

Figure C-1 Cropping Pattern Early Stage 2 to 3 years

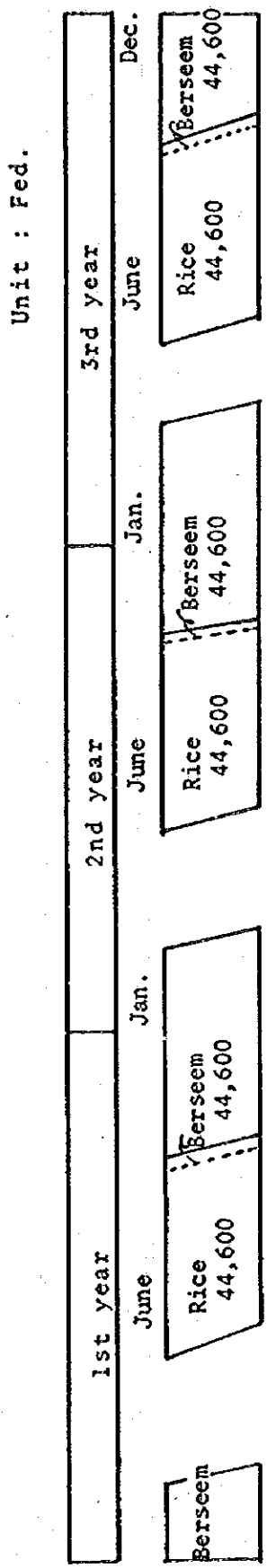


Figure C-2 3 Year Crop Rotation-Middle Stage

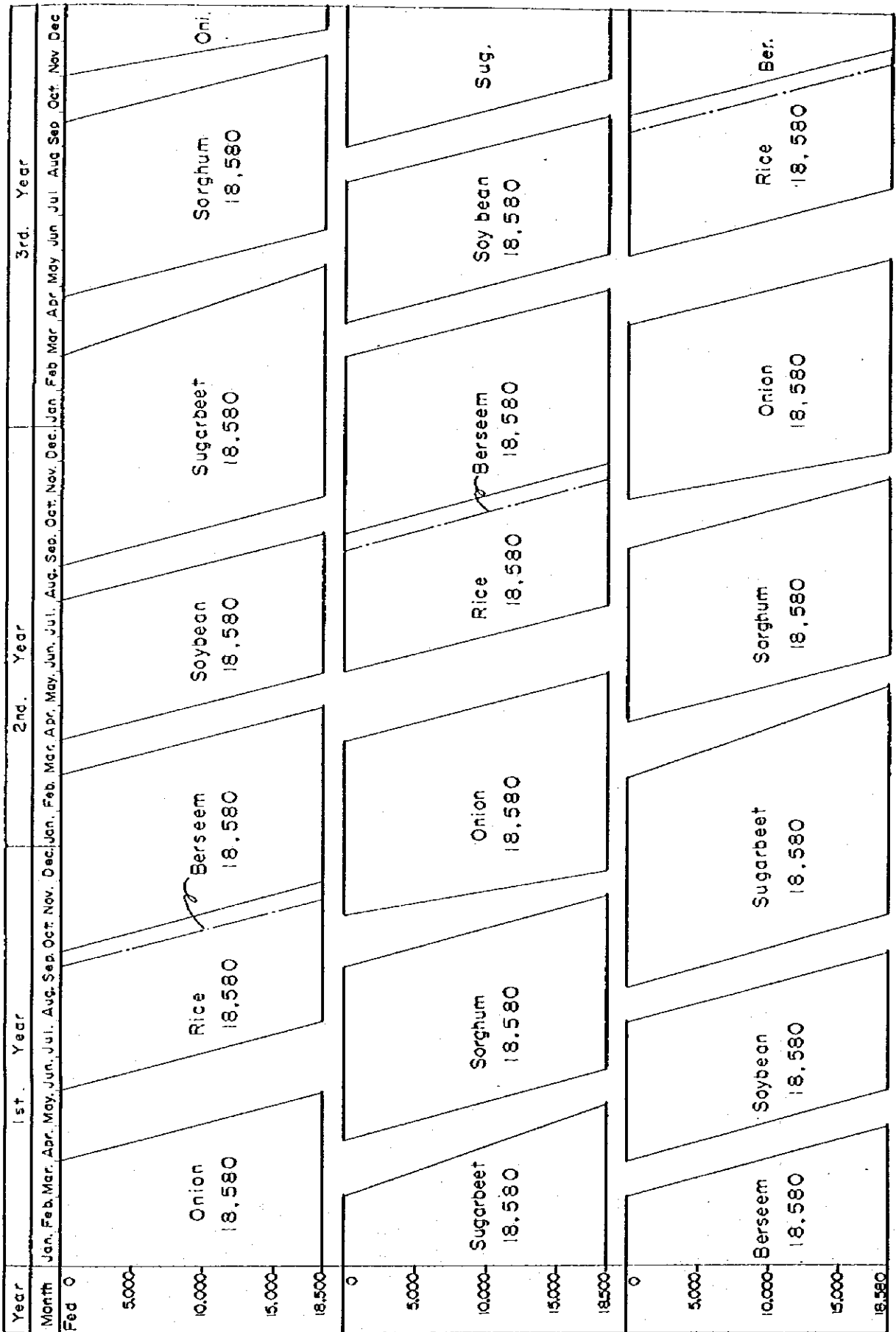


Table C-11 Target Yield by Crop - Ton/Feddan

Crops	1st Stage		2nd Stage			3rd stage			
	1	2	3	4	5		6	7	8
Rice	1.2	1.5	1.8	2.1	2.4	2.5	2.6	2.7	3.0
Berseem	10	13	15	18	20	23	25	25	25
Soybean	-	-	0.7	0.8	0.9	0.9	1.0	1.0	1.2
Sorghum	-	-	13	14	16	18	18	18	18
Sugarbeet	-	-	16	18	18	20	21	23	25
Tomato	-	-	14	16	18	20	20	20	20
Broccoli	-	-	7	8	10	11	12	12	12
Cabbage	-	-	14	16	18	20	20	20	20
Onion	-	-	5	5	6	7	8	9	10

Table C-12 Machinery Efficiency

Machinery	Op. width (m)	Op. speed (Km/hr)	Field efficiency (%)	Field Op. (hr/ha)	Capacity (hr/fed)
Chisel plow	3.00	5	70	1.05	0.41
Disk harrow 14" x 36	3.66	7	80	0.49 2 times 0.98	0.21 0.42
Puddling 40ps	2.70	4	80	1.16	0.49
Broadcaster 40ps	10.00	5	60	0.30	0.13
Transplanter (rice) 5 tons	1.50	2.5	55	4.85	2.04
Planter 8 rows	4.20	4	40	1.49	0.65
Cultivator	1.20 1.50	6 6	80 80	1.72 1.59	0.72 0.58
Combine	1.35	4.0	55	3.36	1.41
Sprayer	14.00	5.0	50	0.29	0.12
Bean harvester	4.50	4.0	80	0.70	0.29
Sub-soiler	1.20	2.0	65	0.64	0.27
Drill with fertilizer	4.0	4.5	55	1.0	0.42
Tapper	2.00	5.0	90	1.1	0.47
Hand mower	2.00	3.0	90	1.85	0.78

Table C-13 Agricultural Machinery Purchase Cost

<u>Machinery</u>	<u>Capacity</u>	<u>No. of Machinery</u>	<u>Unit Cost</u> <u>2/(1,000L.E)</u>	<u>Total Cost</u> <u>(million L.E.)</u>
Tractor	90 ^{PS}	173	22.00	3.81
	40 ^{PS}	147	5.12	0.80
Chisel Plow	3 m	41	0.42	0.02
Disk Harrow	18" x 24	41	2.17	0.89
Puddler	3 m	31	0.17	0.01
Transplanter	5 rows	75	4.9	0.37
Combine	135 cm	27	11.5	0.31
Planter	8 rows	39	3.1	0.12
Cultivator	3 rows	30	0.8	0.02
Ridger	3 rows	34	0.48	0.02
Sprayer	14 m	14	0.75	0.01
Sub-soiler	1.2 m	25	1.26	0.03
Bean Harvester	4.5 m	18	9.51	0.17
Beet Harvester	2 rows	81	0.91	0.07
Broadcaster	500 litter	8	0.63	0.01
Trailer	4 tons	40	3.71	0.15
Workshop		2 ^{1/}		0.17
<u>Total</u>		<u>826</u>		<u>6.98</u>

1/ Workshop 2 set

2/ /LE = 286 YEN

Table C-14 Farm Management

	Irrigation Water Contract	Utilization of Machinery	Management of Crops	Expansion of Technology	Efficiency of Operation	Allocation of income gained from co-production System	Ability of Manager
Alternative 1 Individual farming	difficult	difficult	medium	take long time	low	-	ordinary
Alternative 2 Group farming by 20 farmers	medium	medium	easy	short time	high	difficult	speciality
Alternative 3 Group farming by 30 farmers	easy	easy	easy	short time	high	more difficult	especiality

Table C-15 Labor Requirement per Farmer (5 fed)

Crops Working day	Unit: hour												
	Jan. 26	Feb. 24	Mar. 26	Apr. 25	May 26	Jun. 25	Jul. 26	Aug. 26	Sep. 25	Oct. 26	Nov. 25	Dec. 26	Total 306
Rice 1.7						14.8	21.3	34.0	30.6	26.0	9.7		136.4
Soybean 1.7				8.5	17.9	31.5	30.6	17.0	3.4				108.9
Sugarbeet 1.7	30.6	30.6	18.0	10.4	0.5		27.4	46.4	30.6	30.6	30.6	30.6	255.7
Sorghum 0.8				1.6	5.6	15.0	14.4	16.9	10.8	4.1			68.4
Berseem 1.7	42.1	42.1	12.4	1.2					0.9	15.6	30.1	42.1	184.5
Tomato 0.8	50.9	94.2	123.4	10.5	192	88.8							559.8
Onion 1.6	152.9	41.6	28.8	83.2	73.6				4.8	32.0	60.2	477.1	
Sub-Total	225.9	165.2	153.4	228.5	108.1	253.3	155.1	95.3	92.1	79.1	102.4	132.9	1,791.1
Livestock	27.3	24.6	27.3	26.4	27.3	26.4	27.5	26.4	27.5	26.4	27.3	27.3	321.5
Total man/day	253.2	189.8	180.7	254.7	135.4	279.7	182.4	122.6	118.5	106.4	128.8	160.2	2,112.4
Available Labor	51.7	25.7	22.6	51.8	16.9	35.0	22.8	15.3	14.8	15.5	16.1	20.0	264.0
	52.0	48.0	52.0	50.0	52.0	50.0	52.0	52.0	50.0	52.0	50.0	52.0	612.0

Table C-16 Operation Hour of Farm Machines

	<u>Rice</u> (hr)	<u>Sugarbeet</u> (hr)	<u>Soybean</u> (hr)	<u>Sorghum</u> (hr)	<u>Vegetables</u> (hr)
Plow 90 ps.	7,618	7,618	7,618	4,338	10,898
Harrow "	7,804	7,804	7,804	4,444	11,164
Subsoiler "	5,017	5,017	5,017	2,857	7,177
Broadcaster 40 ps.	2,415	-	-	1,375	-
Puddler "	9,104	-	-	-	-
Transplanter 7 ps.	37,903	-	-	-	-
Combine 40 ps.	13,378	-	-	-	-
Planter "	-	11,705	11,705	-	-
Beet harvester "	-	52,024	-	-	-
Been harvester "	-	-	5,388	-	-
Sprayer "	-	2,230	-	-	-
Trailer	-	-	5,506	-	95,593
Truck	3,716	4,645	-	-	-
Total	86,955	91,043	43,038	13,014	124,832

Table C-17 Fuel Consumption of Farm Machines

	<u>Rice</u> (1)	<u>Sugarbeet</u> (1)	<u>Soybean</u> (1)	<u>Sorghum</u> (1)	<u>Vegetables</u> (1)
Plow	102,843	102,843	102,843	58,563	147,123
Harrow	105,354	105,354	105,354	59,994	150,714
Subsoiler	67,730	67,730	67,730	38,570	96,890
Broadcaster	14,490	-	-	8,250	-
Puddler	54,624	-	-	-	-
Transplanter	39,798	-	-	-	-
Combine	80,268	-	-	-	-
Planter	-	70,230	70,230	-	-
Beet harvester	-	312,144	-	-	-
Bean harvester	-	-	32,328	-	-
Sprayer	-	13,380	-	-	-
Trailer	-	-	33,036	-	-
Truck	892	1,115	-	-	-
<u>Total</u>	465,999	672,796	411,521	165,377	394,727
Light Oil	93,200	134,559	82,304	33,075	78,945
Lubricating Oil					

Figure C-3 Machinery Operation Schedule

Crops	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Rice					<u>Plow 19 (90)</u>					<u>Combine 22</u>		
					<u>Subsoiler 13 (90)</u>					<u>Truck 33</u>		
					<u>Harrow 20 (90)</u>							
					<u>Broad cast 6 (40)</u>							
					<u>Puddler 26 (40)</u>							
					<u>Transplanter 63</u>							
Sugarbeet					^{/1} <u>Harvester 72 (40,90)</u>			<u>Plow 20 (90)</u>		<u>Sprayer 13 (40)</u>		
					<u>Truck 166</u>			<u>Subsoiler 14 (90)</u>				
								<u>Harrow 20 (90)</u>				
								<u>Planter 33 (90)</u>				
Soybean					<u>Plow 21 (90)</u>			<u>Harvester 17 (40)</u>				
					<u>Subsoiler 14 (90)</u>							
					<u>Harrow 22 (90)</u>							
					<u>Planter 33 (40)</u>							
Sorghum					<u>Plow 12 (90)</u>							
					<u>Subsoiler 8 (90)</u>							
					<u>Harrow 12 (90)</u>							
					<u>Broadcaster 4 (90)</u>							
Tomato					<u>Plow 4 (90)</u>							
					<u>Subsoiler 3 (90)</u>							
					<u>Harrow 4 (90)</u>							
Onion										<u>Plow 22 (90)</u>		
										<u>Subsoiler 14 (90)</u>		
										<u>Harrow 22 (90)</u>		
										<u>Fertilizer 33 (40)</u>		

/1 --- using tiller

Figure C-4 Operation System by Farm Machine

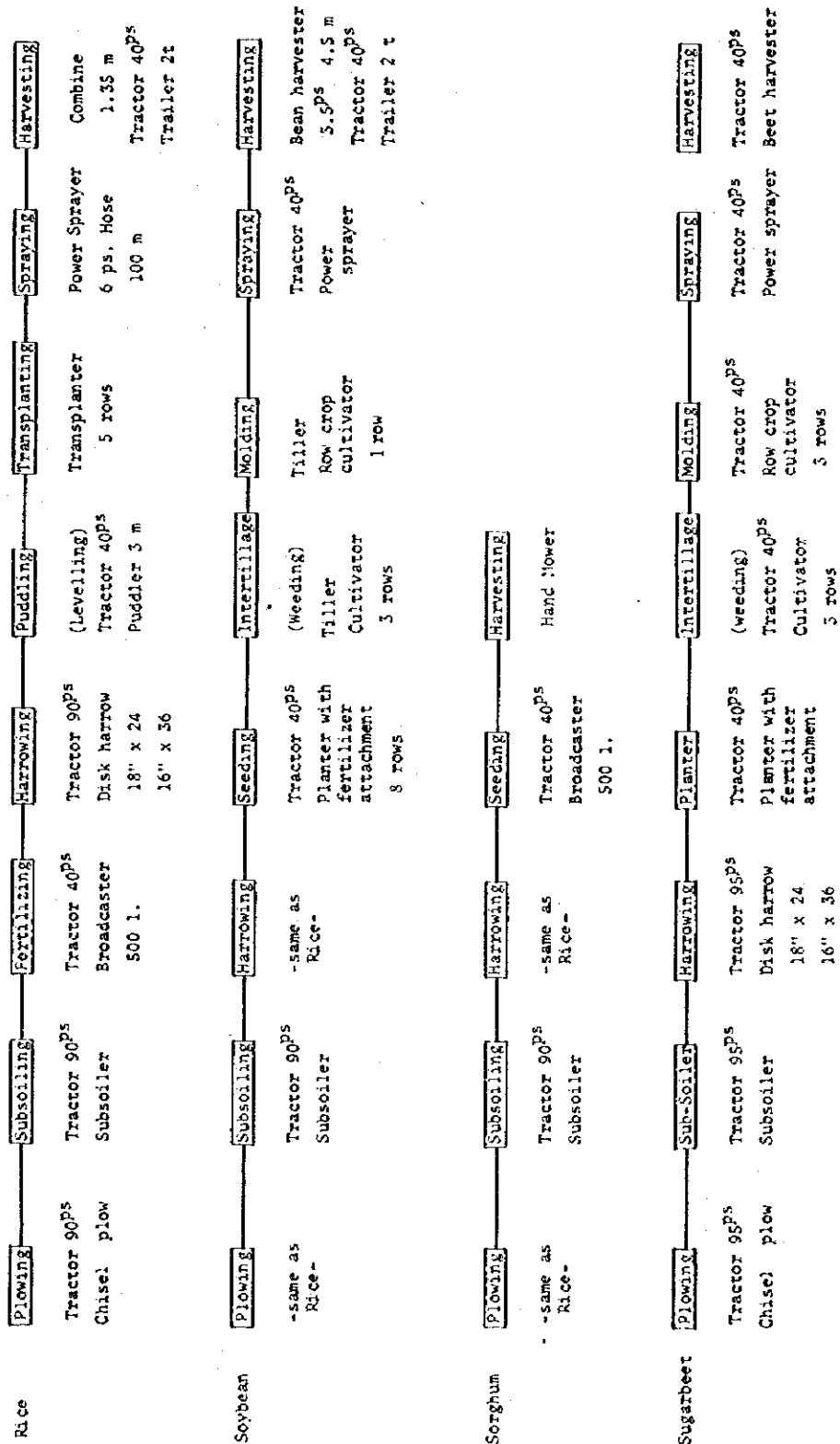


Table C-18 Cropping Area by Year, by Crops (1)
(Unit : Feddan)

Item	Land Class	Crops	1990	1991	1992-96	1997-99	2000-
M 1 /1	2.5	Rice	1,944	1,944	810	810	810
		Berseem	1,944	1,944	810	810	810
	2,430 /2	Soybean	-	-	810	810	810
	(1,944)	Sugarbeet	-	-	810	810	810
		Sorghum	-	-	810	462	462
		Tomato	-	-	-	348	348
		Onion	-	-	567	567	567
		Cauliflower	-	-	122	122	122
		Cabbage	-	-	121	121	121
		Total	3,888	3,888	4,860	4,860	4,860
M 1	4	Rice	10,722	10,722	10,722	4,467	4,467
		Berseem	10,722	10,722	10,722	4,467	4,467
	13,400	Soybean	-	-	4,466	4,466	4,466
	(10,722)	Sugarbeet	-	-	4,466	4,466	4,466
		Sorghum	-	-	-	4,467	2,546
		Tomato	-	-	-	-	1,921
		Onion	-	-	3,127	3,127	3,127
		Cauliflower	-	-	674	674	674
	15,830	Cabbage	-	-	666	666	666
	(12,666)	Total	21,444	21,444	34,843	26,800	26,800

/1 ... The Project area has been divided into three blocks : blocks M1, M2, M3.

/2 ... With open drainage canal.

Cropping Area by Year, by Crops (2)
(Unit : Feddan)

<u>Item</u>	<u>Land Class</u>	<u>Crops</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994-97</u>	<u>1998-2000</u>	<u>2001-</u>
M 2	2, 3	Rice	12,082	12,082	5,033	5,033	5,033	5,033
		Berseem	12,082	12,082	5,033	5,033	5,033	5,033
	15,100 ^{fed.}	Soybean	-	-	5,033	5,033	5,033	5,033
	(12,082)	Sugarbeet	-	-	5,033	5,033	5,033	5,033
		Sorghum	-	-	5,034	5,034	2,870	2,870
		Tomato	-	-	-	-	2,164	2,164
		Onion	-	-	3,524	3,524	3,524	3,524
		Cauliflower	-	-	760	760	760	760
		Cabbage	-	-	750	750	750	750
		Total	24,164	24,164	30,200	30,200	30,200	30,200
	4	Rice	6,337	6,337	6,337	2,640	2,640	2,640
		Berseem	6,337	6,337	6,337	2,640	2,640	2,640
	7,920	Soybean	-	-	-	2,640	2,640	2,640
	(6,537)	Sugarbeet	-	-	-	2,640	2,640	2,640
		Sorghum	-	-	-	2,640	2,640	1,505
		Tomato	-	-	-	-	-	1,135
		Onion	-	-	-	1,848	1,848	1,848
	23,020	Cauliflower	-	-	-	399	399	399
	(18,419)	Cabbage	-	-	-	393	393	393
		Total	12,674	12,674	12,674	15,840	15,840	15,840

Cropping Area by Year, by Crops (3)
(Unit : Feddan)

<u>Item</u>	<u>Land Class</u>	<u>Crops</u>	<u>1992</u>	<u>1993</u>	<u>1994-98</u>	<u>1999-2001</u>	<u>2002-</u>
M 3	2. 3	Rice	5,881	5,881	2,450	2,450	2,450
		Berseem	5,881	5,881	2,450	2,450	2,450
	7,350	Soybean	-	-	2,450	2,450	2,450
	(5,881)	Sugarbeet	-	-	2,450	2,450	2,450
		Sorghum	-	-	2,450	1,337	1,337
		Tomato	-	-	-	1,053	1,053
		Onion	-	-	1,715	1,715	1,715
		Cauliflower	-	-	370	370	370
		Cabbage	-	-	365	365	365
		Total	11,762	11,762	14,700	14,640	14,640
	4	Rice	7,634	7,634	7,634	3,180	3,180
		Berseem	7,634	7,634	7,634	3,180	3,180
	9,540	Soybean	-	-	3,180	3,180	3,180
	(7,634)	Sugarbeet	-	-	3,180	3,180	3,180
		Sorghum	-	-	3,180	3,180	1,800
		Tomato	-	-	-	-	1,380
		Onion	-	-	2,234	2,234	2,234
		Cauliflower	-	-	475	475	475
		Cabbage	-	-	471	471	471
		Total	15,268	15,268	27,988	19,080	19,080

Table C-19 Agricultural Production by Year by Crop

(Unit: ton)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
M 1																
Land Class																
2. 3																
2,430 fed.																
(1,944 fed.)																
Rice	2,533	2,916	3,312	1,531	1,750	1,823	1,896	2,187	2,430	2,430	2,430	2,430	2,430	2,430	2,430	2,430
Berseem	19,440	25,272	10,935	13,122	14,580	16,767	18,225	20,250	20,250	20,250	20,250	20,250	20,250	20,250	20,250	20,250
Soybean	-	-	587	648	729	759	810	810	972	972	972	972	972	972	972	972
Sugarbeet	-	-	12,960	14,580	14,580	16,200	17,010	18,630	20,250	20,250	20,250	20,250	20,250	20,250	20,250	20,250
Sorghum	-	-	10,530	11,340	12,960	14,580	14,580	8,316	8,316	8,316	8,316	8,316	8,316	8,316	8,316	8,316
Tomato	-	-	-	-	-	-	-	5,568	5,568	6,264	6,960	6,960	6,960	6,960	6,960	6,960
Onion	-	-	2,552	2,552	3,062	3,572	4,082	4,592	5,102	5,612	6,122	6,122	6,122	6,122	6,122	6,122
Cauliflower	-	-	293	293	390	488	488	610	610	610	610	610	610	610	610	610
Cabbage	-	-	1,355	1,355	1,742	1,936	1,936	2,420	2,420	2,420	2,420	2,420	2,420	2,420	2,420	2,420
M 2																
Land Class																
2. 3																
15,100 fed.																
(12,082 fed.)																
Rice	12,866	16,083	16,083	7,237	8,443	9,649	10,051	10,453	10,855	11,257	11,659	12,061	12,463	12,865	13,267	13,669
Berseem	107,420	139,386	139,386	60,305	72,365	80,406	92,447	100,508	100,508	100,508	100,508	100,508	100,508	100,508	100,508	100,508
Soybean	-	-	-	3,126	3,573	4,019	4,466	4,913	5,359	5,806	6,252	6,698	7,144	7,590	8,036	8,482
Sugarbeet	-	-	-	71,456	80,388	89,320	95,786	102,718	111,650	111,650	111,650	111,650	111,650	111,650	111,650	111,650
Sorghum	-	-	-	58,071	62,538	71,472	80,406	80,406	80,406	80,406	80,406	80,406	80,406	80,406	80,406	80,406
Tomato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Onion	-	-	-	14,072	14,072	16,886	19,700	22,514	25,328	28,142	30,956	33,770	36,584	39,398	42,212	45,026
Cauliflower	-	-	-	1,618	1,618	2,137	2,656	2,656	2,656	2,656	2,656	2,656	2,656	2,656	2,656	2,656
Cabbage	-	-	-	7,459	8,325	9,590	10,656	10,656	10,656	10,656	10,656	10,656	10,656	10,656	10,656	10,656
M 3																
Land Class																
4																
7,920 fed.																
(6,337 fed.)																
Rice	7,604	7,604	9,506	9,506	4,277	4,990	5,702	5,940	6,178	6,417	6,655	6,893	7,131	7,369	7,607	7,845
Berseem	-	-	63,370	82,381	35,640	42,768	47,520	54,648	59,400	59,400	59,400	59,400	59,400	59,400	59,400	59,400
Soybean	-	-	-	-	1,848	2,112	2,376	2,640	2,904	3,168	3,432	3,696	3,960	4,224	4,488	4,752
Sugarbeet	-	-	-	-	42,240	47,520	47,520	52,800	55,440	60,720	66,000	71,280	76,560	81,840	87,120	92,400
Sorghum	-	-	-	-	34,320	36,960	42,240	47,520	47,520	47,520	47,520	47,520	47,520	47,520	47,520	47,520
Tomato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Onion	-	-	-	-	8,316	8,316	9,979	11,642	13,306	14,969	16,632	18,296	19,959	21,622	23,286	24,949
Cauliflower	-	-	-	-	958	958	1,277	1,596	1,596	1,596	1,596	1,596	1,596	1,596	1,596	1,596
Cabbage	-	-	-	-	4,402	5,030	5,659	6,288	6,288	6,288	6,288	6,288	6,288	6,288	6,288	6,288
M 3																
Land Class																
2. 3																
7,350 fed.																
(5,831 fed.)																
Rice	-	-	7,057	8,822	3,969	4,631	5,292	5,513	5,733	6,415	7,100	7,350	7,350	7,350	7,350	7,350
Berseem	-	-	58,810	76,453	33,075	39,690	44,100	50,715	55,125	61,740	61,740	61,740	61,740	61,740	61,740	61,740
Soybean	-	-	-	-	1,715	1,950	2,205	2,460	2,715	2,970	3,225	3,480	3,735	3,990	4,245	4,500
Sugarbeet	-	-	-	-	39,200	44,100	44,100	49,000	51,450	56,350	61,250	61,250	61,250	61,250	61,250	61,250
Sorghum	-	-	-	-	31,850	34,300	39,200	44,100	48,000	52,900	57,800	62,700	67,600	72,500	77,400	82,300
Tomato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Onion	-	-	-	-	7,718	7,718	9,261	10,805	12,348	14,742	18,954	18,954	21,060	21,060	23,166	25,272
Cauliflower	-	-	-	-	888	888	1,184	1,480	1,480	1,480	1,480	1,480	1,480	1,480	1,480	1,480
Cabbage	-	-	-	-	4,088	4,672	5,256	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840
M 3																
Land Class																
4																
9,540 fed.																
(7,634 fed.)																
Rice	-	-	9,161	9,161	11,451	5,152	6,010	6,869	7,155	7,441	7,907	8,586	9,540	9,540	9,540	9,540
Berseem	-	-	76,340	76,340	99,242	42,930	51,516	57,240	65,826	71,550	71,550	71,550	71,550	71,550	71,550	71,550
Soybean	-	-	-	-	2,226	2,544	2,862	3,180	3,498	3,816	4,134	4,452	4,770	5,088	5,406	5,724
Sugarbeet	-	-	-	-	50,880	57,240	57,240	63,600	66,780	73,140	79,500	79,500	79,500	79,500	79,500	79,500
Sorghum	-	-	-	-	41,340	44,520	50,880	57,240	57,240	57,240	57,240	57,240	57,240	57,240	57,240	57,240
Tomato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Onion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cauliflower	-	-	-	-	10,053	10,053	12,064	14,074	16,085	18,095	20,106	22,117	24,128	26,139	28,150	30,161
Cabbage	-	-	-	-	1,140	1,140	1,520	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900

Table C-19 Agricultural Production by Year by Crop - continue -

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Rice /2	32,306	18,999	61,242	46,679	39,402	37,116	40,277	42,739	45,940	50,061	52,315	54,786	55,740	55,740	55,740	55,740
Berseem /2	126,660	348,848	448,578	399,448	536,437	515,155	558,011	596,604	426,934	438,783	449,950	456,530	464,500	464,500	464,500	464,500
Soybean /3	-	-	550	7,078	8,624	15,098	15,990	17,219	17,696	19,847	21,109	21,630	21,630	21,630	21,630	21,630
Sugarbeet /4	-	-	12,701	163,233	261,662	323,088	348,753	369,606	401,033	432,744	448,953	455,210	455,210	455,210	455,210	455,210
Sorghum /2	-	-	10,530	134,853	212,144	279,196	311,558	321,834	289,242	270,288	235,710	215,280	190,440	190,440	190,440	190,440
Tomato /4	-	-	-	-	-	-	-	4,775	35,147	54,517	87,861	113,504	140,491	149,185	154,115	156,800
Onion /4	-	-	2,501	31,832	48,046	64,264	73,770	85,751	100,394	113,331	121,576	125,358	127,400	127,400	127,400	127,400
Cauliflower /4	-	-	287	3,660	5,564	7,902	8,377	10,723	11,840	12,203	12,863	13,255	13,720	13,720	13,720	13,720
Cabbage /4	-	-	1,528	17,060	27,594	36,557	40,705	43,106	46,785	48,216	50,827	52,367	54,490	54,490	54,490	54,490
Total																

(Unit : ton)

/1 --- with open drain

/2 --- cropping ratio 100 %

/3 --- cropping ratio 97 %

/4 --- cropping ratio 98 %

Outline of Training Center

1. Location

Location of the Training Center should be decided considering the implementation schedule to start in M-1 irrigation block.

2. Acreage

Training Field	5 feddans x 3 places
Demonstration Field	2 feddans
Site of Building	3 (Office, training room, meeting room, quarters, storage for farm machine and inputs and workshop)
Grounds	2 feddans
<u>Total</u>	<u>22 feddans</u>

3. Curriculum

About 1,000 large farmers with 15 and 20 feddans shall be mainly trained in average 200 farmers per year for five years. 200 farmers are divided into two seasons of wet and summer. Number of classes is three and students of one class are about 35 persons. Training field of 5 feddans is allotted to each class by season. Farmers trained would teach and lead small farmers.

4. Period of training --- one course 6 months, 2 times per year

5. Staffs

Rice ----- 1, Upland crops ----- 1, Vegetable ----- 1
Machine -- 1, Irrigation ----- 1 Total 5

6. Farm machines for training

Small machine ----- 20 sets
Nursery facilities ---- 2 sets
Repairing equipment --- 1 set

C.3. Stock Breeding Development

C.3.1. Livestock Farming in A.R.E.

a. Number of Livestock

The number of livestock and poultry by varieties in the five years from 1977 through 1981 is shown in Tables C-20 and C-22, respectively. The total number of livestock comes up to the seven millions' level though recently the trend has been downward. Cows and buffaloes account for about 60 percent of the total number of livestock. As mentioned above, the total number of livestock in A.R.E. is decreasing gradually whereas the number of goats and buffaloes is increasing. As for poultry, the total number increased by four percent in the past five years. Local chickens occupy about 77 percent of the total number, and this trend has been increasing until the present.

b. Animal Production

The Production Yearbook issued by F.A.O. indicates that the meat production in A.R.E. reached 423,000 tons in 1979 as seen in Table C-24. The slaughtered livestock shown in Table C-21 indicates that mainly veal and calves aged several weeks account for are slaughtered for meat production, and both varieties occupy 52 percent in 1981.

This is the reason why no high priority is given to calves nursing for milk supply. It is desirable for the livestock breeding in A.R.E. to control and decrease the slaughter of these young cattle.

c. Consumption of Animal Products

The per capita consumption of meat increased by 13 percent in 1977 to 1978, and reached 12.0 kilograms in 1978. As for dairy

products, 48 kilograms are consumed per capita per year. Their consumption has not fluctuated much in recent years. The per capita intake of animal protein was 13.5 grams per day in 1978.

d. Import and Export of Animal Products

As shown in Table C-23, the amounts of import exceed those of exports. Specially, the import of meat was to 2.4 times greater in 1980 than in 1979. The main commodity of imported meat is beef as shown in Table C-25. The import of cold meat reached 128,000 tons in 1980, and is forecast to increase more in future to meet the swelling demand.

e. Cropped Area for Forage Production

Table C-27 shows that there was neither an increase nor a decrease in cropped areas for forage production in recent years. The major constraint which hinders the expansion of cropping areas of fodder crops in A.R.E. is the limited irrigated areas in this country, which is the major restrictive factor of the feedable number of livestock. The resources of forage for animals in the country consist of berseem (Egyptian clover) for a six-month period from December to May, and maize, sorghum and by-products such as straw for the other six-months of the year.

Table C-20 Number of Livestock

(Unit: Thousand heads)

<u>Variety</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Cows	2,048	2,587	1,954	1,912	1,852
Buffaloes	2,266	2,542	2,321	2,347	2,370
Sheep	1,821	2,554	1,679	1,593	1,498
Goats	1,375	1,440	1,427	1,451	1,475
Camels	97	93	88	84	80
Pigs	15	15	15	15	15

Source: Statistical Yearbook, Central Agency for Public Mobilization and Statistics, August 1982

Table C-21 Number of Slaughtered Livestock

(Unit: Thousand heads)

<u>Variety</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Oxen	1	1	2	1	1
Cows	26	41	56	46	41
Buffaloes	74	98	111	98	82
Veals	285	347	340	282	269
Calves	355	394	472	443	474
Sheep	399	445	432	369	422
Goats	23	21	24	24	30
Pigs	46	45	56	58	59
Camels	57	52	45	32	46

Source: Statistical Yearbook, Central Agency for Public Mobilization and Statistics, August 1982

Table C- 22 Number of Poultry

(Unit: Thousand head)

<u>Variety</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Local Chickens	26,680	26,986	27,292	27,597	27,903
Turkeys	715	724	733	742	751
Ducks	3,343	3,392	3,440	3,489	3,538
Geese	2,661	2,685	2,725	2,734	2,758
Pigeons	1,325	1,207	1,084	1,107	1,126

Source: Statistical Yearbook, Central Agency for Public Mobilization and Statistics, August 1982

Table C-23 Foreign Trade by Tariff Nomenclature

(Unit: LE '000)

<u>Item</u>	<u>Export</u>		<u>Import</u>	
	<u>1979</u>	<u>1980</u>	<u>1979</u>	<u>1980</u>
Live animals	7,732	10,598	1,972	1,806
Meat & edible meat offals	198	168	50,782	120,287
Fish crustaceans & molluscs	525	385	7,687	9,778
Dairy products, birds' eggs and natural honey	96	147	49,172	78,106
Products of animal origin	842	602	108	217
<u>Total</u>	<u>9,393</u>	<u>11,900</u>	<u>109,721</u>	<u>210,194</u>

Source: Monthly Bulletin of Foreign Trade, August 1981
Central Agency for Public Mobilization and Statistics

Table C-24 Animal Products Production

(Unit: '000 tons)

<u>Commodities</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Beef and Veal	122	127	125
Buffalo Meat	117	119	121
Mutton and Lamb	23	25	25
Goat Meat	20	20	21
Pork	2	3	3
Poultry Meat	139	NA	NA
Cow Milk	646	667	688
Buffalo Milk	1,227	1,625	1,303
Sheep Milk	21	22	23
Goat Milk	8	8	9
Cheese	238	243	247
Butter	67	68	70
Hen Eggs	89	90	92

Source: Production Yearbook, FAO

Table C-25 Imports Quantity of Cold Food Stuffs

(Unit: tons)

<u>Commodities</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Beef	46,597	34,277	73,814
Chicken	8,582	27,453	54,354
Fish	52,974	23,070	36,144
Cheese	12,207	15,067	14,146
Butter	27,174	22,008	35,207
<u>Total</u>	<u>147,534</u>	<u>121,875</u>	<u>213,665</u>

Source: Monthly Bulletin of Foreign Trade, Central Agency for
Public Mobilization and Statistics

Table C-26 Volume and Value of Poultry Importation (1980)

<u>Country</u>	<u>Quantity (tons)</u>	<u>Value ('000 LE)</u>
Greece	1,649	1,740
Sweden	832	721
United Kingdom	3,168	2,779
Belgium	212	307
Switzerland	2,774	3,387
France	622	483
U.S.A.	45,049	39,399

Source: Monthly Bulletin of Foreign Trade, 1980, Central Agency
for Public Mobilization and Statistics, August 1981

Table C-27 Mean Retail Prices of Animal Products in Cairo (1981)

<u>Commodities</u>	<u>Unit</u>	<u>Prices (LE)</u>
Local Meat		
Veal with bones	kg	2.25
Beef without bones	"	2.40
Lamb with bones	"	2.30
Poultry and Eggs		
Turkeys (live)	kg	2.42
Local chickens (live)	"	2.30
Ducks (live)	"	2.08
Rabbits (live)	"	2.00
Pigeons (live)	Pairs	2.29
Local chickens (killed)	kg	1.49
Imported chickens (killed)	"	1.20
Eggs	Unit	0.087

Source: Monthly Bulletin of Mean Prices of Food Commodities, Retail Prices, Central Agency for Public Mobilization and Statistics, 1981

Table C-28 Annual Share per Capita from Foodstuffs in ARE

(Unit: kg)

<u>Food Stuffs</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Seeds	231.0	244.6	249.3	254.4	275.9	266.1	281.1
Starchy Products	9.5	16.8	16.1	13.1	16.8	20.4	19.0
Sugar and Sweets	21.9	22.3	23.4	27.4	28.8	28.8	26.3
Pulses, Nuts and Roots	10.2	13.1	12.0	11.7	12.8	9.1	10.2
Fresh Vegetables	92.3	85.4	92.7	96.0	99.3	107.3	90.2
Fruits	54.4	58.8	66.4	63.9	63.1	58.0	62.4
Meat and Poultry	10.9	10.9	10.9	10.6	10.2	10.6	12.0
Fish	2.2	2.2	2.6	2.9	3.7	3.3	4.7
Dairy Products	49.3	48.5	48.2	48.2	50.4	48.2	47.5
Eggs	1.5	1.5	1.5	1.8	1.5	1.8	3.3
Vegetable Oils	9.1	9.9	10.9	11.3	11.0	11.0	12.8

Source: Statistical Indicators, Central Agency for Public Mobilization and Statistics

Note: All of figures in this table was calculated based on the Statistical Indicators mentioned above.

Table C-29 Cultivated Area for Forages

(Unit: '000 feddans)

<u>Year</u>	<u>Clover</u>	<u>Maize</u>
1952	2,202	27
1976	2,757	1,490
1977	2,854	1,323
1978	2,782	1,405
1979	2,777	1,413
1980	2,711	1,432
1981	2,778	1,434

Source: Statistical Yearbook 1982, Central Agency for Public Mobilization and Statistics

Table C-30 Number of Cattle in the Governorate
Sharkia (1981)

(Unit: Head)

<u>Variety</u>	<u>Less than 2 years</u>	<u>More than 2 years</u>	<u>Total</u>
Buffalo	42,158	179,524	221,682
Baladi	69,606	187,728	256,334
Friesian	48	108	156
Cross	224	1,700	1,924
<u>Total</u>	<u>111,036</u>	<u>369,060</u>	<u>480,096</u>

C.3.2. Stock Breeding Development

a. Some Fundamental Items for Livestock Plan

Discussion with GAPPAD officials concerned with fattening farm, dairy farms and the Animal Production Research Institute was carried out to formulate a livestock development plan and necessary data was collected. The results of discussion and some collected data are shown in Table C-31.

b. Feeding Standard and Nutrients Content of Forages

Starch equivalent (S.E.) and digestible crude protein (DCP) have been used as feeding standard in Egypt and the nutrient requirements of the cattle for this project were estimated based on that feeding standard. Feeding standards are shown in Table C-32 and Table C-33.

Table C-34 shows the nutrient content of the main forage crops in Egypt. This data was collected from the Animal Production Research Institution.

c. Selection of Cow to be Introduced

As shown in Table C-30 in the Sharkia Governorate where the Project Area is located about 480,000 head of cow and buffaloes are bred in 1981, of which 53 percent is occupied by Baladi cow. And also about 2,000 head of Friesian and cross are kept. Mainly buffaloes are bred for milk production. Milk fat of buffalo milk is high with 6 to 8 percent but total milk production per year is less with 1,200 to 2,000 kg.

Import of meat and dairy products in Egypt have been increased steeply with increase of population. And it is estimated that this tendency will continue in the near future.

Under these circumstances, consideration would be given to a fine breed of cattle capable of producing a large quantity of meat and milk.

Exotic cow such as Friesian, Brown Swiss, Simmental and soon have been imported to improve a capability of native cattle (Baladi). Among them Friesian cow have been bred popularly and brought a good results in milk production and heat tolerances. Friesian have a slightly lower milk fat ratio with 3.5 to 3.8 percent but produce 4,000 to 4,500 kg milk on an average and their meat quality is the highest of the dairy cows and also character is gentle.

Tables C-35 and C-36 show the estimated income from Friesian and buffalo. These tables show Friesian cow bring higher benefit to farmers than that from buffaloes.

Rural areas in Egypt stubble grazing of sheep are very popular. This method is very efficiency to raise a utilizing ratio of grasslands.

Considering all the above the breed selected for introduction to the Project Area are Friesian, Baladi and sheep.

Furthermore some alternative plans are examined taking into consideration that necessary number of Friesian could not be imported. Those case are shown below.

<u>Case</u>	<u>Friesian</u>	<u>Baladi</u>	<u>Buffalo</u>
Original	30	70	-
Case - 1	40	60	-
Case - 2	-	55	45
Case - 3	15	70	15
Case - 4	15	45	40

Table C-31 Some Items on Livestock Plan for the North & South
Hussinia Project

1. Milk Cow (Friesian)

Body Weight	500 kg
Milk Yield	4,300 kg
Milk Fat	3.8% - 3.6%
First Calving	at 26 month after birth
Lactation Period	305 days
Delivery Rate	85%
Duration for Milk Production	5 - 7 days
Mortality for Raising Cow	7%
Labor Requirement for Management	0.1 person/head (10 head/person)
Fodder Crop to be Offered	50 kg of fodder (berseem)/day
Concentrate to be Offered	3.5 kg - 5 kg/day
Straw to be Offered	2 kg/day
Unit Price of Fresh Milk	LE 0.3/kg - Farm gate price
Unit Price of Concentrate	LE 0.045/kg (LE 45/ton)
Unit Price of Berseem (Hay)	LE 0.08/kg (LE 80/ton)
Unit Price of Imported Heifer	LE 1,000/head
Unit Price of Imported Bull	LE 1,200/head] Brown Swiss
Unit Price of Rice Straw	LE 25/ton (LE 0.025/kg)
Production Cost of Fresh Milk	LE 0.24/kg
Unit Price of Fresh Berseem	LE 10 - 12 ton

2. Beef Cattle

	<u>Baladi</u>	<u>Friesian</u>
Body Weight	350 kg	500 kg
Daily Gain	0.6 kg/day	0.9 kg/day
Duration for Fattening	6 months	6 months
Age to be Slaughtered	18 months	18 months
Mortality	2%	2%
Dressing Percentage	54%	52%

- Continued -

Labor Requirement	50 heads/man	50 heads/man
Straw to be Offered	2 - 3 kg	- do -
Berseem to be Offered	10 kg	- do -
Concentrate	Gradually increased from 2 kg/day to 6 or 7 kg/day	
Unit Price of Meat	LE 2.5/kg	- do -
Selling Price of Fattened Cattle	LE 375/head	535
Production Cost for Fattening	LE 0.50/day	LE 0.71/day

Note: The items mentioned above were collected from discussions with GARPAD and Animal Production Research Institute and Dairy and, Fattening Farms.

Table C-32 Nutrients Requirements of Cattle

	<u>SE</u> (kg/day)	<u>DCP</u> (g/day)
1. Maintenance		
each 100 kg body weight needs	0.58	50
2. Production		
each 1 kg of FCM needs	0.263	67.6
3. Growth		
body weight - 65 kg	1.05	0.20 kg/day
160	1.64	0.29
175	2.33	0.37
250	3.04	0.44
300	3.16	0.48

Table C-33 Feed Requirement for the Cattle

1. Growth

<u>Live weight</u> (kg)	<u>Requirement (g/day)</u>		<u>Expected Daily Gain</u> (kg/day)
	<u>SE</u>	<u>DCP</u>	
91 - 135	2,340	470	0.85
136 - 180	2,580	515	0.85
181 - 225	3,060	565	0.80
226 - 270	3,480	580	0.70
271 - 315	3,650	580	0.70
316 - 360	4,020	605	0.70

2. Finishing

300 - 350	4,980	540 - 600	1.0
351 - 400	5,220	565 - 655	1.0
401 - 450	5,460	585 - 685	1.0
451 - 500	5,580	606 - 700	1.0
501 - 550	5,780	625 - 720	1.0
551 - 600	5,950	645 - 745	1.0

Source: Animal Production Research Institute

Table C-34 Chemical Composition of Crops

(Unit: %)

<u>Materials</u>	<u>Moisture</u>	<u>DCP</u>	<u>SE</u>	<u>Fibers</u>
Berseem				
1st cutting	88.28	1.8	6.3	2.49
2nd cutting	85.15	2.6	7.8	3.88
3rd cutting	80.50	2.0	9.6	6.11
Sorghum	80.46	0.11	11.1	6.04
Hay of Berseem	8.82	7.5	35.2	34.9
Sudan Grass				
1st cutting	26.89	2.50	12.5	7.53
2nd cutting	80.73	2.00	9.9	6.21
3rd cutting	80.00	1.00	9.3	6.24
Maize	9.64	5.9	81.8	1.79
Beet Pulp	88.0	6.0	53.6	1.04
Rice Straw	9.0	-	21.7	30.41
Soybean Cake	11.0	38.4	71.7	-
Wheat Straw	6.88	-	23.0	36.98

Note: DCP : Digestible crude Protein
 SE : Starch Equivalent

Table C-35 Estimated Income from Buffalo

<u>Gross Income</u>					
	<u>Unit</u>	<u>Yield</u>	<u>Production</u>	<u>Unit Price</u>	<u>Gross Income</u>
Milk	1	540 kg	540 kg	450 LE/ton	243.00 LE
Cull	0.13	500	65	600	39.00
Bull Calf	0.25	50	13	2,000	26.00
Heifer	0.13	300	39	1,500	58.50
Manure	-		9,000	3	27.00
<u>Total</u>					<u>393.50</u>

<u>Production Cost</u>					
Berseem			7.0 tons	x 12 LE/ton =	84.00
Rice Straw			1.6	x 25 =	40.00
Berseem Hay			0.2	x 80 =	16.00
Maize Leaves			1.8	x 12 =	21.60
Sorghum Straw			0.8	x 20 =	16.00
Labor			0.1	x 2LE/day x 365 =	73.00
Medicine					3.00
Others					13.35
<u>Total</u>					<u>266.95</u>

Net Income 126.55 LE

Table C-36 Estimated Income from Friesian

<u>Gross Income</u>					
	<u>Unit</u>	<u>Yield</u>	<u>Production</u>	<u>Unit Price</u>	<u>Gross Income</u>
Milk	1	3,655 kg	3,655 kg	250 LE/ton	913.75 LE
Cull	0.14	500	70	600	42.00
Bull Calf	0.42	55	23	2,000	46.00
Heifer	0.14	300	42	1,500	63.00
Manure	-	-	9,000	3	27.00
<u>Total</u>					<u>1,091.75</u>
 <u>Production Cost</u>					
Berseem			9.1 tons x 12 LE/ton =		109.20
Rice Straw			1.3 x 25 =		32.50
Berseem Hay			0.6 x 80 =		48.00
Maize Leaves			3.3 x 12 =		39.60
Sorghum Straw			3.4 x 20 =		68.00
Concentrate			1.6 x 40 =		64.00
Labor			0.2 x 2LE/day x 365 =		146.00
Medicine					4.00
Others					33.88
<u>Total</u>					<u>545.18</u>
<u>Net Income</u>					<u>546.57 LE</u>

Table C-37 Estimated Income from Sheep (EWe)

Gross Income

Farm-gate Price	55.00 LE/head	6 month old
Manure	5.00	
Wool	1.00	1 kg x 1 LE=1 LE
<u>Total</u>	<u>61.00</u>	

Production Cost

Forage	13.3 LE
Cocentrate	6.7
Labor Cost	6.0
Veterinary Care	7.0
Others	2.0
<u>Total</u>	<u>35.00</u>

Net Income 26.00 LE/head

Table C-38 Feeding Plan Through the Year

Winter (Nov. - Apr. - 181 days)

(1) Milk Cow		Cattle		Ration (kg/day)	Period (days)	No. of Head	Total Ration (t)	Remarks
Feed								
<u>Friesian</u>								
Green Fodder (Berseem)	Adult Cow			40	181	11,340	82,101	
	Heifer			18	181	3,500	11,403	
	Raising Stock Cattle			6	181	4,760	5,169	
Rice Straw	Adult Cow			4	181	11,340	8,210	
Soybean Cake	Adult Cow			1.5	181	11,340	3,078	
Concentrate	Adult Cow			2.0	181	11,340	4,105	
<u>Baladi</u>								
Green Fodder (Berseem)	Adult Cow			30	181	26,460	145,678	
	Heifer			14	181	7,940	20,120	
	Raising Stock Cattle			5	181	9,790	8,860	
Rice Straw	Adult Cow			3.5	181	26,460	16,762	
Soybean Cake	Adult Cow			1.0	181	26,460	4,789	

(2) Fattening Cattle

<u>Feed</u>	<u>Cattle</u>	<u>Ration</u> <u>(kg/day)</u>	<u>Period</u> <u>(days)</u>	<u>No. of Head</u>	<u>Total Ration</u> <u>(t)</u>	<u>Remarks</u>
Green Fodder		10	181	4,760	8,615	
Rice Straw	Friesian	4	181	4,760	3,446	
Soybean Cake		4.5	181	4,760	3,877	
Green Fodder		7	181	9,790	12,404	
Rice Straw	Baladi	2.5	181	9,790	4,430	
Soybean Cake		2.5	181	9,790	4,430	

Feed Balance in Winter

<u>Feed</u>	<u>Available Feed</u> <u>(t)</u>	<u>Requirement</u> <u>(t)</u>	<u>Remarks</u>
Berseem	353,020	292,350	60,670t of Berseem will be processed as hay for summer.
Rice Straw	55,740	32,848	22,892t of Straw will be used in summer.
Soybean Cake	16,722	16,174	

Summer (May - Oct. - 184 days)

(1) Milk Cow

<u>Feed</u>	<u>Cattle</u>	<u>Ration (kg/day)</u>	<u>Period (days)</u>	<u>No. of Head</u>	<u>Total Ration (t)</u>	<u>Remarks</u>
<u>Friesian</u>						
Green Fodder (Sorghum)	Adult Cow	16	184	11,340	55,384	
	Heifer	11	184	3,500	7,084	
	Raising Stock Cattle	2.0	184	4,760	1,752	
Berseem Hay	Adult Cow	1.5	184	11,340	5,130	
	Heifer	1.0	184	3,500	644	
Rice Straw	Adult Cow	3	184	11,340	6,260	
Beet Pulp	Adult Cow	2	184	11,340	4,173	
Concentrate	Adult Cow	3	184	11,340	6,260	
<u>Baladi</u>						
Green Fodder (Sorghum)	Adult Cow	13	184	26,460	63,292	
	Heifer	6	184	7,940	8,766	
	Raising Stock Cattle	2	184	9,790	3,603	
Berseem Hay	Adult Cow	1.1	184	26,460	5,355	
	Heifer	1.0	184	7,940	1,461	
Rice Straw	Adult Cow	2.0	184	26,460	9,737	
Beet Pulp	Adult Cow	1.5	184	26,460	7,303	
Concentrate	Adult Cow	2.0	184	26,460	9,737	

(2) Fattening Cattle

<u>Feed</u>	<u>Cattle</u>	<u>Ration (kg/day)</u>	<u>Period (days)</u>	<u>No. of Head</u>	<u>Total Ration (t)</u>	<u>Remarks</u>
Green Fodder (Sorghum)		15	184	4,760	13,138	
Rice Straw	Friesian	2.5	184	4,760	2,190	
Beet Pulp		5	184	4,760	4,379	
Green Fodder (Sorghum)		11	184	9,790	19,814	
Rice Straw	Baladi	2.0	184	9,790	3,603	
Beet Pulp		2.5	184	9,790	4,503	

Feed Balance in Summer

<u>Feed</u>	<u>Available Feed (t)</u>	<u>Requirement (t)</u>
Sorghum	152,350	150,833
Rice Straw	22,892	21,790
Beet Pulp	21,738	20,358
Berseem Hay	10,706	10,590

C.4. Marketing Plan

C.4.1. Agricultural Products

The marketing of agricultural products in the Project Area will be made through the marketing system or marketing channels which are presently predominant in Egypt. In Egypt governmental control is executed in the marketing of agricultural products through the obligatory marketing commitments and with controlled prices. The extent of Governmental marketing control varies with each product. Some are completely controlled, some are strongly, and the others only slightly. Most of crop disposal is not under the Government control. In this sense, the products in the Project Area will be grouped into the following categories;

<u>Governmental Control</u>	<u>Products</u>
Complete	Sugarbeet
Strong	Rice and soybean
Slight	Milk, meat and vegetables

Agro-industries belong to the Government except for the production of white cheese which is in the private sector. The state enterprise of agro-industries are monopolized by two companies, KAHA and AD FINA.

C.4.2. Marketing Channels

The recommendable marketing channels which are prepared taking into consideration the present ones are illustrated in the following page.

Figure C-5 Distribution Channels for Vegetables

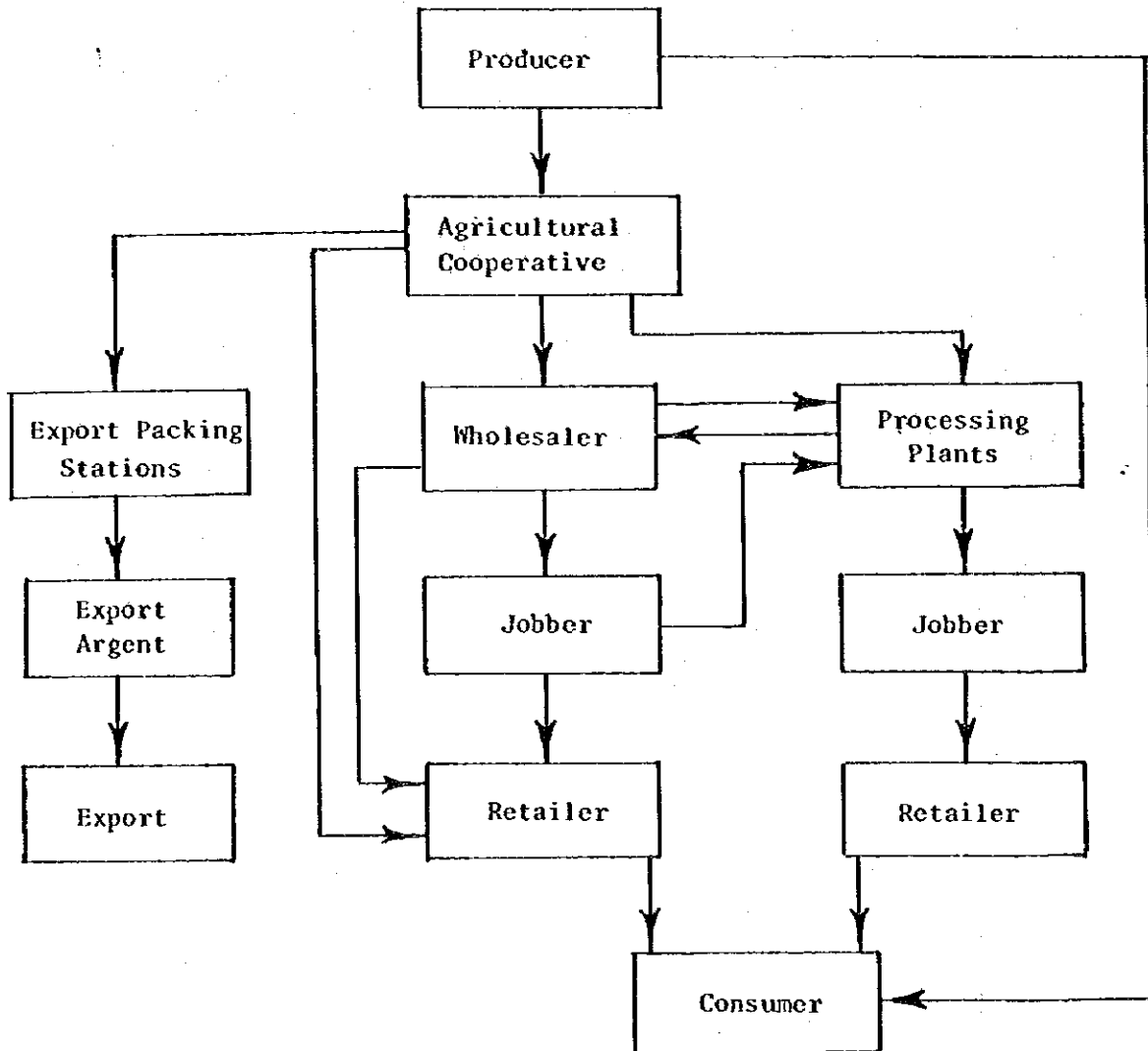
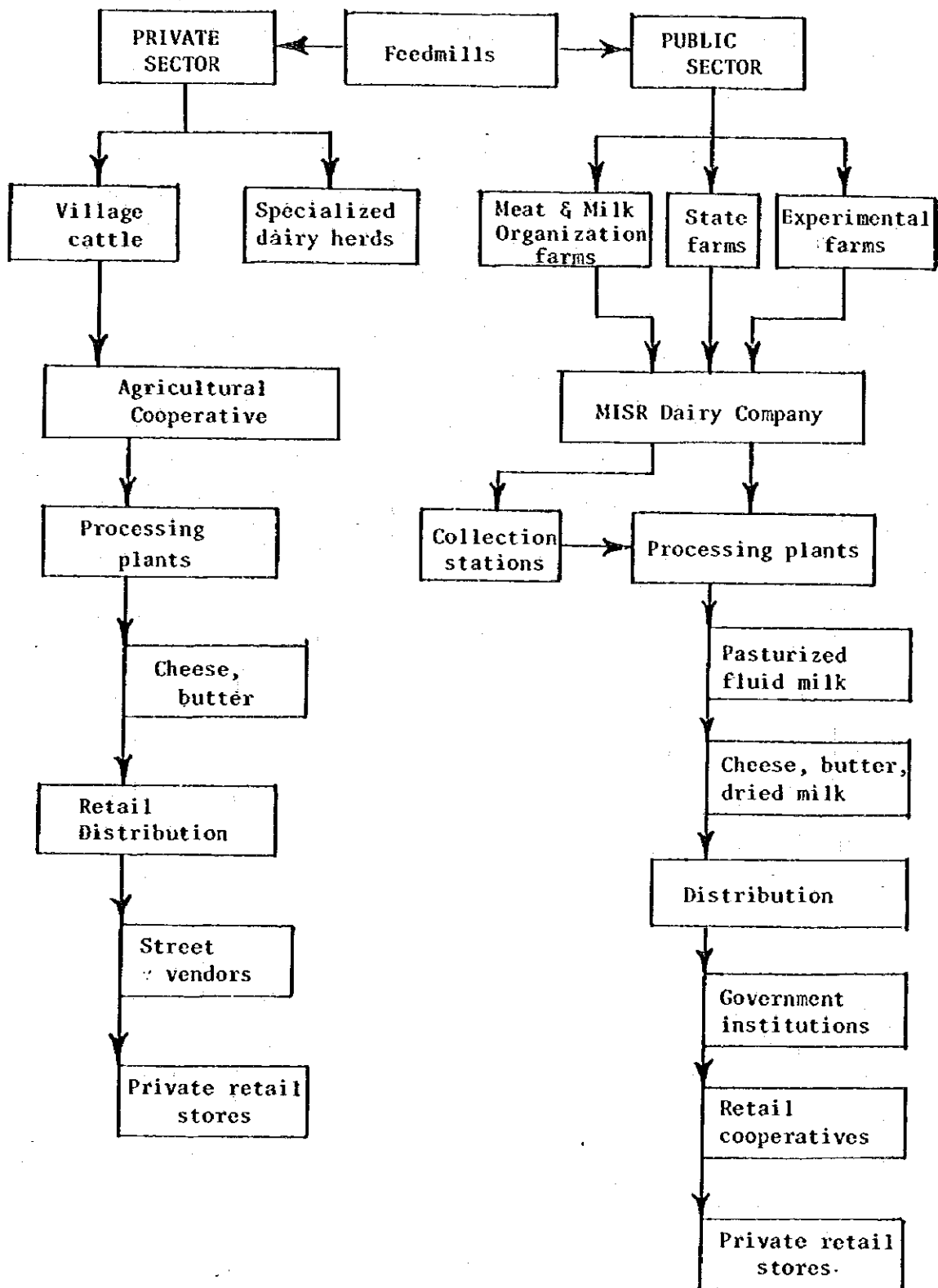


Figure C-6 Production and Marketing System for Milk and Dairy Products



C.4.3. Marketing Plan of Vegetables

The total production of vegetables as shown in Table C-39 is expected in the full development stage of the Project. Of the total 40 percent will be hauled to processing factories, 50 percent will be exported, and the remainder, 10 percent, will be consumed locally. The consumption of vegetables by inhabitants in the Project Area would be about 10,000 tons. Hence, the remaining 25,000 tons shall be mainly marketed to Zagazig, Port Said and Ismailia.

Table C-39. Marketing Plan of Vegetables

<u>Vegetables</u>	<u>Production</u>	<u>Processing</u>	<u>Export</u>	<u>Consumption</u>
(Unit: tons)				
Summer cropping:				
Tomato	156,800	141,000	-	15,800
Winter cropping:				
Onion	127,400	-	115,000	12,400
Califlower	13,720	-	12,400	1,320
Cabbage	54,490	-	49,000	5,490
<u>Total</u>	<u>352,410</u> (100%)	<u>141,000</u> (40%)	<u>176,400</u> (50%)	<u>35,010</u> (10%)

C.4.4. Demand and Supply of Vegetables

Table C-40 shows the demand and supply of vegetables in Sharkia Governorate to which the Project Area belong. It is considered that the demand and supply of vegetables in this Governorate were balanced in year 1979 if per capita consumption was about 115 kilograms as reported by the FAO in 1980. However, the balance was negative in that year assuming that the per capita consumption was 158 kilograms. In the year 2000, the demand for vegetables could be met locally by supply from the present cropping area, if per capita consumption remains at 115 kilograms. However, with a per capita consumption of 158

kilograms, vegetable production in the present cropping areas will be insufficient to meet the demand, and some products in the Project Area should be shared to meet the demand.

Table C-40. Demand and Supply of Vegetables
in the Sharkia Governorate

<u>Year</u>	<u>Population</u> (Million) persons	<u>Demand</u> (Thousand, tons)	<u>Supply</u>		<u>Total</u>
			<u>Old Land</u> (Thousand tons)	<u>Project</u> (Thousand tons)	
1979	2.6	365 (500)	394	-	394
2000	3.9	540 (740)	590	350	940

Note:

1. Population in urban and rural areas in Sharkia in the year 1979 was 0.53 million and 2.09 million, respectively. The annual growth rates were 2.9 percent and 1.5 percent, respectively.
2. Demand was estimated based on the food supply volume per capita in Food Balance Sheets, 1975-1977, Average and Per Capita Food Supplies, 1961-1965, and 1967-1977, FAO. Figures in parenthesis are estimated with per capita consumption of 158 kilograms, (MOP).
3. Based on the data of the Department of Statistics, MOA, production in the present cropping areas (old land in the above table) in the year 2000 was estimated with an annual growth rate of 2 percent.

C.4.5. Animal Products

The statistical yearbook, 1982, shows trading volumes of animal products and vegetables as follows;

Export and Import of Animal Products and Vegetables

(Unit: Million L.E.)

<u>Year</u>	<u>Livestock and their Products</u>		<u>Vegetable Products</u>	
	<u>Export</u>	<u>Import</u>	<u>Export</u>	<u>Import</u>
1976	4.1	39.2	93.8	274.8
1977	5.1	54.9	97.9	267.9
1978	5.6	95.2	81.9	366.6
1979	9.4	109.7	95.1	360.4
1980	11.9	210.2	116.9	545.1
1981	14.5	417.5	122.4	1,146.0

The imported value of vegetables has been increasing since 1980. Hence, vegetables to be produced in the Project Area, by aiming as a substitute for imports, shall help to eliminate the increase in import value in the future. Fresh vegetables are marketable to European countries in the winter season since vegetables are short in these countries, whereas fresh vegetables can be exported to Arab countries.

Reportedly the loss of fruits and vegetables in Cairo marketing amounts to 40 to 50 percent because of spoilage from poor handling, inadequate transportation, and lack of cooling facilities. (EGYPT Major Constraints to Increasing Agricultural Productivity, U.S.D.A., 1976) Hence, the expansion of export to Arab countries might depend upon the upgrading of transportation and handling inclusive of the improvement of relevant facilities.

C.4.6. Tomato

Tomatoes produced in Egypt were only exported to Arab countries according to the trade statistics in 1981. The quantities exported are as follows:

Kuwait	1,284 ton,	Saudi Arabia	1,036 ton
Lebanon	391 " ,	U.A.E.	233 "
Bahrain	154 " ,	Oman	23 "
Algeria	5 "		

The quantities exported have been variable in the recent year as follows.

	(Unit: tons)		
	<u>1979</u>	<u>1980</u>	<u>1981</u>
Kuwait	1,711	677	1,284
Saudi Arabia	463	577	1,063

Kuwait is the largest market for Egyptian tomatoes. But the marketable quantities seems to be unstable. Hence, the CIF price of fresh tomato imported in Kuwait could be compared with prices of other exporting countries. As shown in Table C-42, the CIF price per kg of Egyptian tomato is the highest in value. It is about three times the price of Jordan and Saudi Arabian tomatoes. It may be considered that the quality of Egyptian tomatoes are high class. But the high CIF price should make exports of Egyptian tomato to be unstable.

Tables C-43 through C-45 show the CIF prices of garlic, onions, vegetables frozen or in temporary preservative, fruit juice & vegetable juice by countries and other vegetables exported. The CIF price of Egyptian garlic is pretty high. The onion price is not shown as the quantity is very small. Egyptian vegetables frozen or in temporary preservation show a comparatively low CIF price, but fruits juice & vegetable juice is the highest price. Cucumber, eggplants and fresh bean are also expensive. Table C-46 shows the quantity of vegetables

Table C-41 Fresh Tomato Exported from Egypt

Country	1981			1980			1979		
	Value 1,000 LE	Qt ton	LE/Kg	Value 1,000 LE	Qt ton	LE/Kg	Value 1,000 LE	Qt ton	LE/Kg
(Arab Country)									
Saudi Arabia	573	1,036	0.36	197	577	0.34	151	463	0.33
Algeria	2	5	0.40	-	-	-	-	-	-
Lebanon	131	391	0.34	235	688	0.34	515	1,150	0.27
Kuwait	440	1,284	0.34	230	677	0.34	423	1,711	0.25
Bahrain	54	154	0.35	-	-	-	9	32	0.28
U.A.E.	76	233	0.33	-	-	-	20	79	0.25
Oman	9	23	0.39	-	-	-	-	-	-

Table C-42 Fresh Tomato Imported in Kuwait - 1980

Country	Value	Qt	K.../Kg	Country	Value	Qt	K.../Kg
	1,000 K.D.	ton			1,000 K.D.	ton	
Iraq	34.9	323.5	0.11	Turkey	843.1	8,516.0	0.10
Jordan	1,065.2	10,647.7	0.10	Italy	40.5	270.0	0.15
Lebanon	125.2	1,220.1	0.10	Greece	5.9	37.4	0.16
Saudi Arabia	590.7	5,827.8	0.10	Rumania	3.8	40.5	0.09
U.A.E.	14.9	152.8	0.10				
<u>EGYPT</u>	<u>448.3</u>	<u>1,570.2</u>	<u>0.29</u>	<u>Total</u>	<u>3,182.2</u>	<u>28,888.0</u>	<u>0.11</u>
Cyprus	1.5	3.2	0.47				
India	1.3	7.5	0.17				
Iran	5.3	56.6	0.09				

Note: K. .; Kuwait

Source: Trade Year Book.

Table C-43 Processing Vegetable Imported in Kuwait — 1980

<u>Vegetable, Frozen or in Temporary Preservation</u>				<u>Fruits Juice & Vegetable Juice</u>		
<u>Country</u>	<u>Value</u> <u>1,000 K...</u>	<u>Qt</u> <u>ton</u>	<u>K. ./Kg</u>	<u>Value</u> <u>1,000 K...</u>	<u>Qt</u> <u>ton</u>	<u>K.../Kg</u>
Egypt	232.4	746.0	0.31	53.6	150.5	0.36
Canada	83.7	319.9	0.26	1.0	4.6	0.21
U.S.A.	85.7	205.2	0.42	37.2	360.3	0.10
Cyprus	43.2	76.8	0.56	3.3	12.8	0.26
India	21.0	59.4	0.35	523.0	1,167.1	0.28
Taiwan	20.4	117.0	0.17	75.0	220.3	0.34
China	15.4	80.0	0.19	114.1	319.5	0.36
Denmark	6.9	19.0	0.37	839.8	4,811.3	0.17
France	22.3	73.5	0.30	582.0	2,970.4	0.20
Germany Fed. Rep.	15.4	16.4	0.82	183.3	862.6	0.21
Netherlands	142.8	273.2	0.52	257.2	1,306.8	0.20
U.K.	257.1	463.6	0.51	117.3	424.9	0.28
Greece	45.5	92.9	0.47	19.3	63.8	0.3
Poland	138.3	541.8	0.26	103.4	410.4	0.25
New Zealand	89.0	244.2	0.36			
<u>Total</u>	<u>1,251.3</u>	<u>3,492.0</u>	<u>0.36</u>	<u>3,250.5</u>	<u>15,251.3</u>	<u>0.21</u>

Table C-44 Vegetables Imported in Kuwait — 1980

<u>Country</u>	<u>Garlic</u>			<u>Onion</u>		
	<u>Value</u> <u>1,000 K...</u>	<u>Qt</u> <u>ton</u>	<u>K. ./Kg</u>	<u>Value</u> <u>1,000 K. .</u>	<u>Qt</u> <u>ton</u>	<u>K. ./Kg</u>
Iraq	11.5	40.6	0.28	52.4	585.4	0.08
Jordan	0.1	0.5	0.25	2.5	54.8	0.07
Lebanon	201.4	678.5	0.30	73.3	1,057.5	0.07
Saudi Arabia	0.3	0.6	0.45	19.4	145.2	0.13
<u>Egypt</u>	99.3	289.0	<u>0.34</u>	4.5	6.4	<u>0.71</u>
India	31.8	127.8	0.25	6.8	102.3	0.07
Iran	1.4	3.9	0.36	6.5	77.7	0.08
Turkey	65.0	250.3	0.28	632.0	8,413.4	0.08
Taiwan	5.7	25.1	0.23	160.1	1,660.7	0.10
Pakistan	6.6	22.5	0.29	560.0	7,809.4	0.07
South Korea	3.2	2.4	1.34	272.2	3,700.1	0.07
U.S.A.	0.1	0.5	0.29	28.8	364.4	0.08
Siria	7.2	26.4	0.27	1.0	12.5	0.08
<u>Total</u>	<u>453.5</u>	<u>1,448.0</u>	<u>0.30</u>	<u>1,799.2</u>	<u>23,825.3</u>	<u>0.08</u>

Table C-45 Vegetables Imported in Kuwait - 1980

Country	Cucumber			Eggplant		
	Value	Qt	K.D./Kg	Value	Qt	K.D./Kg
	1,000 K.D.	ton		1,000 K.D.	ton	
Iraq	38.0	364.8	0.10	30.4	323.8	0.09
Jordan	816.6	8,039.8	0.10	406.9	4,117.1	0.10
Lebanon	210.3	2,058.7	0.10	73.8	749.1	0.10
Saudi Arab.	1.0	9.5	0.10	0.8	8.4	0.10
Siria	1.7	17.0	0.10	3.2	28.5	0.11
UAE	0.1	0.8	0.15	10.5	33.7	0.31
Egypt	32.9	98.0	0.34	1.1	2.2	0.51
Iran	1.7	12.3	0.13	0.6	5.5	0.10
Turkey	11.6	113.4	0.10	21.7	222.1	0.10
Greece	0.7	3.1	0.22	0.2	0.4	0.48
<u>Total</u>	<u>1,114.8</u>	<u>10,698.8</u>	<u>0.10</u>	<u>549.3</u>	<u>5,491.2</u>	<u>0.10</u>

Country	Fresh Bean			Cauliflowers		
	Value	Qt	K.D./Kg	Value	Qt	K.D./Kg
	1,000 K.D.	ton		1,000 K.D.	ton	
Iraq	4.8	55.5	0.15	363.4	3,606.6	0.10
Jordan	78.9	652.6	0.12	5.4	54.6	0.10
Lebanon	3.1	24.4	0.13	1.6	20.5	0.08
Saudi Arab.	0.3	2.5	0.12	0.4	3.1	0.12
UAE	0.0	0.8	0.10	1.2	10.8	0.11
Egypt	112.8	318.2	0.35	0.02	0.1	0.10
Turkey	39.4	268.6	0.15	0.8	1.3	0.60
Cyprus	1.6	3.1	0.53	0.5	5.4	0.10
Spanish	30.1	39.4	0.08			
Greece	0.1	1.0	0.13			
<u>Total</u>	<u>246.1</u>	<u>1,354.5</u>	<u>0.18</u>	<u>373.6</u>	<u>3,704.0</u>	<u>0.10</u>

Table C-46 Exported Vegetable, Egypt, 1981 - ton

Country	Onion	Garlic	Artichokes	Haricot	Peas	String beans	Potatoes	Water Melon	Vegetable Presented	Sunflower seeds
Arab Countries										
Saudi Arab.	375	582	387	268	160	51	2,301	2,649	63	-
Lebanon	1,038	404	510	-	-	-	38,360	2,351	53	-
Kuwait	-	123	31	390	106	254	273	5,360	661	-
Bahrain	-	28	-	-	-	-	-	-	12	-
UAE	-	74	-	235	95	30	153	-	147	-
Oman	-	-	-	-	-	-	-	-	12	-
Algeria	-	-	-	-	-	-	-	10	-	-
Eastern Europe										
USSR	7,664	3,437	-	-	-	-	-	-	-	-
Western Europe										
Spanish	700	-	-	-	-	-	-	-	137	-
Sweden	-	-	-	-	-	-	-	-	-	-
Austria	47	29	-	63	-	-	-	71	-	-
UK	1,214	117	-	49	58	-	53,380	-	282	-
Italy	2,181	684	-	-	-	-	1,000	103	68	-
Belgium	-	-	-	85	-	-	-	-	91	38
Gibraltar	-	-	-	-	-	-	-	-	10	-
Germany F.R.	1,220	27	-	48	-	-	-	-	1,843	1,268
France	3,462	442	-	570	-	-	-	-	52	-
Netherlands	1,061	-	-	4,321	-	-	-	-	1,192	468
Swiss	-	-	115	253	-	-	-	-	-	248

Note : 1/ : Onion dehydrated

Source: Trade Yearbook

excluding tomatoes exported to Arab, Eastern Europe and Western European Countries in 1981. Main vegetables exported to Europe are fresh onion, dehydrated onion, garlic and haricot.

Table C-42 shows the countries to which rice was exported 1981.

C.4.7. Milk and Meat Production Plan

The livestock breeding plan estimates that the annual productions of milk and meat in the full development stage will be 63,800 tons and 4,100 tons, respectively. Milk will be hauled to the milk processing factory to be established in the Project Area. Meat cattle will be sent to an existing slaughterhouse at Ismailia.

C.4.8. Meat Production in Egypt

Meat production in Egypt has annually increased at the rate of 2.4 percent. However, its exports have been also growing as shown in 5). Despite three meatless days per week, the demand for meat has increased because of a high population growth rate (2.3% from 1966 to 1976).

C.4.9. Forecasting of Demand and Supply of Meat in Egypt

The Feasibility Study Report on Cold Storage Chain Development Project, 1983, JICA, forecasts the demand and supply of meat & chicken, and cheese & butter until the year 2000 as shown in Table C-49.

Table C-47 Exported Rice, Egypt

Country	1981		
	Value 1,000 LE	Qt ton	LE/ton
Lebanon	2,829	7,870	359
U.A.E.	559	1,550	414
Poland	596	2,000	298
Checkoslovakia	513	1,500	342
Cyprus	86	250	344
Austria	4,465	16,697	267
Germany F.R.	142	412	345
<u>Total</u>	<u>9,190</u>	<u>30,079</u>	<u>306</u>

Table C-48 Imported Meat & Edibles, Egypt

Year	Value 1,000 LE	Qt ton	LE/ton
1979	53,199	34,277	0.969
1980	69,884	73,814	0.947
1981	125,882	117,071	1.075

Table C-49. Forecasted Demand and Supply of Animal Products

(Unit:1,000 tons)

	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>Demand</u>				
Meat and chicken	634	797	980	1,191
Cheese and butter	411	474	544	623
<u>Supply</u>				
Meat and chicken	475	512	549	588
Cheese and butter	366	408	451	494
<u>Import</u>				
Meat and chicken	159	285	431	603
Cheese and butter	45	66	93	129

Note: The demand for meat and chicken as in the above table is a conservative estimate.

C.4.10. Per Capita Consumption of Foods

The FAO data for 1975-1977 shows the following per capita supply of foods covering vegetables, meat, eggs, milk, cheese, butter, and canned foods;

Fresh vegetables:	115 kg/person/year
Frozen vegetables:	0
Processed vegetables:	0.2
Meat:	11.4
Beef:	7.6
Mutton:	2.0
Chicken:	1.8
Hens eggs:	1.7
Milk:	8.9
Cow milk:	3.6
Buffalo milk:	5.3
Cheese:	6.1
Butter:	2.1

The major determinants of consumers' demand consist of an increase in population, changes in consumption patterns and increases in income. The demand for meat, vegetables, and fruits shows a high income elasticity. The following table shows the correlation between food expenditure and food consumption in Egypt.

Table C-50. Annual Food Consumption per Capita
(1974 to 1975)

Expenditure at Random Interval (L.E.)	Rural Households			Urban Household		
	Meat, Chicken Eggs (kg)	Milk and Products (kg)	Vege- tables (kg)	Meat Chicken Eggs (kg)	Milk and Products (kg)	Vege- tables (kg)
Less than 50	3.3	6.0	34.5	3.5	7.6	43.1
100 - 149	5.7	6.0	39.7	6.9	9.3	56.0
300 - 349	9.1	9.3	50.3	10.7	15.0	74.7
600 - 799	13.8	18.5	69.8	18.0	28.0	94.5
1,000 - 1,399	25.6	31.9	105.0	28.5	44.1	122.0
1,400 - 1,999	24.9	42.1	102.5	40.7	65.4	145.1
2,000 or more	55.0	37.0	108.7	48.7	77.2	152.6

Source: Household Expenditure Survey, 1974 to 75, Economic Management in a Period of Transition, 1980, Khalid Ikram, World Bank Report.

In future, household income shall increase and be followed by an increase in food expenditure. Hence, market demand will expand, and simultaneously consumption patterns will be diversified. For instance, even though new canned jam is more expensive than traditional goods, consumers may choose the new jam, if it is excellent in taste, smell and can modalities.

C.4.11. Export of Tomato

Tomatoes exported from Egypt shows the highest CIF prices. The reason for this is not clear. One of the main strategies to develop exports is to keep the international marking standardisation of goods for exported. Table C-51 shows the common standards in connection with "marking" of tomatoes in the international market.

C.4.12. Consumption of Vegetables

The quantity of vegetable supplied for the Egyptian from 1975 to 1977 was larger than that in the west European countries. The supply per capita with cabbages, cauliflowers, dry onions and tomatoes, which are proposed in the Project, are internationally compared as follows:

- Supply per Capita (kg) -
(Average 1975 - 1977)

<u>Country</u>	<u>Vegetable Total</u>	<u>Cabbages</u>	<u>Cauliflower</u>	<u>Dry Onions</u>	<u>Tomatoes</u>
Egypt	116.9	7.7	1.9	14.1	50.7
Denmark	39.9	7.4	0.1	5.5	4.6
France	100.6	4.6	5.2	3.9	9.0
Germany F.R.	55.4	7.4	2.6	3.5	4.6
Italy	151.5	9.2	7.2	6.2	49.7
Netherlands	52.5	7.7	5.5	3.1	2.2
Sweden	44.5	5.1	1.1	2.7	5.3
U.K.	62.3	10.0	3.6	6.0	5.0

Note: Detail is shown by Table C-52.

Since present consumption of cauliflowers in Egypt is relatively less than those in the west European countries, the cauliflowers to be produced in the Project Area would be still marketable for the domestic consumption.

Consumption of dry onions and tomatoes are larger than that in the western Europe. Cabbages are consumed at the same quantity in each country. According to the Food Balance Sheets, 1975 - 77, FAO, seven countries mentioned above imported vegetables as follows:

- Imports -
(Average 1975 - 1977)

<u>Country</u>	<u>Cabbages</u>	<u>Cauliflower</u>	<u>Dry Onion</u>
Denmark	3 (7.1)	8 (50.0)	12 (38.7)
France	15 (5.2)	10 (3.3)	117 (48.1)
Germany F.R.	114 (19.4)	128 (63.0)	263 (94.9)
Italy	1 (0.2)	- -	6 (1.5)
Netherlands	5 (3.9)	33 (39.3)	37 (56.1)
Sweden	13 (26.5)	5 (45.5)	17 (70.8)
U.K.	20 (2.8)	21 (7.8)	170 (48.2)

Note: Figures in the parenthesis shows percentage in domestic supply quantity. Detail is shown by Table C-47.

Germany F.R. is the most hopeful market for three crops mentioned above. Netherlands is also marketable for cauliflower and onions.

France, U.K. and Italy for dry onions. Table C-46 shown onion quantities exported in 1981.

According to the trading statistics in Germany F.R., 1982, c.i.f. price of onions are shown as follows.

Table C-51 Summary Comparative Table of Requirements
Laid Down by the Standard on Tomatoes

REQUIREMENTS	CLASSES		
	"EXTRA" Superior quality	I Good quality	II Minimum requirements
I. Minimum requirements (all classes)	-intact -fresh looking -sound -clean -free of abnormal external moisture -free of foreignsmell and/or moisture -appropriate degree of development		
II. Classification			
-appearance	-all typical characteristics of the variety	-all typical characteristics of the variety	-in keeping with minimum requirements
-shape	(a) "round" (including "cherry") -spherical -descoid (b) "ribbed" (c) "oblong"	(a) "round" (including "cherry") (b) "ribbed" (c) "oblong"	-may be slightly irregular
- fresh	-firm	-reasonably firm	-fairly firm
-greenbacks	-excluded	-excluded if visible	
-defects	-exempt, except for very slight superficial damage to the skin	-unhealed cracks excluded	-unhealed cracks excluded
		Defects allowed:	Defects allowed:
		-Slight defects in shape and development	-defect of shape and development
		-slight defect in skin colouring	-defect of colouring
		-slight skin defect	-skin defects, damage from machine handling and bruises which do not seriously affect the fruit
		-very slight damage from machine handling	

- Continued -

REQUIREMENTS	CLASSES		
	"EXTRA"	I	II
		-very slight bruises -healed cracks not more than 1 cm long, in the case of "ribbed" tomatoes	-healed cracks not more than 3 cm long
III. Sizing	-compulsory (excluding "cherry" tomatoes) -minimum diameter: "round" and "ribbed": 35mm "oblong": 30mm	-compulsory (excluding "cherry" tomatoes) -minimum diameter: "round and "ribbed": 35mm "oblong": 30mm	-optional -unsized minimum diameter: "round" and "ribbed": 35mm "oblong": 30mm
IV. Tolerances			
-quality (in number or weight)	5%	10%	10%
-size	-10% with a minimum of 33mm for "round" and "ribbed", and 28mm for "oblong"	-10% with a minimum of 33mm for "round" and "ribbed", and 28mm for "oblong"	-10% with a minimum fo 33mm for "round" and "ribbed", and 28mm for "oblong"
V. Packaging and Presentation			
-uniformity	-origin -commercial type or variety -shape -ripeness -colouring -uniform length for "oblong" -quality	-origin -commercial type or variety -shape -ripeness -colouring -uniform length for "oblong" -quality	-origin -variety or commercial type -quality
-packaging	-some form of protection compulsory -packages must be free from any foreign bodies		

Source: International standardization of Fruit and Vegetables; OECD, PARIS, 1976

- Onions Imported to Germany F.R. in 1982 -

<u>Country</u>	<u>Value (100 \$)</u>	<u>Quantity (ton)</u>	<u>\$/ton</u>
Egypt	824	2,920	282
Belgium Luxembourg	4,062	8,202	495
France	5,336	13,202	404
Italy	14,488	39,879	363
Netherlands	36,785	205,259	179
Spain	14,784	85,764	172
U.K.	818	4,504	182
Poland	1,300	13,132	99
Czechoslovakia	632	7,285	87
Hungry	1,801	17,607	102
South Africa	210	1,038	202
Chile	476	2,464	193
Israel	1,847	7,520	246

Source: OECF Tokyo Office

Germany F.R. imported more much cauliflower during December to April than those during April to November shown as the following Table.

Trade of Cauliflower in Germany F.R., 1982

15 April - 30 November

	<u>Import</u>			<u>Export</u>		
	<u>Quantity (ton)</u>	<u>Value ('000 DM)</u>	<u>Unit (DM/kg)</u>	<u>Quantity (ton)</u>	<u>Value ('000 DM)</u>	<u>Unit (DM/kg)</u>
England	38,973	30,848	0.79	1,383	1,061	0.77
France	25,153	18,903	0.75	459	382	0.83
Belgium	1,399	1,912	1.37	-	-	-
Netherlands	2,397	2,695	1.12	529	305	0.57
Italy	9,942	7,186	0.72	362	463	2.00
Sweden	-	-	-	80	80	1.00
<u>Total</u>	<u>77,864</u>	<u>61,544</u>	<u>0.79</u>	<u>2,813</u>	<u>2,190</u>	<u>0.78</u>

1 December - 14 April

	Import			Export		
	Quantity (ton)	Value ('000 DM)	Unit (DM/kg)	Quantity (ton)	Value ('000 DM)	Unit (DM/kg)
England	89,711	69,236	0.77	144	131	0.91
France	55,794	35,553	0.64	-	-	-
Belgium	223	100	0.45	-	-	-
Italy	33,608	33,507	1.00	-	-	-
<u>Total</u>	<u>179,336</u>	<u>138,396</u>	<u>0.77</u>	<u>144</u>	<u>131</u>	<u>0.91</u>

Source: Aussenhandel much Waren und Landern (Specialhandel).
Dec. 1982, Statistisches Bundesamt Wiesbaden.

G.4.13. Imports and Exports of Fresh Tomatoes

Fresh tomatoes in the world market have been traded at the annual rate of 1.8 million tons since 1980. European markets have occupied the largest share for tomato trade following by North & Central America and Asia.

Trade of fresh tomatoes in the world is shown as follows.

- Imports and Exports for Fresh Tomatoes, 1982 -

	Imports		Exports	
	Quantities	Percent	Quantities	Percent
Europe	1,130.9	60.3	1,051.9	56.5
North & Central America	407.1	21.7	433.6	23.3
Asia	255.5	13.6	288.2	15.5
South America	9.4	0.5	88.2	0.4
Africa	0.5	0.0	80.5	4.3
<u>Total</u>	<u>1,877.1</u>	<u>100.0</u>	<u>1,862.4</u>	<u>100.0</u>

Source: FAO Trade Yearbook, 1982

Detail is shown by Table C-54, Table C-55.

The major importers of fresh tomatoes are Germany F.R., U.S.A., France, U.K., Saudi, Syria, Czechoslovak, Netherland, Germany, D.R., Sweden, Austria, Switzerland and Kuwait. These 13 countries occupy about 80 percent of the total trading amount (see Table C-55).

On the other hand, the main exporters are Netherlands, Mexico, Spain, Jordan, Romania, Bulgaria and Turkey. These seven countries occupy about 80 percent of the total exported quantity. Big three exporters, of Netherland, Mexico and Spain handle 425,000, and 338,000 and 318,000 tons in 1982 respectively. Egypt exported only 3,000 tons (see Table C-56 and Table C-57).

The following table shows FOB price of fresh tomatoes per ton. FOB price of Netherland's tomatoes is the highest. It seems that quality of tomatoes exported from Netherland is superior or good class. Quality of Egyptian tomatoes exported is comparatively good.

- FOB Price of Fresh Tomatoes -
(1982)

<u>Country</u>	<u>Export Quantity</u> (ton)	<u>Export Value</u> ('000 \$)	<u>FOB/Ton</u> (\$)
Netherland	424,775	347,005	817
Mexico	338,206	153,850	455
Spain	318,364	159,200	500
Yordan	152,314	20,424	134
Romania	120,000	48,000	400
Moroco	75,000	30,000	400
Egypt	3,000	1,400	467

Source: FAO Trade Yearbook, 1982

C.4.14. Marketing Facilities for Vegetables

Marketing facilities for packing and transport are one of important factors to develop modernization of marketing system. At present, for tomatoes and other vegetables, dealers use small crates made of risk of palm leaves in domestic marketing channel. Because of the absence of any corrugated cardboard or soft paper etc. and mostly being overloaded, the sharp crate ribs harm the vegetables. prepacking cannot be done without proper equipment. Packaging measures should be taken considering three levels, that is, regulatory, economic and information.

Table C-52 Average and Per Capita Food Supplies, Cabbages, Cauliflower, Onions and Tomato

Vegetable Supplied per capita (kg)	Egypt	Denmark	France	Germany		Italy	Netherlands	Sweden	U.K.
				F.R.					
	116.9	39.9	100.6	55.4		151.5	52.5	44.5	62.3
Cabbages									
Output (1,000 tons)	327	41	287	480		608	233	37	685
Import (")	-	3	15	114		1	5	13	20
Export (")	-	2	15	7		14	109	-	1
Domestic supply(")	327	42	288	588		594	129	49	704
Supply per capita(kg)	7.7	7.4	4.6	7.4		9.2	7.7	5.1	10.0
Cauliflower									
Output (1,000 tons)	80	9	427	75		567	56	6	248
Import (")	-	8	10	128		-	33	5	21
Export (")	-	1	130	1		91	5	-	-
Domestic supply(")	80	16	306	205		476	84	11	268
Supply per capita(kg)	1.9	0.1	5.2	2.6		7.2	5.5	1.1	3.6
Dry Onions									
Output (1,000 tons)	652	20	134	15		488	411	7	185
Import (")	-	12	117	263		6	37	17	170
Export (")	67	1	7	1		94	355	-	3
Domestic supply(")	608	31	243	277		400	66	24	353
Supply per capita(kg)	14.1	5.5	3.9	3.5		6.2	3.1	2.7	6.0

Note: Vegetables supplied per capita does not include roots, tubers and pulses.
Source: Food Balance Sheets 1975 - 1977, FAO, 1980.

Average and Per Capita Food Supplies, Cabbages, Cauliflower, Onions and Tomato - continued-

	<u>Egypt</u>	<u>Denmark</u>	<u>France</u>	<u>Germany</u> <u>F.R.</u>	<u>Italy</u>	<u>Netherlands</u>	<u>Sweden</u>	<u>U.K.</u>
<u>Tomato</u>								
Output (1,000 tons)	2,191	21	594	33	3,261	360	12	179
Import (")	-	6	182	334	4	25	35	158
Export (")	2	3	6	1	22	316	-	4
Domestic supply(")	2,189	25	770	366	3,243	69	47	315
Supply per capita(kg)	50.7	4.6	9.0	4.6	49.7	2.2	5.3	5.0

<u>Tomato/Tomato Juice</u>								
Output (1,000 tons)	-	-	60	-	18	-	-	-
Import (")	-	-	3	11	-	5	-	1
Export (")	-	-	3	1	18	-	-	-
Domestic supply(")	-	-	60	10	-	5	-	1
Supply per capita(kg)	-	-	1.1	0.2	-	0.4	-	0

<u>Tomato/Tomato Paste</u>								
Output (1,000 tons)	-	-	-	-	-	-	-	-
Import (")	-	-	-	44	-	-	-	71
Export (")	-	-	-	-	-	-	-	1
Domestic supply(")	-	-	-	43	-	-	-	70
Supply per capita(kg)	-	-	-	0.7	-	-	-	1.2

<u>Tomato/Peeled Tomato</u>								
Output (1,000 tons)	-	-	-	35	-	-	-	-
Import (")	-	-	-	-	-	-	-	-
Export (")	-	-	-	1	-	-	-	-
Domestic supply(")	-	-	-	34	-	-	-	-
Supply per capita(kg)	-	-	-	0.5	-	-	-	-

Table C- 53 Fresh Tomato Trading - Imports

	<u>1980</u>	<u>1981</u>	<u>1982</u>
A. Quantities Imported	----- thousand metric tons -----		
Europe	1,078.9(59.5)	1,098.9(59.7)	1,130.9(60.3)
North & Central America	445.0(24.5)	382.6(20.8)	407.1(21.7)
Asia	204.3(11.3)	252.3(13.7)	255.5(13.6)
South America	17.1(0.9)	9.3(0.5)	9.4(0.5)
Africa	0.9(0.0)	0.8(0.0)	0.5(0.0)
<u>World Total</u>	<u>1,813.6(100.0)</u>	<u>1,840.5(100.0)</u>	<u>1,877.1(100.0)</u>
B. Value Imported	----- thousand US\$ -----		
Europe	1,057,448	918,852	818,964
North & Central America	198,180	321,258	249,533
Asia	54,796	67,254	62,176
South America	7,544	4,230	3,882
Africa	1,067	773	533
<u>World Total</u>	<u>1,353,179</u>	<u>1,360,981</u>	<u>1,171,095</u>
C. C.I.F./ton	----- US\$ 1 ton -----		
Europe	980	836	724
North & Central America	445	840	613
Asia	268	267	243
South America	441	453	413
Africa	1,227	932	1,017
<u>World Total</u>	<u>746</u>	<u>739</u>	<u>624</u>

Note: Figures in a parenthesis indicate percentage.

Source: FAO Trade Yearbook, 1982, Vol.36.

Table C-54 Fresh Tomato Trading - Exports

	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>A. Quantities Exported</u>	----- thousand metric tons -----		
Europe	964.3(54.0)	1,056.0(56.7)	1,051.9(56.5)
North & Central America	511.8(28.7)	391.5(21.0)	433.6(23.3)
Asia	194.8(10.9)	308.5(16.6)	288.2(15.5)
South America	14.0(0.8)	10.6(0.6)	8.2(0.4)
Africa	100.2(5.6)	95.5(5.1)	80.5(4.3)
<u>World Total</u>	<u>1,785.1(100.0)</u>	<u>1,862.1(100.0)</u>	<u>1,862.4(100.0)</u>
<u>B. Value Exported</u>	----- thousand US\$ -----		
Europe	766.3	718.2	643.4
North & Central America	233.1	303.9	205.9
Asia	43.1	70.5	50.6
South America	6.6	4.8	4.0
Africa	65.0	46.4	32.7
<u>World Total</u>	<u>1,114.1</u>	<u>1,143.8</u>	<u>936.6</u>
<u>C. F.O.B./ton</u>	----- US\$ 1 ton -----		
Europe	795	680	611
North & Central America	455	776	475
Asia	221	229	176
South America	471	453	488
Africa	649	486	406
<u>World Total</u>	<u>624</u>	<u>614</u>	<u>503</u>

Note: Figures in a parenthesis indicate percentage.

Source: FAO Trade Yearbook, 1982, Vol.36.

Table C-55 Trading for Fresh Tomato in 1982

<u>Country</u>	<u>Imports</u>		<u>Country</u>	<u>Exports</u>	
	<u>Quantities</u> (1,000 tons)	<u>Accumulat.</u> (%)		<u>Quantities</u> (1,000 tons)	<u>Accumulat.</u> (%)
Germany F.R.	357.4	19.0	Netherlands	424.8	22.8
U.S.A.	268.8	33.3	Mexico	338.2	41.0
France	209.3	44.5	Spain	318.4	58.1
U.K.	205.4	55.5	Jordan	152.3	66.2
Saudi	84.0	59.9	Romania	120.0	72.6
Syria	72.5	63.8	Bulgaria	80.2	76.9
Czechoslovak	68.0	67.4	Turky	80.0	81.2
Netherland	56.6	70.4			
Germany D.R.	50.0	73.1			
Sweden	38.3	75.1			
Austria	37.7	77.1			
Switzerland	36.2	79.1			
Kuwait	30.0	80.7			

Note: Total quantities;
imports 1,877.1 thousand tons
exports 1,862.4 thousand tons

Source: FAO Trade Yearbook, 1982, Vol.36.

Table C-56 Fresh Tomato Exported by Main Country

(1,000 M/T)

<u>Countries</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Europe</u>			
Netherlands	357.5	373.9(+4.5)	424.8(+13.6)
Spain	273.3	359.3(+31.5)	318.4(-11.4)
Romania	143.9	130.6(-9.2)	120.0(-8.1)
Bulgaria	89.3	99.6(+11.5)	80.2(-19.4)
Belgium-Lux	35.2	38.7(+9.9)	48.6(+25.6)
Albania	18.2	13.8(-24.2)	18.0(+30.4)
France	14.7	9.4	10.2
U.K.	5.2	4.1	7.2
<u>North & Central America</u>			
Mexico	373.1	292.6(-21.6)	338.2(+15.6)
U.S.A.	119.6	87.6(-26.8)	79.8(-8.9)
<u>Asia</u>			
Jordan	115.6	180.2(+55.9)	152.3(-15.5)
Turky	26.4	75.4	80.0(+6.1)
Lebanon	13.0	9.6	10.0
<u>Africa</u>			
Egypt	2.1	3.3	3.0
Morocco	96.2	90.6(-5.8)	75.0(-17.2)

Note: Figures in a parenthesis indicate annual growth rate.

Source: FAO Trade Yearbook, 1982 Vol.36.

Table C-57 Fresh Tomato Imported by Main Country

(1,000 M/T)

<u>Countries</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Europe</u>			
Germany F.R.	359.9	350.5(-2.6) [%]	357.4(+2.0) [%]
France	182.9	202.4(+10.7)	209.3(+3.4)
U.K.	177.8	207.0(+16.4)	205.4(-0.8)
Czechoslovak	73.0	74.0(+1.4)	68.0(-8.0)
Germany D.R.	55.7	53.7(-3.6)	50.0(-6.9)
Sweden	37.7	37.2(-1.3)	38.3(+3.0)
Switzerland	37.3	33.8(-9.4)	36.2(+7.1)
Austria	35.1	33.7(-4.0)	37.7(+11.9)
Netherlands	34.2	45.3(+32.5)	56.6(+24.9)
Belgium-Lux.	9.5	8.7(-8.4)	8.5(-2.3)
Spain	-	0.0	0.0
<u>North & Central America</u>			
U.S.A.	295.6	238.5(-19.3)	268.8(+12.7)
Mexico	0.3	0.5(+66.7)	0.4(-20.0)
<u>Asia</u>			
Saudi Arabia	60.1	72.9(+21.3)	84.0(+15.2)
Syria	55.0	65.2(+18.5)	72.5(+11.1)
Kuwait	28.7	31.4(+9.4)	30.0(-4.5)
Lebanon	11.7	11.7(0)	10.0(-14.5)
Jordan	4.4	10.0(+127.3)	9.0(-10.0)

Note: Figures in a parenthesis indicate annual growth rate.

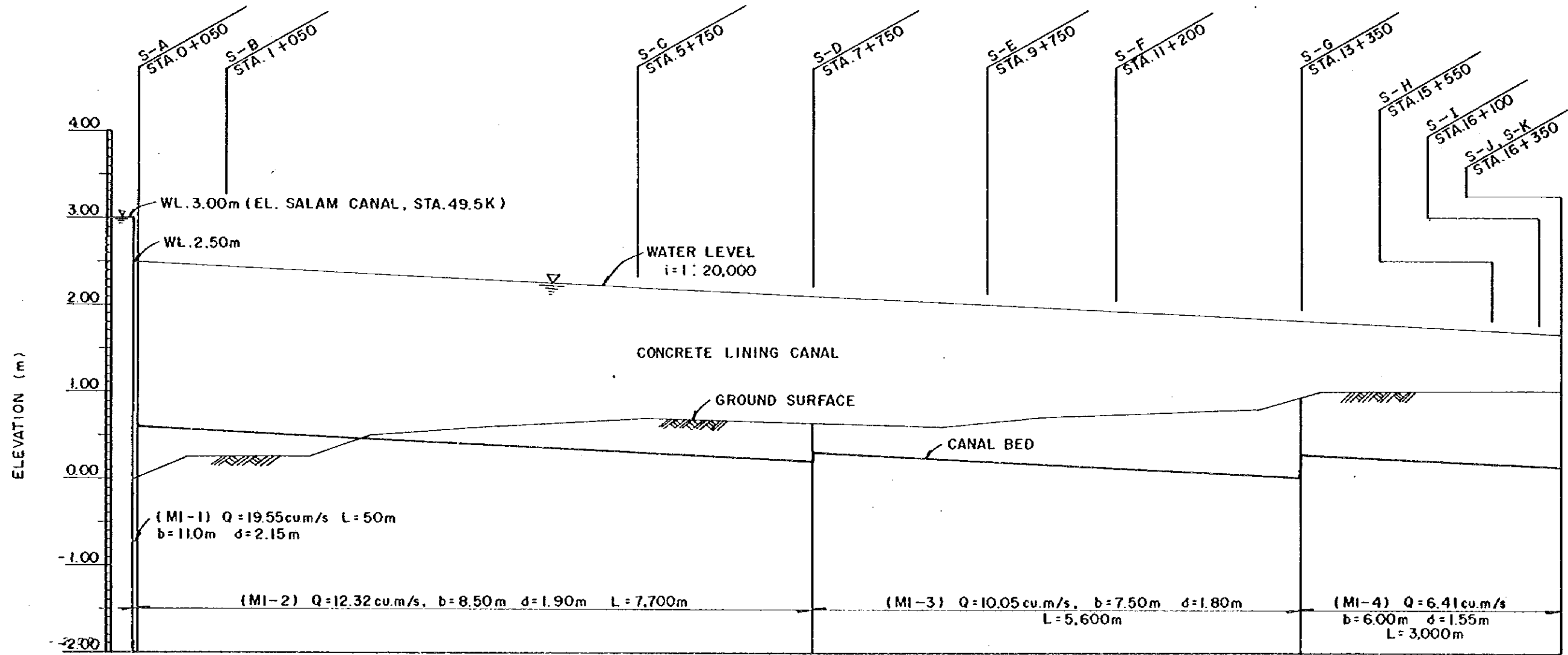
Source: FAO Trade Yearbook, 1982, Vol.36.

LIST OF DRAWINGS

DWG	NO.1	LONGITUDINAL SECTION OF M1 IRRIGATION CANAL
	NO.2	LONGITUDINAL SECTION OF M2 IRRIGATION CANAL
	NO.3	LONGITUDINAL SECTION OF M3 IRRIGATION CANAL
	NO.4	CROSS SECTION OF MAIN IRRIGATION CANAL
	NO.5	CROSS SECTION OF SECONDARY IRRIGATION CANAL
	NO.6	CROSS SECTION OF DRAINAGE CANAL
	NO.7	DRAINAGE PUMPING STATION
	NO.8	M2 MAIN PUMPING STATION
	NO.9	RELIFT PUMPING STATION
	NO.10	M3 MAIN PUMPING STATION
	NO.11	HEAD GATE
	NO.12	OFF - TAKE
	NO.13	CHECK, TYPE - A (1)
	NO.14	CHECK, TYPE - A (2)
	NO.15	CHECK, TYPE - B
	NO.16	BOX CULVERT
	NO.17	ROAD CROSSING, TYPE - A
	NO.18	ROAD CROSSING, TYPE - B
	NO.19	PARSHALL FLUME

LONGITUDINAL SECTION OF MI IRRIGATION CANAL

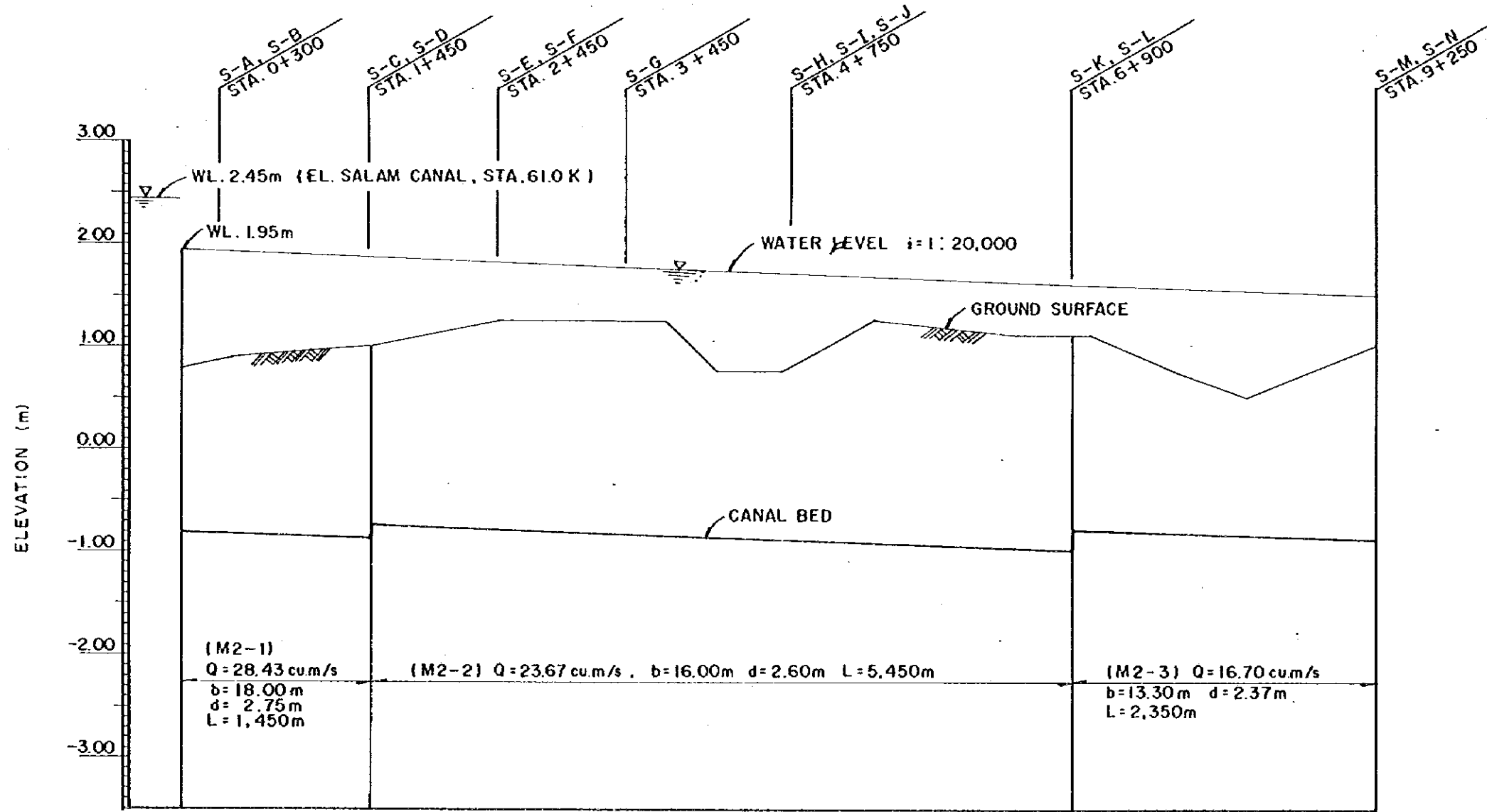
DWG. NO. 1



STATION NO.	DISTANCE (Km)	ELEVATION (m)		WATER LEVEL (m)
		GROUND	CANAL BOTTOM	
0	0	0.00	0.350	2.500
0 600	600	0.25	0.598	2.498
2 060	2.060	0.25	0.570	2.470
2 950	2.950	0.50	0.497	2.397
4 200	4.200	0.60	0.453	2.353
5 800	5.800	0.70	0.390	2.290
7 750	7.750	0.65	0.310	2.210
9 200	9.200	0.60	0.213	2.113
10 350	10.350	0.70	0.313	2.040
12 850	12.850	0.80	0.183	1.983
13 350	13.350	0.95	0.058	1.858
13 550	13.550	1.00	0.033	1.833
16 350	16.350	1.00	0.255	1.823
		1.00	0.275	1.682

LONGITUDINAL SECTION OF M2 IRRIGATION CANAL

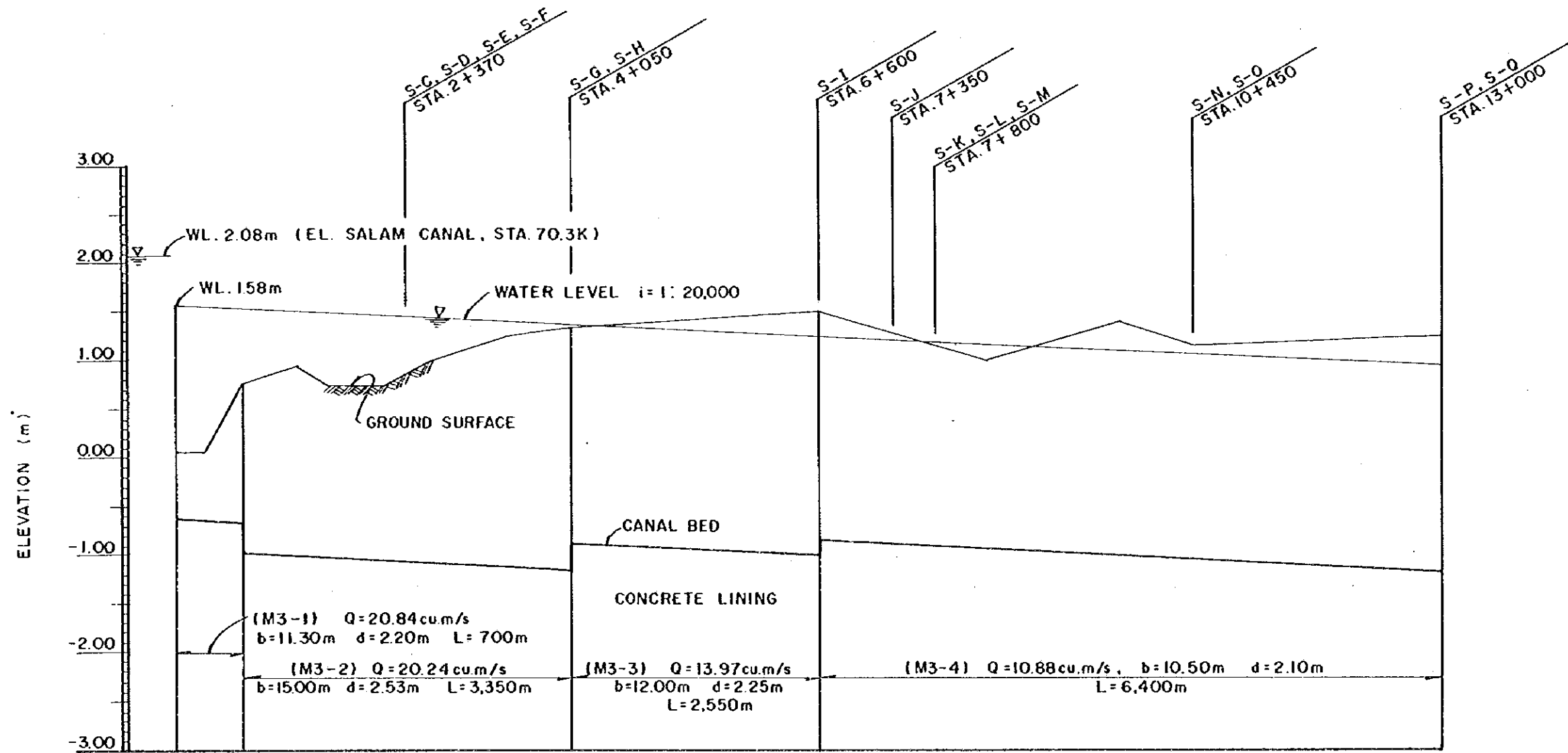
DWG. NO. 2



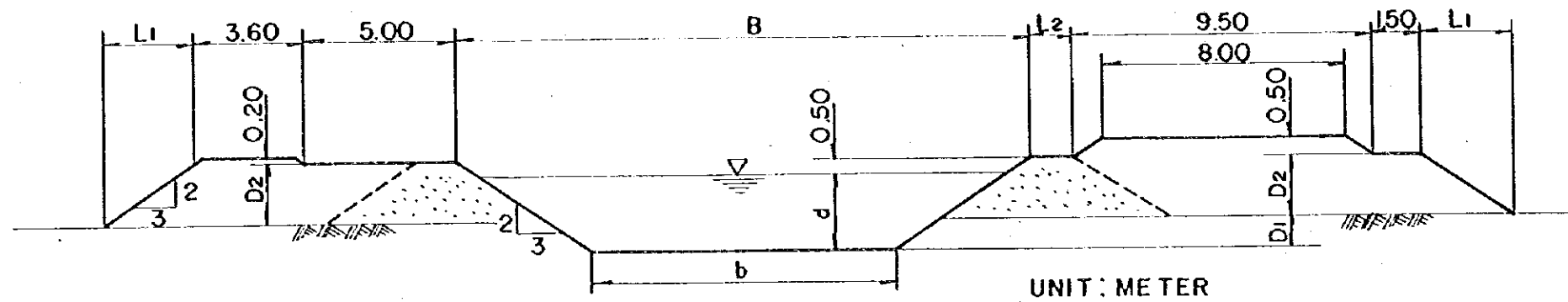
WATER LEVEL (m)		1.950	1.930	1.878	1.827	1.760	1.741	1.716	1.680	1.605	1.538	1.487
ELEVATION (m)	CANAL BOTTOM	-0.800		-0.872 -0.722	-0.773	-0.840	-0.859	-0.884	-0.920	-0.995 -0.765	-0.832	-0.883
	GROUND	0.80	0.90	1.00	1.25	1.25	0.75	0.75	1.25	1.15	0.50	1.00
DISTANCE (Km)		0	0.400	1.450	2.470	3.810	4.180	4.680	5.400	6.900	8.250	9.250
STATION NO.		0	0 400	1 450	2 470	3 810	4 180	4 680	5 400	6 900	8 250	9 250

LONGITUDINAL SECTION OF M3 IRRIGATION CANAL

DWG. NO. 3

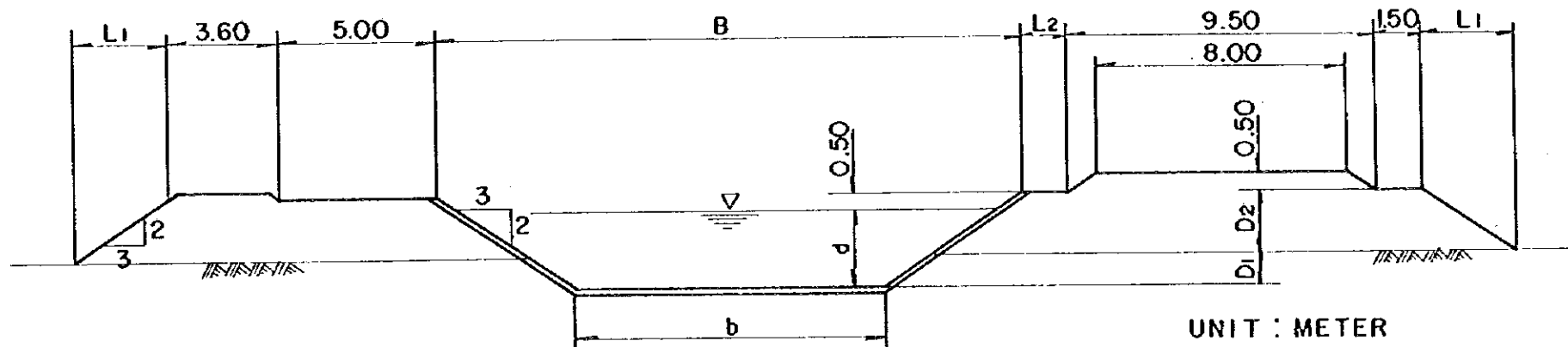


STATION NO.	DISTANCE (Km)	ELEVATION (m)		WATER LEVEL (m)
		GROUND	CANAL BOTTOM	
0	0	0.06	-0.620	1.580
0 300	0.300	0.06	-0.635	1.565
0 700	0.700	0.75	-0.655 -0.985	1.545
1 260	1.260	0.94	-1.018	1.517
1 540	1.540	0.75	-1.027	1.503
2 100	2.100	0.75	-1.055	1.475
4 050	4.050	1.34	-1.152 -0.872	1.378
6 600	6.600	1.50	-1.000 -0.850	1.250
8 300	8.300	1.00	-0.935	1.165
9 700	9.700	1.40	-1.002	1.095
10 450	10.450	1.15	-1.042	1.058
13 000	13.000	1.25	-1.170	0.930



MAIN IRRIGATION CANAL

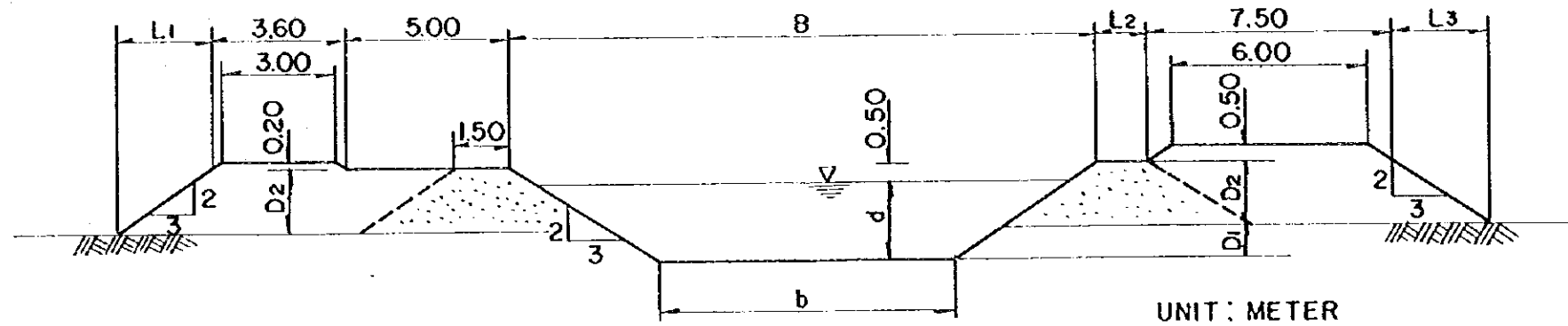
TYPE	b	d	D ₁	D ₂	L ₁	L ₂	B
MI-1	11.0	2.15	-0.35	2.65	4.50	1.50	18.95
MI-2	8.5	1.90	-0.60	2.40	3.60	1.50	15.70
MI-3	7.5	1.80	0.39	1.91	2.87	1.50	14.40
MI-4	6.0	1.55	0.67	1.38	2.07	1.50	12.15
M3-1	11.3	2.20	0.68	2.02	3.03	1.50	19.40



CONCRETE LINING CANAL

TYPE	b	d	D ₁	D ₂	L ₁	L ₂	B
M2-1	18.0	2.75	1.60	1.65	2.48	2.0	27.75
M2-2	16.0	2.60	1.72	1.38	2.03	2.0	25.30
M2-3	13.3	2.37	1.87	1.00	1.50	1.5	21.91
M3-2	15.0	2.53	2.49	0.54	0.81	2.0	24.09
M3-3	12.0	2.25	2.21	0.54	0.81	1.5	20.25
M3-4	10.5	2.10	2.35	0.50	0.75	1.5	18.30

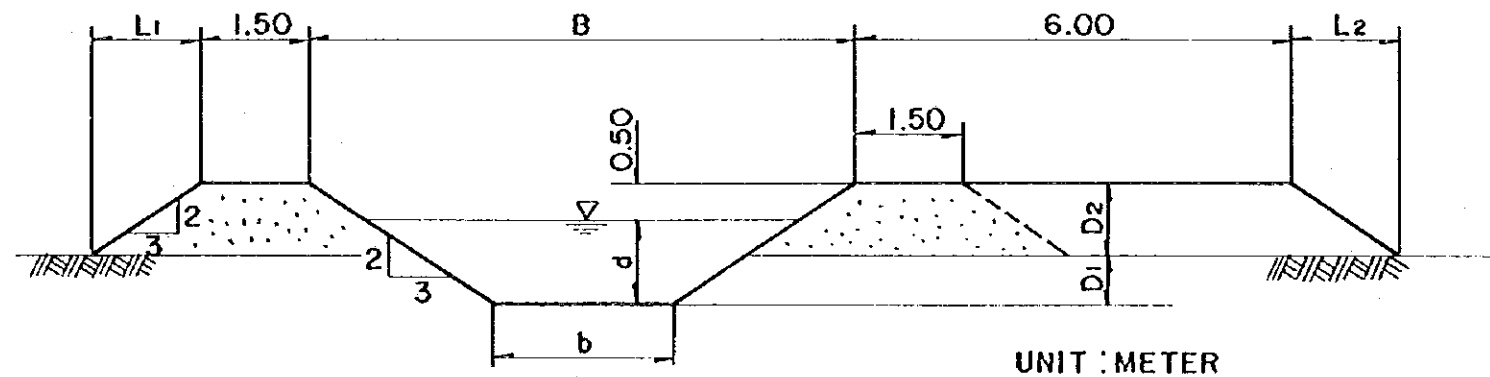
ARAB REPUBLIC OF EGYPT MINISTRY OF LAND RECLAMATION			
SOUTH HUSSINIA VALLEY AGRICULTURAL DEVELOPMENT PROJECT			
CROSS SECTION OF MAIN IRRIGATION CANAL			
DATE		OWG. NO.	4
JAPAN INTERNATIONAL COOPERATION AGENCY			



UNIT : METER

SECONDARY IRRIGATION CANAL (I)

TYPE	b	d	D ₁	D ₂	L ₁	L ₂	L ₃	B
M2-S-C	6.0	1.57	1.07	1.00	1.50	1.50	1.50	12.21
M1-S-J	6.0	1.57	1.07	1.00	1.50	1.50	1.50	12.21
M3-S-Q	6.4	1.64	1.14	1.00	1.50	1.50	1.50	12.82
M2-S-N-2	6.9	1.71	1.21	1.00	1.50	1.50	1.50	13.53
M1-S-A	8.6	1.91	1.41	1.00	1.50	1.50	1.50	15.83
M2-S-M	8.8	1.93	1.43	1.00	1.50	1.50	1.50	16.09
M2-S-N	9.2	1.97	1.47	1.00	1.50	1.50	1.50	16.61



UNIT : METER

SECONDARY IRRIGATION CANAL (II)

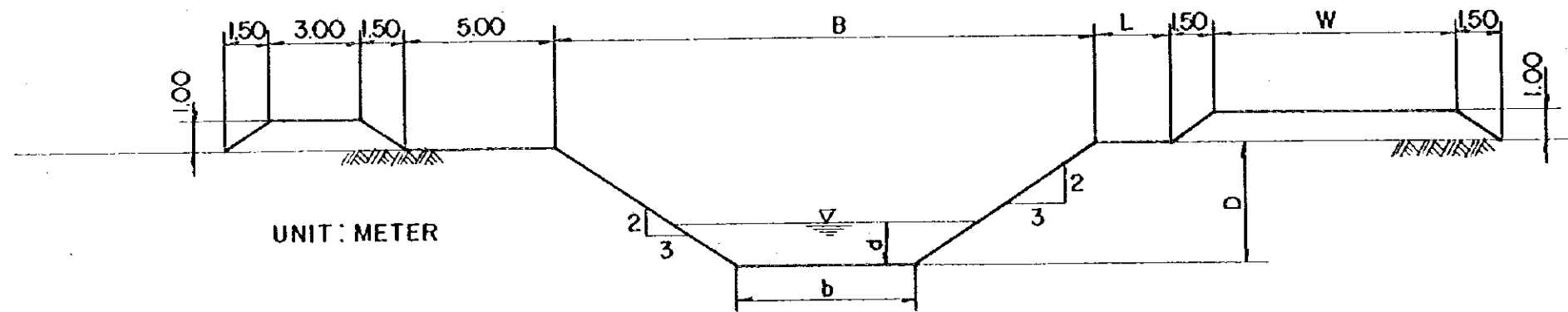
TYPE	b	d	D	D	L	L	B
S 1	1.50	0.75	0.25	1.00	1.50	1.50	5.25
S 2	2.00	1.00	0.50	1.00	1.50	1.50	6.50
S 3	2.50	1.25	0.75	1.00	1.50	1.50	7.75
S 4	3.00	1.50	1.00	1.00	1.50	1.50	9.00
S 5	3.50	1.75	1.25	1.00	1.50	1.50	10.25

ARAB REPUBLIC OF EGYPT
MINISTRY OF LAND RECLAMATION
SOUTH HUSSINIA VALLEY
AGRICULTURAL DEVELOPMENT PROJECT

CROSS SECTION OF
SECONDARY IRRIGATION CANAL

DATE _____ DWG. NO. 5

JAPAN INTERNATIONAL COOPERATION AGENCY



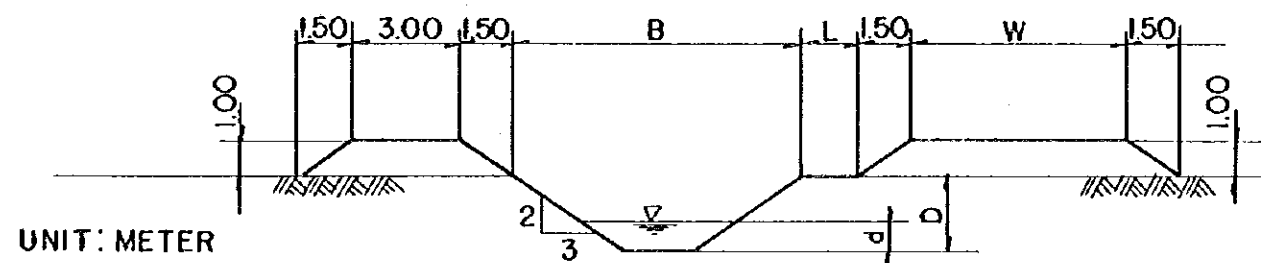
MAIN CANAL AND SECONDARY CANAL (I)

MAIN DRAINAGE CANAL

TYPE	b	d	D	B	L	W
DM (1)	13.0	1.85	5.0	28.0	2.5	8.0
DM (2)	11.0	1.60	4.3	23.9	2.5	8.0
DM (3)	10.5	1.46	4.0	22.5	2.0	8.0
DM (4)	8.0	1.10	3.4	18.2	2.0	8.0
DM (5)	7.5	1.12	3.3	17.4	2.0	8.0
DM-1	7.0	1.01	4.0	19.0	2.0	8.0
DM-2	7.5	1.12	3.6	18.3	2.0	8.0
DM-3	7.5	1.09	3.6	18.3	2.0	8.0

SECONDARY DRAINAGE CANAL (I)

TYPE	b	d	D	B	L	W
DM, L-J	3.5	0.50	2.8	11.9	1.5	6.0
L-O	5.5	0.80	3.1	14.8	2.0	6.0
L-P	4.5	0.68	3.0	13.5	1.5	6.0
DM1, L-B	4.5	0.68	3.0	13.5	1.5	6.0
L-C	4.0	0.53	2.8	12.4	1.5	6.0
DM3, L-C	5.0	0.76	3.0	14.0	1.5	6.0
L-D	4.0	0.62	2.9	12.7	1.5	6.0



SECONDARY CANAL (II)

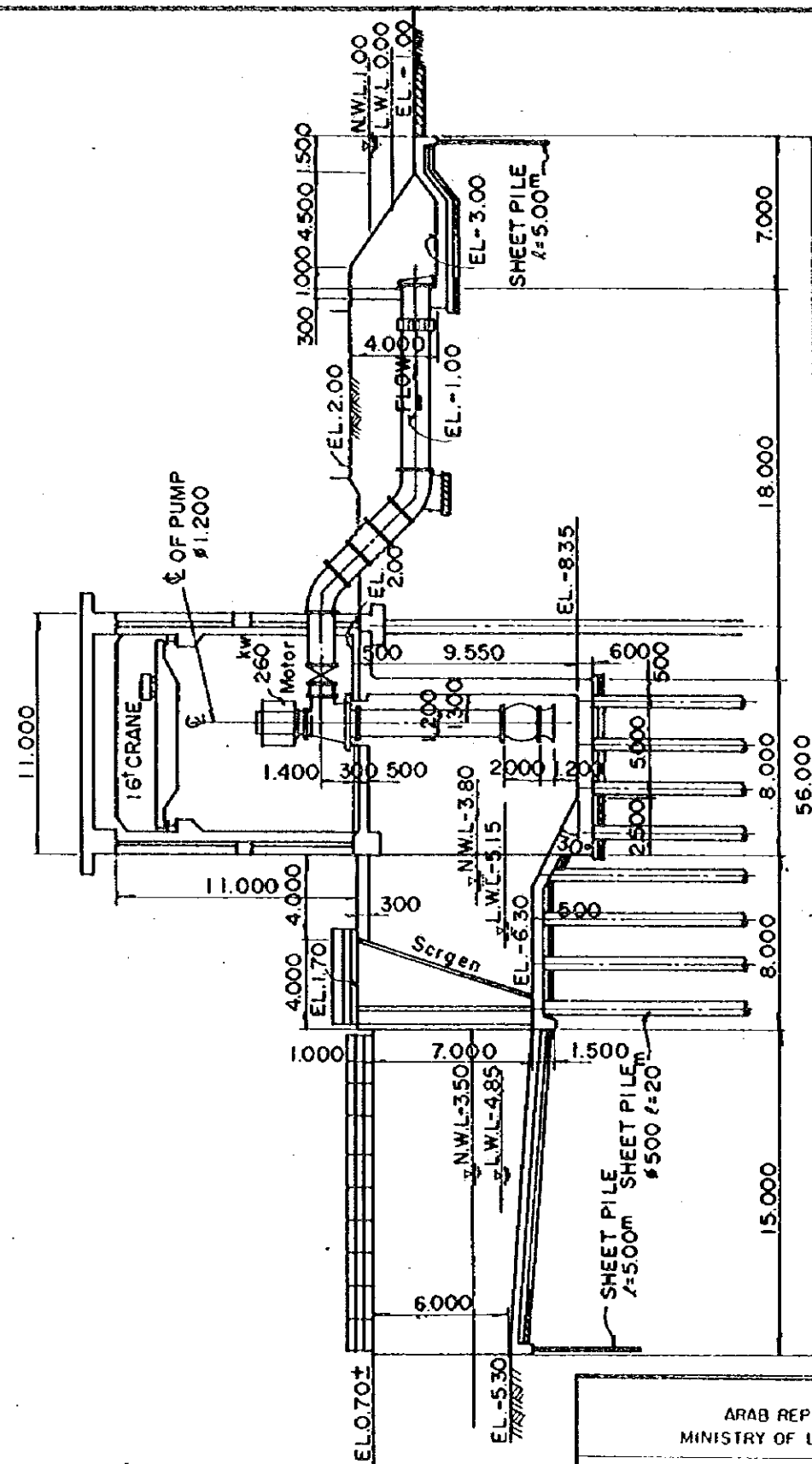
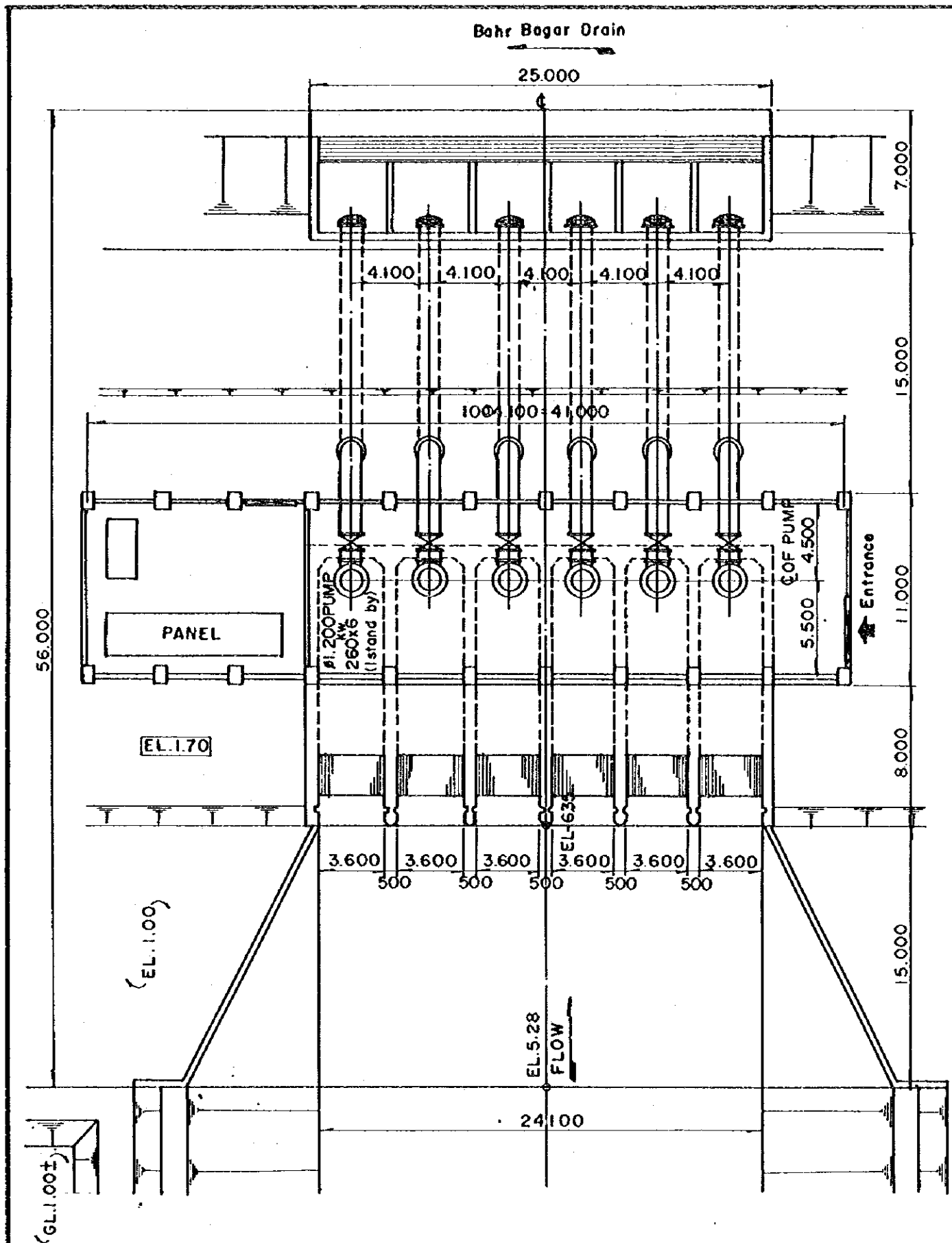
SECONDARY DRAINAGE CANAL (II)

TYPE	b	d	D	B	L	W
S-1	0.5	0.25	2.1	6.8	1.5	6.0
S-2	1.0	0.50	2.3	7.9	1.5	6.0
S-3	1.5	0.75	2.6	9.3	1.5	6.0
S-4	2.5	0.75	2.6	10.3	1.5	6.0

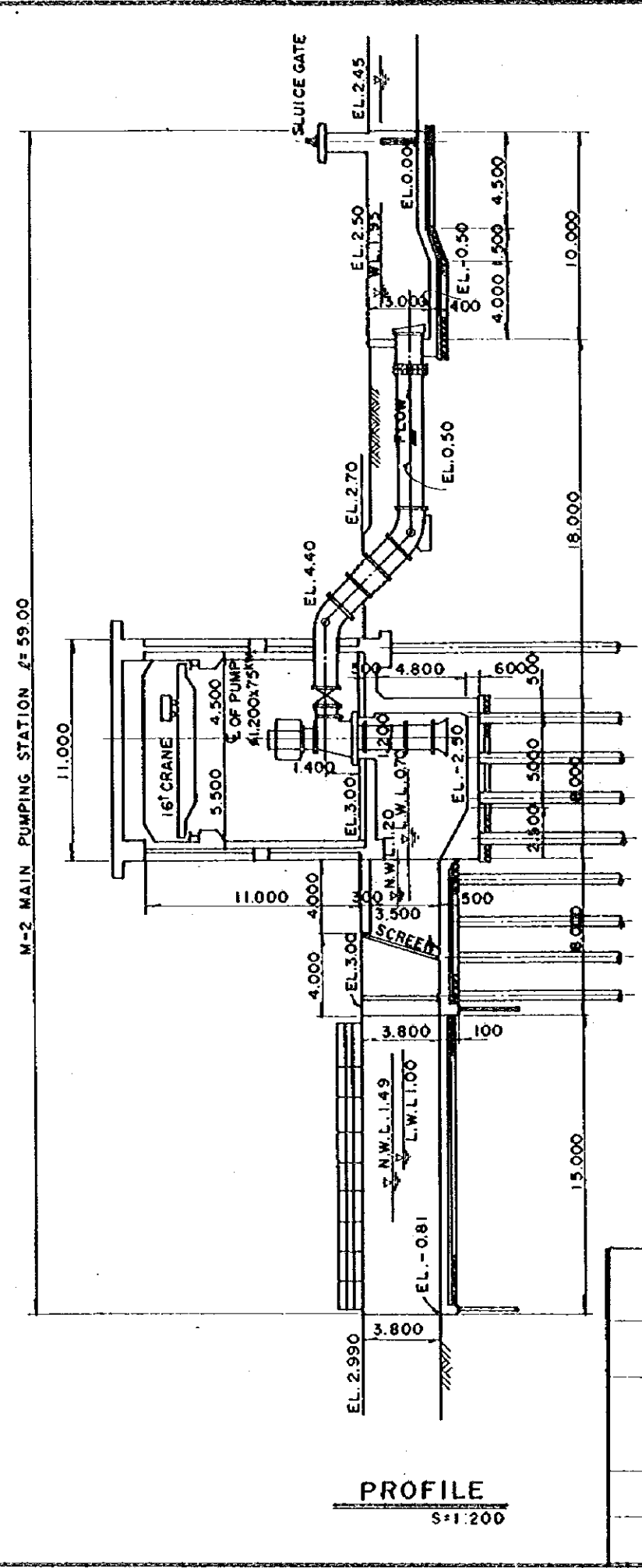
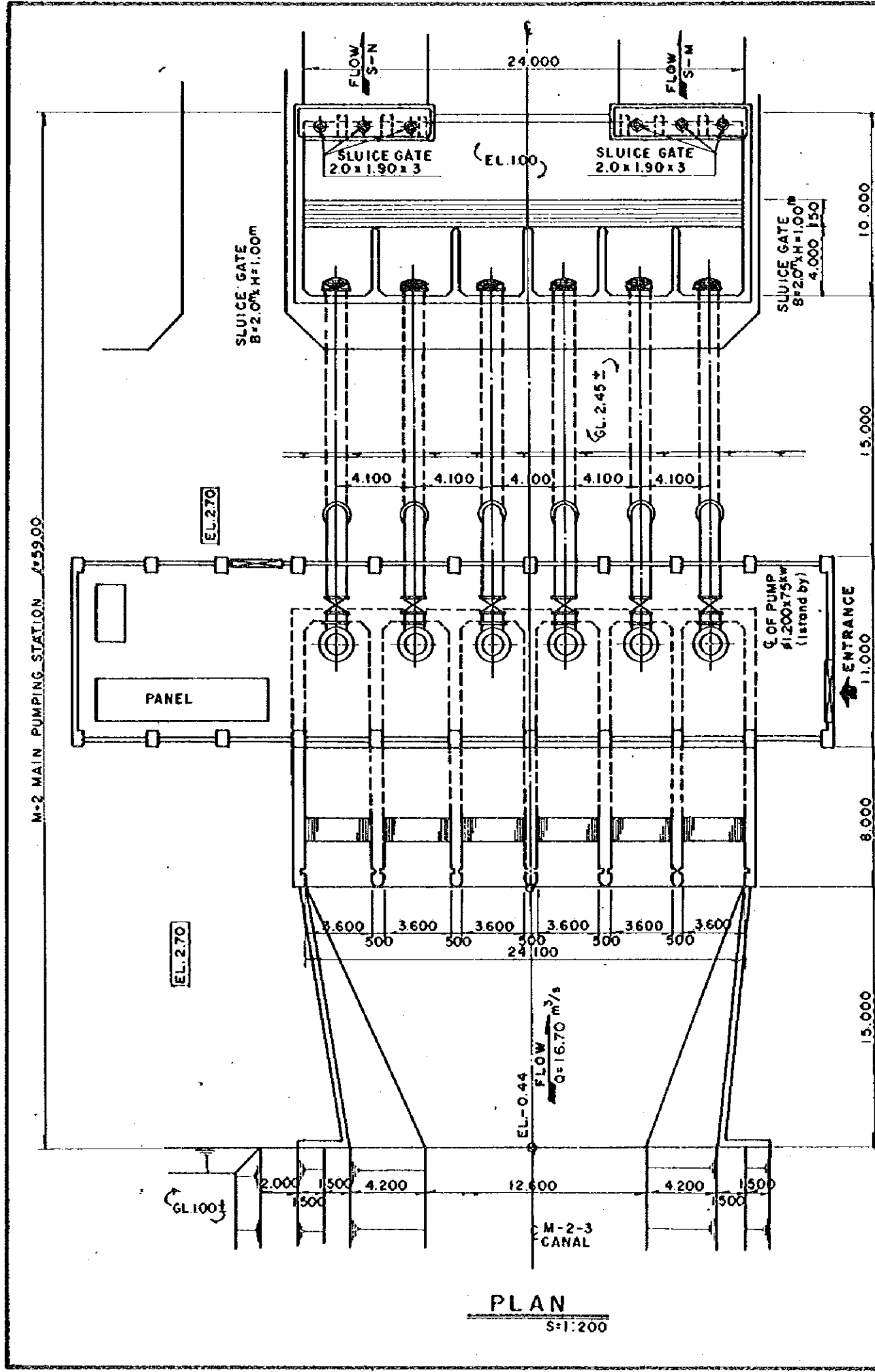
ARAB REPUBLIC OF EGYPT
MINISTRY OF LAND RECLAMATION
SOUTH HUSSINIA VALLEY
AGRICULTURAL DEVELOPMENT PROJECT

CROSS SECTION OF
DRAINAGE CANAL

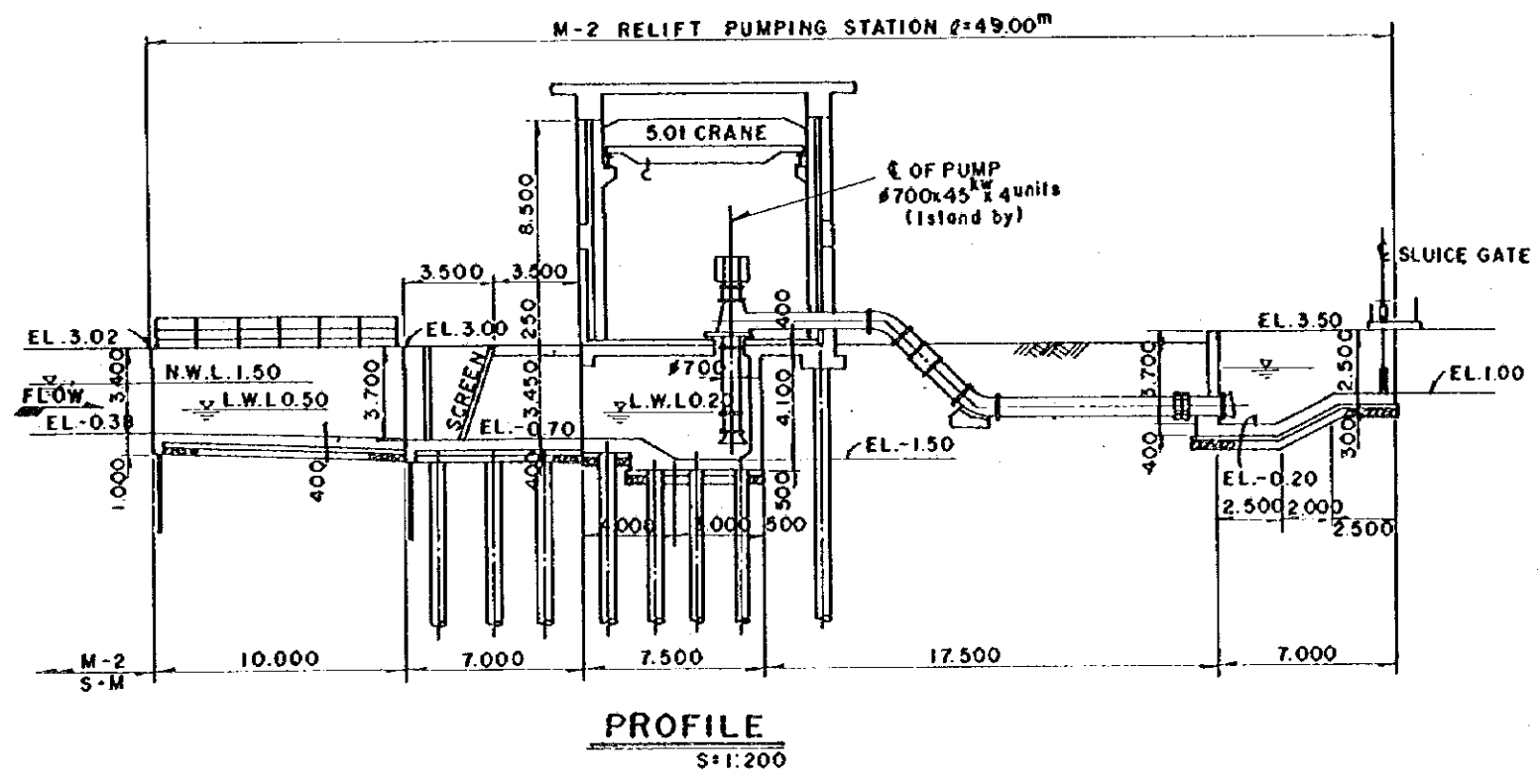
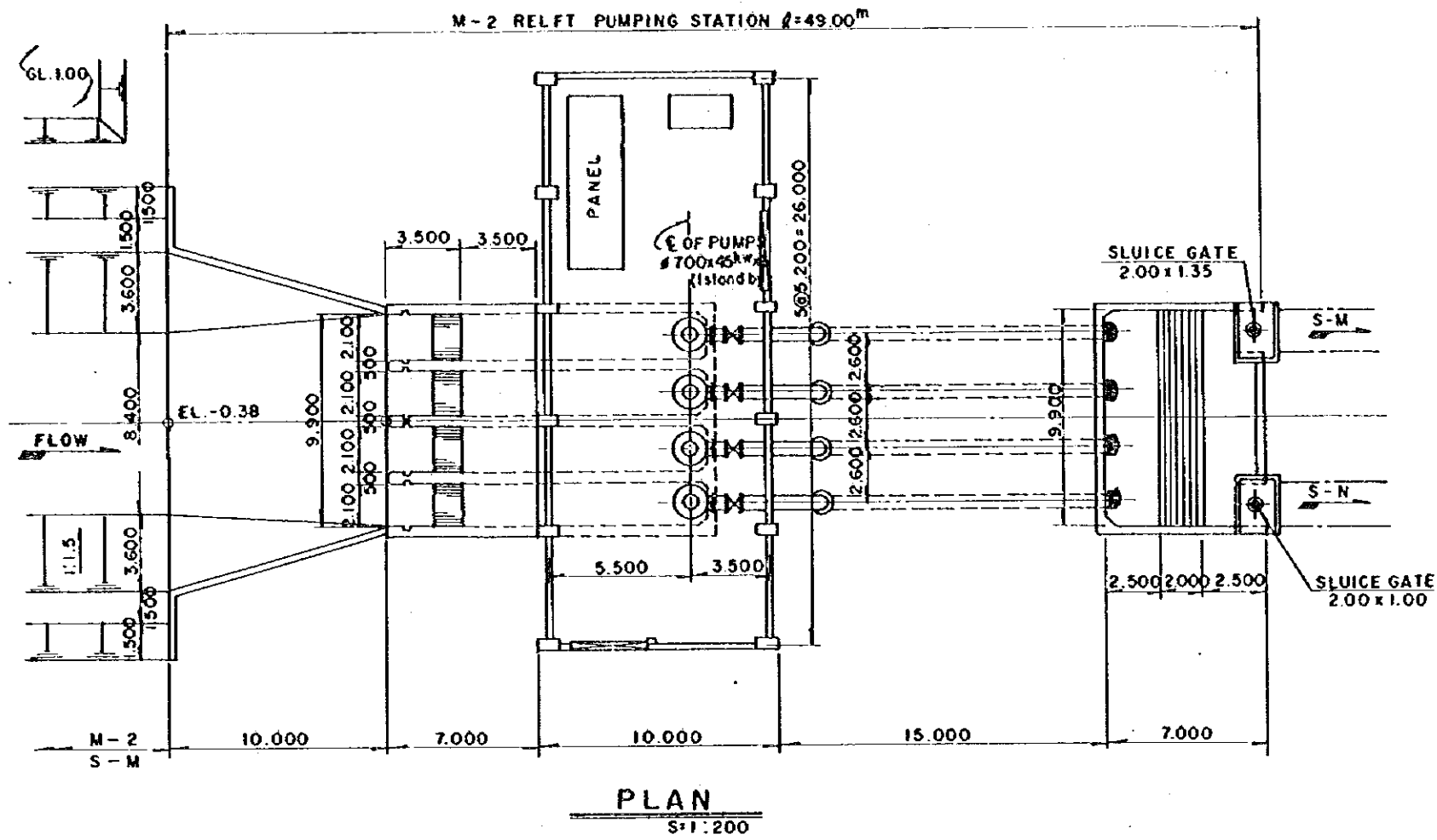
DATE _____ DWG. NO. 6
JAPAN INTERNATIONAL COOPERATION AGENCY



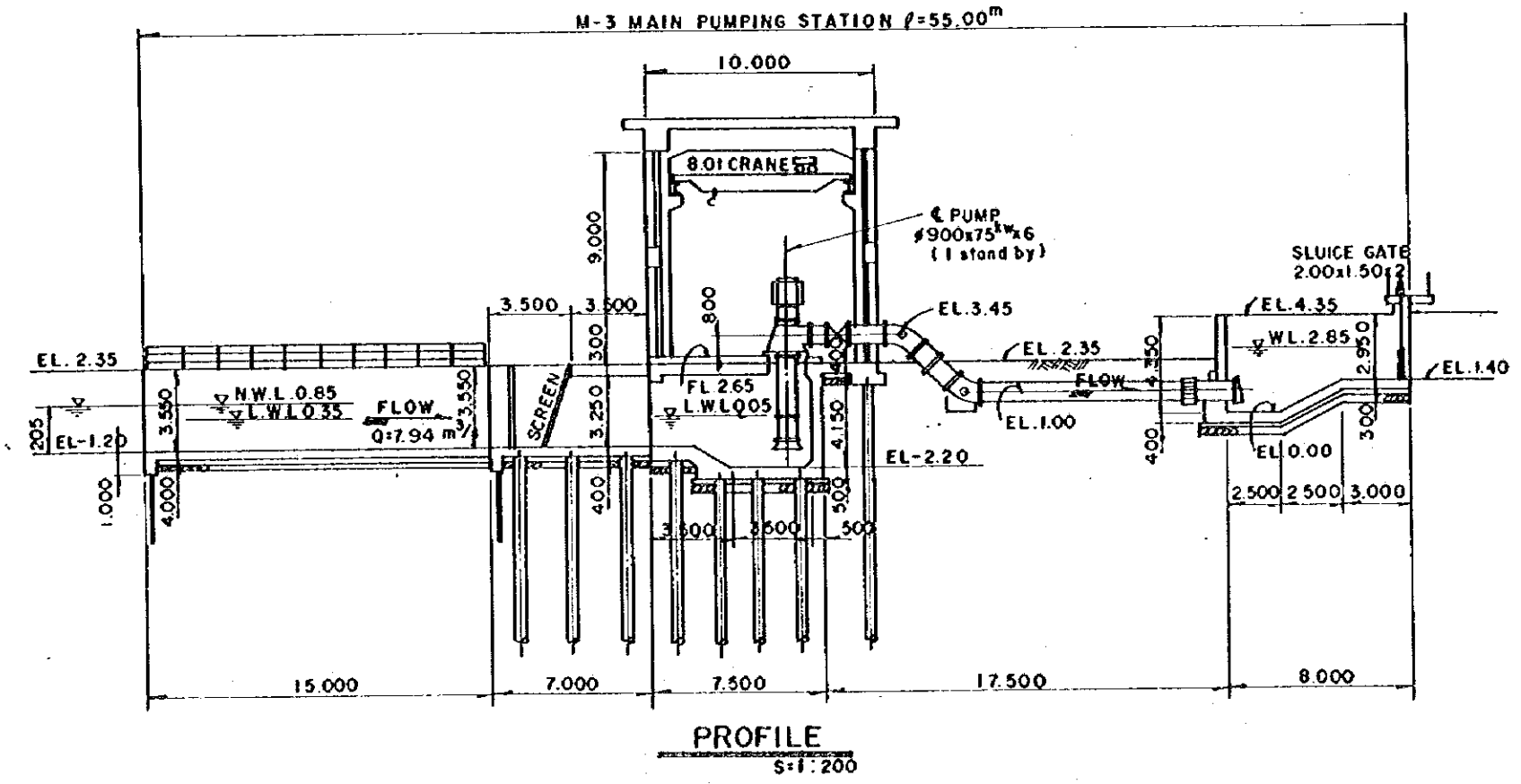
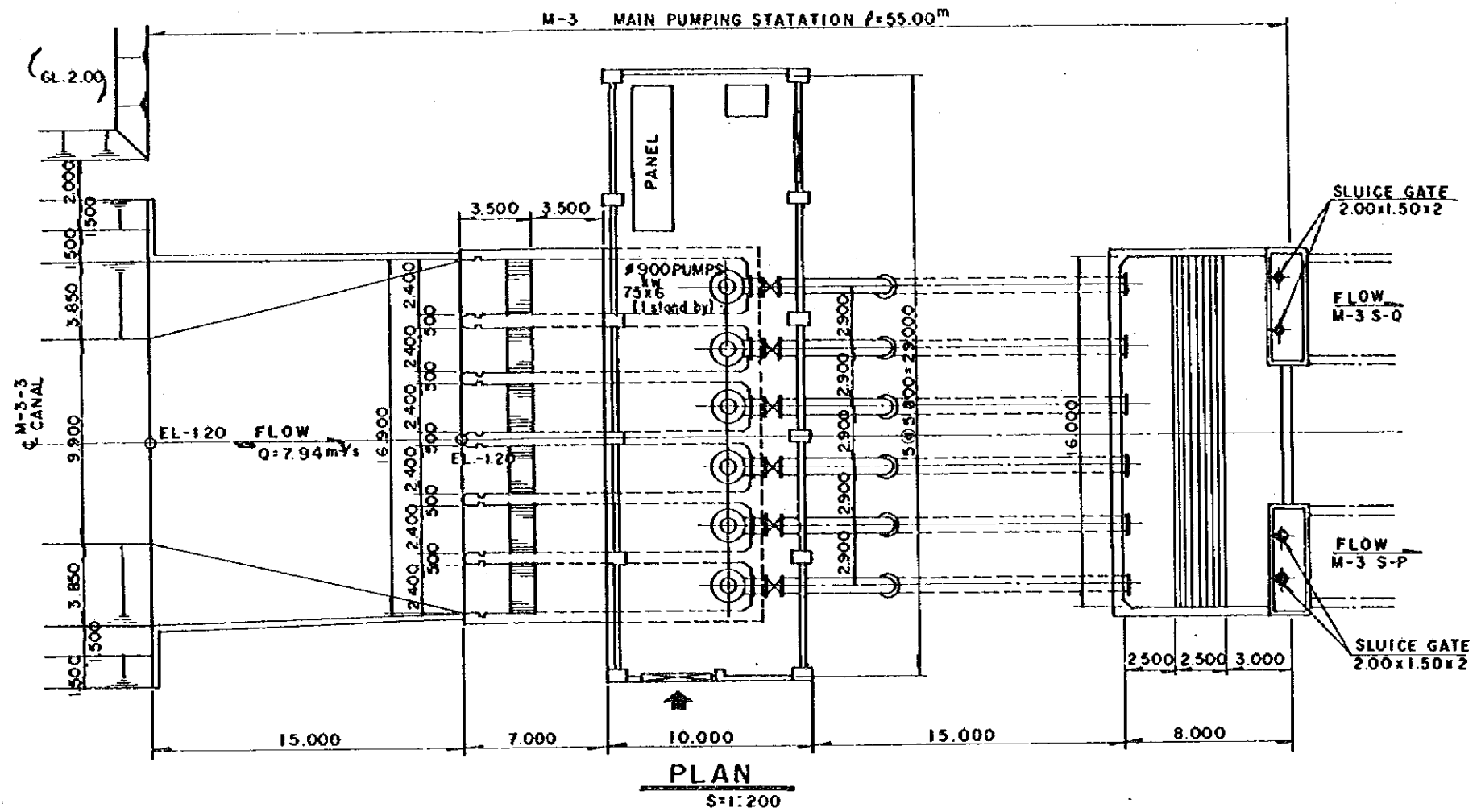
ARAB REPUBLIC OF EGYPT MINISTRY OF LAND RECLAMATION			
SOUTH HUSSINIA VALLEY AGRICULTURAL DEVELOPMENT PROJECT			
DRAINAGE PUMPING STATION			
DATE	OWG. NO.	7	
JAPAN INTERNATIONAL COOPERATION AGENCY			



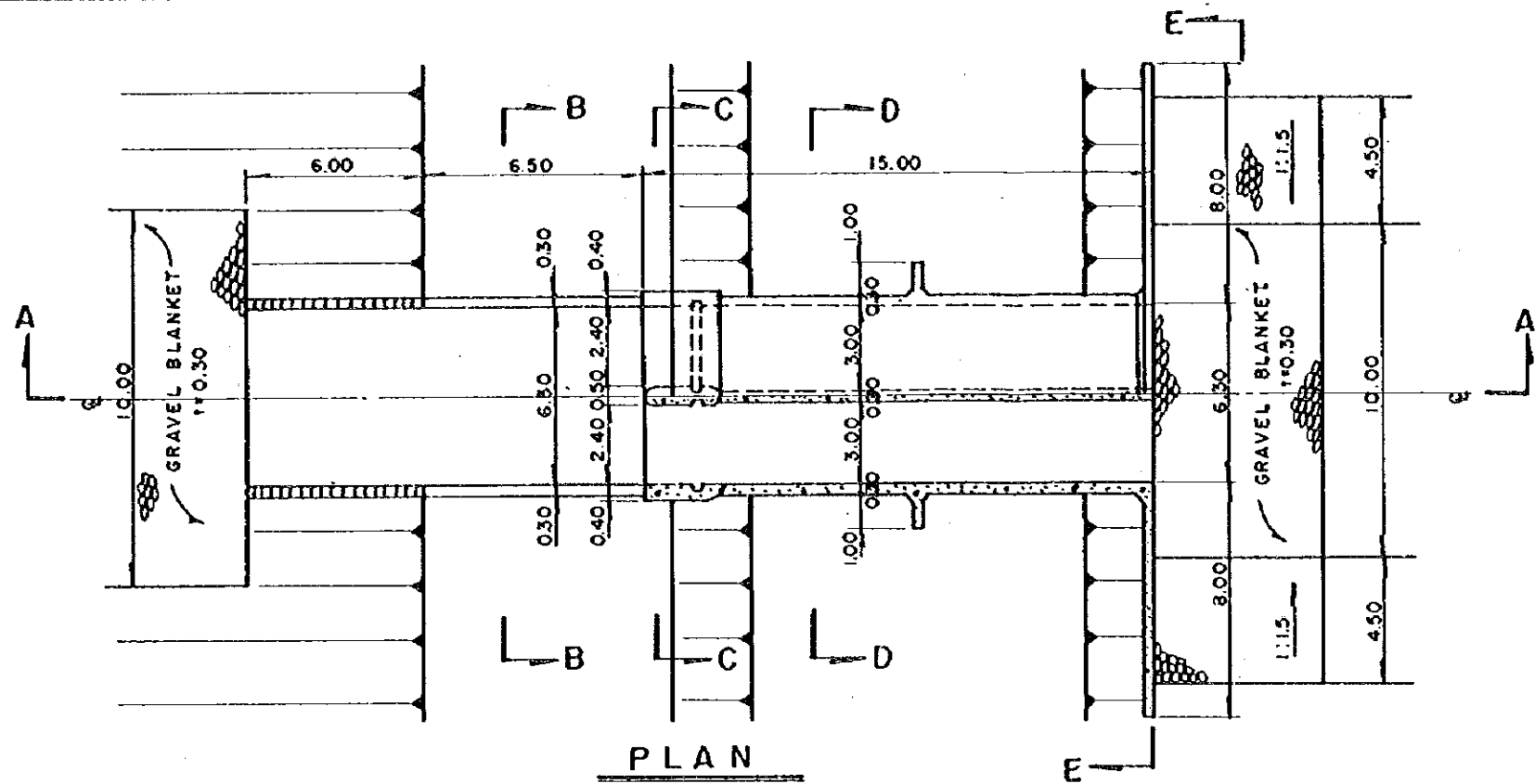
ARAB REPUBLIC OF EGYPT			
MINISTRY OF LAND RECLAMATION			
SOUTH HUSSINIA VALLEY			
AGRICULTURAL DEVELOPMENT PROJECT			
M2 MAIN PUMPING STATION			
DATE		DWG. NO.	8
JAPAN INTERNATIONAL COOPERATION AGENCY			



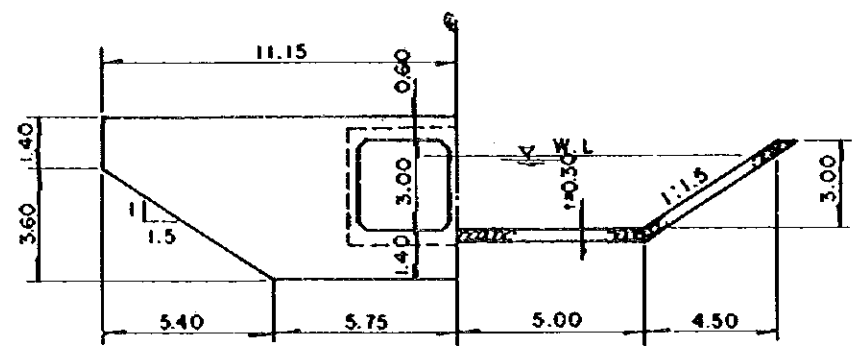
ARAB REPUBLIC OF EGYPT			
MINISTRY OF LAND RECLAMATION			
SOUTH HUSSINIA VALLEY			
AGRICULTURAL DEVELOPMENT PROJECT			
RELIFT PUMPING STATION			
DATE		DWG. NO.	9
JAPAN INTERNATIONAL COOPERATION AGENCY			



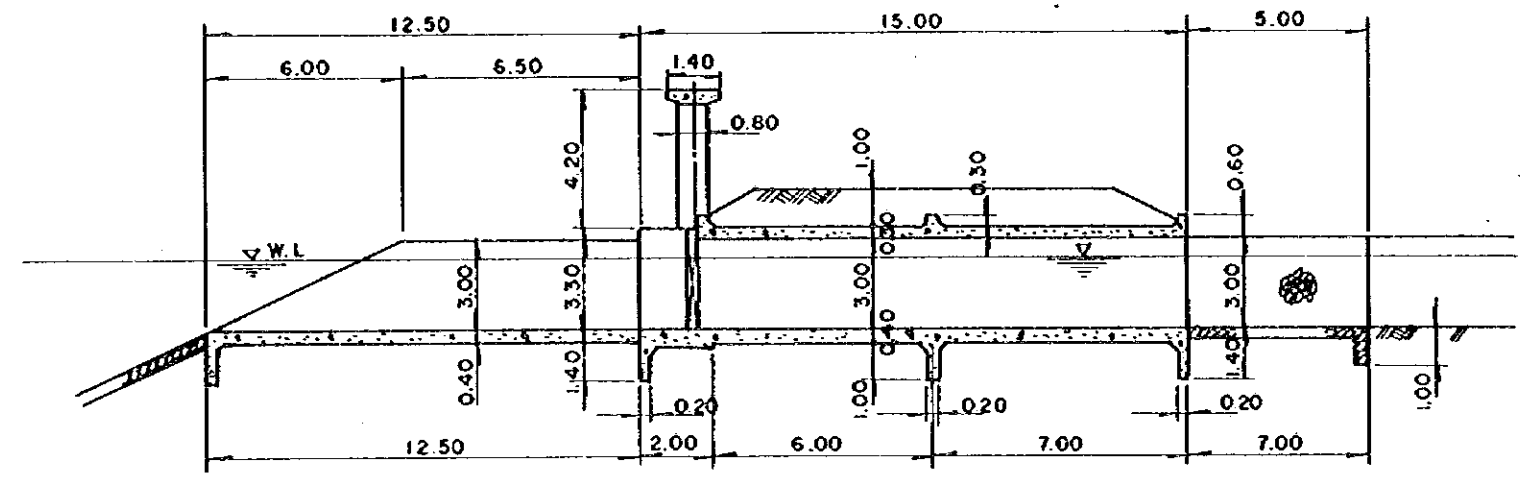
ARAB REPUBLIC OF EGYPT MINISTRY OF LAND RECLAMATION		
SOUTH HUSSINIA VALLEY AGRICULTURAL DEVELOPMENT PROJECT		
M3 MAIN PUMPING STATION		
DATE	DWG. NO.	10
JAPAN INTERNATIONAL COOPERATION AGENCY		



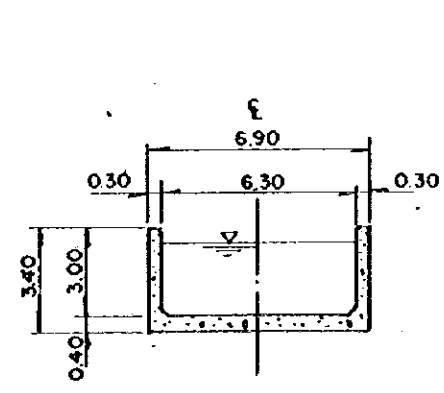
PLAN



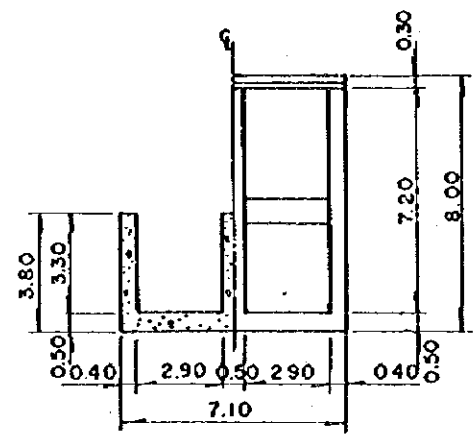
SECTION E-E



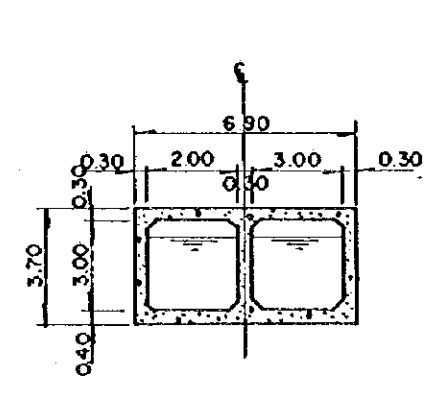
SECTION A-A



SECTION B-B

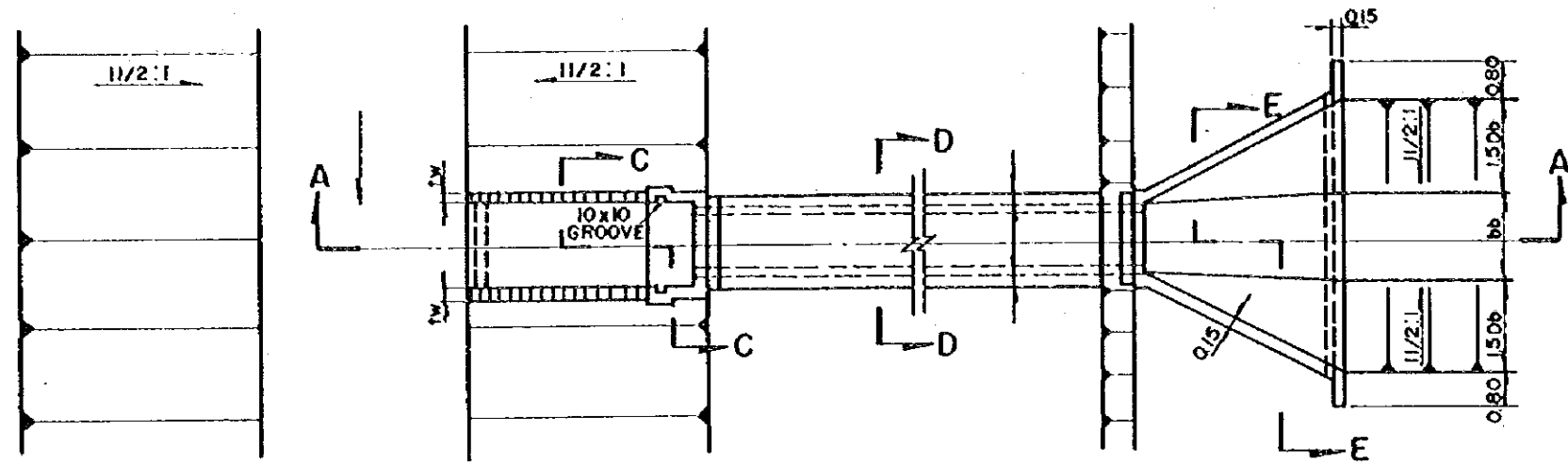


SECTION C-C

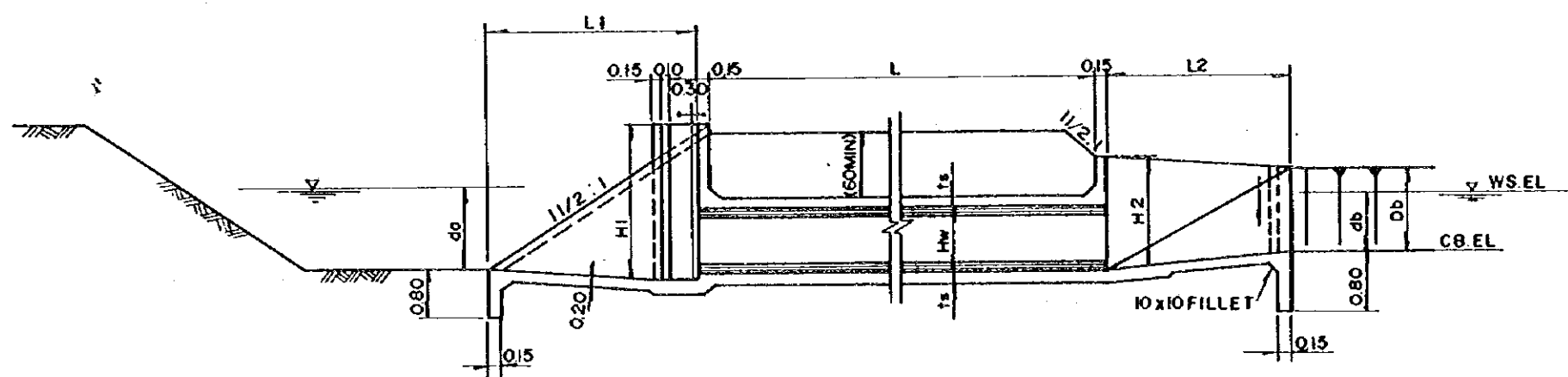


SECTION D-D

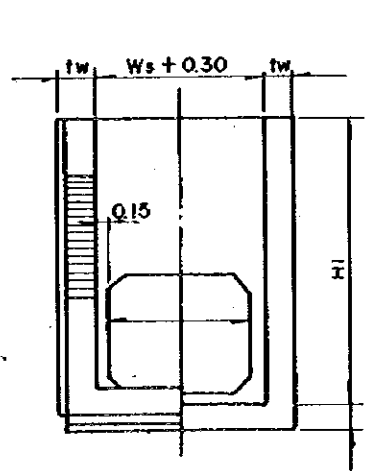
ARAB REPUBLIC OF EGYPT			
MINISTRY OF LAND RECLAMATION			
SOUTH HUSSINIA VALLEY			
AGRICULTURAL DEVELOPMENT PROJECT			
HEAD GATE			
DATE		DWG. NO.	
JAPAN INTERNATIONAL COOPERATION AGENCY			



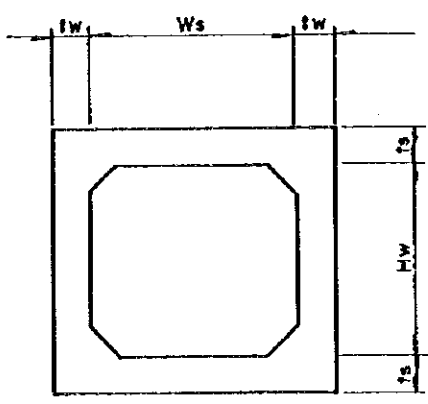
P L A N



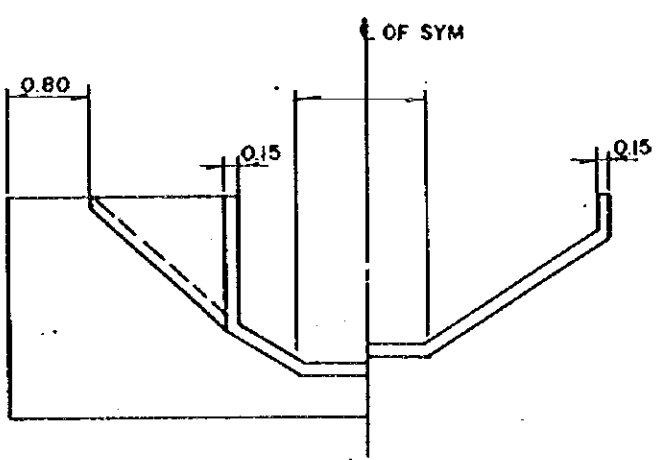
SECTION A - A



SECTION C - C



SECTION D - D



SECTION E - E

TYPE	Ws	Hw	tw	ts	H1	H2	L	L1	L2	do	db	Db	bb	REMARKS
AB	2.00	2.00	0.20	0.20	3.00	2.70	9.00	4.50	6.00	3.00	1.70	2.20	7.50	
A10	2.50	2.50	0.25	0.25	3.50	3.25	9.00	5.25	8.00	2.50	2.10	2.60	9.00	

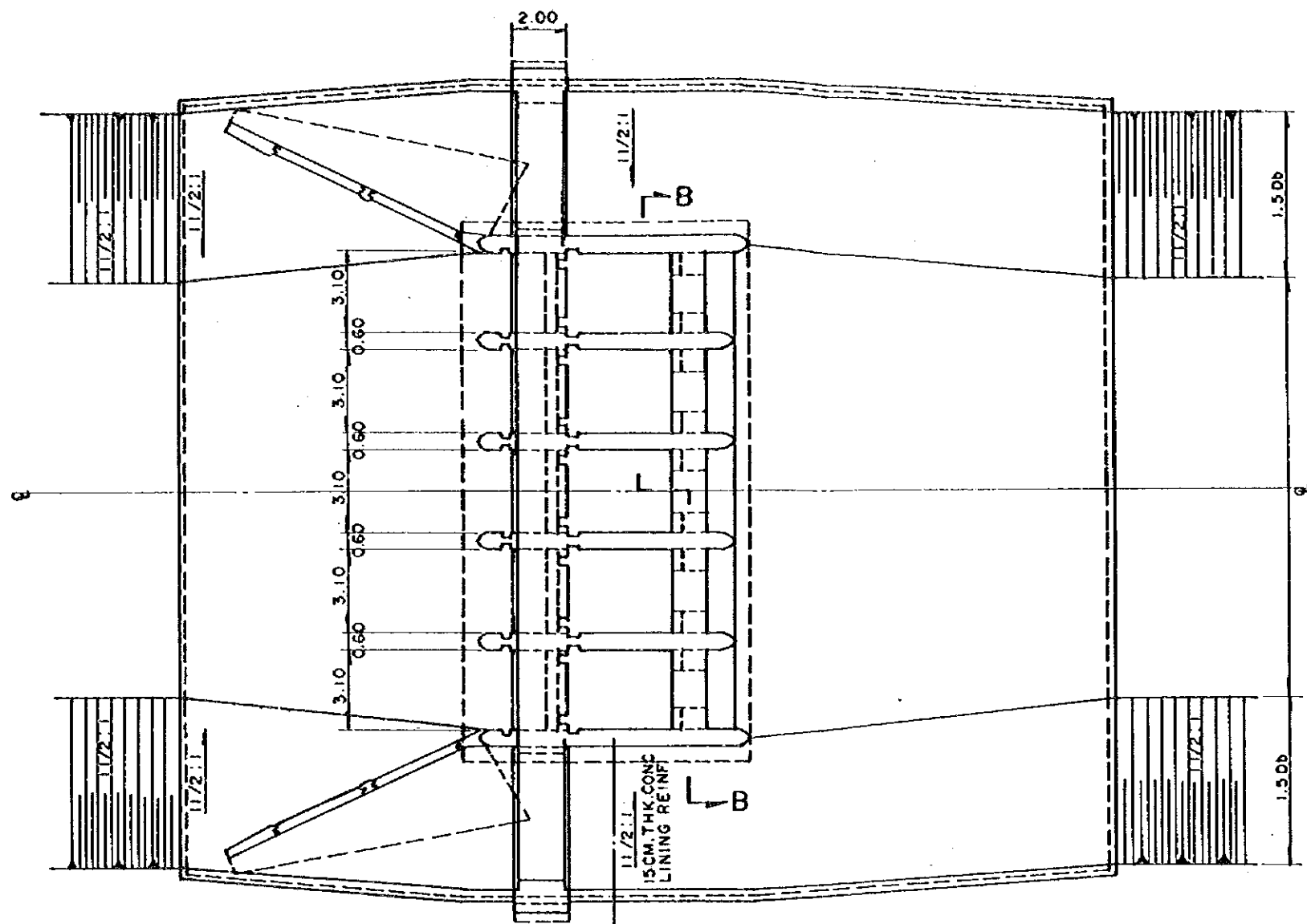
ARAB REPUBLIC OF EGYPT
MINISTRY OF LAND RECLAMATION

SOUTH HUSSINIA VALLEY
AGRICULTURAL DEVELOPMENT PROJECT

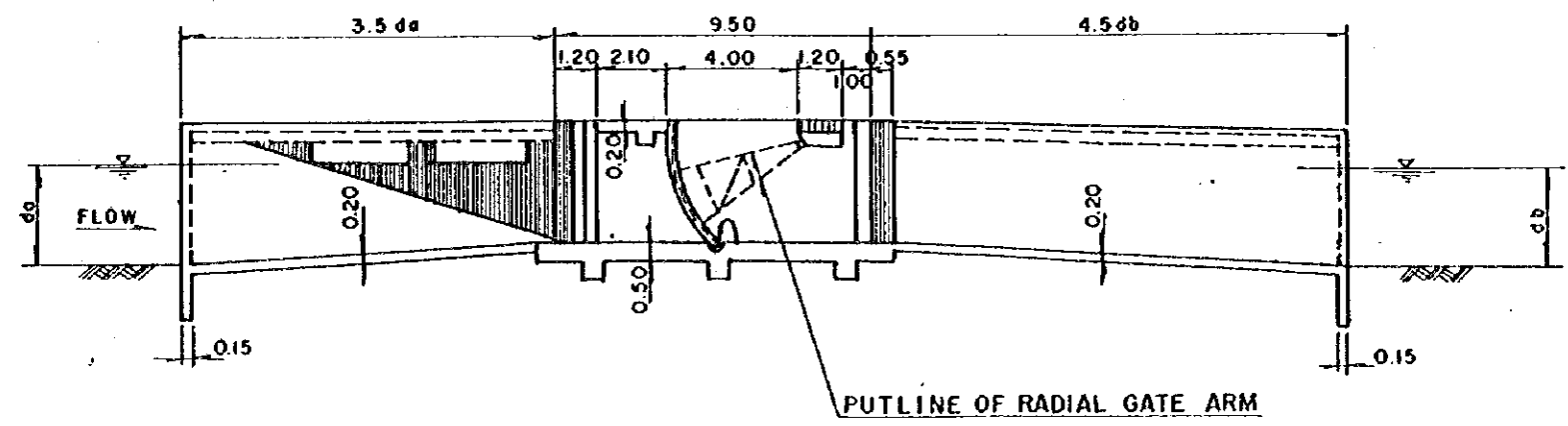
OFF-TAKE

DATE		DWG. NO.	12
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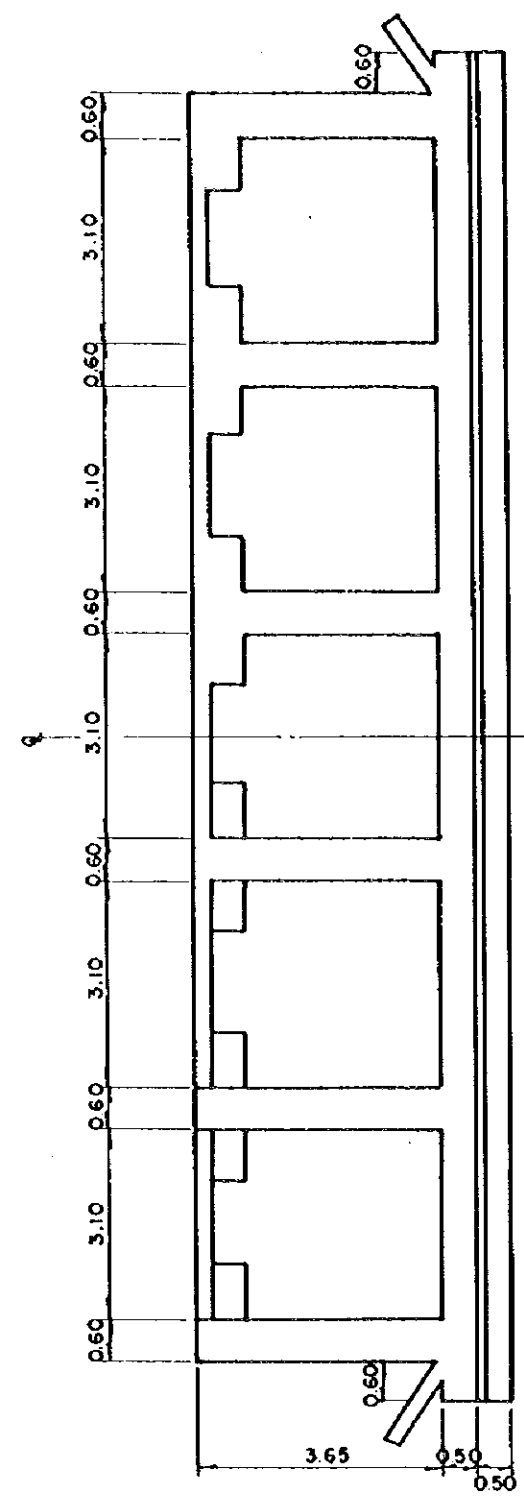
JAPAN INTERNATIONAL COOPERATION AGENCY



P L A N

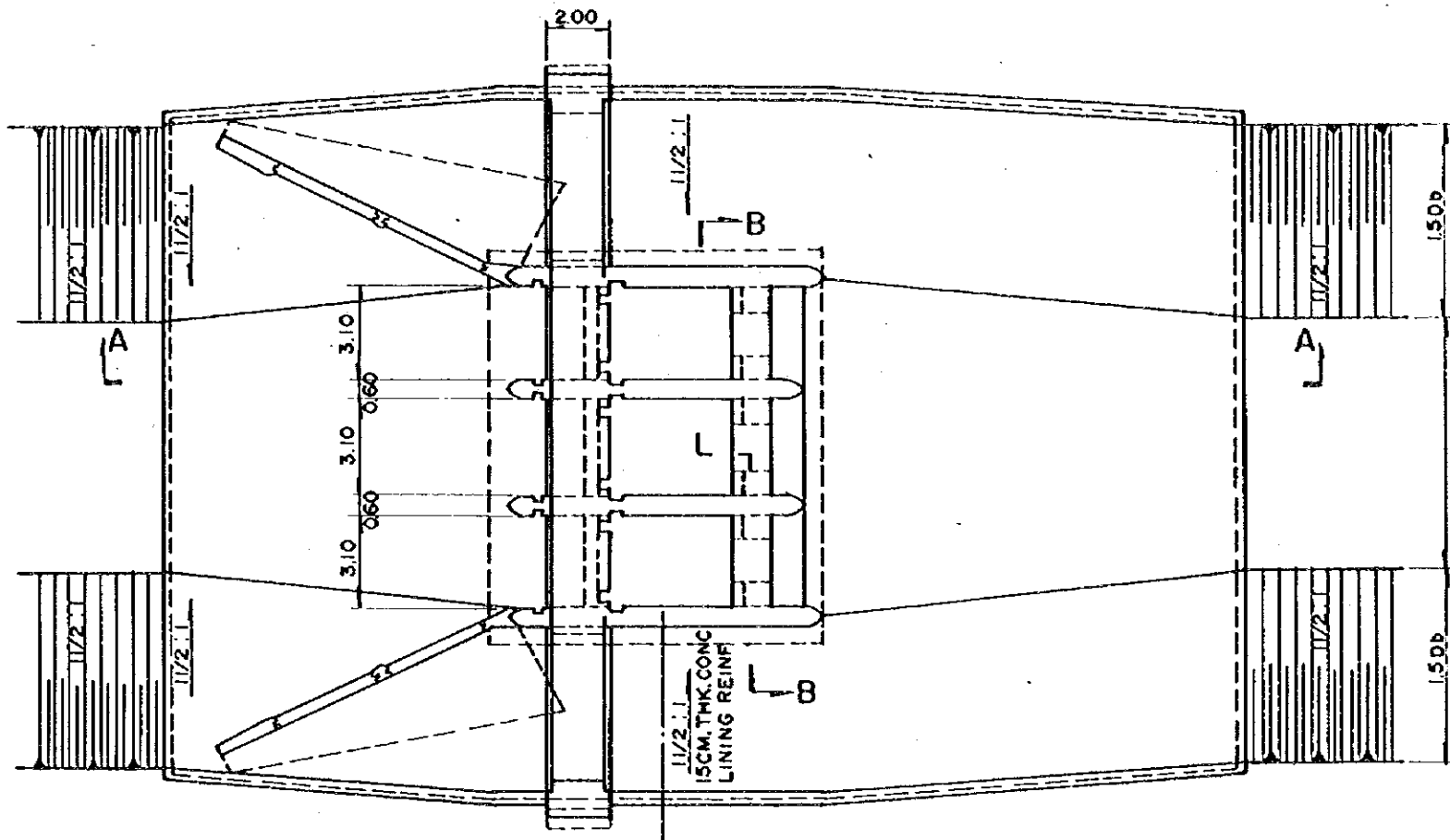


SECTION A-A

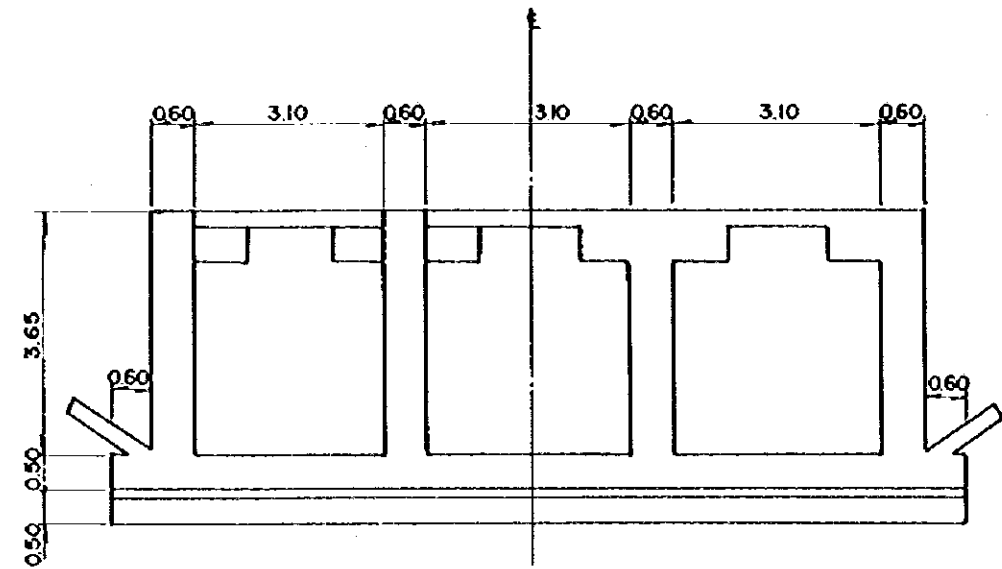


SECTION B-B

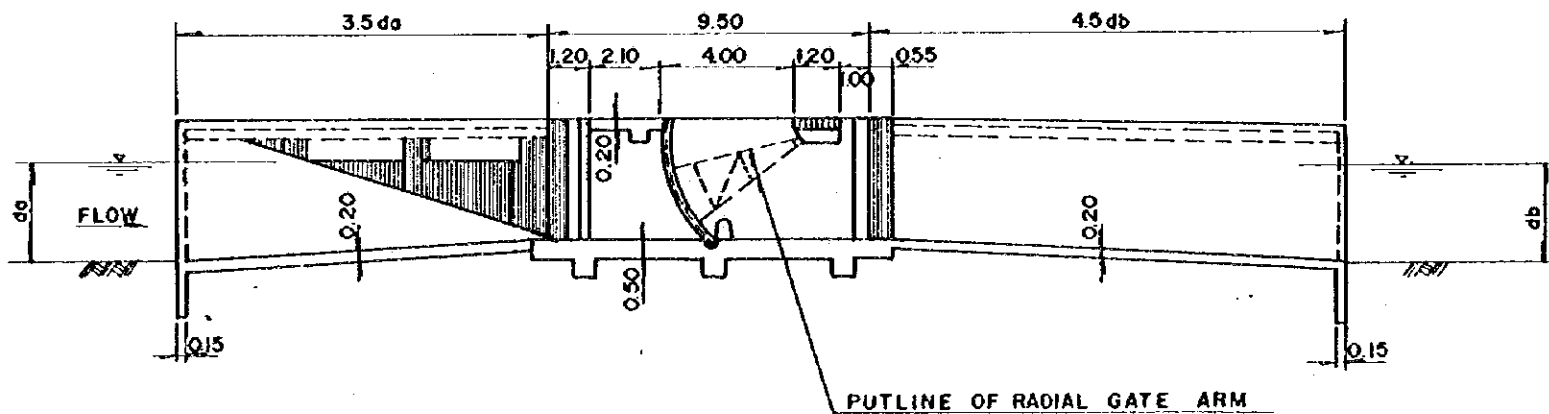
ARAB REPUBLIC OF EGYPT			
MINISTRY OF LAND RECLAMATION			
SOUTH HUSSINIA VALLEY			
AGRICULTURAL DEVELOPMENT PROJECT			
CHECK, TYPE -A (1)			
DATE		DWG. NO.	13
JAPAN INTERNATIONAL COOPERATION AGENCY			



P L A N

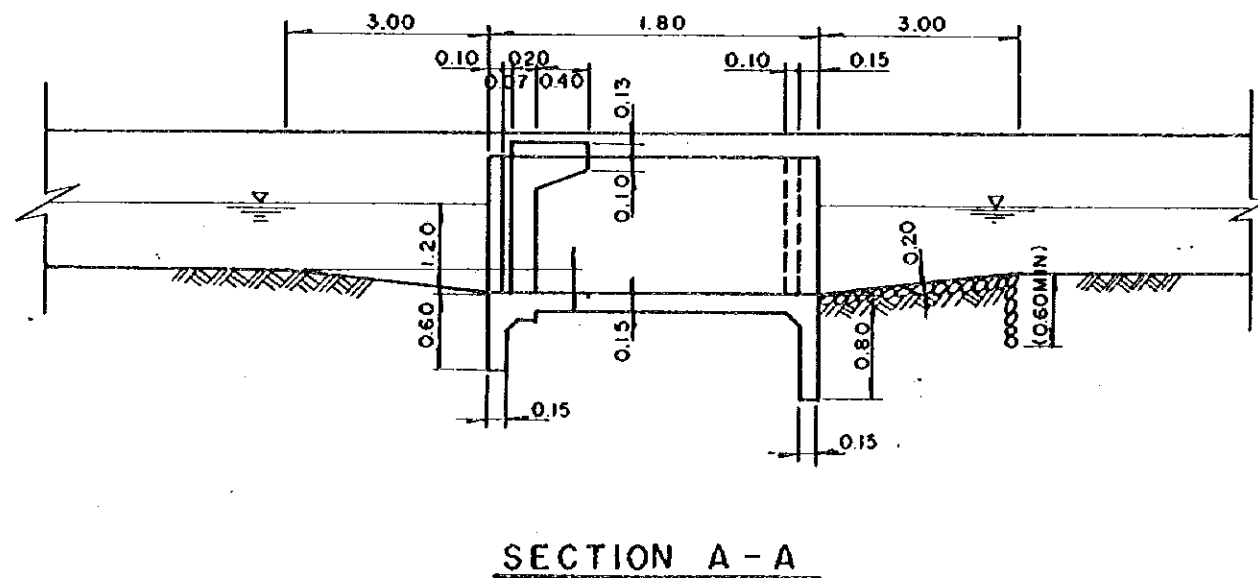
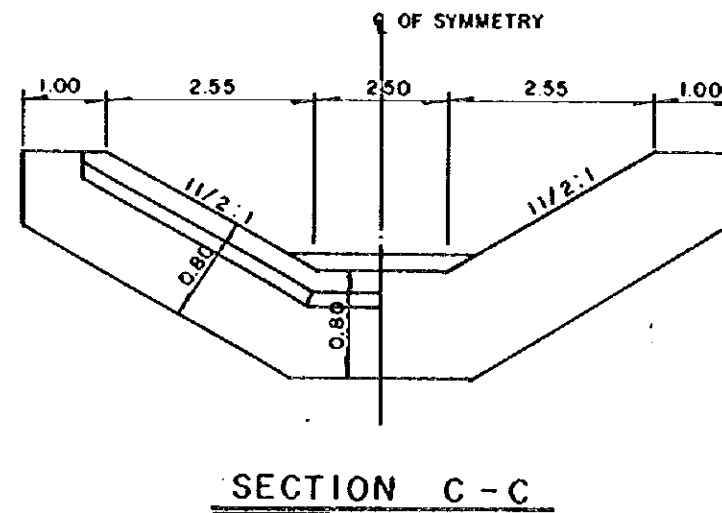
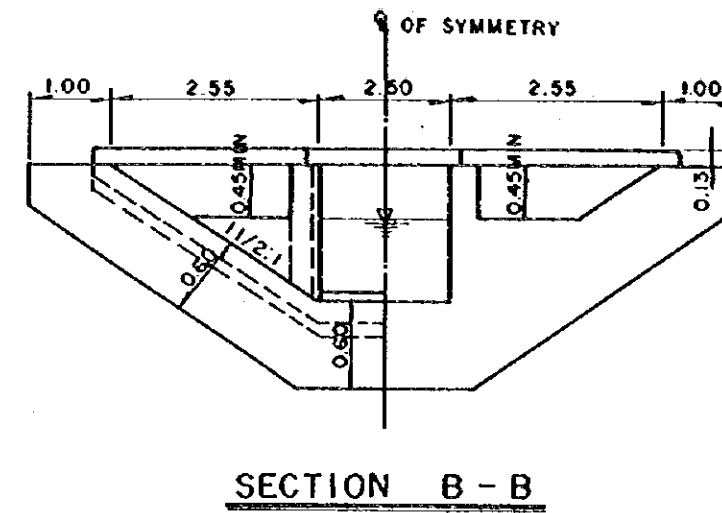
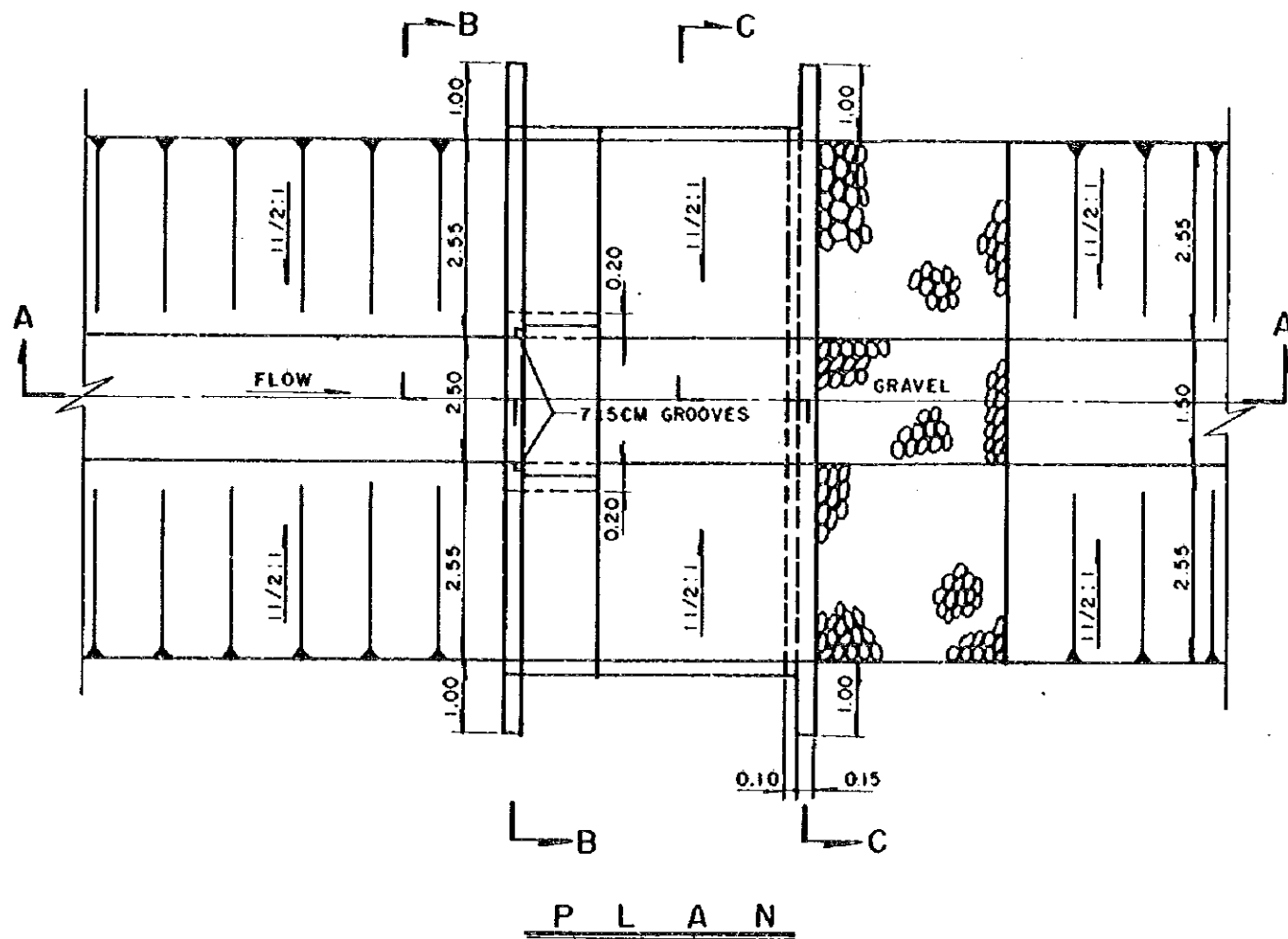


SECTION B-B

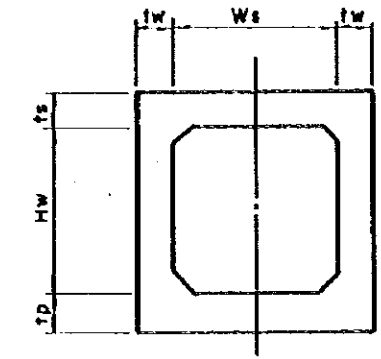
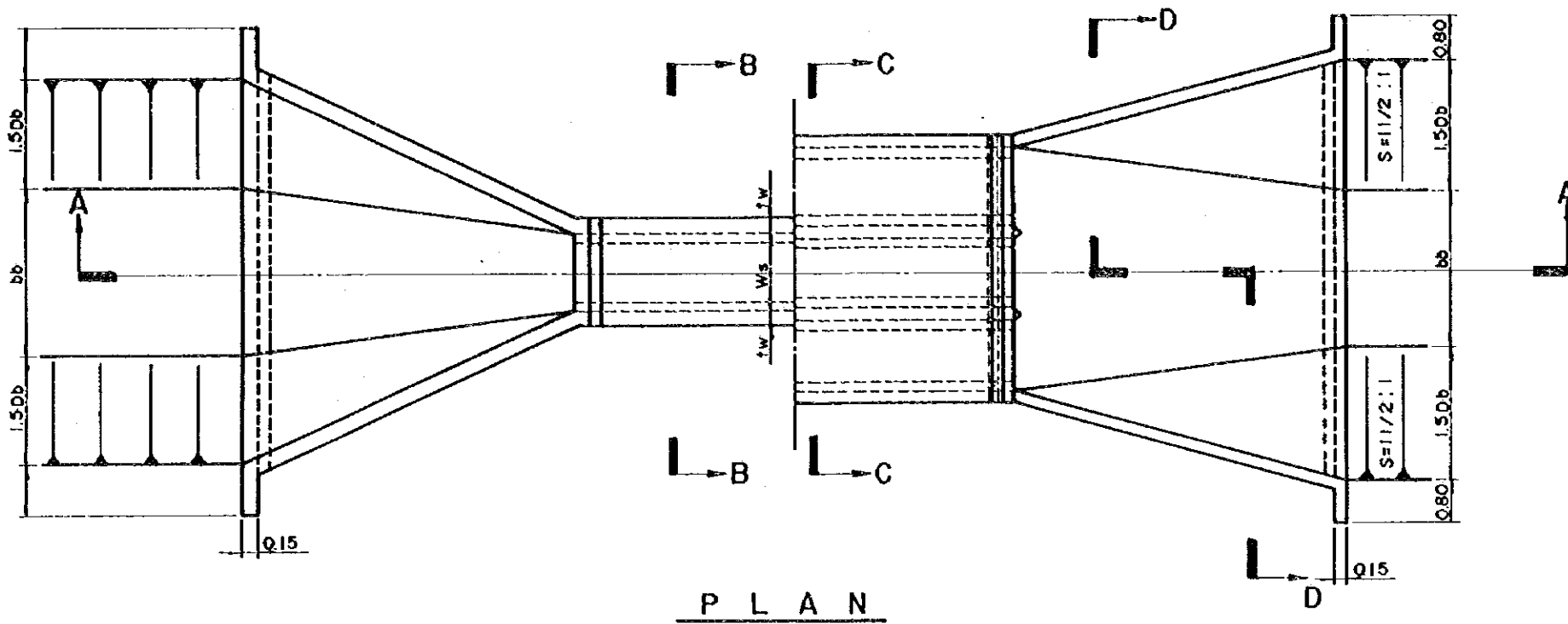


SECTION A-A

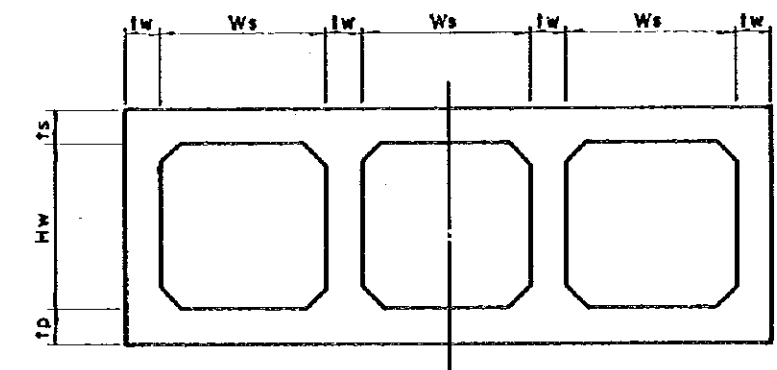
ARAB REPUBLIC OF EGYPT MINISTRY OF LAND RECLAMATION			
SOUTH HUSSINIA VALLEY AGRICULTURAL DEVELOPMENT PROJECT			
CHECK, TYPE -A (2)			
DATE		DWG. NO.	14
JAPAN INTERNATIONAL COOPERATION AGENCY			



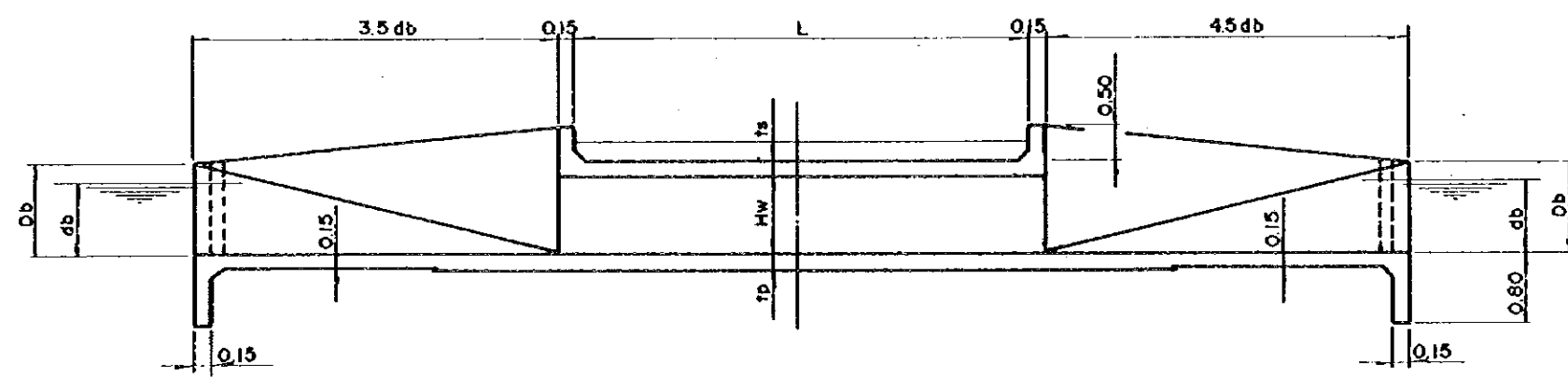
ARAB REPUBLIC OF EGYPT MINISTRY OF LAND RECLAMATION			
SOUTH HUSSINIA VALLEY AGRICULTURAL DEVELOPMENT PROJECT			
CHECK, TYPE -B			
DATE		DWG. NO.	15
JAPAN INTERNATIONAL COOPERATION AGENCY			



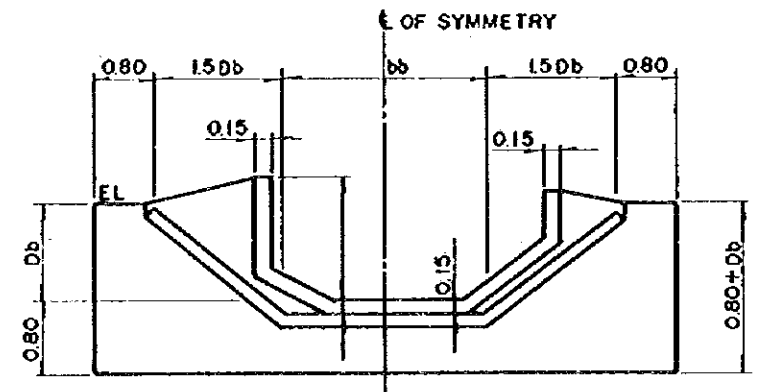
SECTION B-B



SECTION C-C



SECTION A-A



SECTION D-D

TYPE	Ws	Hw	tw	ts	tp	db	Db	bb	L	REMARKS
A-1	1.25	1.25	0.15	0.15	0.20	1.00	1.50	2.50	9.00	1 BOX
A-2	/	/	/	/	/	/	/	/	6.00	/
B-1	2.00	2.00	0.20	0.20	0.25	2.00	2.50	10.00	9.00	3 BOX
B-2	/	/	/	/	/	/	/	/	6.00	/
C-1	2.50	2.50	0.25	0.25	0.30	2.30	2.80	13.00	9.00	/
C-2	/	/	/	/	/	/	/	/	6.00	/

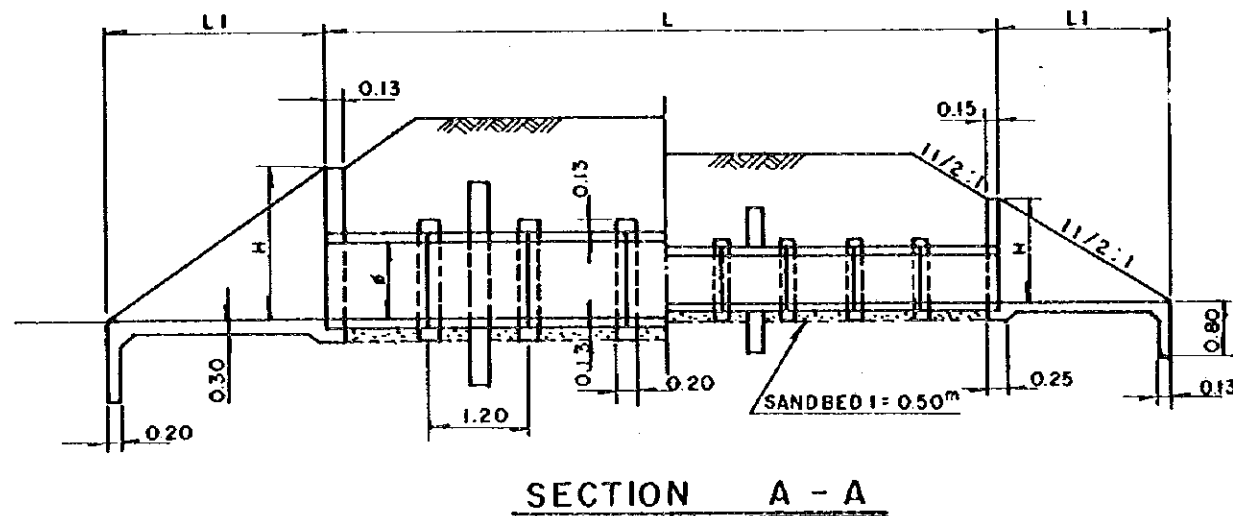
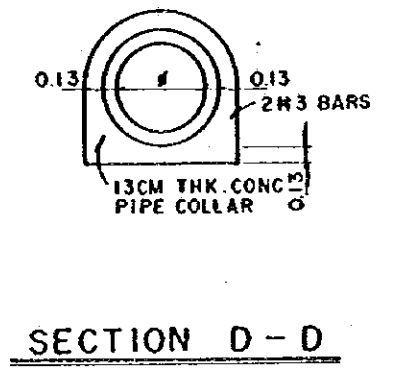
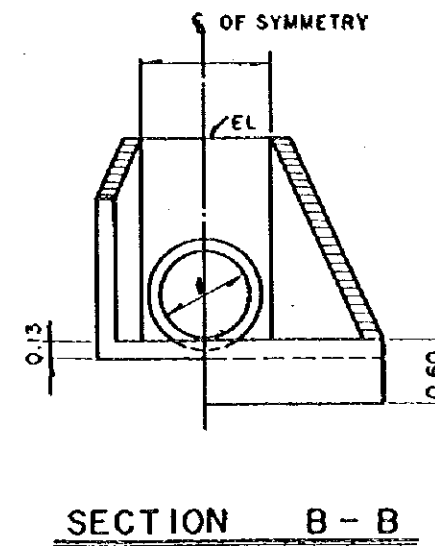
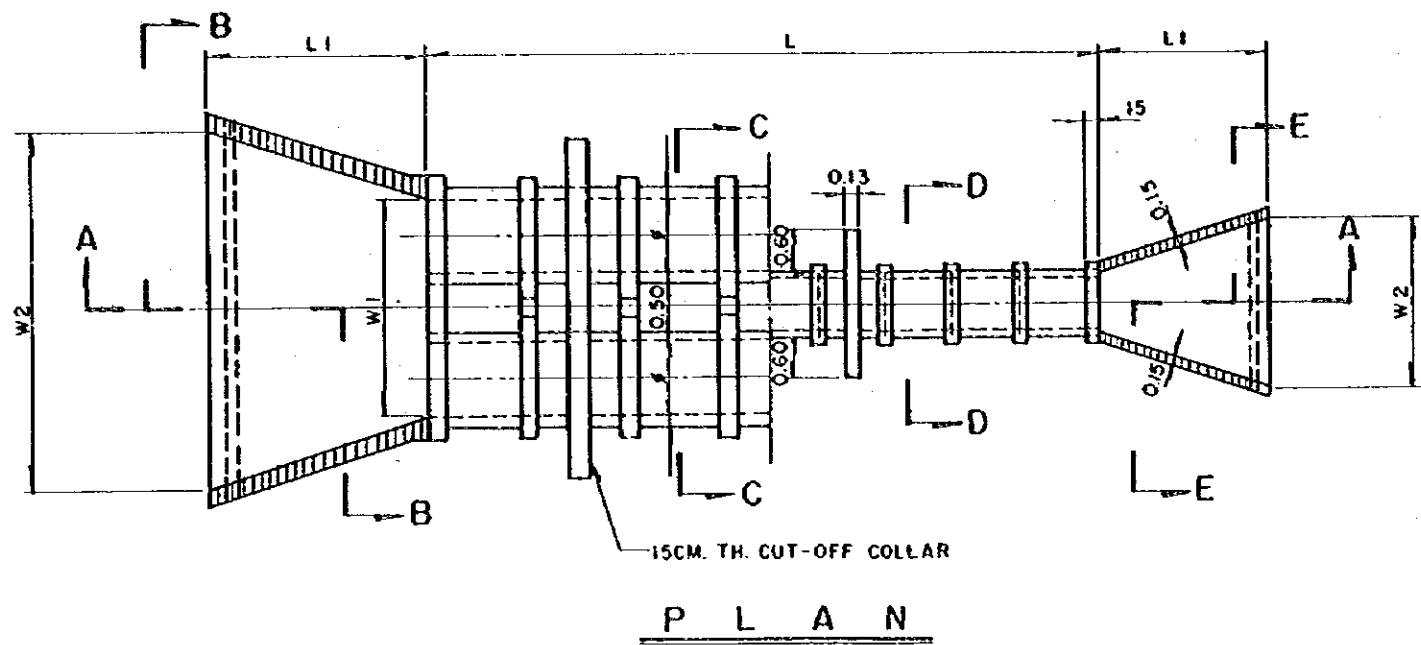
ARAB REPUBLIC OF EGYPT
MINISTRY OF LAND RECLAMATION

SOUTH HUSSINHA VALLEY
AGRICULTURAL DEVELOPMENT PROJECT

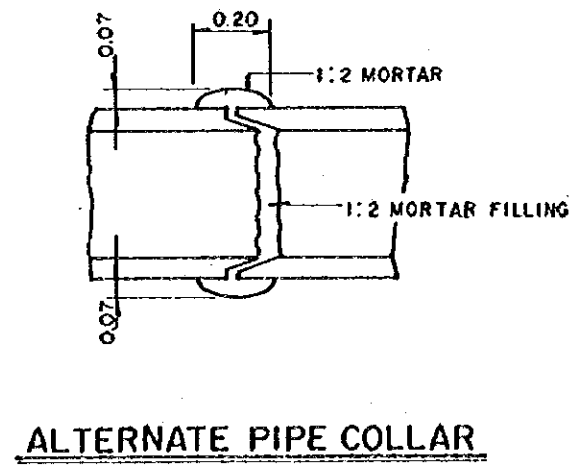
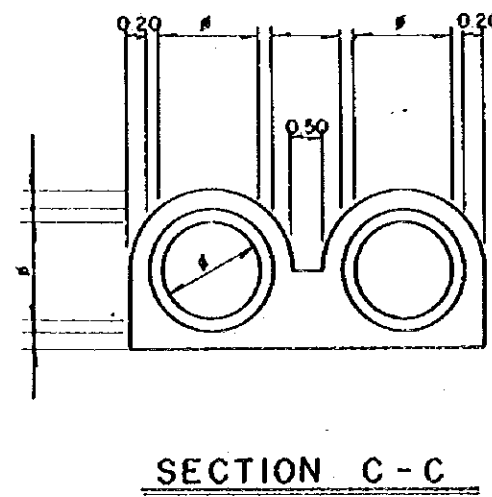
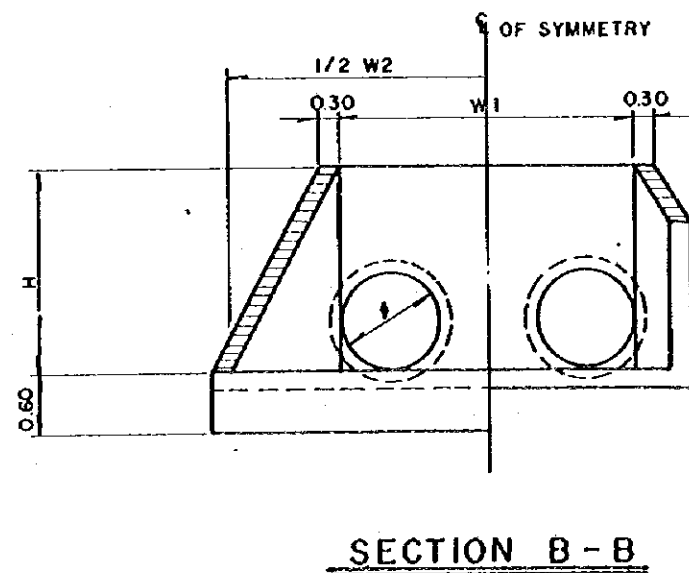
BOX CULVERT

DATE		DWG. NO.	16
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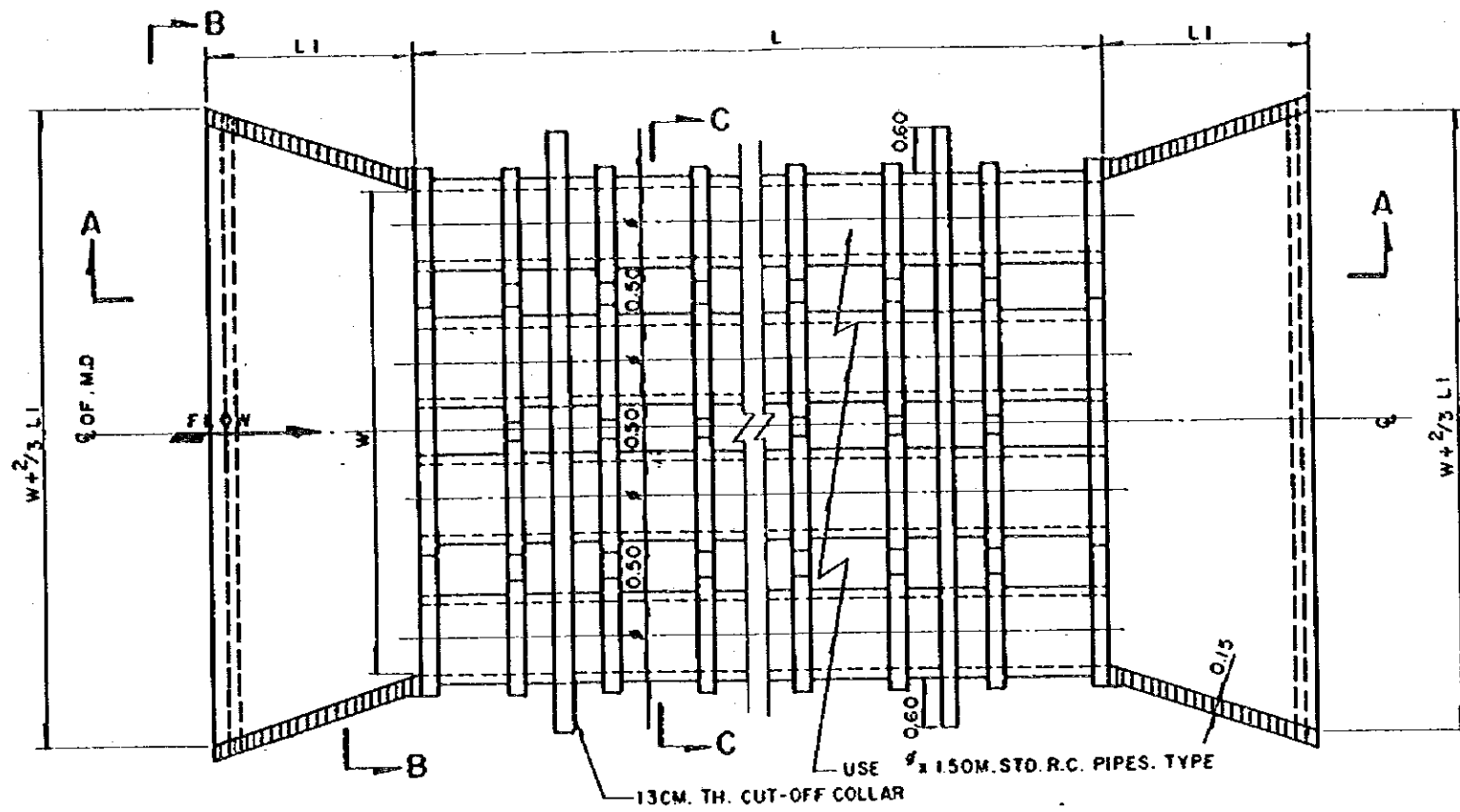
JAPAN INTERNATIONAL COOPERATION AGENCY



TYPE	Ø	W1	W2	H	L1	L	REMARKS
A-1	0.50	0.50	1.00	2.30	3.50	9.00	Ø0.50 x 1
A-2	"	"	"	"	"	12.00	"
B-1	1.35	3.20	5.00	3.00	5.00	9.00	Ø1.35 x 2
B-2	"	"	"	"	"	12.00	"
C	1.50	7.50	9.60	4.00	6.00	12.00	Ø1.50 x 4

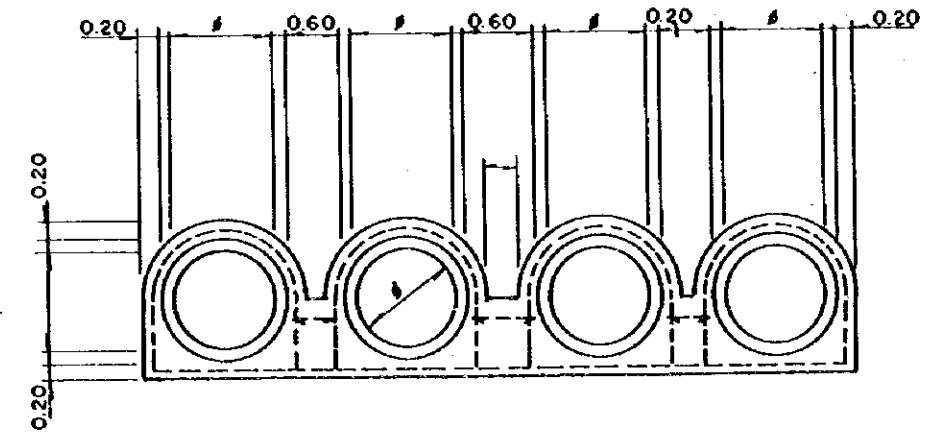


ARAB REPUBLIC OF EGYPT MINISTRY OF LAND RECLAMATION			
SOUTH HUSSINIA VALLEY AGRICULTURAL DEVELOPMENT PROJECT			
ROAD CROSSING, TYPE-A			
DATE		DWG. NO.	17
JAPAN INTERNATIONAL COOPERATION AGENCY			

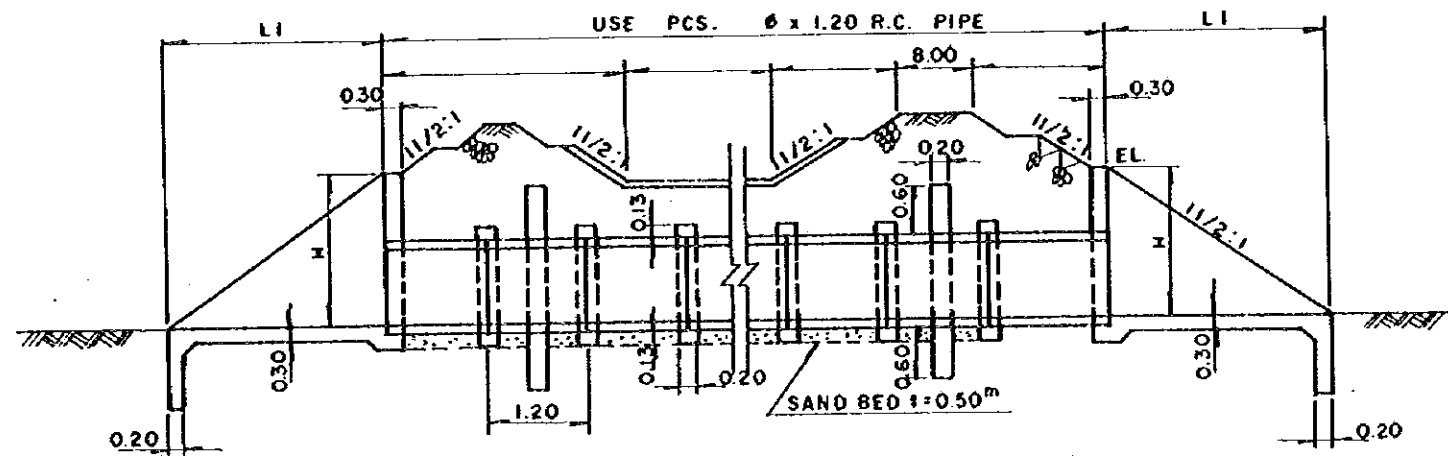


PLAN

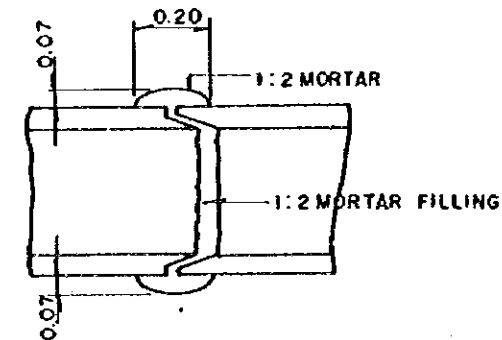
CROSS CANAL	NOS.	Ø	L	W	L ₁	H
M-2	1	Ø1.50x4	47.0 ^m	7.5 ^m	15.0 ^m	6.0 ^m
M-3	1	Ø1.50x4	44.0	7.5	15.0	6.0
SECONDARY (S)	3	Ø0.90x2	17.0	2.3	12.0	3.0



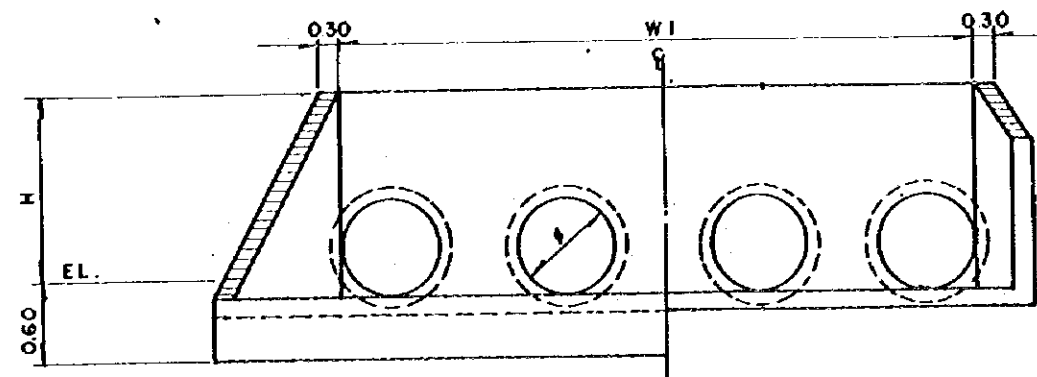
SECTION C-C



SECTION A-A

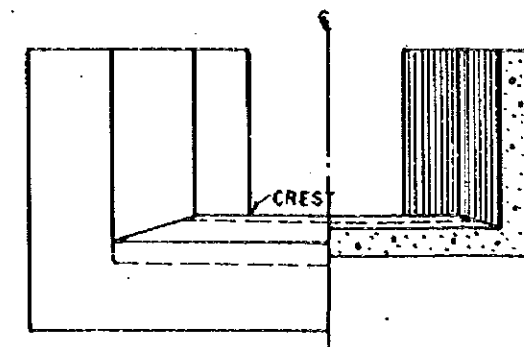
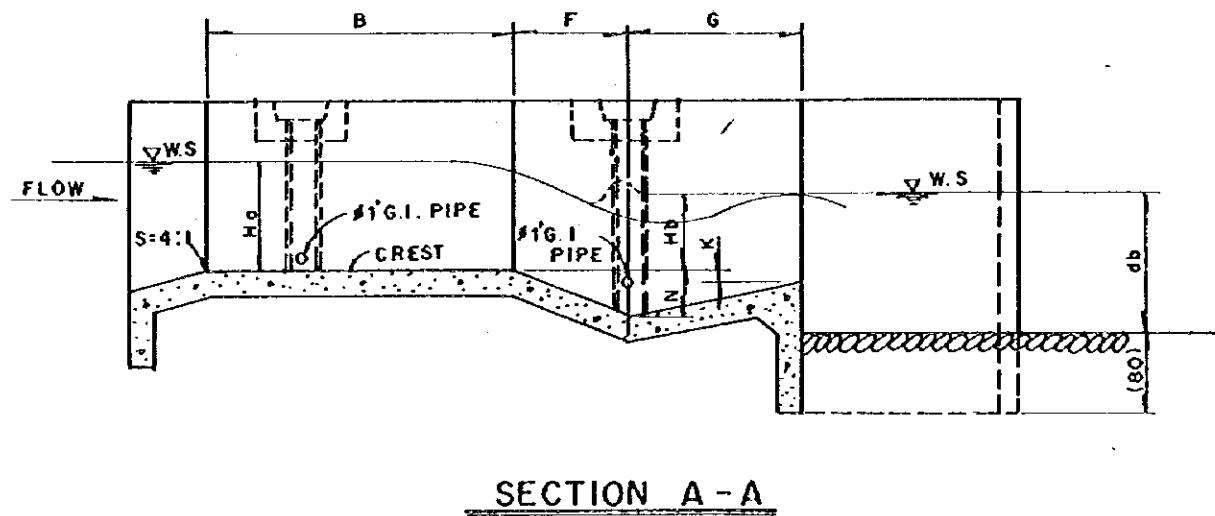
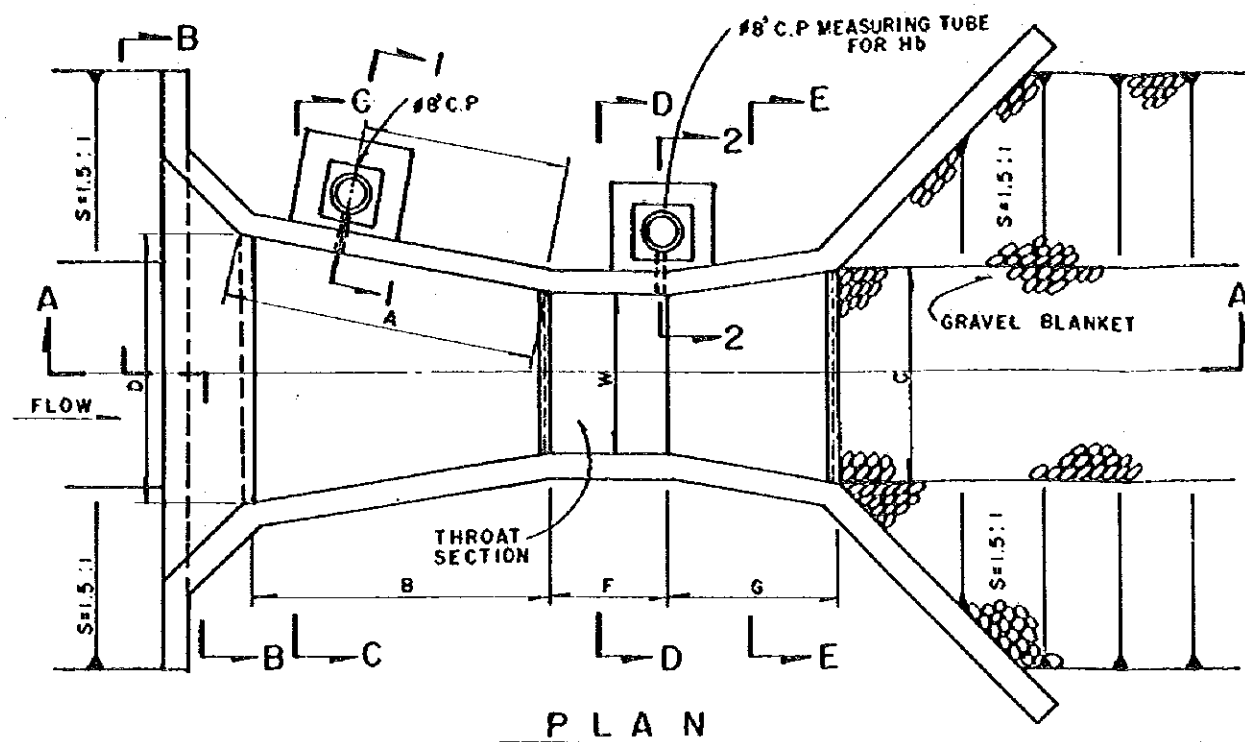


ALTERNATE PIPE COLLAR

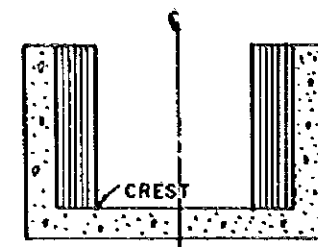


SECTION B-B

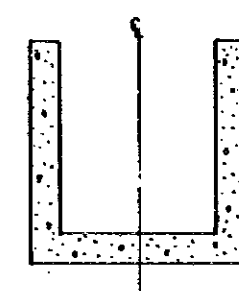
ARAB REPUBLIC OF EGYPT MINISTRY OF LAND RECLAMATION		
SOUTH HUSSINIA VALLEY AGRICULTURAL DEVELOPMENT PROJECT		
ROAD CROSSING, TYPE-B		
DATE	OWG. NO.	18
JAPAN INTERNATIONAL COOPERATION AGENCY		



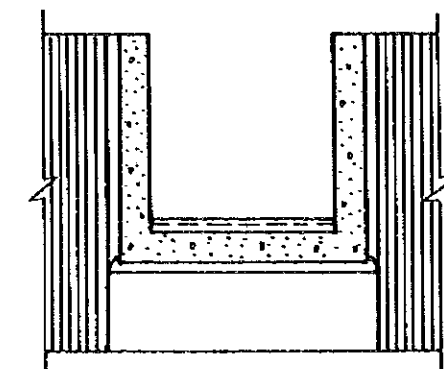
SECTION B-B



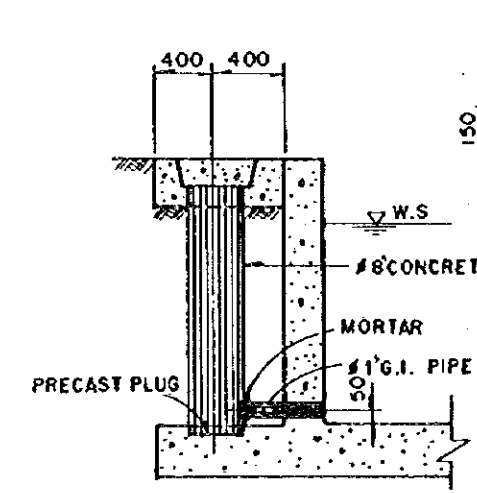
SECTION C-C



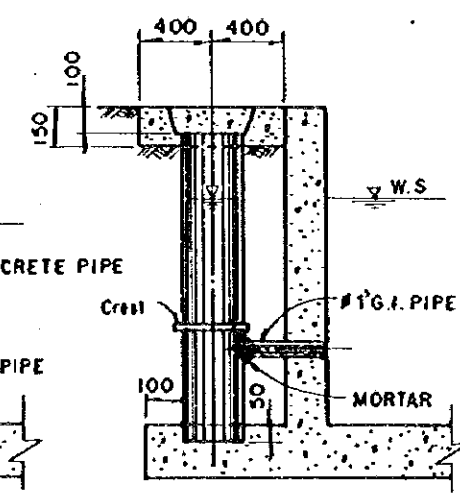
SECTION D-D



SECTION E-E



SECTION 1-1



SECTION 2-2

THROAT WIDTH (W)		PARSHALL FLUME DIMENSIONS IN CENTIMETERS								
FEET	CENTIMETER	A	B	C	D	F	G	K	N	T
8	244	244	239	274	340	61	91	8	23	7
10	305	435	427	366	473	91	183	15	34	28
12	366	498	488	447	561	91	244	15	34	28

ARAB REPUBLIC OF EGYPT
 MINISTRY OF LAND RECLAMATION
 SOUTH HUSSINIA VALLEY
 AGRICULTURAL DEVELOPMENT PROJECT

PARSHALL FLUME

DATE	OWG. NO.	19
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