165	2.0	1.55	-do-	-do-	-do-	
		RD. 2+500 to RD. 5+300	35.57	1:200	2.0	1.50	-do-	-do-	-do-	
		RD. 5+300 to RD. 7+800	29.35	1:200	2.0	1.4	-do-	-do-	-do-	
		RD. 7+800 to RD. 10+750	24.35	1:200	2.0	1.30	-do-	-do-	-do-	
		RD. 10+750 to RD. 12+100	22.32	1:360	2.0	1.45	-do-	-do-	-do-	
		RD. 12+100 to RD. 13+050	19.67	1:250	2.0	1.25	-do-	-do-	-do-	
		RD. 13+050 to RD. 17+300	15.35	1:800	2.0	1.45	-do-	-do-	-do-	
		RD. 17+300 to RD. 19+800	12.62	1:500	1.5	1.25	-do-	-do-	-do-	
		RD. 19+800 to RD. 20+300	11.43	1:400	1.5	1.15	-do-	-do-	-do-	
		RD. 20+300 to RD. 21+250	9.61	1:600	1.5	1.15	-do-	-do-	-do-	

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING PARTICULARS OF LINING ON VARIOUS CHANNELS UNDER CWM PROJECT

PROVINCE: PUNJAB

Sr. No.	Name of Subproject	Name of Channel	Discharge at Beginning of Lined Reach	Length of Lining (Canal Miles)	Type of Lining	Total Surface Area of Lining (% Sft)	Total Cost (Rs.)	Cost Per % Sft of Surface Area (Rs.)
1	2	3	4	5	6	7	8	9
1.	SHAHKOT	-Pandwan Minor	1.5	0.98	Brick Lining (Rect. Section)	367	538,000	1,466.00
		-Pacca Dalla Minor	6.0	2.01	P.C.C. 1:2:4 3" thick (Trapezoidal Section)	1,576	1,920,000	1,218.00
		-Shahkot Distributary	33.0	7.24	5.02 miles is P.C.C. 1:2:4 3" thick and 2.22 miles is Brick Lining with Rectan-gular Section	4,654	7,563,600	1,625.00
2.	NIAZBEG	-Kamogil Minor	17	3.20	P.C.C. 1:2:4 3" thick (Trapezoidal Section)	2,726	3,794,000	1,392.00
		-Jalleki Minor	16	2.14	------- do -----	1,755	3,112,700	1,774.00
		-Niazbeg Distributary	92.0	10.35	------- do -----	12,377	19,796,200	1,600.00

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING PARTICULARS OF LINING ON VARIOUS CHANNELS UNDER CWM PROJECT

PROVINCE: PUNJAB

Sr. No.	Name of Subproject	Name of Channel	Discharge at Beginning of Lined Reach	Length of Lining (Canal Miles)	Type of Lining	Total Surface Area of Lining (% Sft)	Total Cost (Rs.)	Cost Per % Sft of Surface Area (Rs.)
1	2	3	4	5	6	7	8	9
3.	PAKPATTAN	-1R/3R Minor	25	5.42	P.C.C. 1:2:4 3" thick (Trapezoidal Section	4,282	7,188,500	1,679.00
		-1L/3R Minor	28	8.11	-do-	7,460	10,671,000	1,430.00
		-2L/3R Minor	5	1.54	-do-	1,056	1,692,900	1,602.00
		-3L/3R Minor	6	1.48	-do-	1,066	1,633,700	1,533.00
		-1R/4R Minor	6	2.57	-do-	1,729	2,568,500	1,486.00
		-5R Distributary	8	2.40	-do-	1,794	2,498,100	1,392.00
		-1L/5R Minor	13	2.12	-do-	1,682	2,362,100	1,404.00
		-2L/5R Minah	9	4.30	-do-	3,033	4,863,200	1,603.00
		-1R/6R Minor	19	5.18	-do-	4,211	5,798,000	1,377.00
		-1L/6R Minor	6	2.93	-do-	2,062	3,248,000	1,575.00
		-2L/6R Minor	10	4.02	-do-	2,967	3,916,000	1,320.00

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING PARTICULARS OF LINING ON VARIOUS CHANNELS UNDER CWM PROJECT

PROVINCE: PUNJAB

Sr. No.	Name of Subproject	Name of Channel	Discharge at Beginning of Lined Reach	Length of Lining (Canal Miles)	Type of Lining	Total Surface Area of Lining (% Sft)	Total Cost (Rs.)	Cost Per % Sft of Surface Area (Rs.)
1	2	3	4	5	6	7	8	9
4.	6-R (HAKRA)	-6R (Hakra) Distributary RD.0+000 to RD.37+550	482	7.51	P.C.C. 1:2:4 4" thick (Trapezoidal Section)	22,873	52,576,200	2,298.00
		-6R (Hakra) Distributary RD.128+000 to RD.148+360 (Tail)	15	4.07	P.C.C. 1:2:4 3" thick (Trapezoidal Section)	3,092	4,596,200	1,486.00
		- 1R/6R Minor	26	4.56	-do-	3,870	7,606,000	1,965.00
		- 2R/6R Minor	5	1.17	Brick Lining (Rectangular Section)	350	910,500	2,601.00
		-1L/6R Minor	24	3.61	P.C.C. 1:2:4 3" thick (Trapezoidal Section)	2,860	4,387,700	1,534.00

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING PARTICULARS OF LINING ON VARIOUS CHANNELS UNDER CWM PROJECT

PROVINCE: PUNJAB

Sr. No.	Name of Subproject	Name of Channel	Discharge at Beginning of Lined Reach	Length of Lining (Canal Miles)	Type of Lining	Total Surface Area of Lining (% Sft)	Total Cost (Rs.)	Cost Per % Sft of Surface Area (Rs.)
1	2	3	4	5	6	7	8	9
	6-R (HAKRA)	-2L/6R Minor	30	6.96	4.25 miles is P.C.C. 1:2:4 3" thick while 2.71 miles is Brick lining (Trapezoidal Section)	4,485	9,927,100	2,213.00
		-1R/1L/6R Sub-Minor	32	3.61	P.C.C. 1:2:4 3" thick (Trapezoidal Section)	3,006	4,447,600	1,480.00
		-1L/1L/6R Sub-Minor	21	5.67	-do-	4,927	7,856,400	1,595.00

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING PARTICULARS OF LINING ON VARIOUS CHANNELS UNDER CWM PROJECT

PROVINCE: SINDH

Sr. No.	Name of Subproject	Name of Channel	Discharge at Beginning of Lined Reach	Length of Lining (Canal Miles)	Type of Lining	Total Surface Area of Lining (% Sft)	Total Cost (Rs.)	Cost Per % Sft of Surface Area (Rs.)
1	2	3	4	5	6	7	8	9
5.	NAULAKHI/ SEHRA	-Thatt Minor	10	3.36	P.C.C.	2,363	4,237,600	1,793.00
		-Puran Minor	8	2.76	-do-	1,854	3,460,000	1,866.00
		-Morio Minor	18	4.58	-do-	3,450	7,165,000	2,077.00
		-Mahesar Minor	8	3.84	Brick Masonry Retaining Walls	1,978	4,878,000	2,466.00
		-Dewan Minor	30	5.60	P.C.C.	5,527	12,330,600	2,231.00
		-Manjuth Minor	9	2.40	-do-	1,734	3,987,600	2,300.00
		-Salehpur Minor	15	2.32	-do-	1,876	4,059,300	2,164.00
		-Jatoi Minor	26	6.00	-do-	5,362	12,788,400	2,385.00
		-Bukhri Minor	10	2.76	-do-	1,908	3,052,700	1,600.00
		-Keti Old Minor	18	1.93	-do-	1,376	2,671,600	1,942.00
		-Lundo Minor	10	2.77	-do-	1,965	3,724,600	1,895.00
		-Detha Minor	33	6.47	-do-	5,266	10,807,800	2,052.00
		-Larik Minor	33	5.40	-do-	4,345	8,039,100	1,850.00
		-Khushik Minor	12	2.56	-do-	1,892	3,462,300	1,830.00
		-Khanwahan Minor	37	7.69	-do-	6,003	11,121,000	1,853.00

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING PARTICULARS OF LINING ON VARIOUS CHANNELS UNDER CWM PROJECT

PROVINCE: PUNJAB

Sr. No.	Name of Subproject	Name of Channel	Discharge at Beginning of Lined Reach	Length of Lining (Canal Miles)	Type of Lining	Total Surface Area of Lining (% Sft)	Total Cost (Rs.)	Cost Per % Sft of Surface Area (Rs.)
1	2	3	4	5	6	7	8	9
	NAULAKHI/ SEHRA	-New Keti Minor	13	3.04	P.C.C.	2,107	3,861,000	1,832.00
		-Sial Minor	21	1.83	-do-	1,303	2,921,800	2,242.00
		-Abji Minor	37	8.92	-do-	7,886	19,550.000	2,480.00
		-Darbelo Minor	36	6.31	-do-	7,803	10,229,800	1,311.00
		-Let Minor	33	6.18	-do-	4,763	8,220,000	1,726.00

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING PARTICULARS OF LINING ON VARIOUS CHANNELS UNDER CWM PROJECT

PROVINCE: N.W.F.

Sr. No.	Name of Subproject	Name of Channel	Discharge at Beginning of Lined Reach	Length of Lining (Canal Miles)	Type of Lining	Total Surface Area of Lining (% Sft)	Total Cost (Rs.)	Cost Per % Sft of Surface Area (Rs.)
1	2	3	4	5	6	7	8	9
6.	WARSAK LIFT	-Warsak Lift Canal from RD. 39+100 to RD. 64+400	172	5.06	P.C.C. (1:3:6)	7,917	8,969,200	1,133.00
		-Warsak Lift Canal from RD. 101+100 to RD. 153+000	95	10.38	-do-	10,064	12,630,000	1,255.00

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING PARTICULARS OF LINING ON VARIOUS CHANNELS UNDER CWM PROJECT

PROVINCE: BALOCHISTAN

Sr. No.	Name of Subproject	Name of Channel	Discharge at Beginning of Lined Reach	Length of Lining (Canal Miles)	Type of Lining	Total Surface Area of Lining (% Sft)	Total Cost (Rs.)	Cost Per % Sft of Surface Area (Rs.)
1	2	3	4	5	6	7	8	9
7.	LSBELA	-Minor No. 1	14	1.52	R.C.C. Pipe	381	1,830,000	4,803.00
		-Minor No. 2	12	1.36	P.C.C.	812	1,660,000	2,044.00
		-Minor No. 3	14	1.96	-do-	1,155	2,627,700	2,275.00
		-Minor No. 4	39	4.86	-do-	3,550	10,374,300	2,922.00
		-Minor No. 5	14	1.78	-do-	1,096	3,006,000	2,743.00

Lining of Jatoi Minor. Formation of Bed/Slopes & Excavation for Profiles completed.

Lining of Jatoi Minor. Cement Concrete work completed.

Laying and Curing of P.C.C. Lining along Lundo Minor in Progress at RD.8+000

Finished P.C.C. Lining View of Old Keti Minor at RD. 5+000

Bund Sluice in Head Reach on Mahessar Minor.

Lining of Mahessar Minor after Completion-RD 6+000.

Compaction of Subgrade and Excavation of Profiles along Slope in Progress in 6-R(Hakra) Disty:

Alternate Panels of P.C.C. Lining being laid in 6-R (Hakra) Disty:

Lining of Dewan Minor. Cement Plaster completed-RD 5+000.

Running of Salehpur Minor after completion of Lining.

P.C.C. Lining on Niaz Beg disty. Downstream R.D. 134.

P.C.C. Lining in progress on Niaz Beg distribu. tary.

A View of finished R.C.C. Lining of Shahkot Disty: as seen from RD. + 131

A view of finished rectangular Lined Section U/S of Tail Shahkot Disty:

Brick-Masonry and Cement Plaster Lining in progress in the tail reach of 2L/6R minor.

Finished P.C.C. Lining on IR/IL/6-R sub-minor.

P.C.C. Lining Work in progress on a Channel in Pakpattan Sub-project.

A completed view of P.C.C. Lining on a Channel in Pakpattan Sub-project. The Old Channel can be seen on the left.

FIELD TEST FOR COMPACTION BEING CARRIED OUT.
SAMPLE TAKEN FROM THE SIDE SLOPE OF THE SECTION.

A FINISHED LINED REACH BEING CHECKED
FOR LEVEL AND GRADE

A CHANNEL PRISM WITH LAYER OF LEAN MORTAR VISIBLE IN THE FOREGROUND BAYS WITH EARTHEN SECTION BEYOND, ORIGINAL SECTION RUNNING FOR FEEDING CROPS.

ANOTHER CHANNEL UNDER LINING PROCESS. THE EARTHEN BUND SEEN AT THE END OF THE LINED SECTION IS TO HOLD WATER FOR CURING.

A view of Canal covering in the reach R.D. 0+700 to 1+000.

A downstream view of Canal Lining on Warsak lift Canal reach R.D. 59+500 to 61 200

An upstream view of Kohat Road Crossing in the Lined reach of Warsak Lift Canal at R.D. 101+000.

A downstream view of P.C.C. Lining in Warsak Lift Canal R.D. 110+800 to 112+100.

PIPE LINING OF MINOR NO. 1
DOWN STREAM BRIDGE RD. 2980

A view of P.C.C. Lining in minor No. 2 near R.D. 1+1000. Existing Minor can be seen on the left.

A view of start of P.C.C. Lining in minor No. 3. Existing Minor can be seen on the right.

. LINING WORK ON NIAZ-BEG
DISTRIBUTARY IN PROGRESS

Burried Membrane Lining Comprising Butyle Sheet overlaid by Brick on edge masonry being done in the head reach of Thathi Uttar Minor of Niaz Beg Subproject in Punjab.

COMMAND WATER MANAGEMENT PROJECT (IDA COMPONENT)
STATEMENT SHOWING HYDRAULIC DATA OF MAJOR LINED CHANNEL

PROVINCE: PUNJAB

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
1.	Shah Kot Distributary	117+315 to 131+800	33	0.00025	4.8	2.4	0.016	1:1	c.c (1:2:4)	
		131+800 to 142+435	18	0.00040	3.4	1.8	0.016	1:1	-do-	
		142+435 to 153+515	4.0	0.00060	2.2	1.2	0.016		Bricke (Rectangular section)	Lining with plaster
2.	Niaz Beg Distributary	133+500 to 150+129	92	0.00018	9.1	3.2	0.016	1.5:1	c.c (1:2:4)	
		150+129 to 156+081	81	0.00018	8.4	3.1	0.016	1.5:1	c.c	
		156+081 to 166+736	60	0.0002	6.2	2.9	0.016	1.5:1	c.c	
		166+736 to 169+750	42	0.0002	5.2	2.8	0.016	1:1	c.c	
		169+750 to 173+000	40	0.0002	4.9	2.8	0.016	1:1	c.c	
		173+000 175+612 Fall	36	0.0002	4.7	2.7	0.016	1:1	c.c	
		175+612 to 180+000	19	0.000325	3.2	2.0	0.016	1:1	c.c	
		180+000 to 183+635 Fall	18	0.000325	3.2	1.9	0.016	1:1	c.c	
		183+635 to 185+240	11.25	0.00031	2.9	1.6	0.016	1:1	c.c	

PROVINCE: PUNJAB

Sr. No.	Name of Channel	Reach R.D. to R.D.	Disch in Cusecs	Longitu-dinal Slope	Bed width ft.	Depth ft.	Manning 'n'	Side slope	Type of of lining	Remarks
1	2	3	4	5	6	7	8	9	10	11
3.	1L/3R (Pakpattan) (Minor)	0+000 to 20+600	28	0.00019	4.8	2.4	0.016	1:1	c.c (1:2:4)	
		20+600 to 30+968	19.18	0.00020	4.0	2.1	0.016	1:1	c.c	
		30+968 to 40+550 Tail	9.16	0.00025	3.1	1.50	0.016	1:1	c.c	
4.	6-R(HAKRA) Distributary	0+000 to 13+750	482	0.000138	28.5	5.00	0.016	1.5:1	c.c	Due to High S.S.W.L depth could not increased further
		13+750 to 32+000	437	0.000157	28.5	4.60	0.016	1.5:1	c.c	
		32+000 to 37+550	409	0.000157	28.5	4.6	0.016	1.5:1	c.c	
		128+000 to 135+150	14.70	0.00025	3.9	1.7	0.016	1:1	c.c	
		135+150 to 138+800	9.5	0.00025	2.8	1.6	0.016	1:1	c.c	
		138+800 to 148+360	5.7	0.00025	1.9	1.4	0.016	1:1	c.c	
5.	2L/6R Hakra Minor	0+000 to 21+270	30	0.00023	5.0	2.3	0.016	1:1	c.c	
		21+270 to 24+200	17	0.00033	3.9	1.7	0.016	1:1	Brick Lining with plaster	
		24+200 to 30+000	14.5	0.00033	3.7	1.6	0.016	1:1	"	Trape-zoidal
		30+000 to 32+000	10	0.00037	2.7	1.5	0.016	1:1	"	
		32+000 to 34+790	6.5	0.00037	1.8	1.4	0.016	1:1	"	