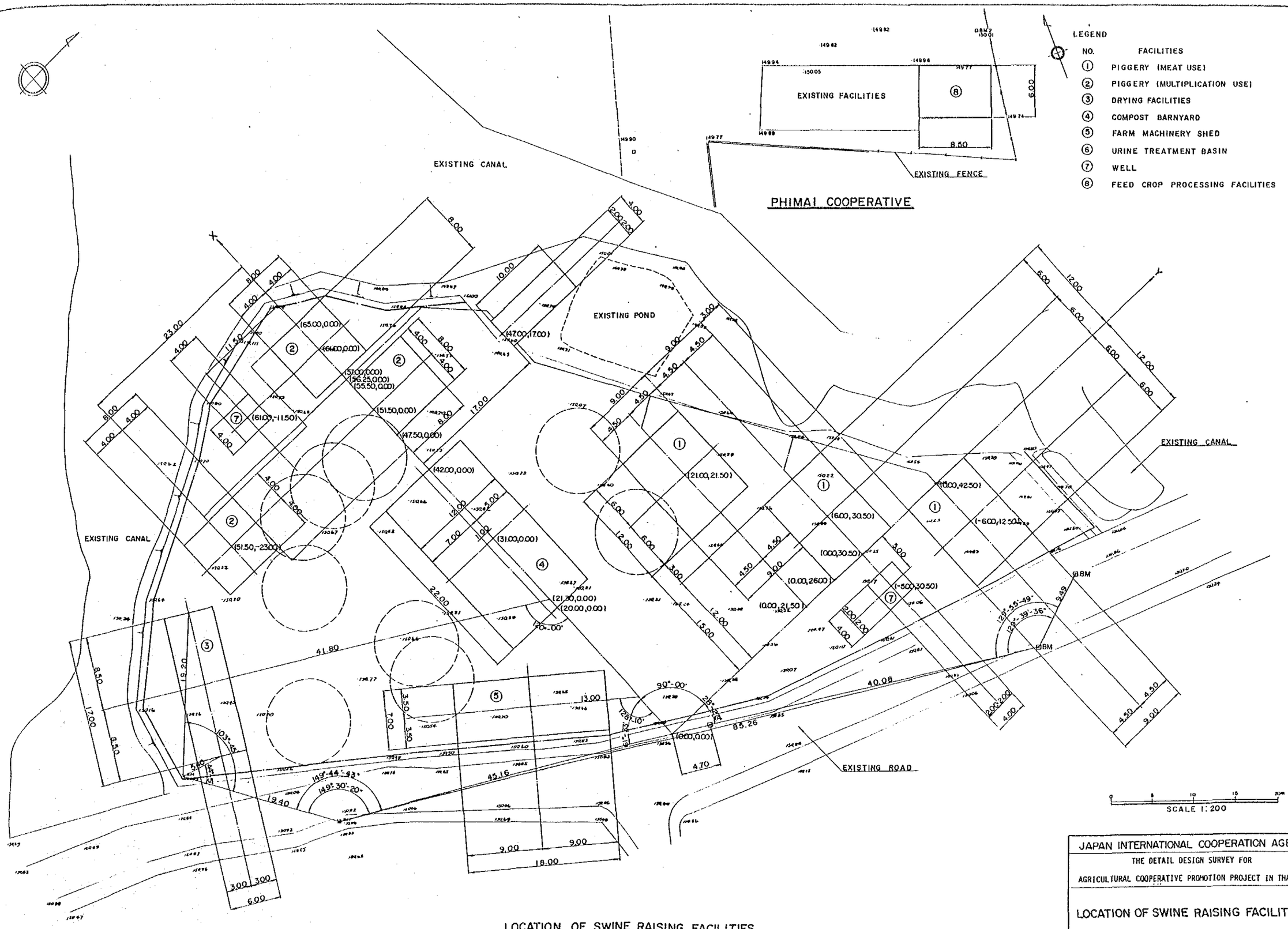
DRAWINGS

D R A W I N G L I S T

No.	T I T L E
1	LOCATION OF SWINE RAISING FACILITIES
2	PLAN OF EARTH WORKS (SWINE RAISING FACILITIES)
3	CROSS SECTION (- do -)
4	PLAN OF PIGGERY (MEAT USE) (- do -)
5	PLAN OF PIGGERY (MULTIPICATION USE) AND DRYING FACILITIES (- do -)
6	PLAN OF FEED CROP PROCESSING FACILITIES (- do -)
7	PLAN OF COMPOST BARNYARD (- do -)
8	PLAN OF MACHINERY SHED (- do -)
9	PLAN OF ELECTRIC FACILITIES (- do -)
10	PLAN OF URINE TREATMENT BASIN (- do -)
11	PLAN OF WELL (- d0 -)
12	LOCATION OF IRRIGATION AREA
13	PLAN OF FARM ROAD (1)
14	- do - (2)
15	FARM ROAD CROSS SECTION
16	PLAN OF MAIN CANAL
17	LATERAL CANAL LONGITUDINAL SECTION
18	PLAN OF WATER DIVISION (1)
19	- do - (2)
20	PLAN OF POND
21	PLAN OF WATER SUPPLY FACILITIES
22	PLAN OF PUMP STATION (1)
23	- do - (2)
24	PLAN OF PIPE WORKS
25	PLAN OF REGURATING TANK
26	PLAN OF BORROW AREA
27	PLAN OF SPOIL AREA
28	PLAN OF ELECTRIC FACILITIES



LEGEND

NO.	FACILITIES
①	PIGGERY (MEAT USE)
②	PIGGERY (MULTIPLICATION USE)
③	DRYING FACILITIES
④	COMPOST BARNYARD
⑤	FARM MACHINERY SHED
⑥	URINE TREATMENT BASIN
⑦	WELL
⑧	FEED CROP PROCESSING FACILITIES

LOCATION OF SWINE RAISING FACILITIES

JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR

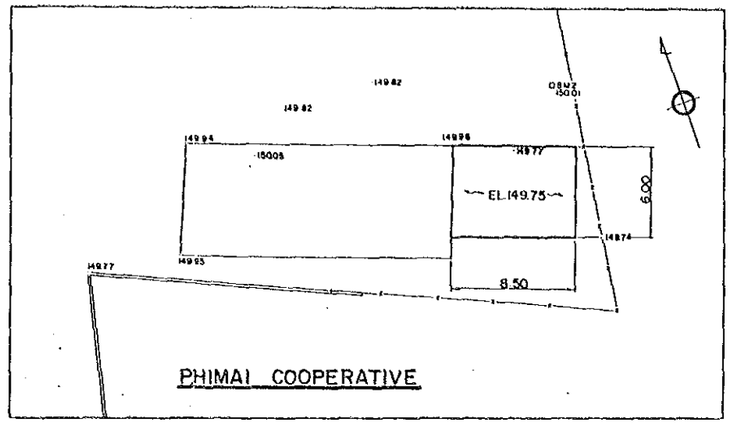
AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

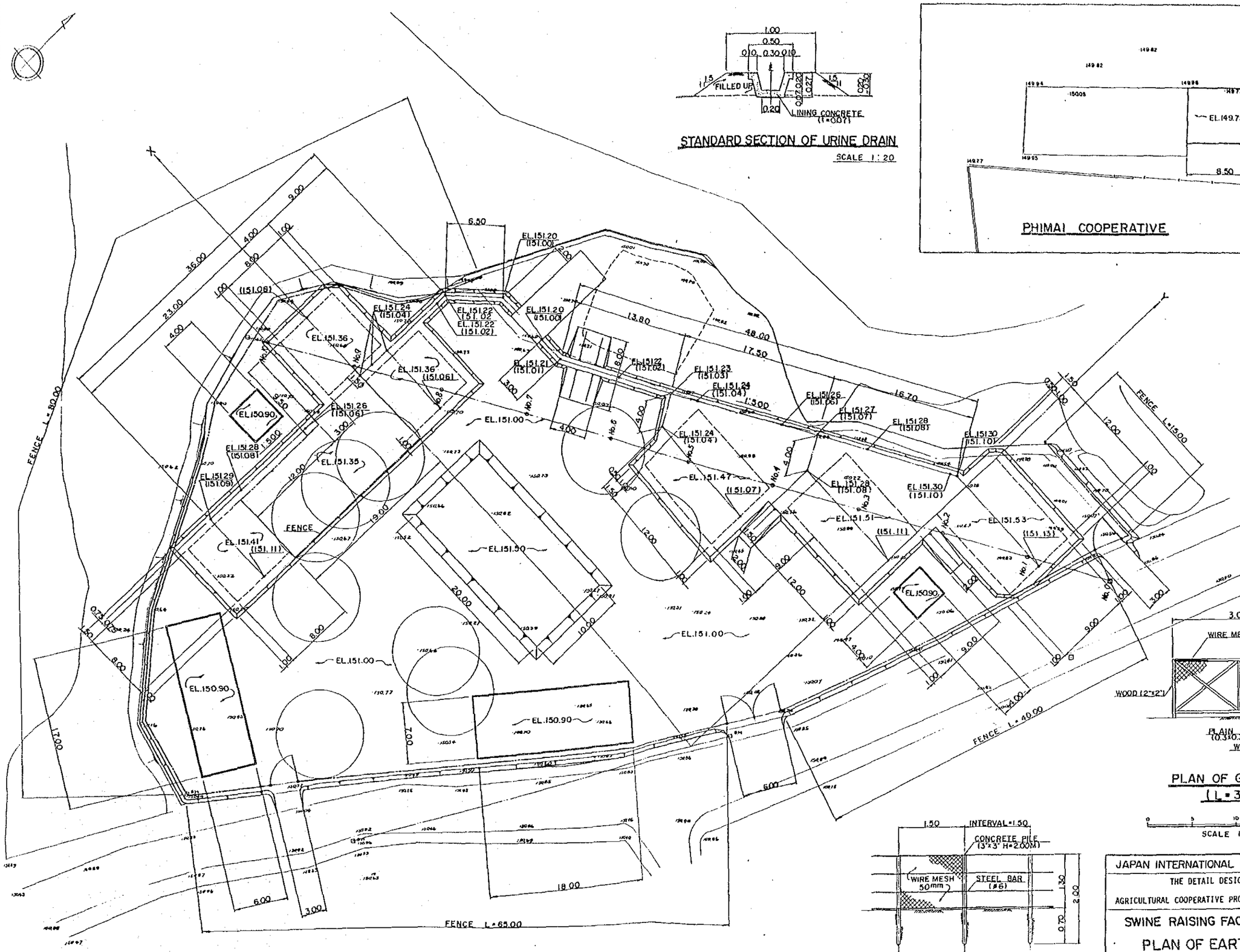
LOCATION OF SWINE RAISING FACILITIES

PREPARED BY	DRAWING NO.
CHECKED BY	1

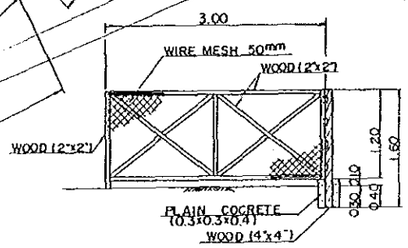
STANDARD SECTION OF URINE DRAIN

SCALE 1 : 20



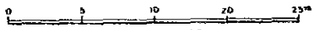


PLAN OF EARTH WORKS



PLAN OF GATE FENCE
(L=3.0m)

DETAIL OF FENCE



SCALE 1 : 200

JAPAN INTERNATIONAL COOPERATION AGENCY

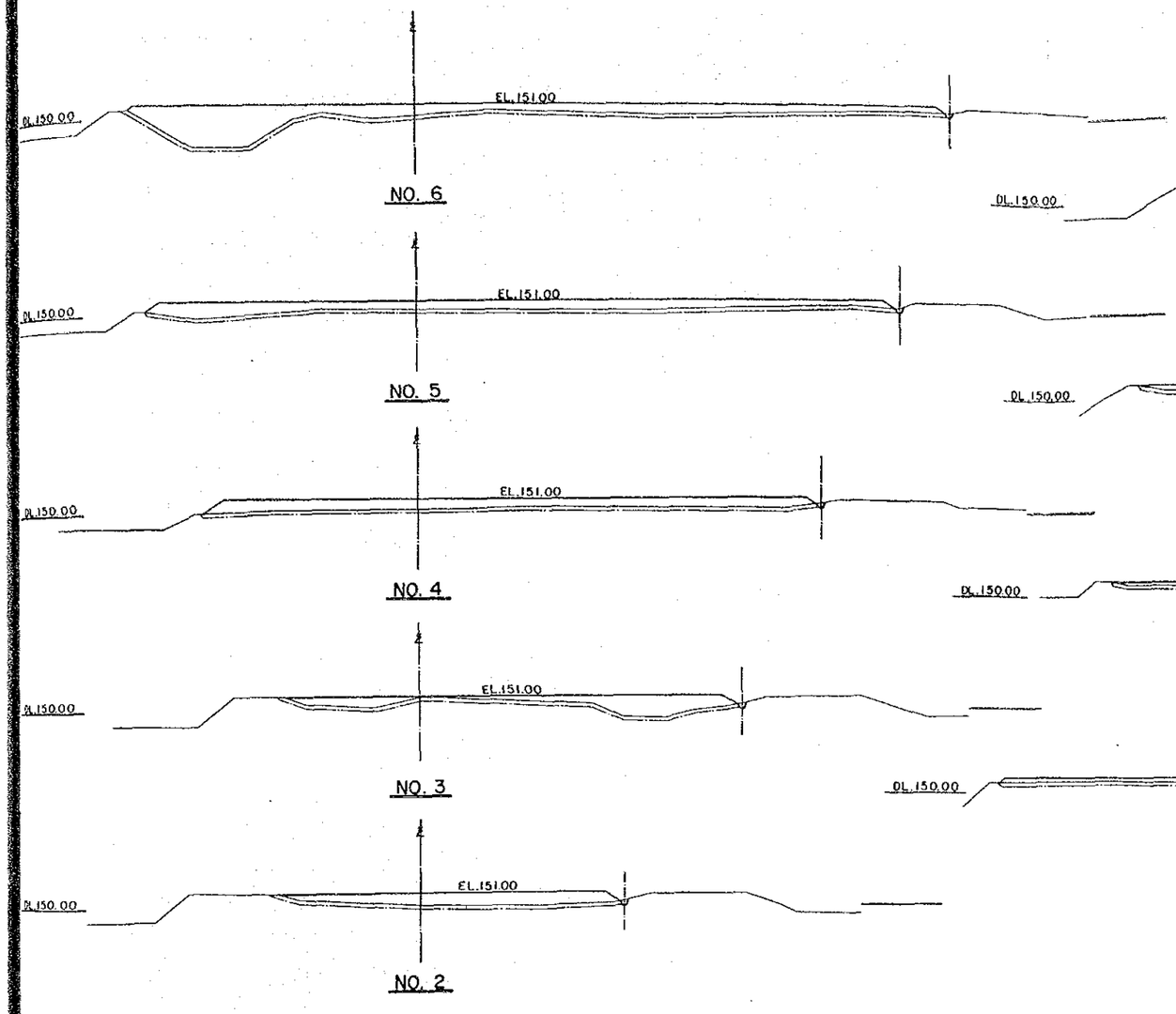
THE DETAIL DESIGN SURVEY FOR

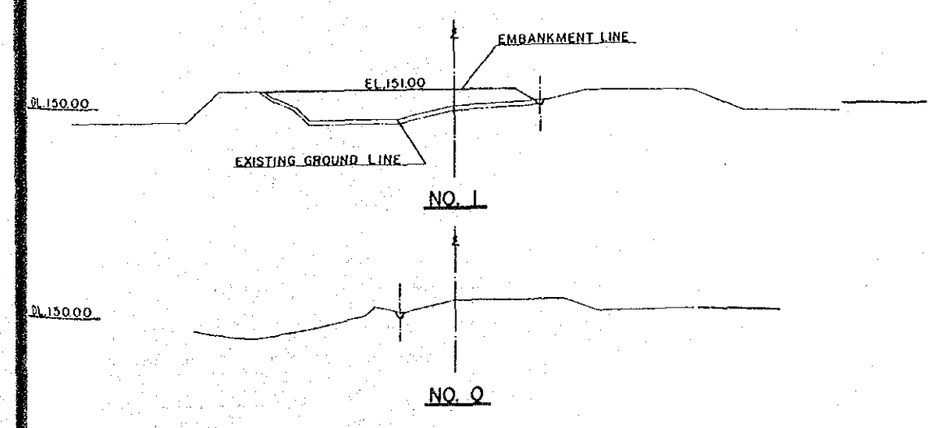
AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

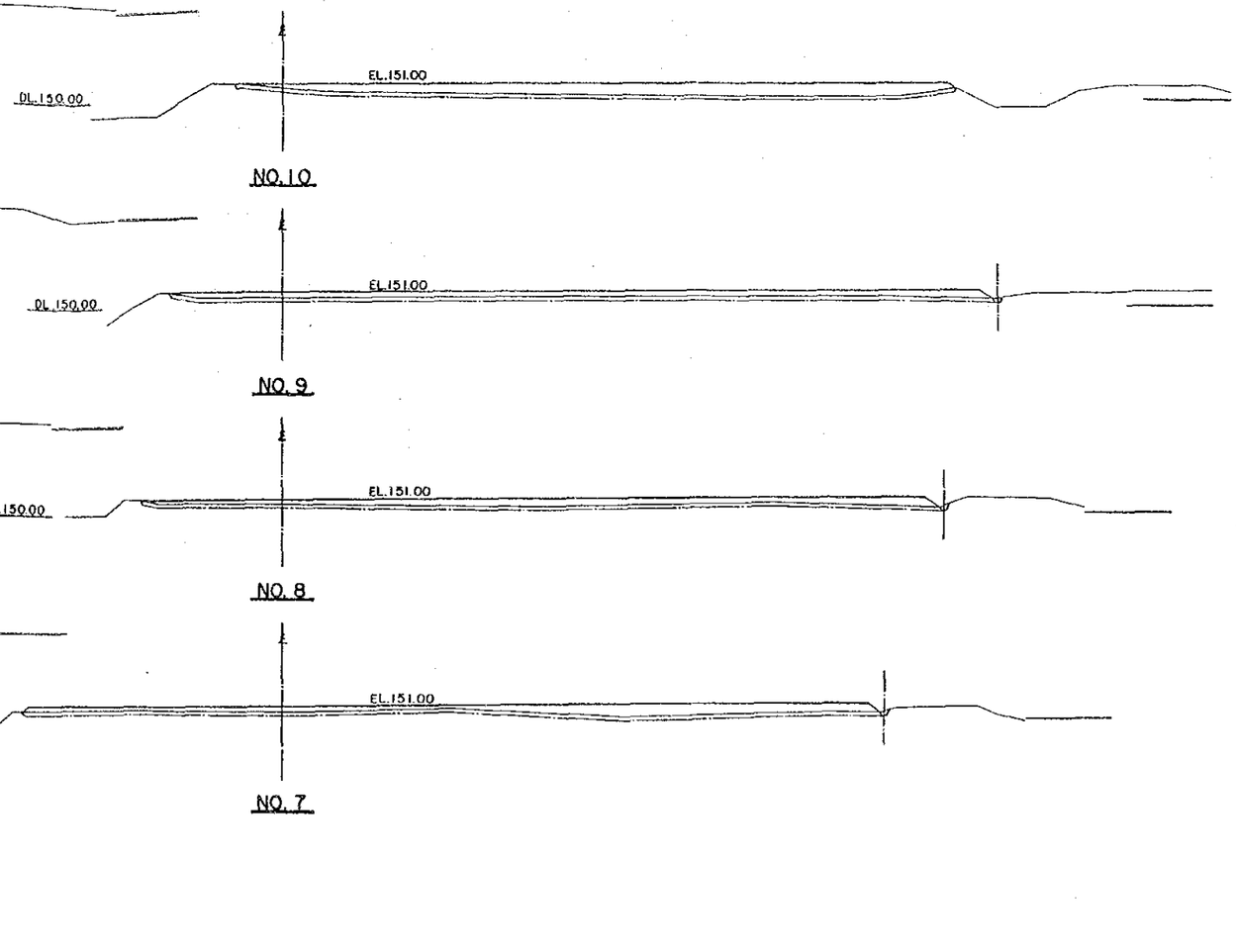
SWINE RAISING FACILITIES

PLAN OF EARTH WORKS

PREPARED BY	DRAWING NO.
CHECKED BY	2

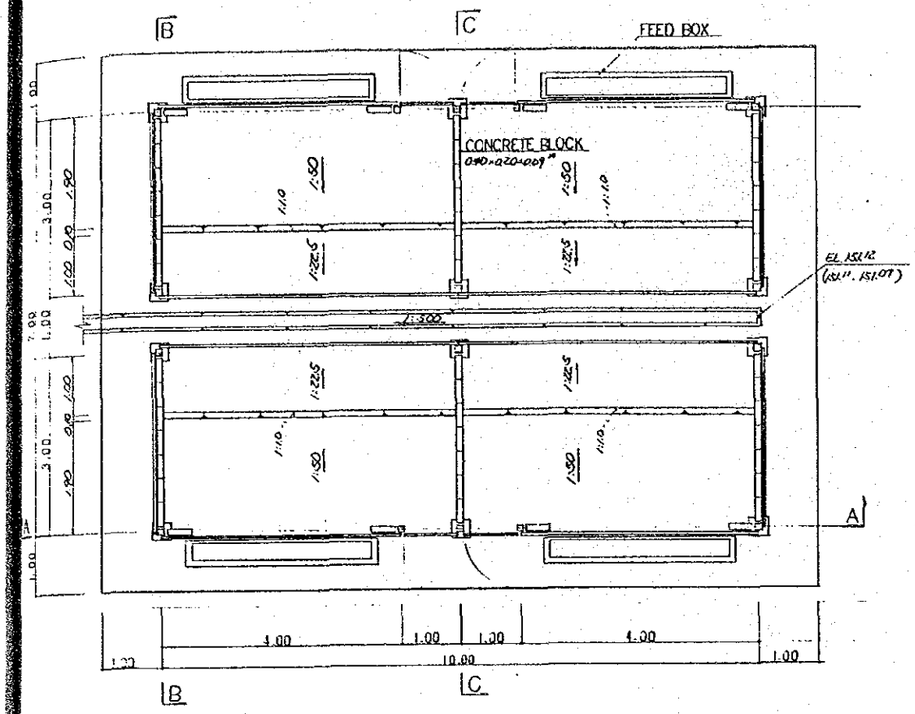




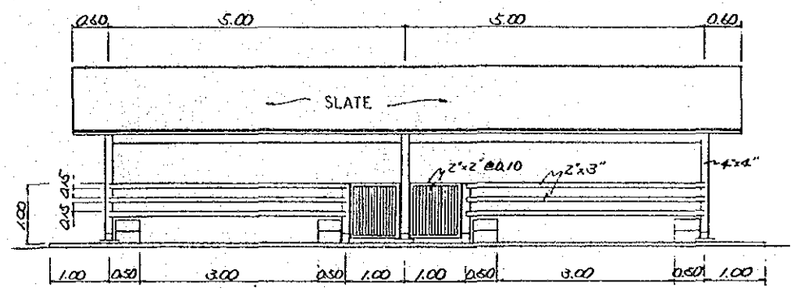


NOTE : 1. CENTER LINE IS SHOWN IN DRAWING NO.2
2. EARTH FOUNDATION FOR ANY FACILITIES IS SHOWN IN DRAWING NO.2
3. ——— SHOWS EXCAVATION LINE OF TOP SOIL.

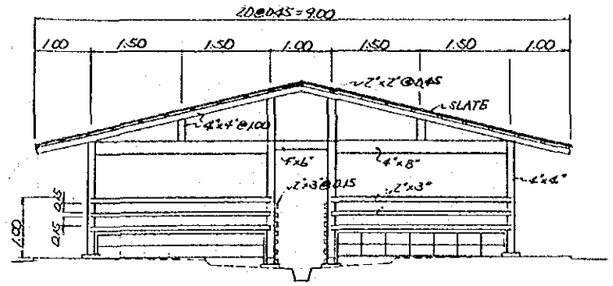
JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND	
SWINE RAISING FACILITIES CROSS SECTION	
PREPARED BY	DRAWING NO. 3
CHECKED BY	



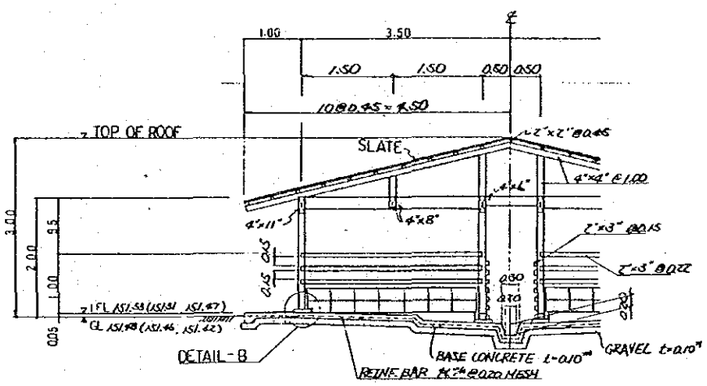
PLAN
SCALE 1:50



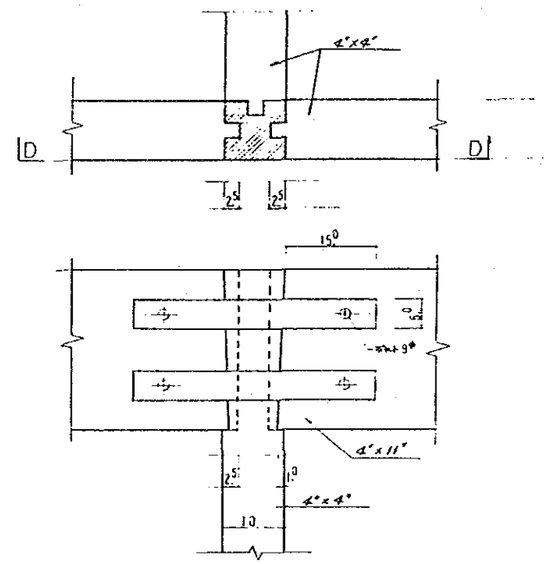
A - A
SCALE 1:50



B - B
SCALE 1:50

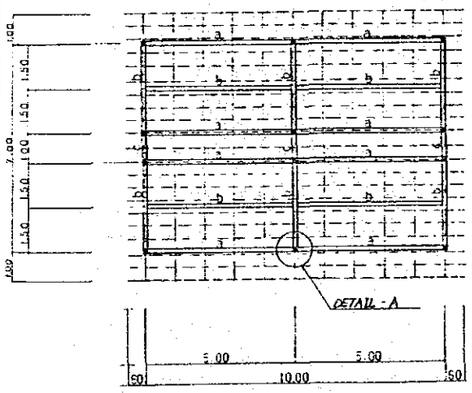


C - C
SCALE 1:50



D - D

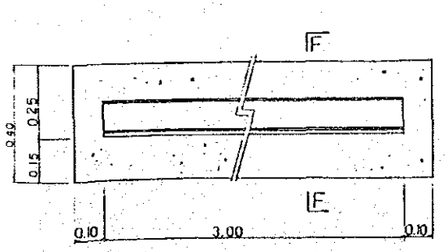
DETAIL - A
SCALE 1:5



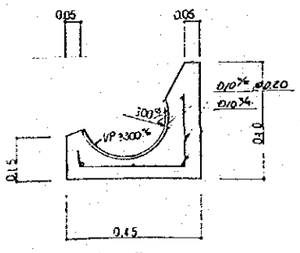
PLAN OF ROOF
SCALE 1:100

LEGEND

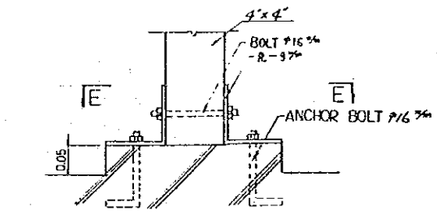
a	4" x 4"
b	4" x 11"
c	4" x 8"
d	4" x 5"
	4" x 4" @1.00
	2" x 2" @.45

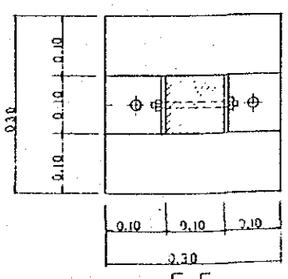


FEED BOX SCALE 1:10



F - F



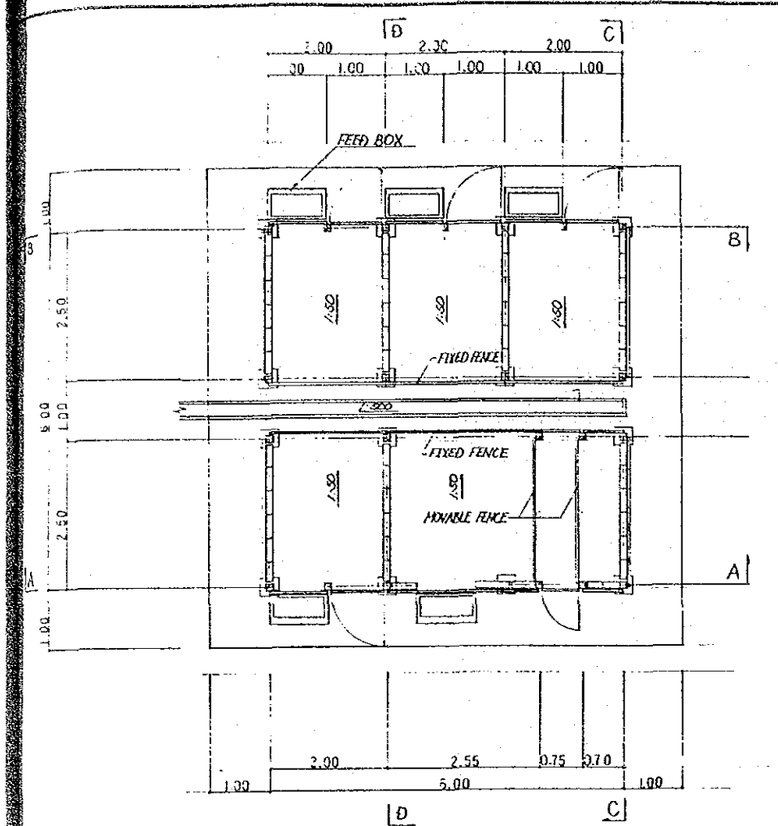


E-E

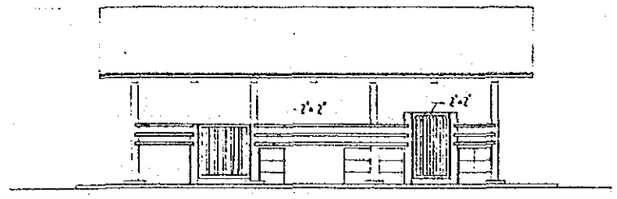
DETAIL - B
SCALE 1:5

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL : ELEVATION

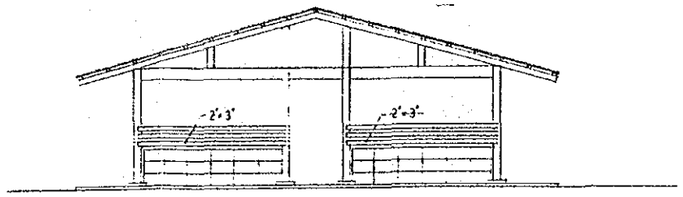
JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND	
SWINE RAISING FACILITIES PLAN OF PIGGERY (MEAT USE)	
PREPARED BY	DRAWING NO. 4
CHECKED BY	



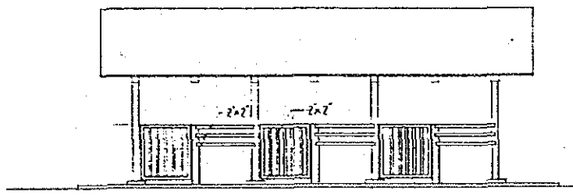
PLAN OF PIGGERY(MALTIPICATION USE)
SCALE 1:50



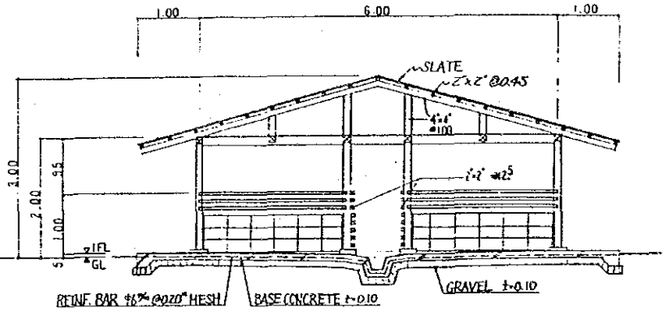
A - A
SCALE 1:50



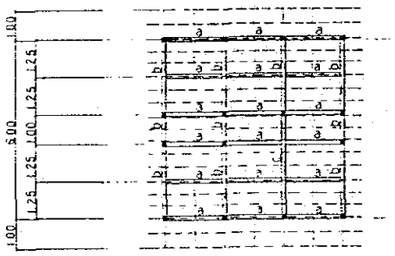
C - C
SCALE 1:50



B - B
SCALE 1:50

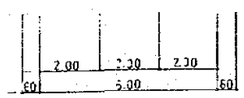


D - D
SCALE 1:50

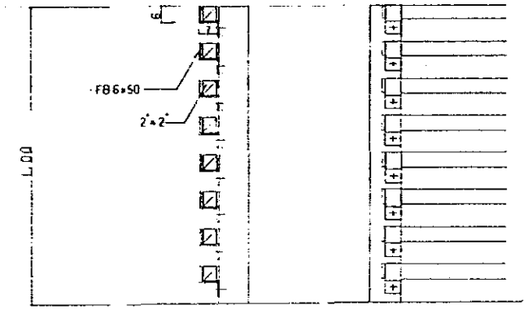


LEGEND

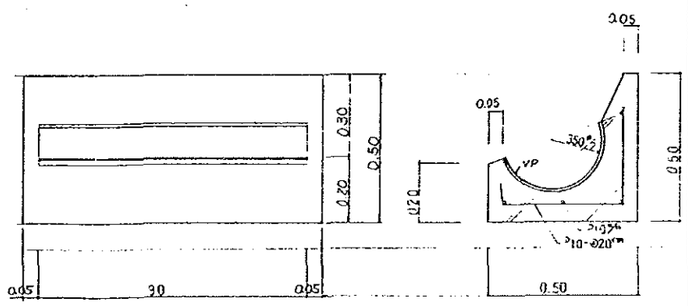
a	4" x 4"
b	4" x 5"
c	4" x 6"
	4" x 7"
	4" x 4" @100
	2" x 2" @45



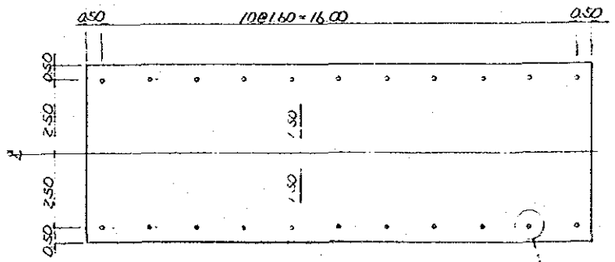
ROOF OF PIGGERY
SCALE 1:100



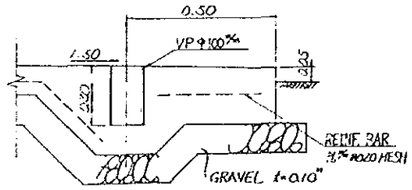
MOVABLE FENCE
SCALE 1:10



FEED BOX
SCALE 1:10



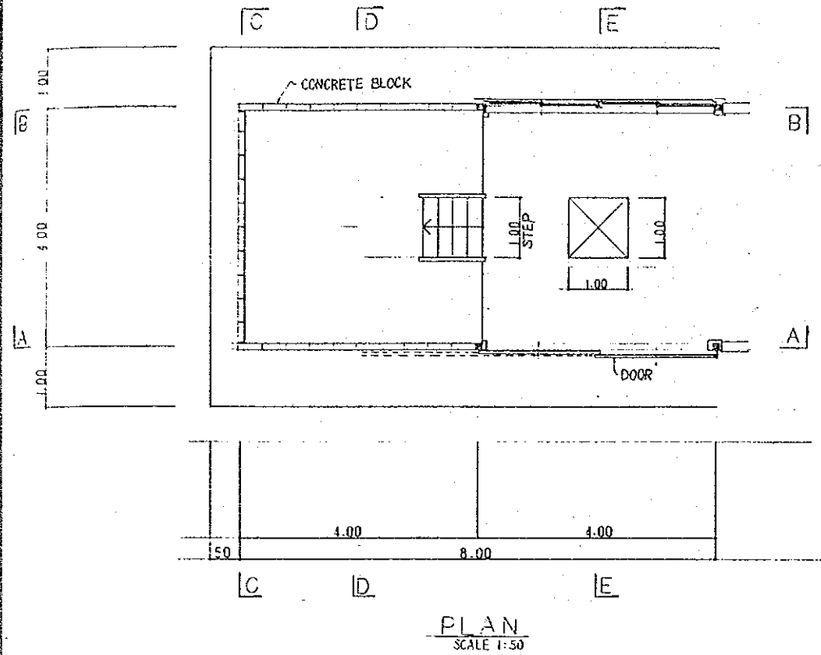
PLAN OF DRYING FACILITIES
SCALE 1:100



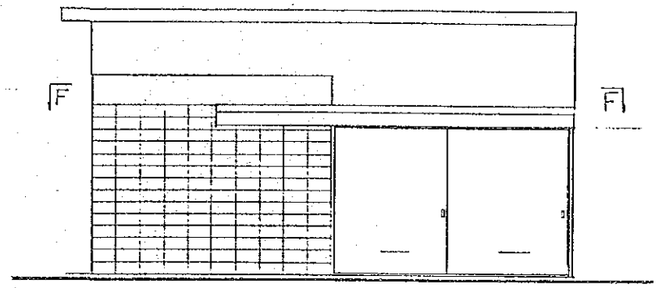
DETAIL - A
SCALE 20

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL : ELEVATION

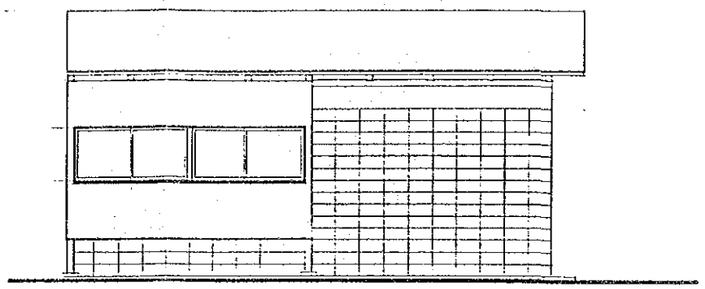
JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND	
SWINE RAISING FACILITIES PLAN OF PIGGERY (MULTIPLICATION USE) AND DRYING FACILITIES	
PREPARED BY	DRAWING NO. 5
CHECKED BY	



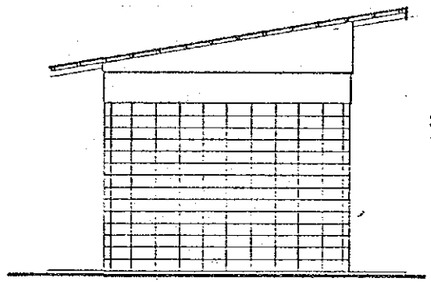
PLAN
SCALE 1:50



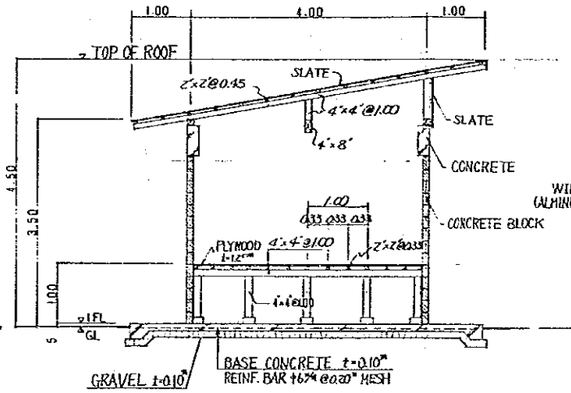
A - A
SCALE 1:50



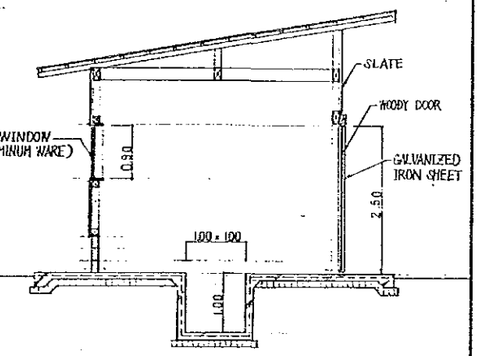
B - B
SCALE 1:50



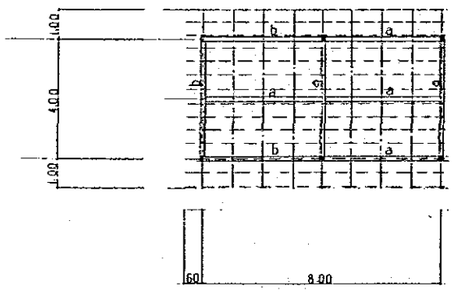
C - C
SCALE 1:50



D - D
SCALE 1:50



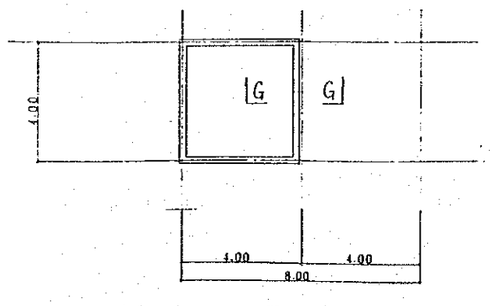
E - E
SCALE 1:50



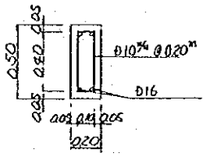
ROOF
SCALE 1:100

LEGEND

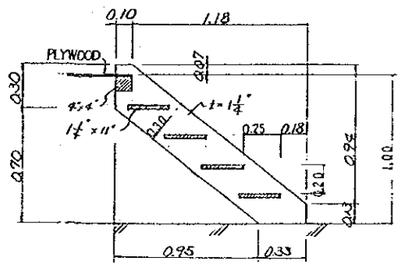
- 4" × 4"
- a — 4" × 8"
- b — 4" × 4"
- 4" × 4" @ 1.00m
- 2" × 2" @ 0.45m



F - F
SCALE 1:100



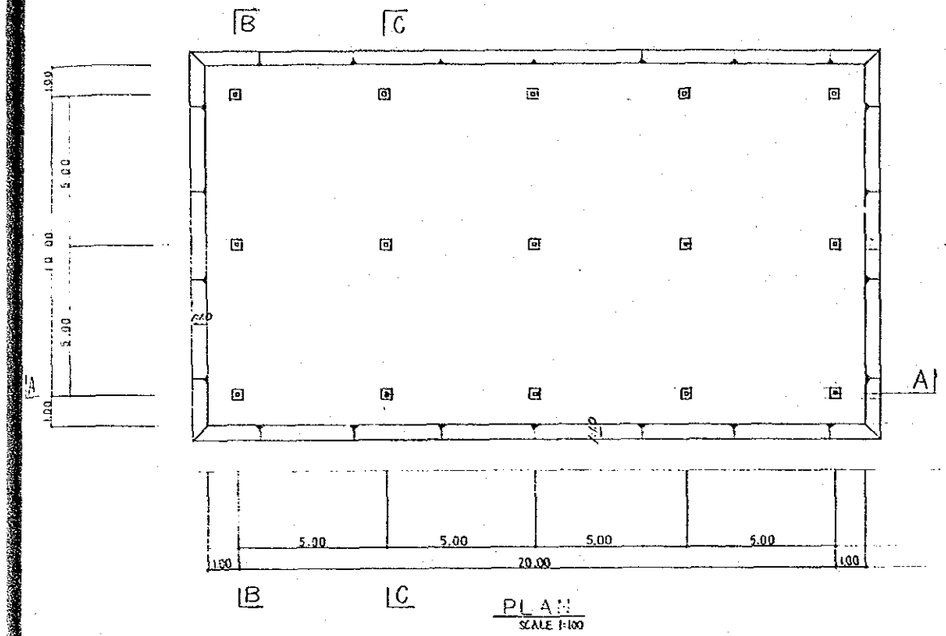
G - G
SCALE 1:20



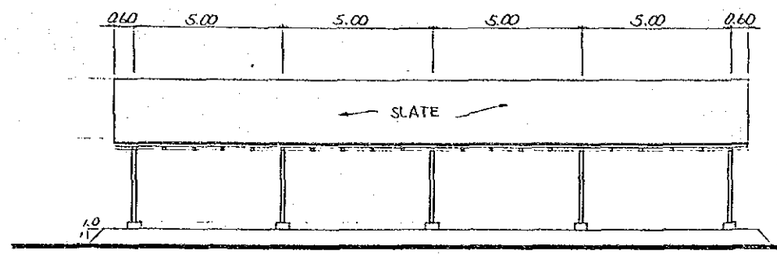
STEP
SCALE 1:20

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL : ELEVATION

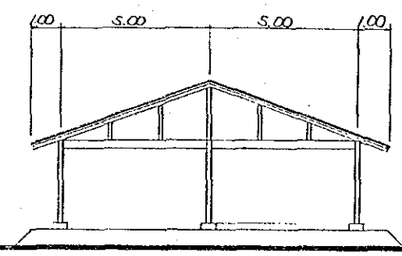
JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND	
SWINE RAISING FACILITIES PLAN OF FEED CROP PROCESSING FACILITIES	
PREPARED BY	DRAWING NO. 6
CHECKED BY	



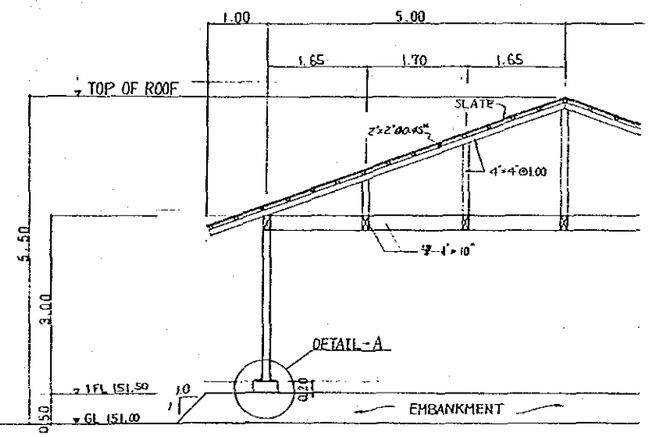
PLAN
SCALE 1:100



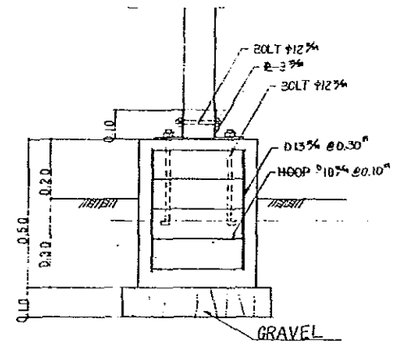
A - A
SCALE 1:100

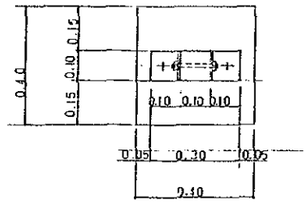


B - B
SCALE 1:100

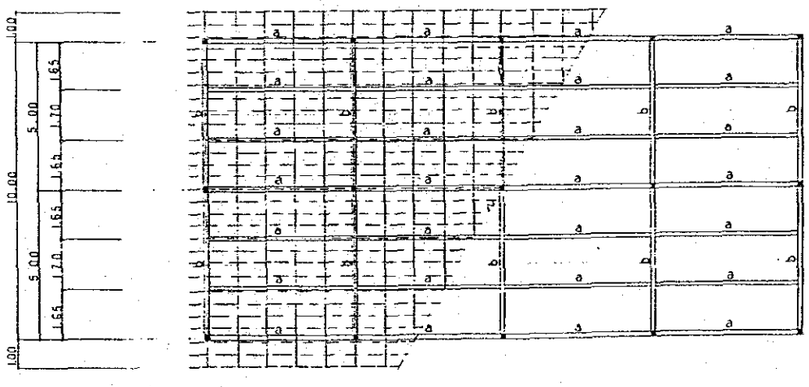


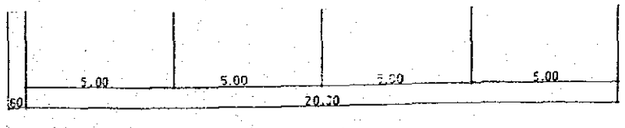
C - C
SCALE 1:100





DETAIL - A
SCALE 1:10





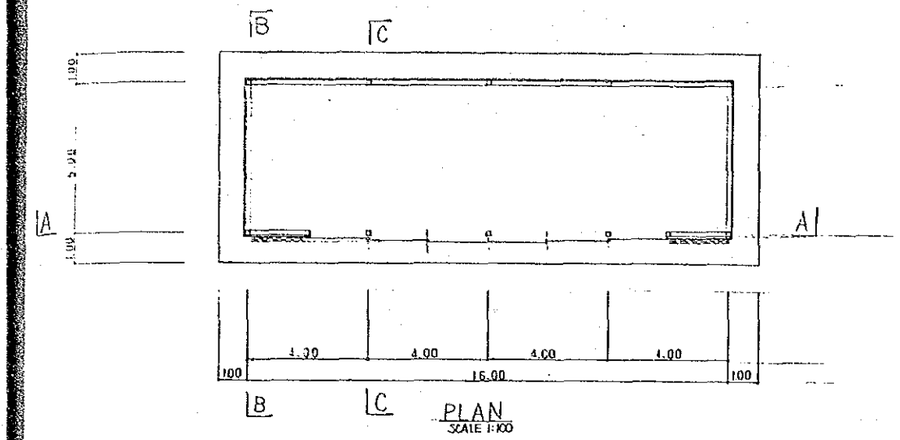
ROOF
SCALE 1:200

LEGEND

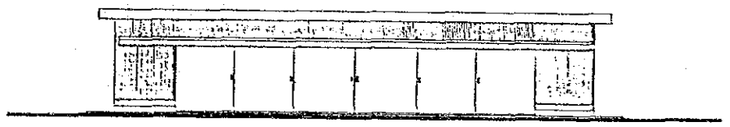
■	4" × 4"
a	4" × 10"
b	4" × 10"
———	4" × 4" @1.00m
- - - -	2" × 2" @0.45m

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL : ELEVATION

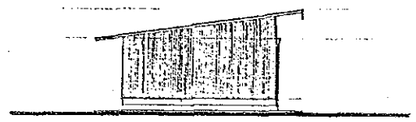
JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND	
SWINE RAISING FACILITIES PLAN OF COMPOST BARNYARD	
PREPARED BY	DRAWING NO.
CHECKED BY	7



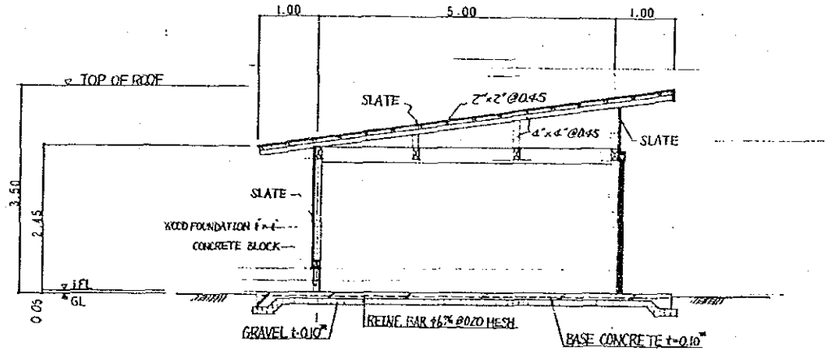
PLAN
SCALE 1:100



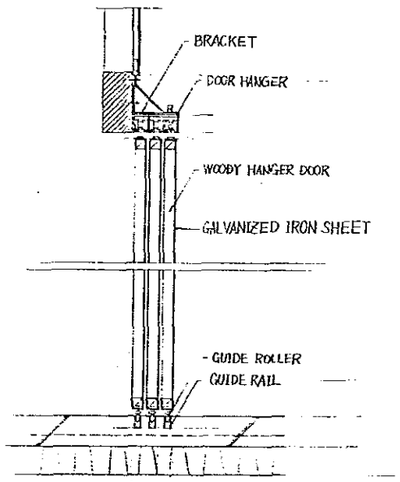
A - A
SCALE 1:100



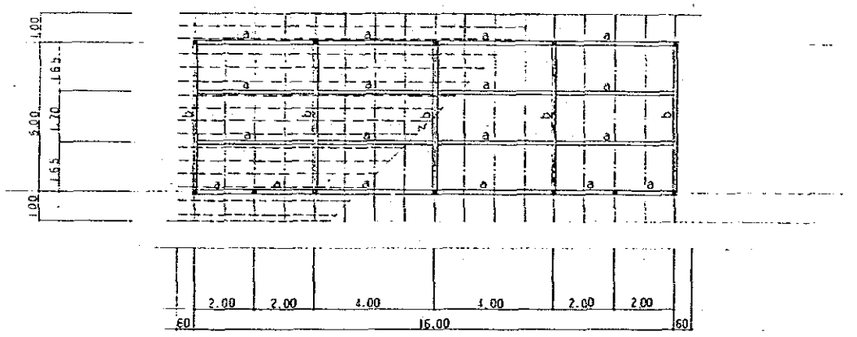
B - B
SCALE 1:100



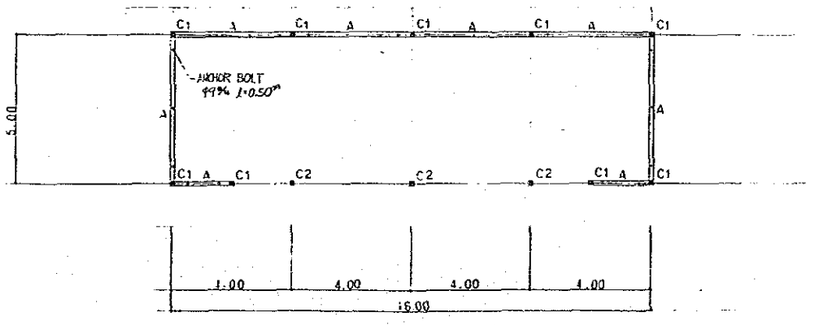
C - C
SCALE 1:50



DETAIL OF DOOR
SCALE 1:10



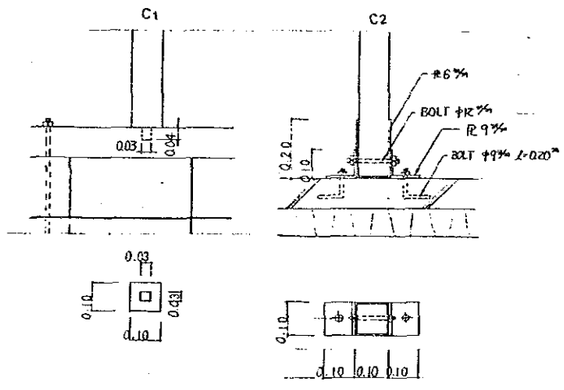
ROOF
SCALE 1:100



WOOD FOUNDATION
SCALE 1:100

LEGEND

C1	4" x 4"	a	4" x 8"
C2	4" x 4"	b	4" x 9"
A	4" x 4"		4" x 4" @ 1.00
			2" x 2" @ 0.45

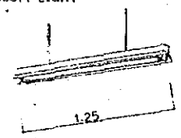


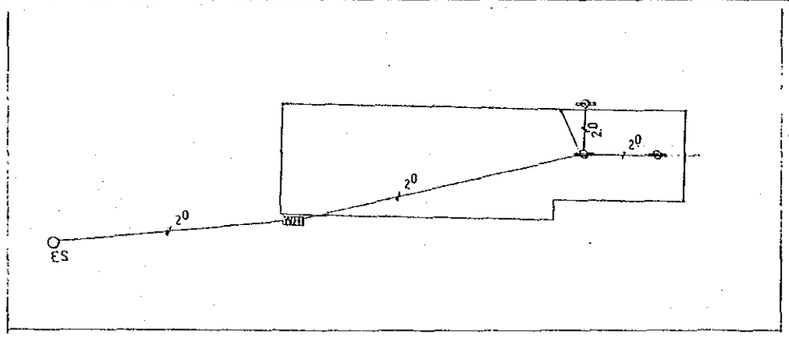
DETAIL OF WOOD FOUNDATION
SCALE 1:10

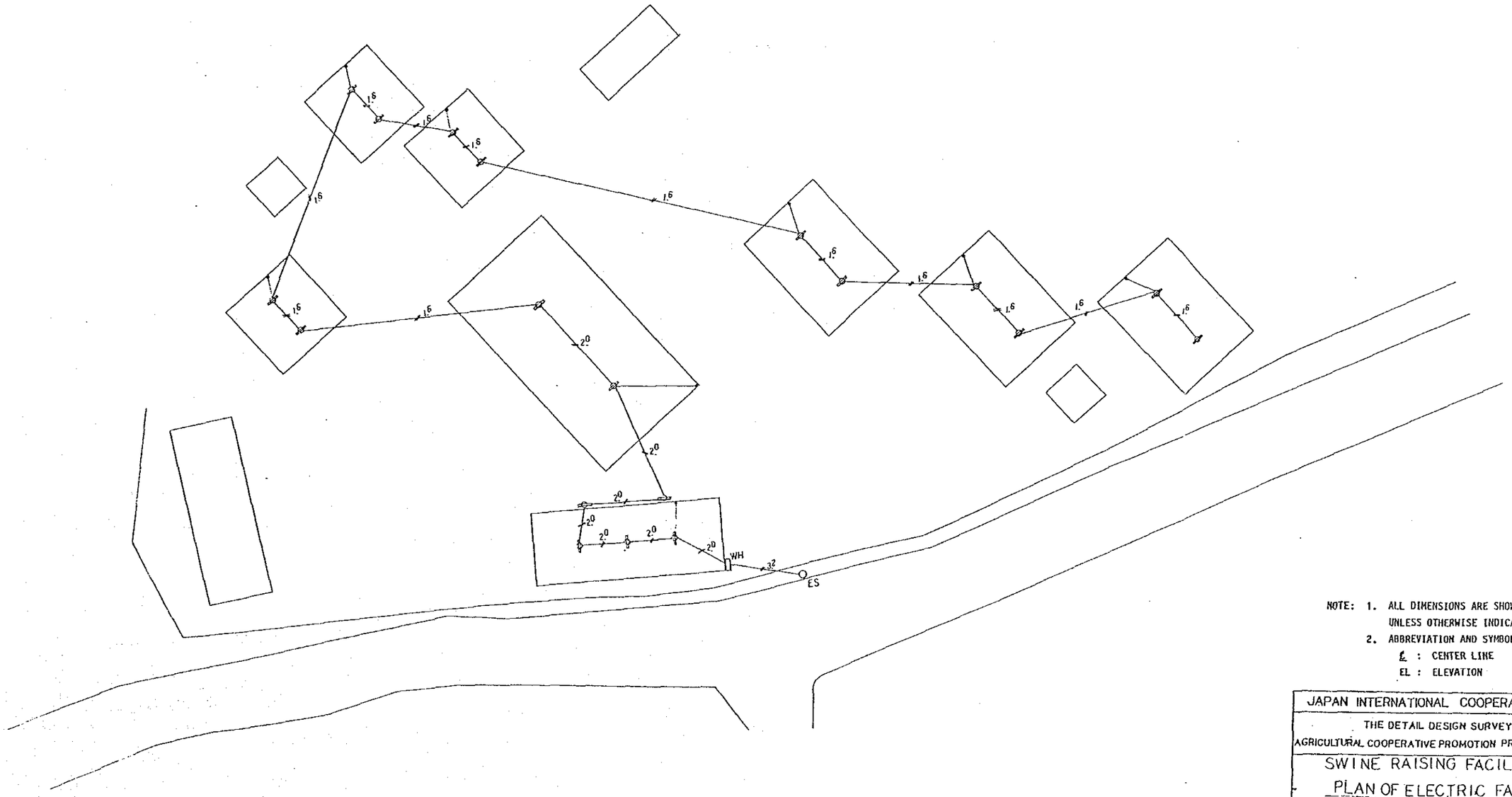
NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL : ELEVATION

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND	
SWINE RAISING FACILITIES — PLAN OF MACHINERY SHED	
PREPARED BY	DRAWING NO. 8
CHECKED BY	

40W ROOM LIGHT







NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
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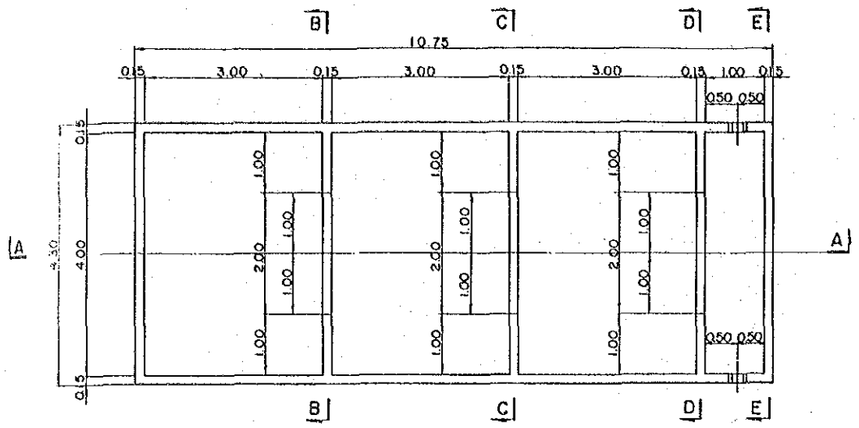
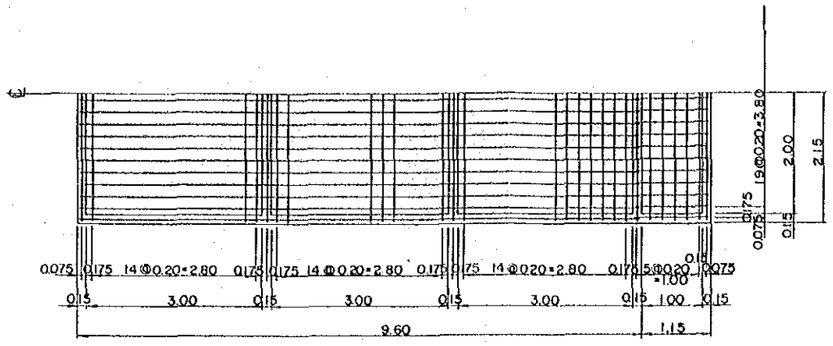
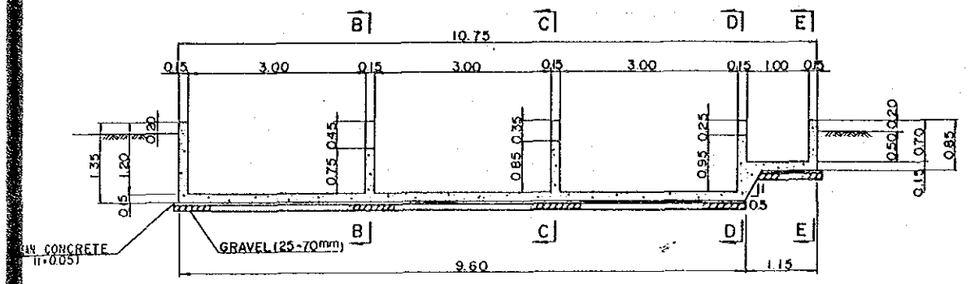
JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND	
SWINE RAISING FACILITIES PLAN OF ELECTRIC FACILITIES	
PREPARED BY	DRAWING NO.
CHECKED BY	9



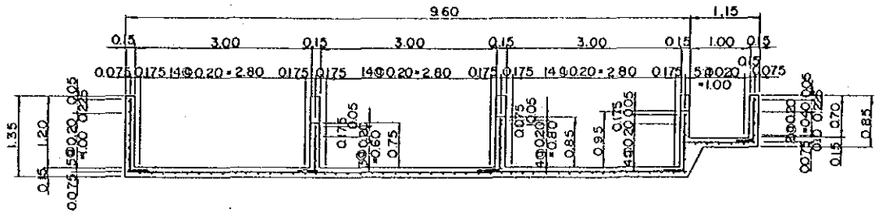
PLANE OF URINE TREATMENT BASIN



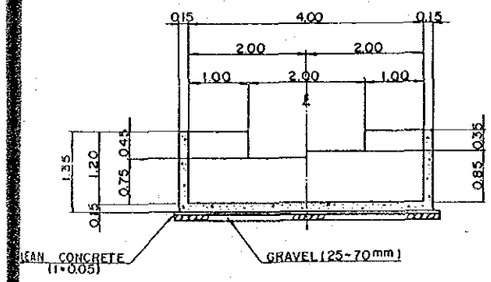
REINF. OF BOTTOM SLAB



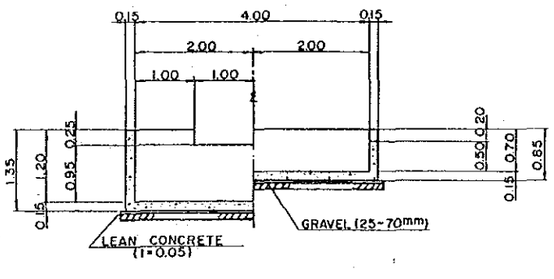
SECTION A-A



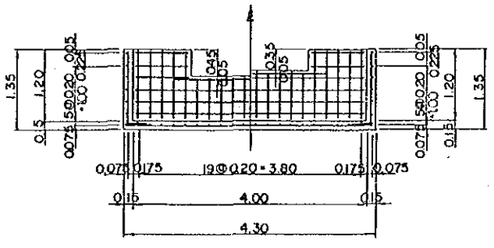
REINF. OF SECTION G—G



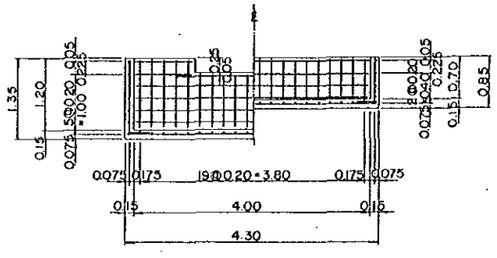
SECTION B—B SECTION C—C



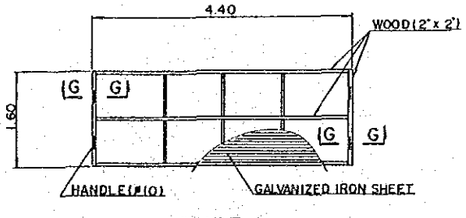
SECTION D—D SECTION E—E



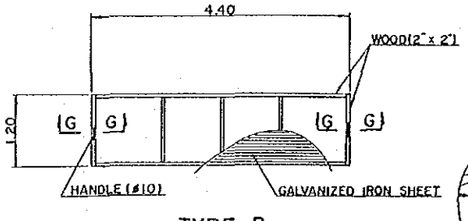
SECTION B—B SECTION C—C



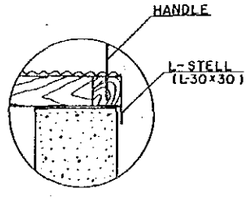
SECTION D—D SECTION E—E



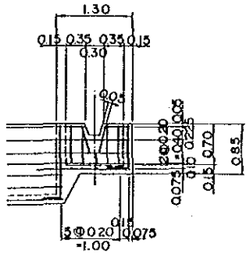
TYPE. A



TYPE. B



DETAIL G—G



SECTION F—F

COVER OF URINE TREATMENT BASIN

SCALE 1:50

NOTE: 1. ALL REINFORCING STEEL IS TO BE DEFORM BAR.
2. LENGH OF LAP AND ANCHORAGE (USE SR 30) IS 35 BAR DIAMETER, COVER FOR REINFORCING IS TO BE 5 cm MINIMUM
3. ALL REINFORCING STEE IS Ø10.

SCALE 1:50

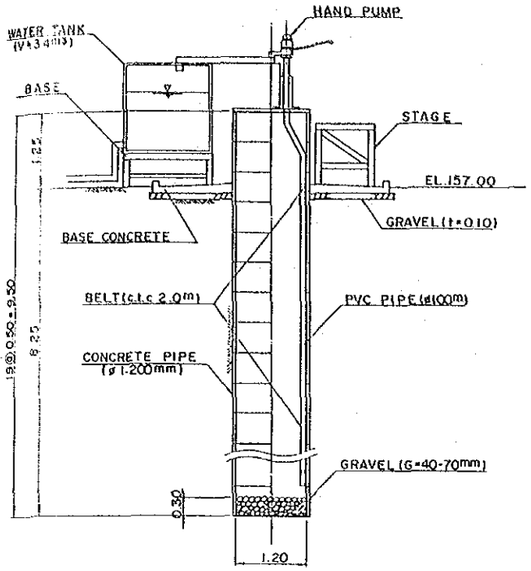
JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

SWINE RAISING FACILITIES

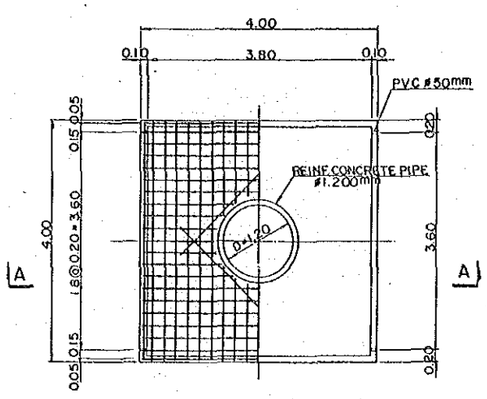
PLAN OF URINE TREATMENT BASIN

PREPARED BY	DRAWING NO.
CHECKED BY	10



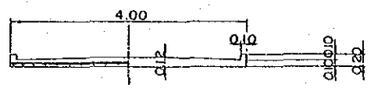
PROFILE OF WELL

SCALE 1:50



PLAN OF BASE CONCRETE

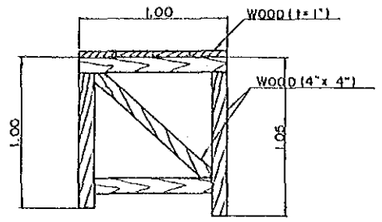
SCALE 1:50



ALL REINFORCING BAR SHOULD BE #6

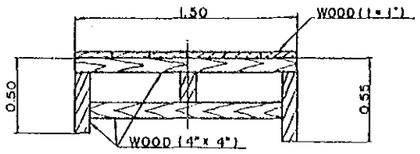
SECTION A—A

SCALE 1:50



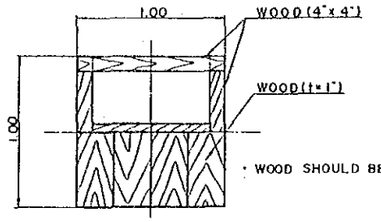
PROFILE OF STAGE

SCALE 1:20



PROFILE OF TANK BASE

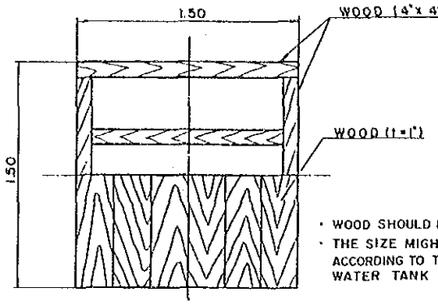
SCALE 1:20



· WOOD SHOULD BE PAINTED

PLAN OF STAGE

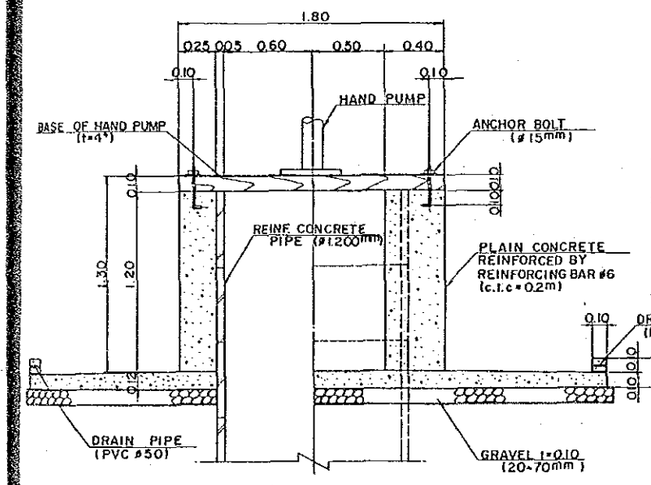
SCALE 1:20



· WOOD SHOULD BE PAINTED
· THE SIZE MIGHT BE CHANGED ACCORDING TO THE SIZE OF WATER TANK

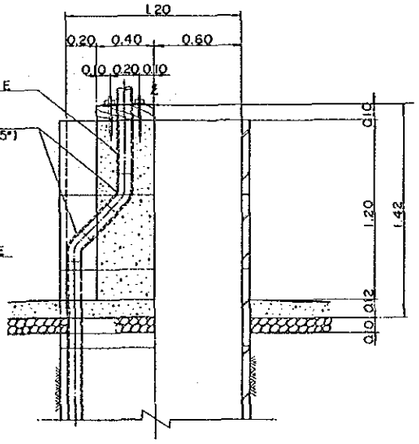
PLAN OF BASE

SCALE 1:20



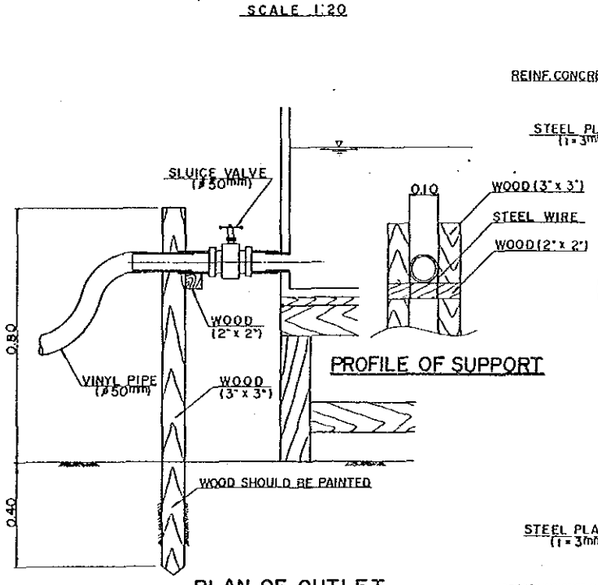
SECTION B—B

SCALE 1:20



SECTION C—C

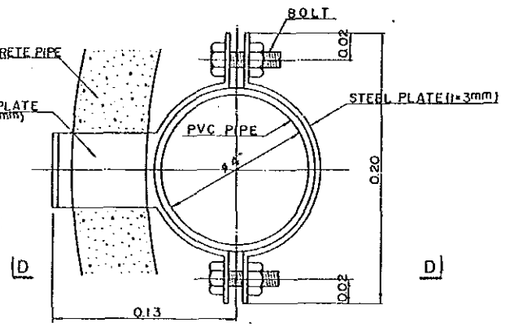
SCALE 1:20



PROFILE OF SUPPORT

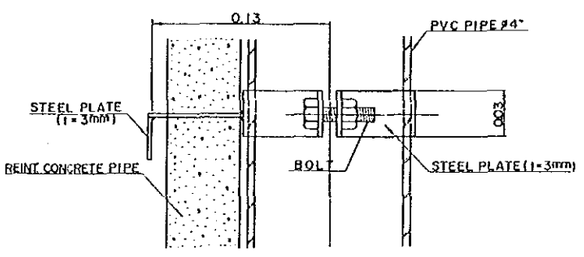
PLAN OF OUTLET

SCALE 1:10



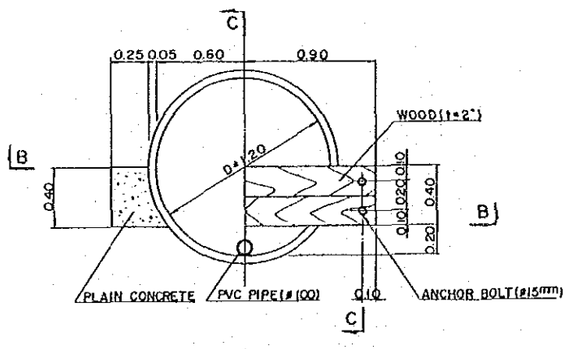
DETAIL OF BELT

SCALE 1:2



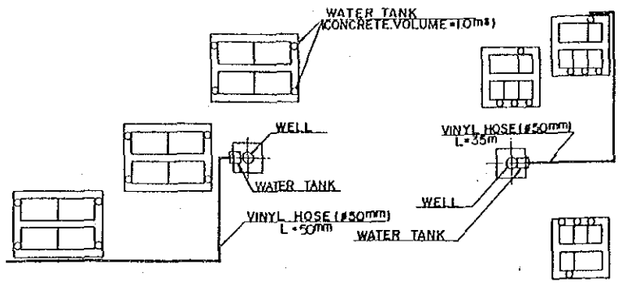
SECTION D—D

SCALE 1:2



DETAIL OF HAND PUMP BASE

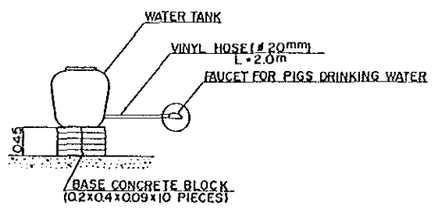
SCALE 1:20



PIGGERY (MEAT USE)

PIGGERY (MULTIPLICATION USE)

PLAN OF WATER SUPPLY



JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND	
SWINE RAISING FACILITIES PLAN OF WELL	
PREPARED BY	DRAWING NO. 11
CHECKED BY	

JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR
AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

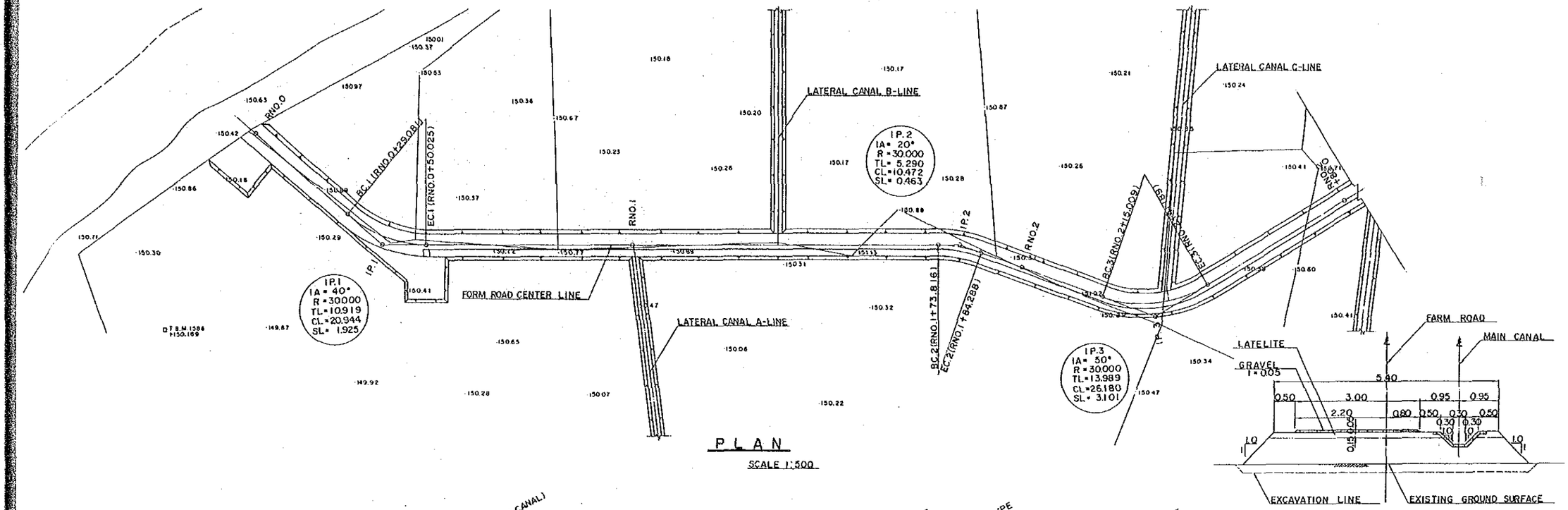
LOCATION OF IRRIGATION AREA

PREPARED BY	DRAWING NO.
CHECKED BY	12

NOTE : ALL DIMENSIONS ARE SHOWN IN METERS
UNLESS OTHERWISE INDICATED

2 ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL. : ELEVATION

SCALE 1:1000

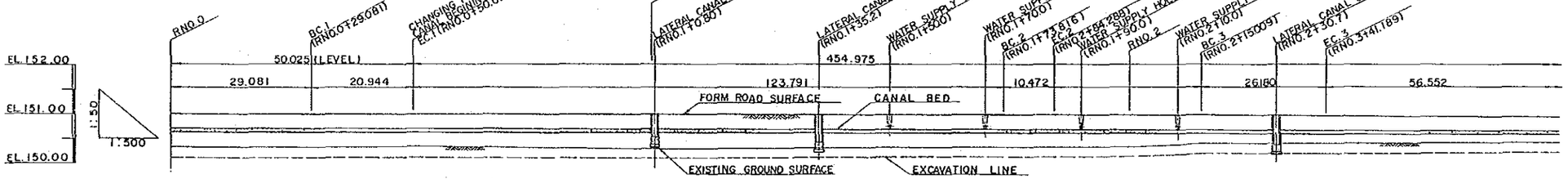


PLAN

SCALE 1:500

STANDARD SECTION

SCALE 1:50



SLOPE	151.000	LEVEL	151.000		I=1:2,500						150.908
CANAL BED	151.000	151.000	151.000	150.980 150.980	150.966	150.950	150.945	150.940	150.934	150.928	150.924	150.908
GROUND ELEVATION	150.32	150.32	150.37	150.26 150.26	150.31	150.32	150.31	150.30	150.29	150.34	150.38	150.41
ACCUMULATED DISTANCE	0.000	29.081	20.944	49.975 0.800	34.400	73.816	10.472	15.712	15.009	15.691	26.180	38.811
DISTANCE	0.000	29.081	50.025	100.000 100.800	135.200	173.816	184.288	200.000	215.009	230.700	241.189	280.000
STATION	RNO.0	SC.1 (+29.081)	EC.1 (+50.025)	RNO.1 RNO.1 +0.80	RNO.1 +35.2	BC.2 (+73.816)	EC.2 (+84.288)	RNO.2	BC.3 (+15.009)	RNO.2 +30.7	EC.3 (+41.189)	+80.00
CURUVE		IP.1 IA=40° R=30.000 TL=10.919 CL=20.944 SL=1.925				IP.2 IA=20° R=30.000 TL=5.290 CL=10.472 SL=0.463			IP.3 IA=50° R=30.000 TL=13.989 CL=26.180 SL=3.101			

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
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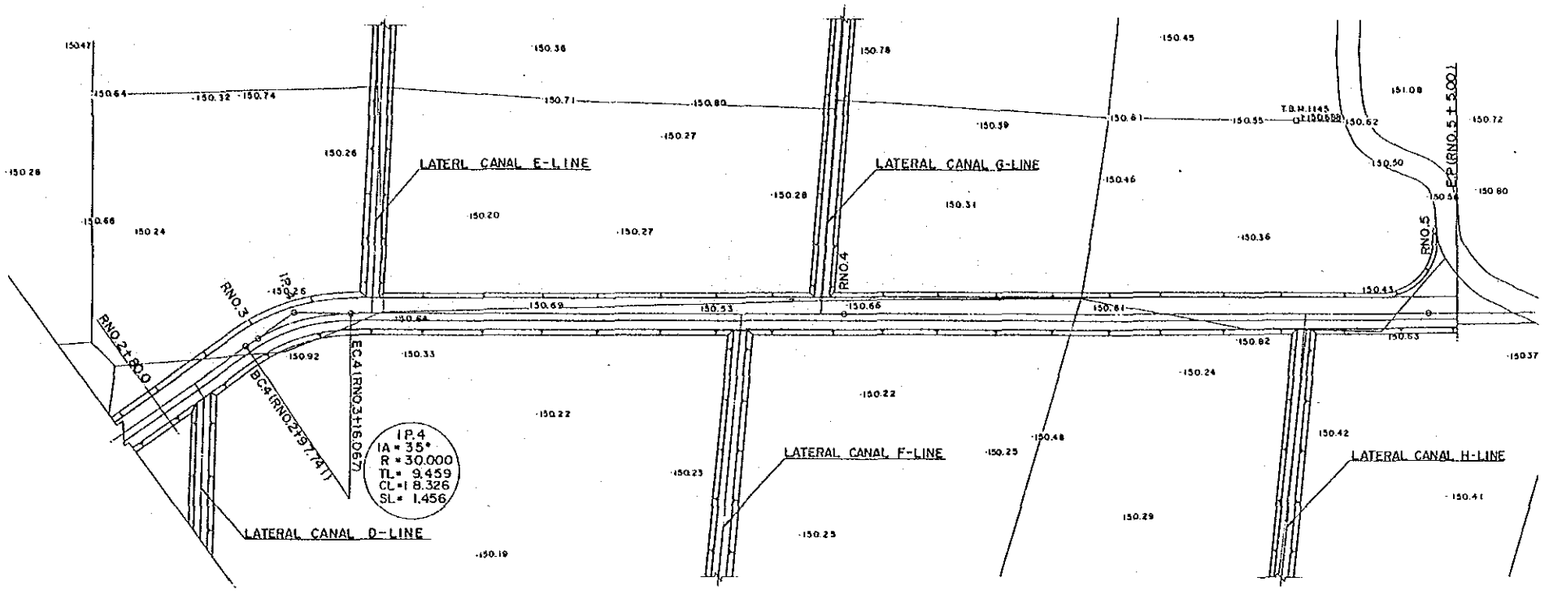
JAPAN INTERNATIONAL COOPERATION AGENCY
THE DETAIL DESIGN SURVEY FOR
AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

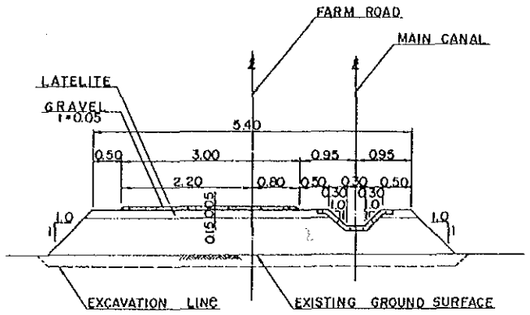
PLAN OF FARM ROAD (I)

PREPARED BY
CHECKED BY
DRAWING NO. 13



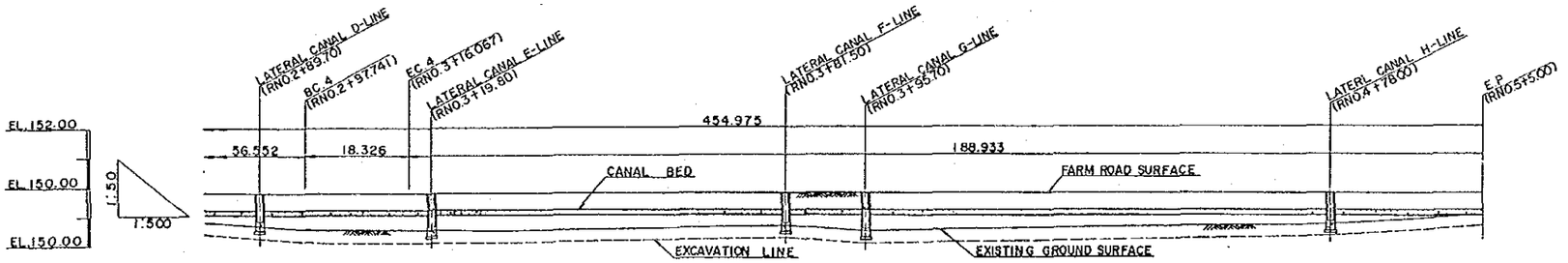
PLAN

SCALE 1:500



STANDARD SECTION

SCALE 1:50



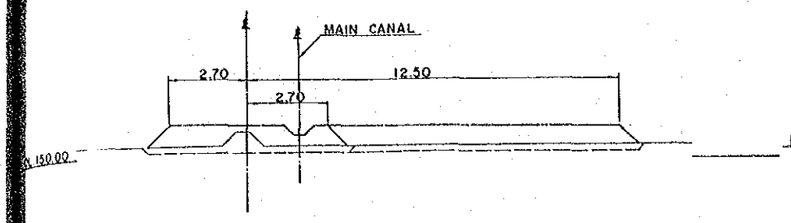
SLOPE	150.908					I=1:2,500					150.818
CANAL BED	150.908	150.904	150.900	150.894	150.892	150.867	150.862	150.860	150.829	150.820	150.818
GROUND ELEVATION	150.41	150.26	150.26	150.26	150.26	150.31	150.22	150.22	151.31	150.43	150.43
ACCUMULATED DISTANCE	38.811	9.700	20.000	16.067	3.733	65.433	14.200	4.300	78.000	22.000	5.000
DISTANCE	280.000	289.700	300.000	316.067	319.800	381.500	395.700	400.000	478.000	500.000	505.000
STATION	RNO.2 +80.00	+89.70	RNO.3	EC.4 (+16.067)	RNO.3 +19.80	+81.50	+95.70	RNO.4	+78.00	RNO.5	E.P (+5.00)
CURUVE		IP.4 IA=35° R=30.000 TL=9.459 CL=18.326 SL=1.456									

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL : ELEVATION

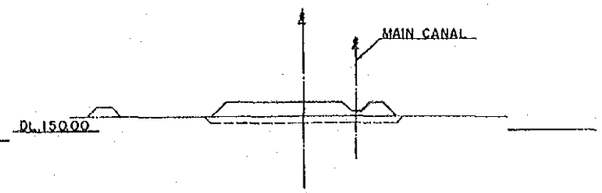
JAPAN INTERNATIONAL COOPERATION AGENCY
THE DETAIL DESIGN SURVEY FOR
AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

PLAN OF FARM ROAD (2)

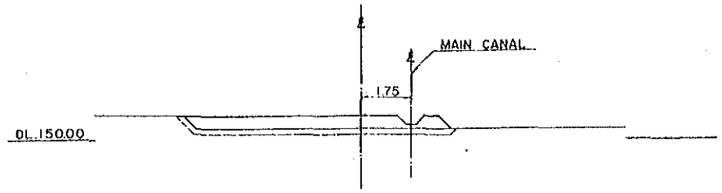
PREPARED BY
CHECKED BY
DRAWING NO. 14



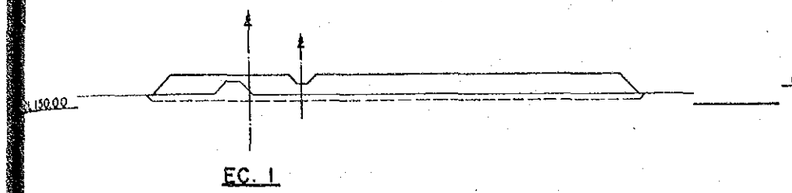
RNO.0+54.525(±)



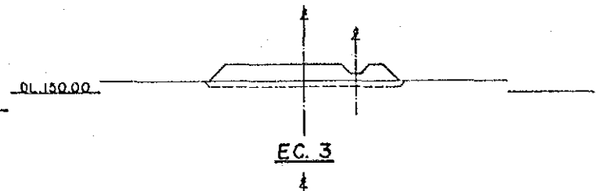
RNO.2+80.00



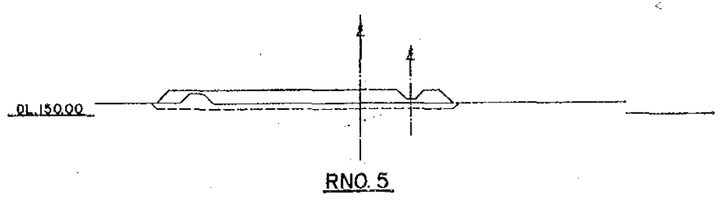
RNO.5+5.00



EC. 1



EC. 3



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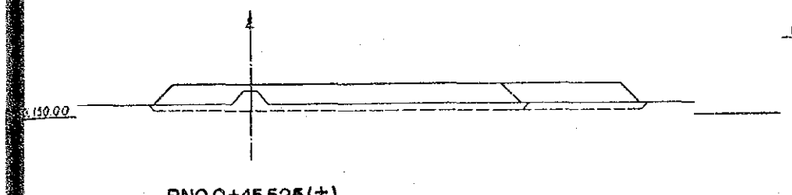
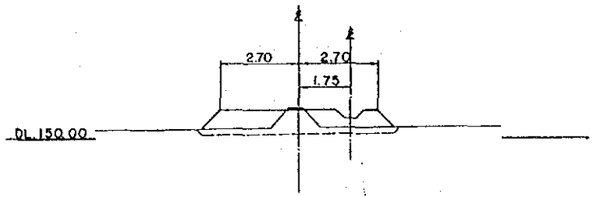
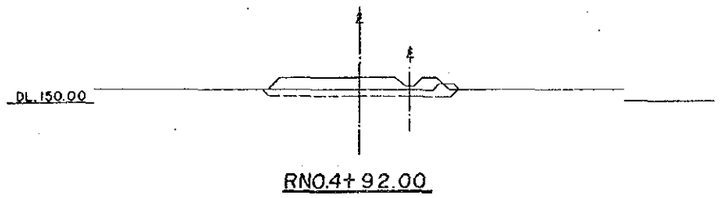


RNO.0+45.525(±)



BC. 3



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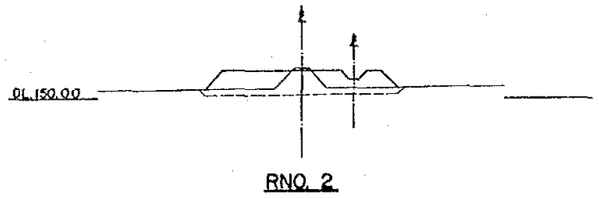
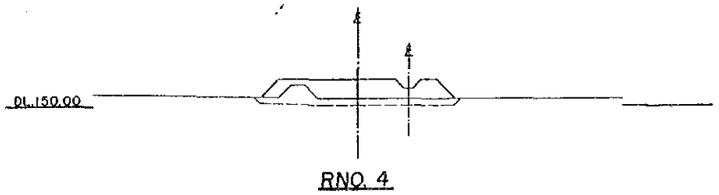


RNO. 2



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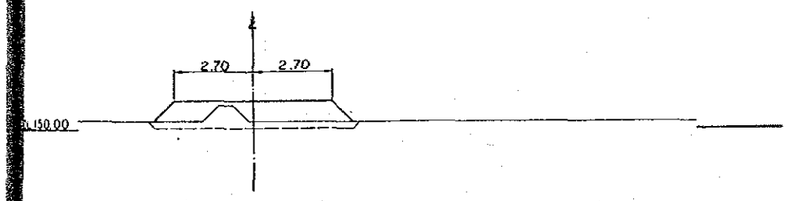
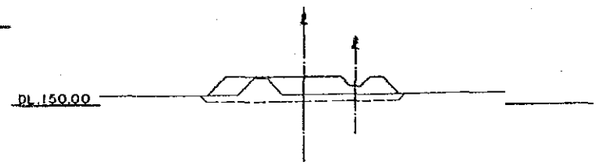


BC. 1



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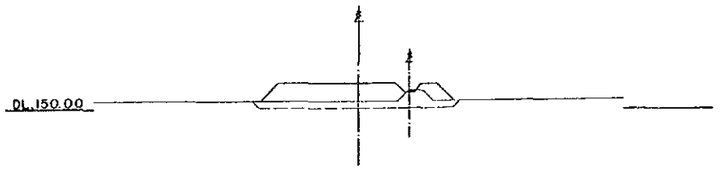
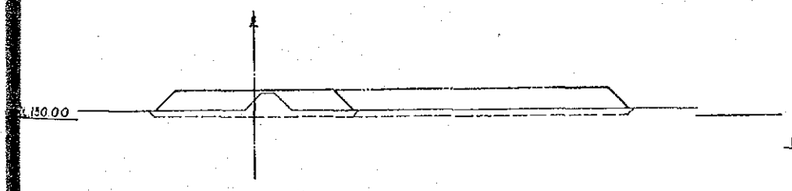
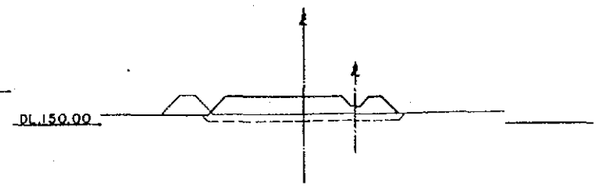


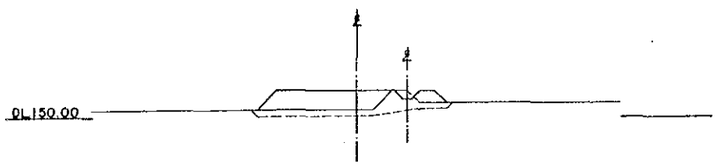
EC. 4



RNO.0+7.00(±)



BC. 2



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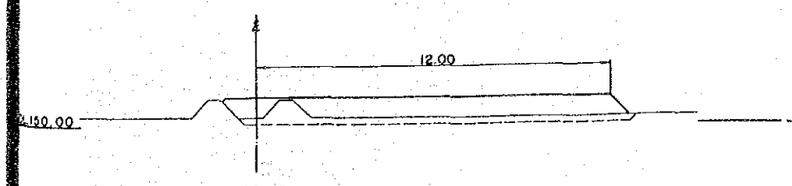

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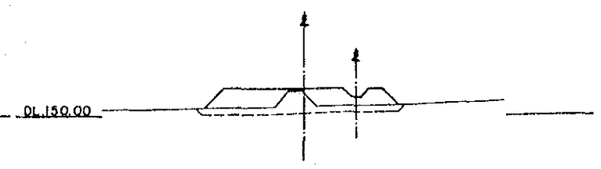


RNO. 1

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. *ABBREVIATION AND SYMBOL*
℄ : CENTER LINE
DL : DATUM LINE

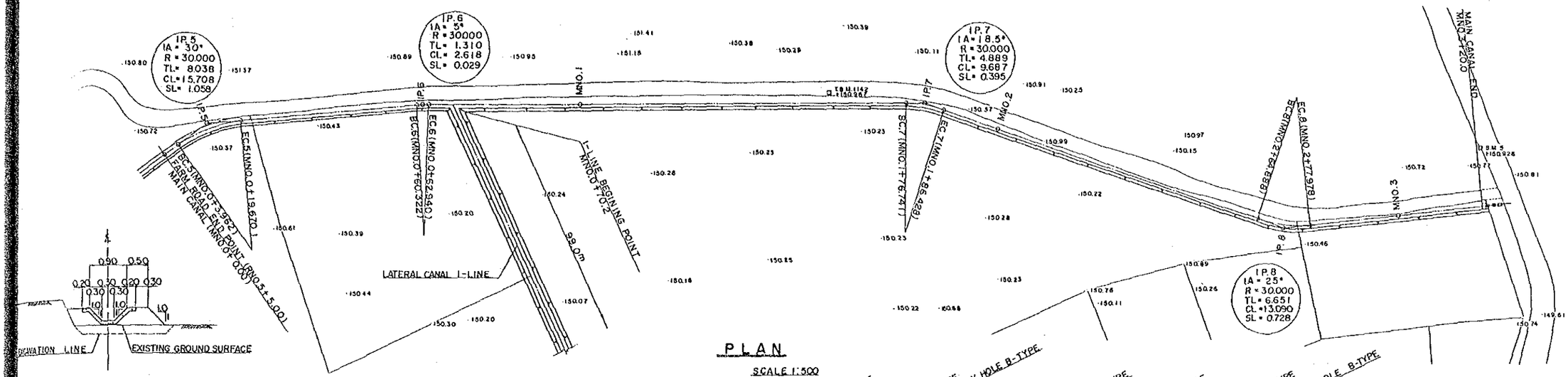
JAPAN INTERNATIONAL COOPERATION AGENCY

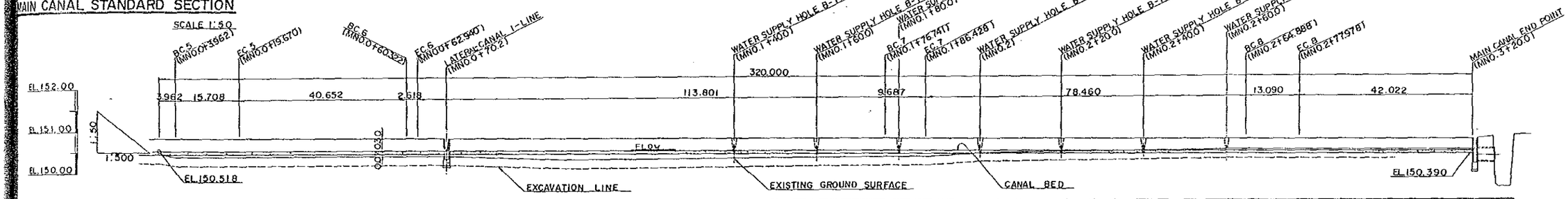
THE DETAIL DESIGN SURVEY FOR

AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

FARM ROAD CROSS SECTION

PREPARED BY	DRAWING NO.
CHECKED BY	15





PLAN

SCALE 1:500

MAIN CANAL STANDARD SECTION

SCALE 1:50

SLOPE	150.518	1:1:2,500												150.390
CANAL BED	150.518	150.516	150.510	150.494	150.493	150.490	150.478	150.447	150.443	150.438	150.412	150.407	150.398	150.390
GROUND ELEVATION	150.43	150.37	150.37	150.35	150.35	150.35	150.26	150.30	150.30	150.37	150.46	150.46	150.43	150.43
ACCUMULATED DISTANCE		3.962	15.708	40.652	2.618	7.260	29.800	76.741	9.687	13.572	64.888	13.090	22.022	20.000
DISTANCE		3.962	19.670	60.322	62.940	70.200	100.00	176.741	186.428	200.000	264.888	277.978	300.000	320.000
STATION	MNO.0	BC.5 (+3.962)	EC.5 (+19.670)	BC.6 (+60.322)	EC.6 (+62.940)	+70.200	MNO.1	BC.7 (+76.741)	EC.7 (+86.428)	MNO.2	BC.8 (+64.888)	EC.8 (+77.978)	MNO.3	+20.00
CUR VE		IP.5 IA = 30° R=30000 TL = 8.039 CL = 15.708 SL = 1.508		IP.6 IA = 5° R = 30.000 TL=1.310 CL=2.618 SL=0.029				IP.7 IA = 18.5° R=30000 TL = 4.889 CL=9.687 SL=0.395			IP.8 R=30.000 IA=25° TL=6.651 CL=13.090 SL=0.728			

EC. 5

SCALE 1:100

MNO. 2

MNO.3+20.0

MNO. 0

MNO. 1

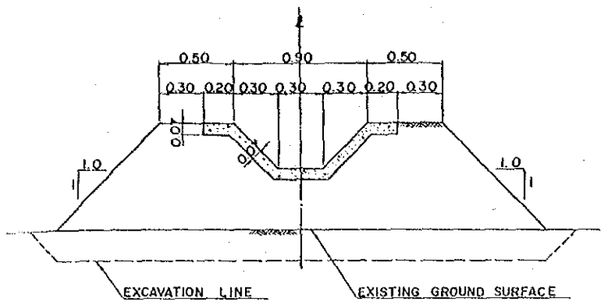
MNO. 3

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL : ELEVATION
DL : DATUM LINE

JAPAN INTERNATIONAL COOPERATION AGENCY
THE DETAIL DESIGN SURVEY FOR
AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

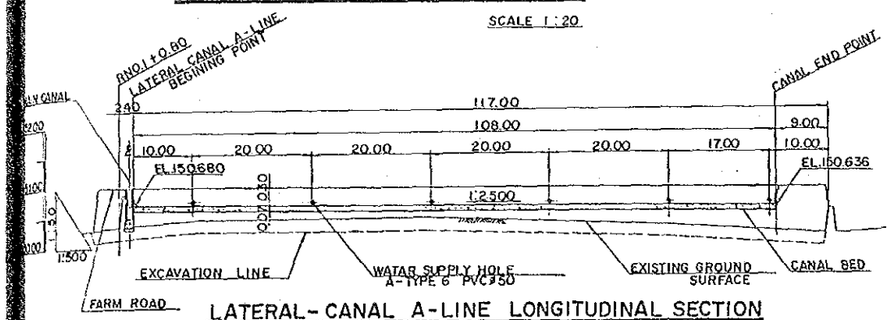
PLAN OF MAIN CANAL

PREPARED BY
CHECKED BY
DRAWING NO. 16

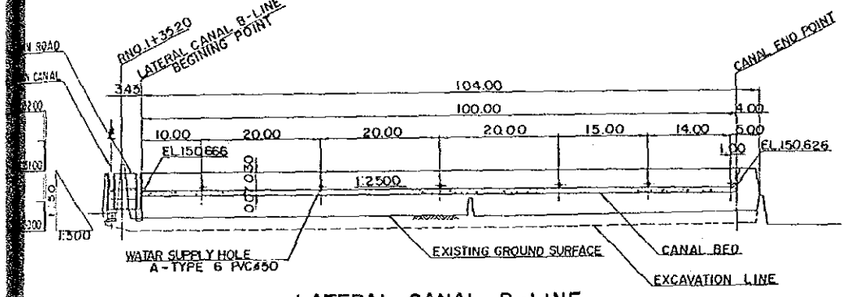


LATERAL-CANAL STANDARD SECTION

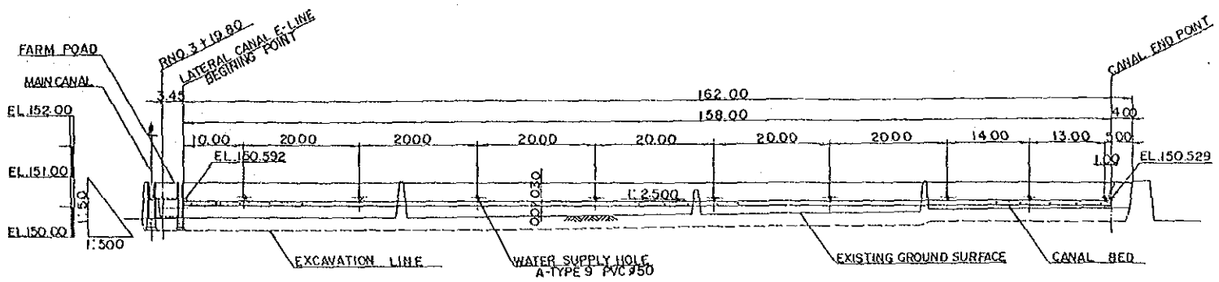
SCALE 1:20



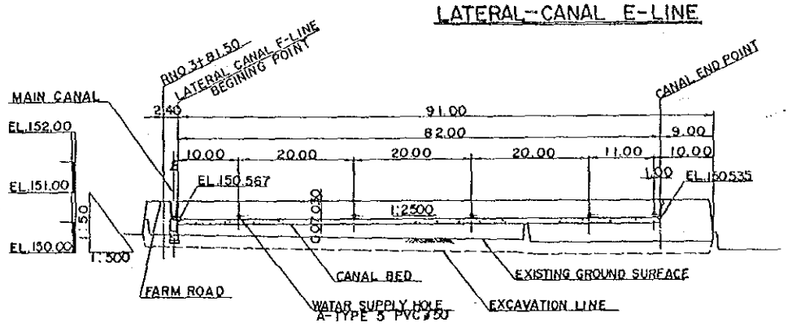
LATERAL-CANAL A-LINE LONGITUDINAL SECTION



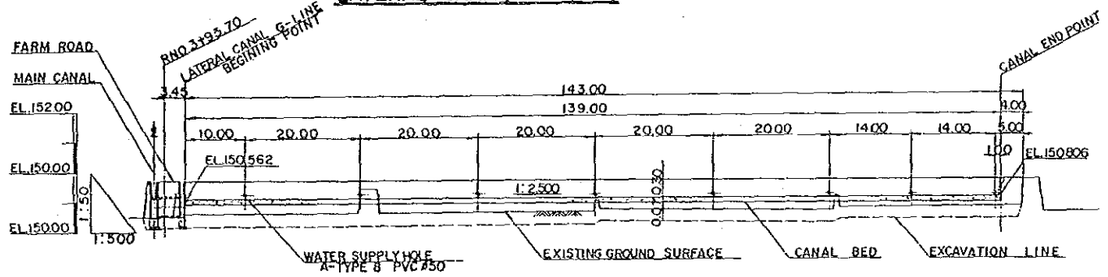
LATERAL-CANAL B-LINE



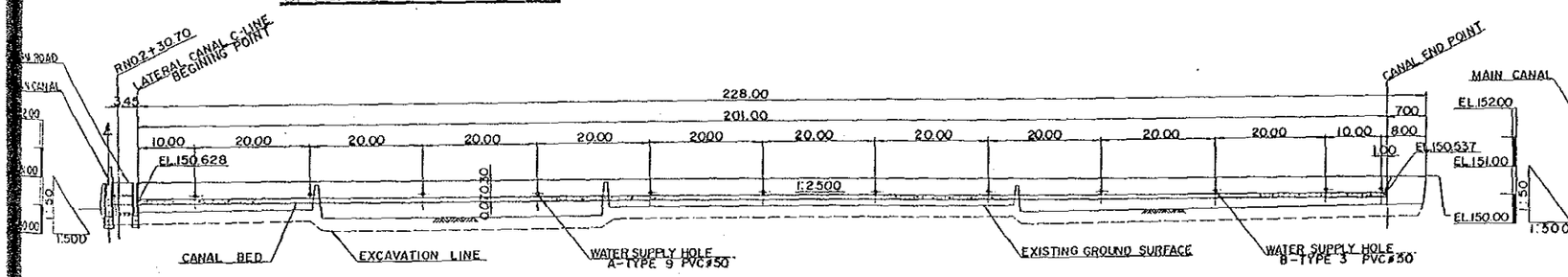
LATERAL-CANAL E-LINE



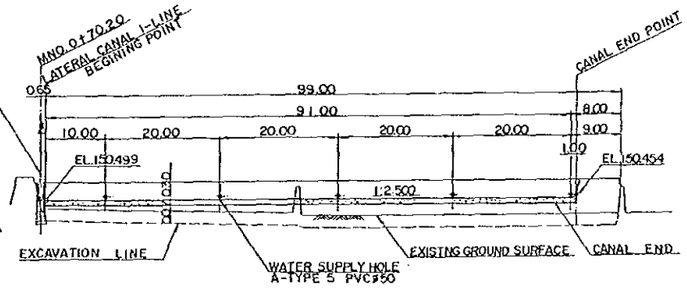
LATERAL-CANAL F-LINE



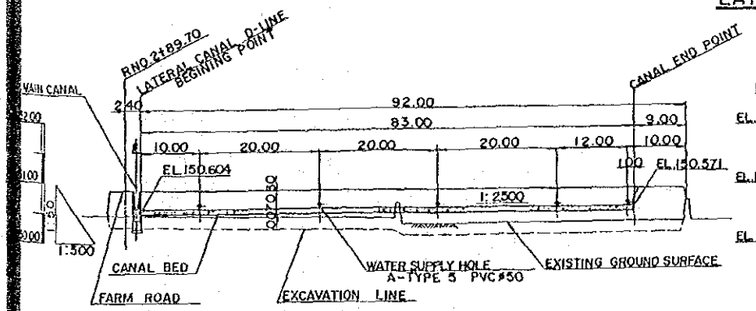
LATERAL-CANAL G-LINE



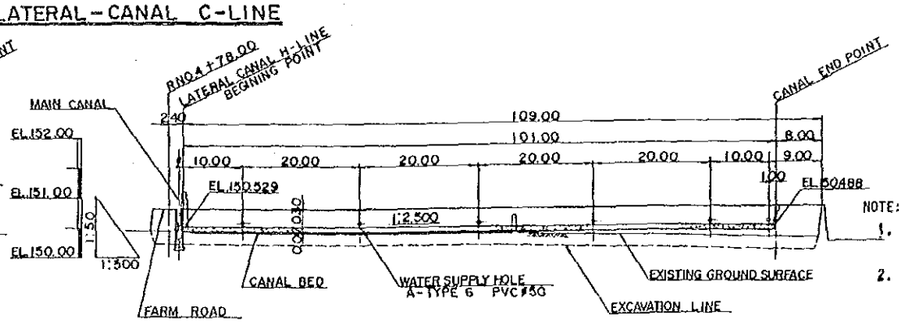
LATERAL-CANAL C-LINE



LATERAL-CANAL I-LINE



LATAERAL-CANAL D-LINE



LATERAL-CANAL H-LINE

NOTE:
1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL : ELEVATION

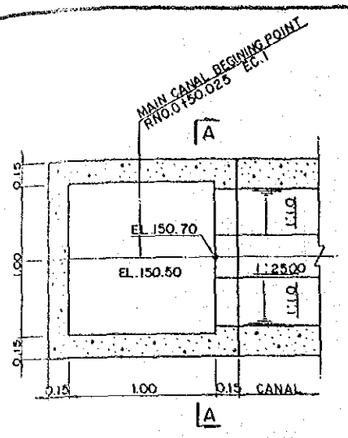
JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR

AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

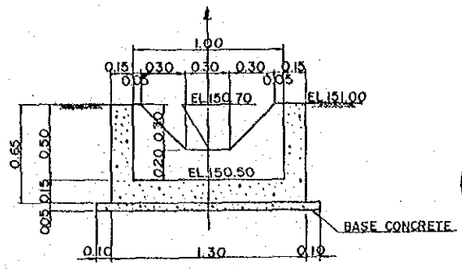
LATERAL CANAL LONGITUDINAL SECTION

PREPARED BY	DRAWING NO.
CHECKED BY	17



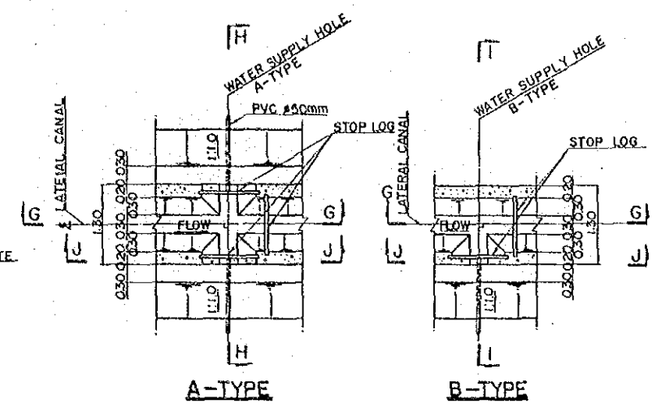
MAIN CANAL BEGING POINT PLAN

SCALE 1:20



SECTION A-A

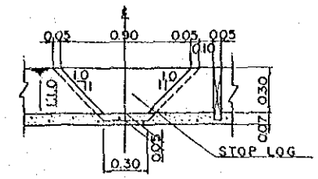
SCALE 1:20



A-TYPE B-TYPE

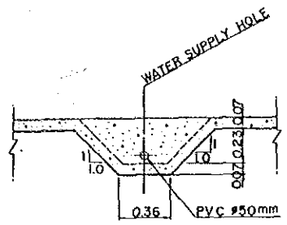
WATER SUPPLY HOLE PLAN

SCALE 1:50



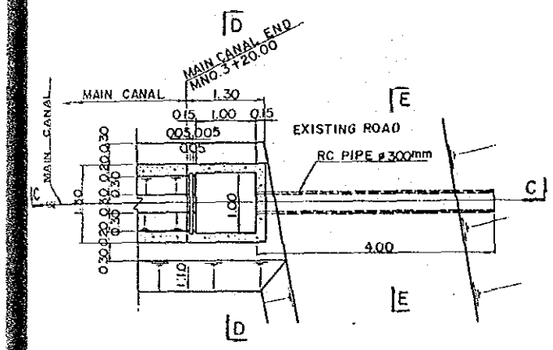
SECTION G-G

SCALE 1:20



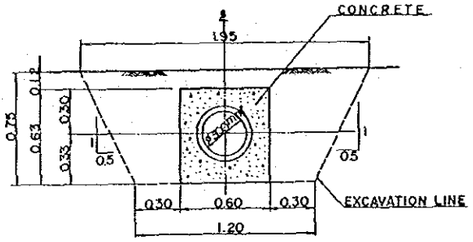
SECTION J-J

SCALE 1:20



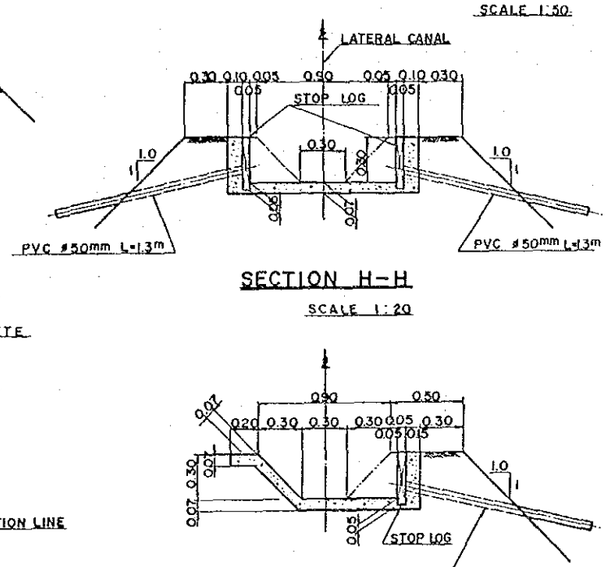
MAIN CANAL END POINT PLAN

SCALE 1:50



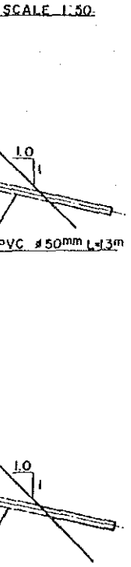
SECTION E-E

SCALE 1:20



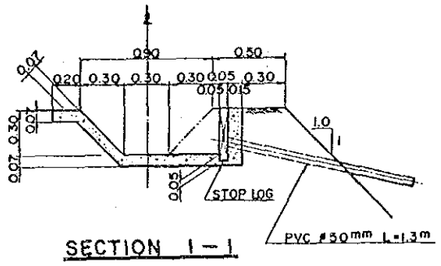
SECTION F-F

SCALE 1:20



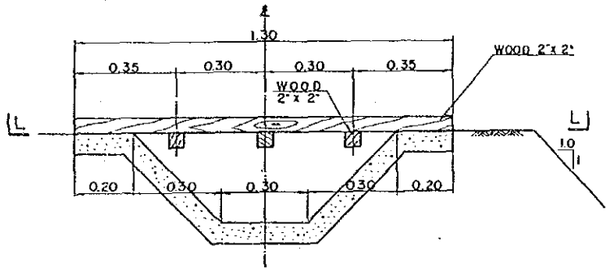
SECTION H-H

SCALE 1:20



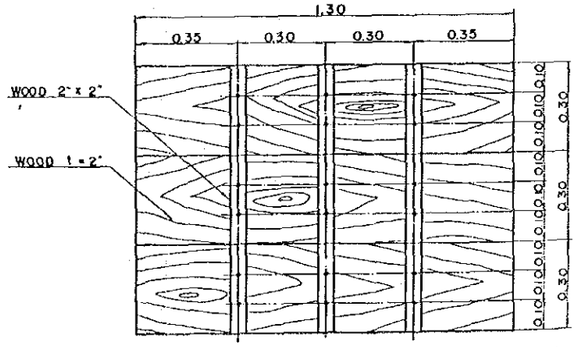
SECTION I-I

SCALE 1:20



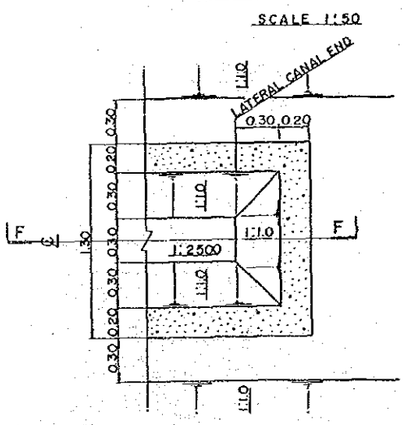
FARM BOARC

SCALE 1:10



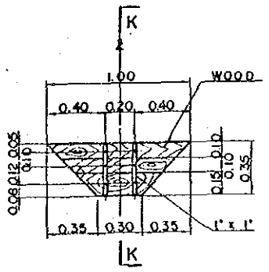
SECTION L-L

SCALE 1:10



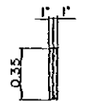
SUB CANAL END POINT PLAN

SCALE 1:20



STOP LOG

SCALE 1:20



SECTION K-K

SCALE 1:20

NOTE:
1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL : ELEVATION
3. THE FARM BOARDS ARE SET UP 10SHEETS ON THE MAIN CANAL

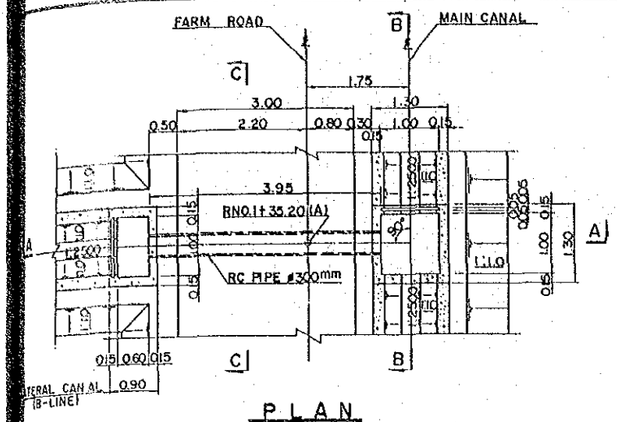
JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR

AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

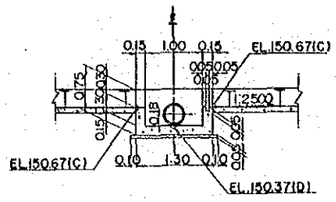
PLAN OF WATER DIVISION (1)

PREPARED BY	DRAWING NO.
CHECKED BY	18



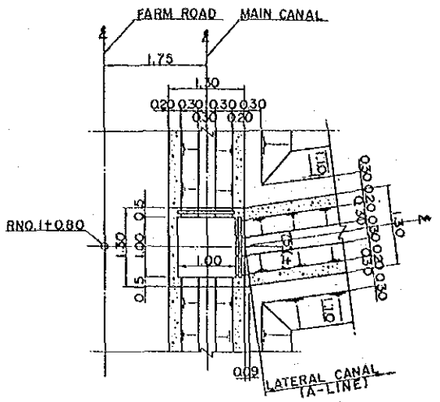
PLAN

SCALE 1:50



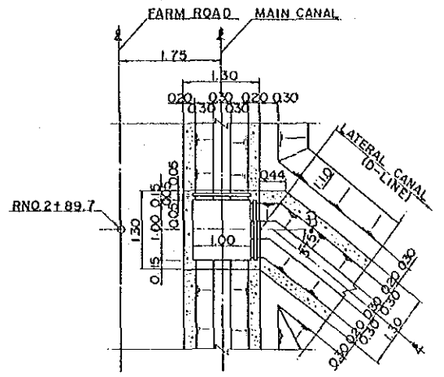
SECTION B-B

SCALE 1:50



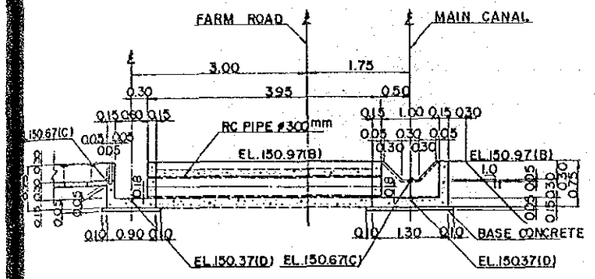
A-LINE BEGINING POINT PLAN

SCALE 1:50



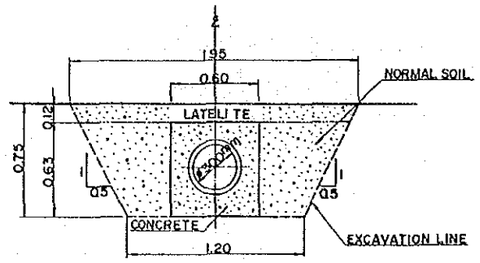
D-LINE BEGINING POINT PLAN

SCALE 1:50



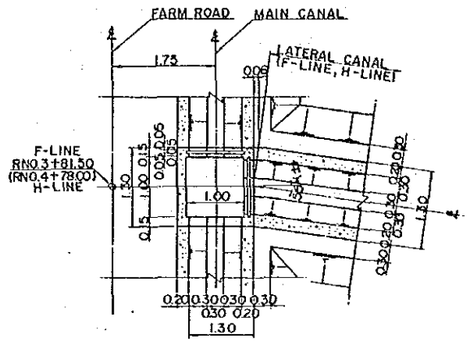
SECTION A-A

SCALE 1:50



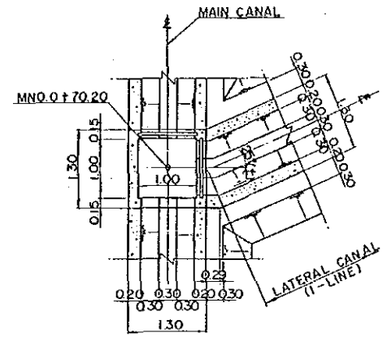
SECTION C-C

SCALE 1:50



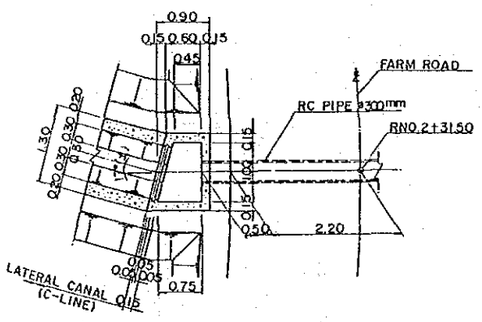
F,H-LINE BEGINING POINT PLAN

SCALE 1:50



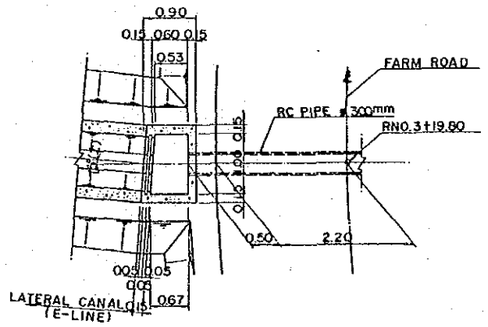
I-LINE BEGINING POINT PLAN

SCALE 1:50



C-LINE BEGINING POINT PLAN

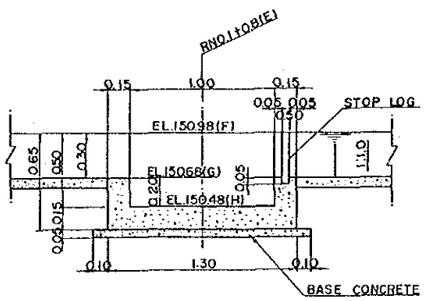
SCALE 1:50



E-LINE BEGINING POINT PLAN

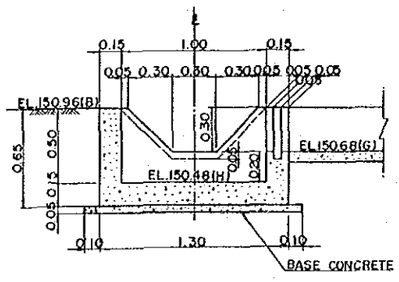
SCALE 1:50

STATION (A)	LATERAL CANAL (LINE)	ELEVETION (B)	(C)	(D)
RN0.1+35.20	B-LINE	150.97	150.67	150.37
RN0.2+31.50	C-LINE	150.93	150.63	150.33
RN0.3+19.80	E-LINE	150.89	150.59	150.29
RN0.3+95.70	G-LINE	150.86	150.56	150.26



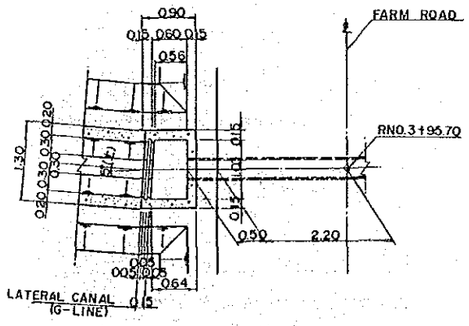
SECTION A-A

SCALE 1:20



SECTION B-B

SCALE 1:20



G-LINE BEGINING POINT PLAN

SCALE 1:50

STATION (E)	LATERAL CANAL (LINE)	ELEVEATION (F)	(G)	(H)
RN0.1+0.80	A-LINE	150.98	150.68	150.48
RN0.2+89.70	D-LINE	150.90	150.60	150.40
RN0.3+81.50	F-LINE	150.87	150.57	150.37
RN0.4+78.00	H-LINE	150.83	150.53	150.33
MN00+70.20	I-LINE	150.79	150.49	150.29

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL : ELEVATION

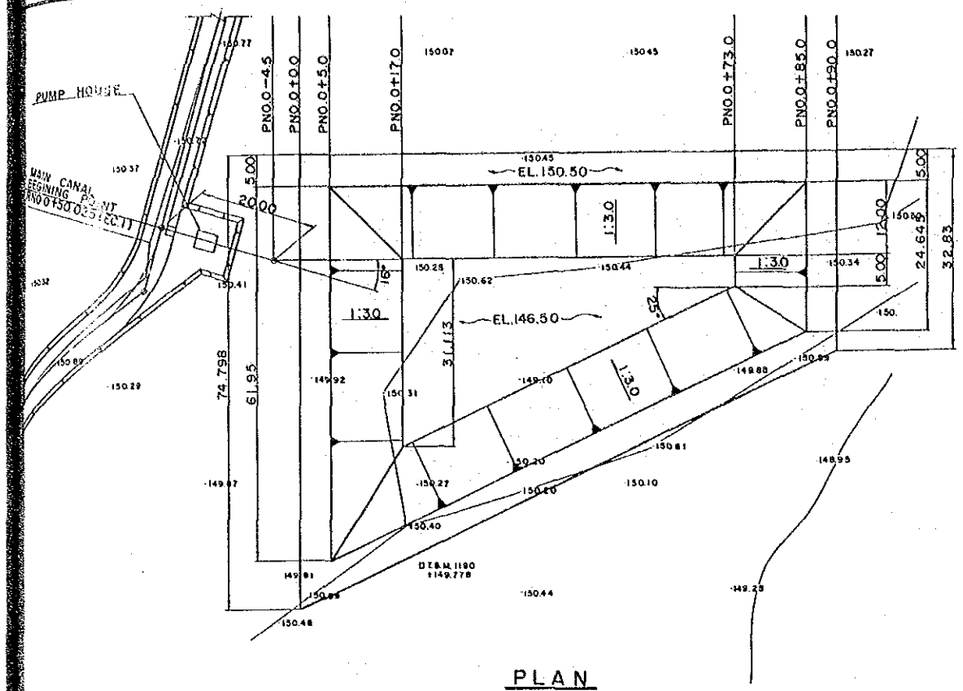
JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR

AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

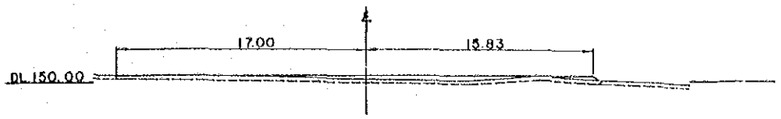
PLAN OF WATER DIVISION (2)

PREPARED BY	DRAWING NO.
CHECKED BY	19

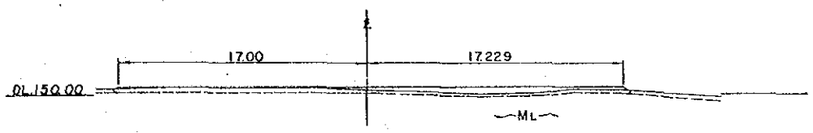


PLAN

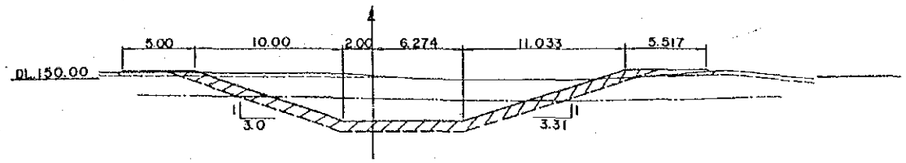
SCALE 1:500



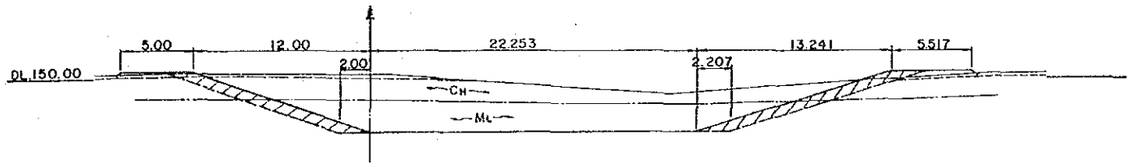
PN0.0+90.0



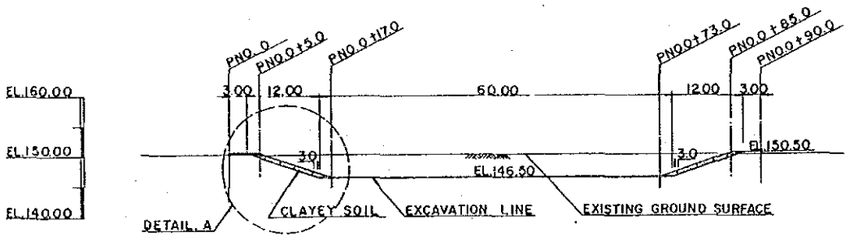
PN0.0+87.0



PN0.0+75.0

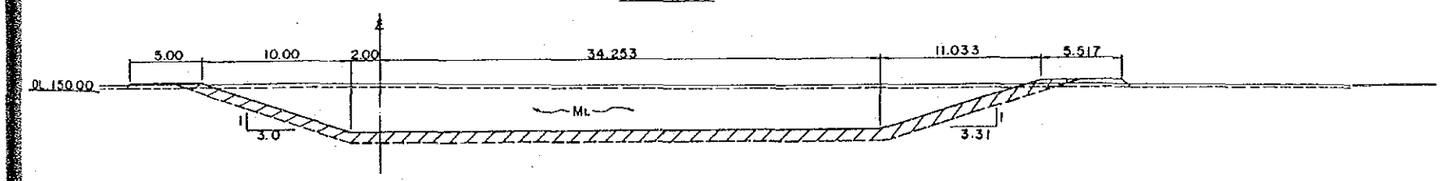


PN0.0+36.0

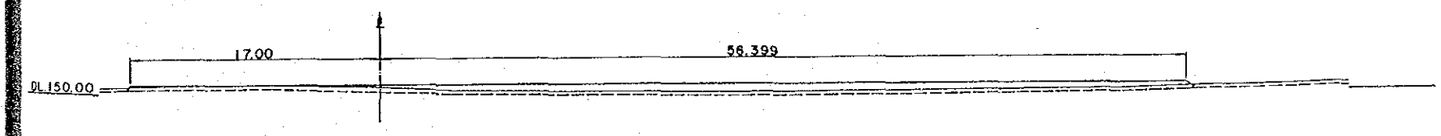


LONGITUDINAL SECTION

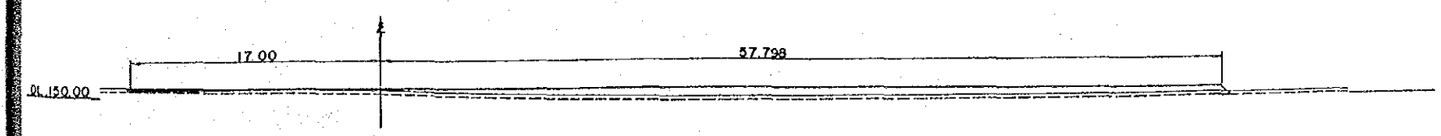
SCALE 1:500



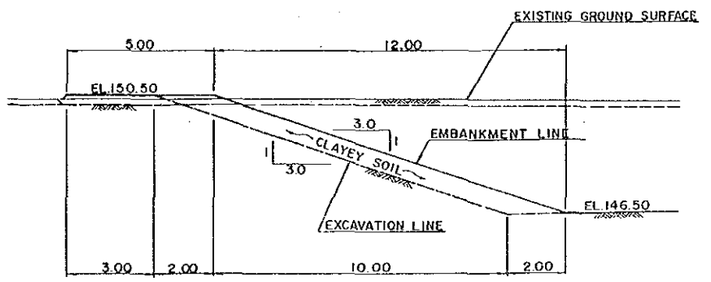
PN0.0+15.0



PN0.0+3.0



PN0.0

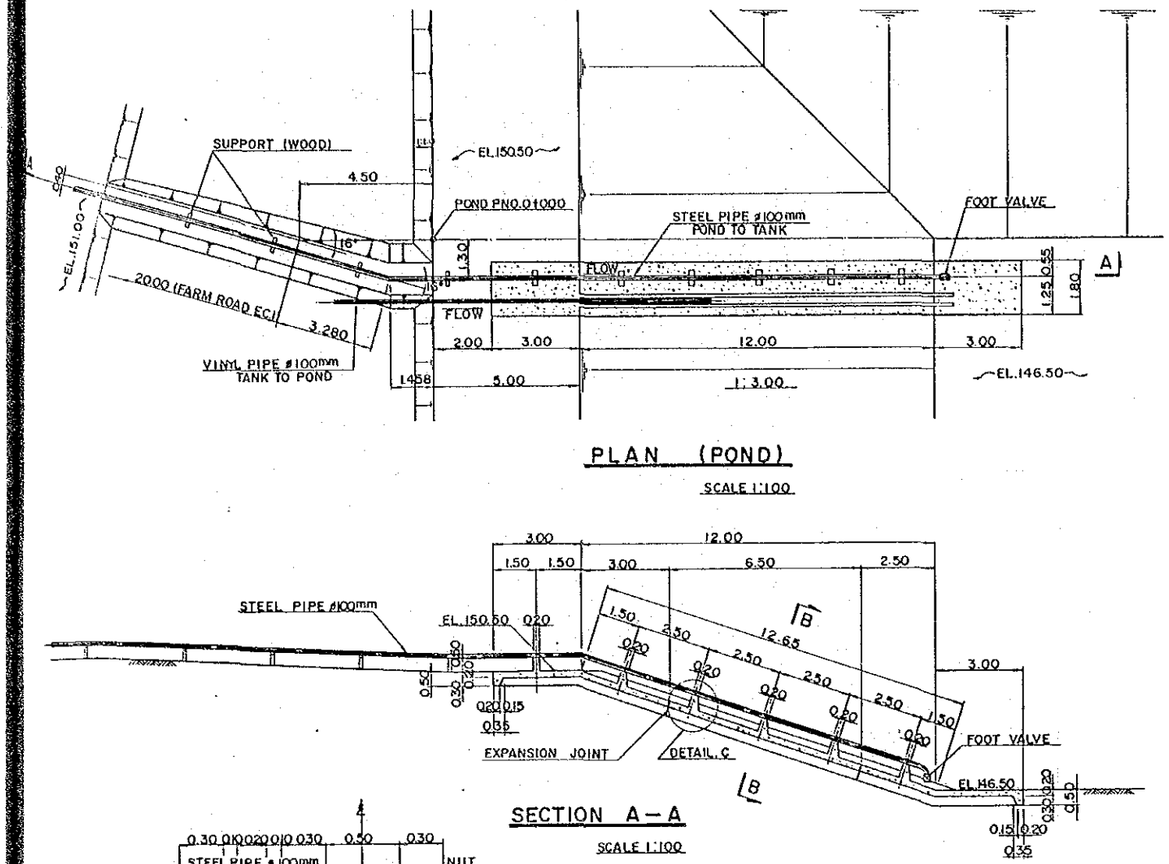


DETAIL A

SCALE 1:100

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL : ELEVATION
DL : DATUM LINE

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND	
PLAN OF POND	
PREPARED BY	DRAWING NO. 20
CHECKED BY	

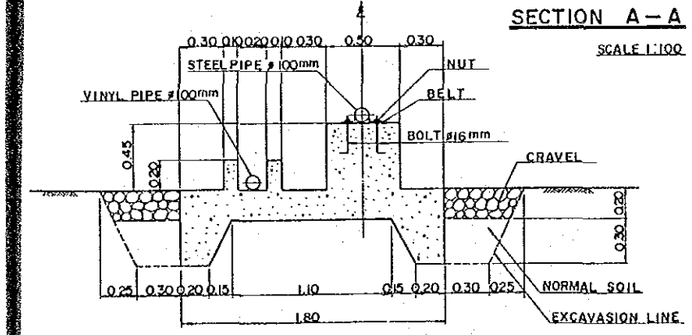


PLAN (POND)

SCALE 1:100

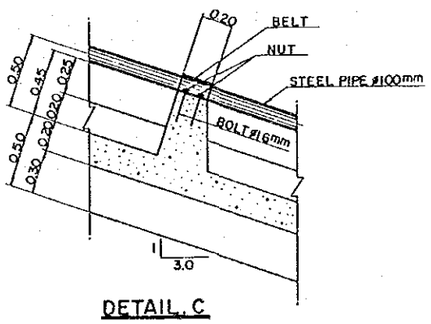
SECTION A—A

SCALE 1:100



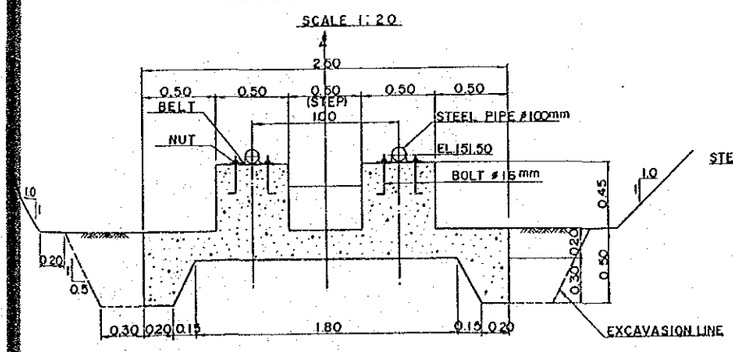
SECTION B—B

SCALE 1:20



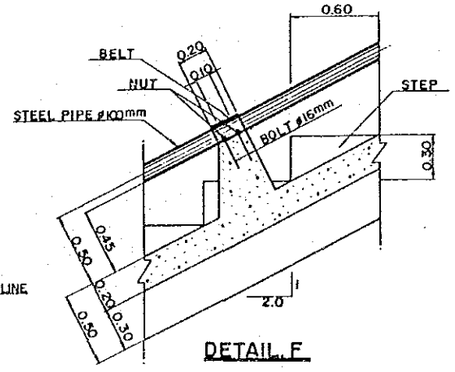
DETAIL C

SCALE 1:20



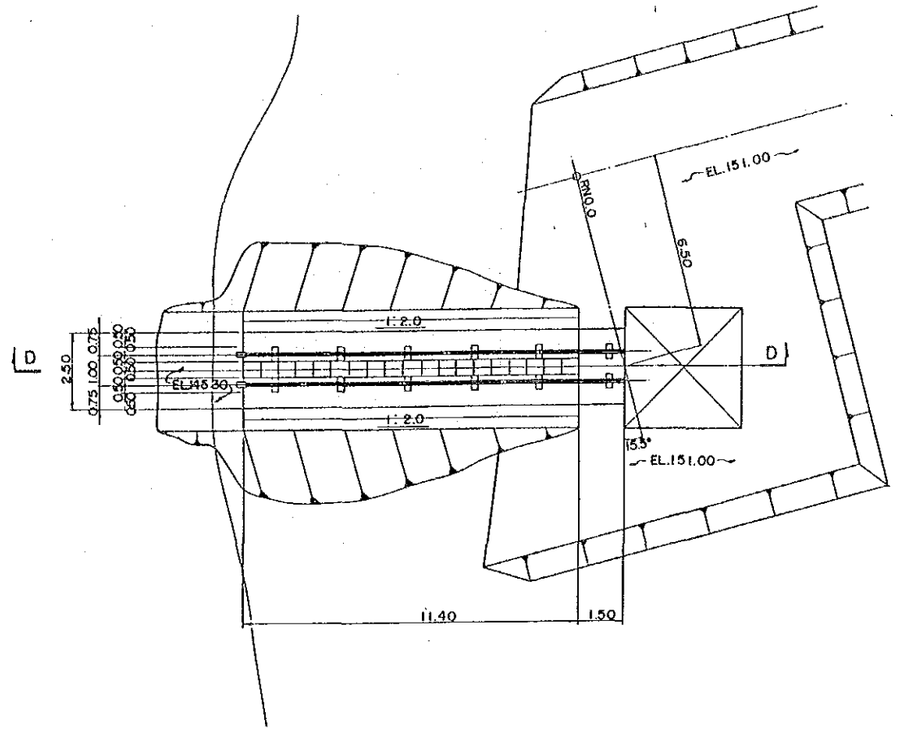
SECTION E—E

SCALE 1:20



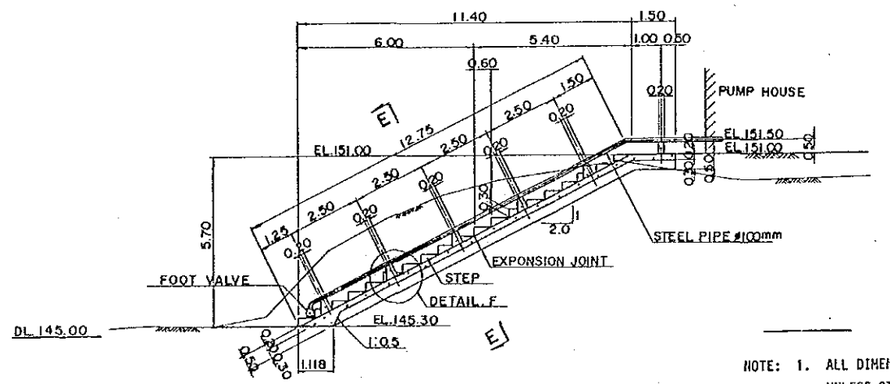
DETAIL F

SCALE 1:20



PLAN (RIVER)

SCALE 1:100



SECTION D—D

SCALE 1:100

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL : ELEVATION

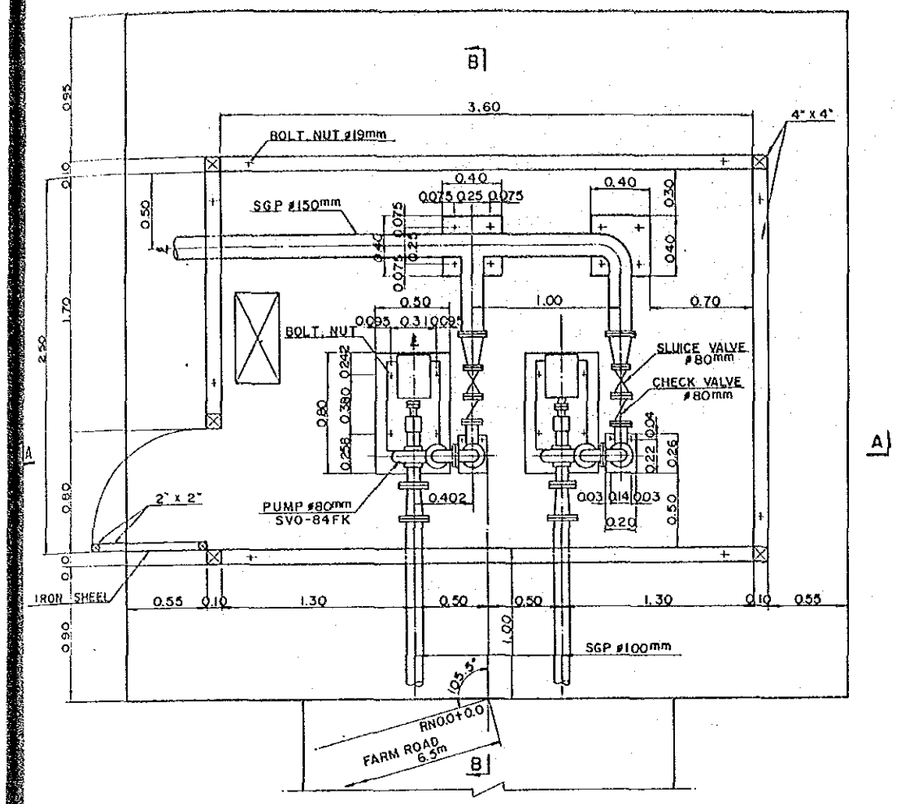
JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR

AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

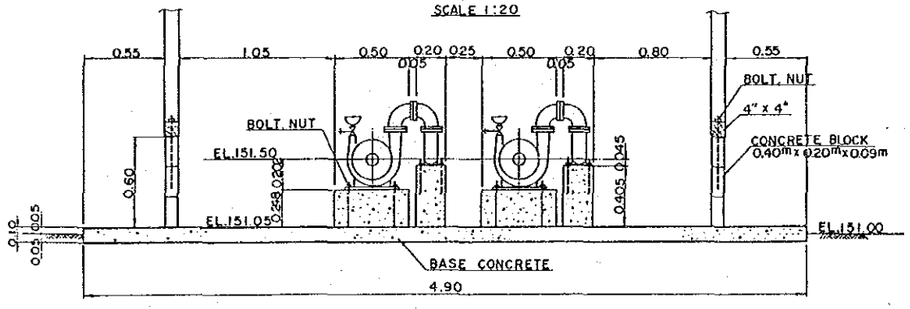
PLAN OF WATER SUPPLY FACILITY

PREPARED BY	DRAWING NO.
CHECKED BY	21



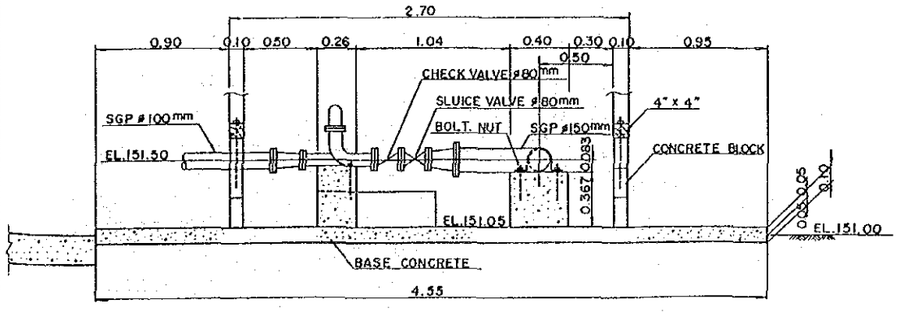
PLAN

SCALE 1:20



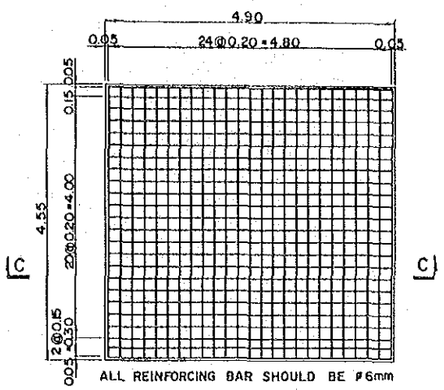
SECTION A—A

SCALE 1:20



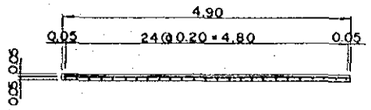
SECTION B—B

SCALE 1:20



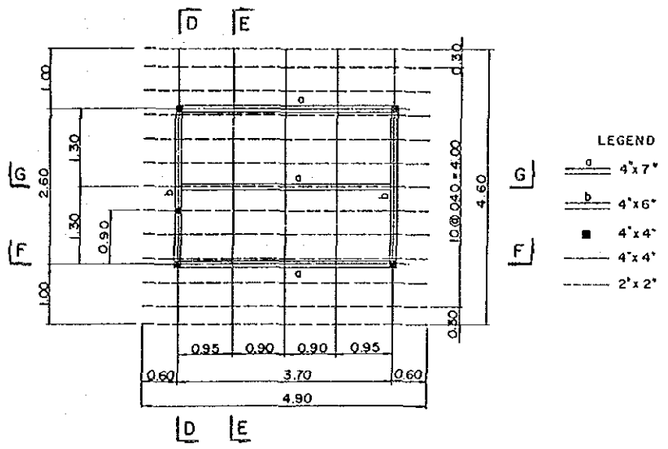
REINF OF BASE CONCRETE

SCALE 1:50



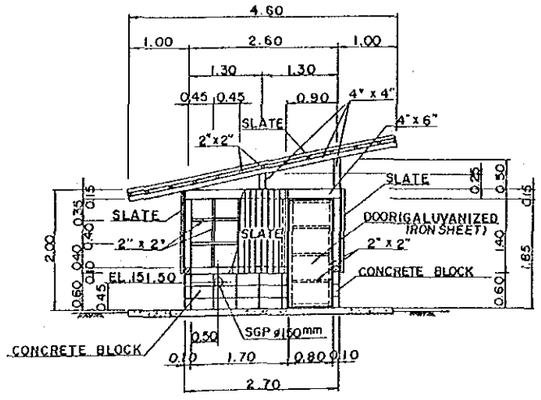
SECTION C—C

SCALE 1:50



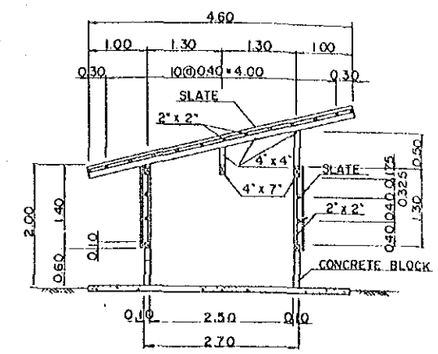
PLAN OF ROOF

SCALE 1:50



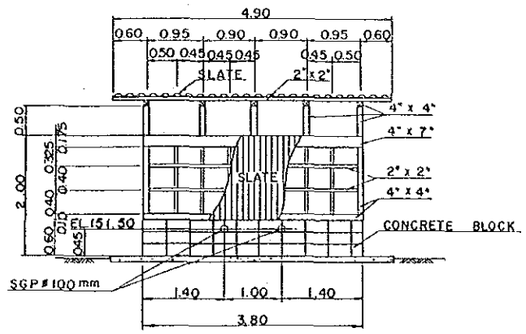
SECTION D—D

SCALE 1:50



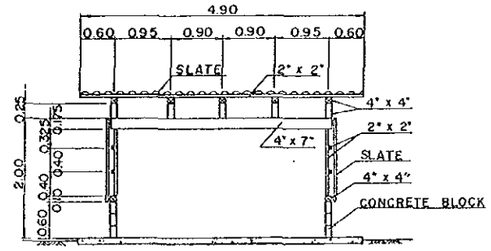
SECTION E—E

SCALE 1:50



SECTION F—F

SCALE 1:50



SECTION G—G

SCALE 1:50

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
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EL : ELEVATION

JAPAN INTERNATIONAL COOPERATION AGENCY

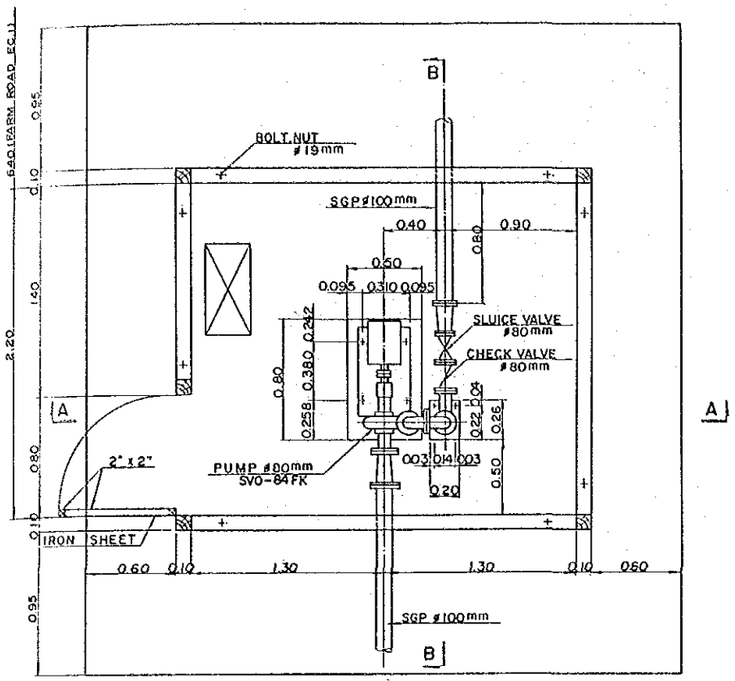
THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

PLAN OF PUMP STATION (1)

PREPARED BY

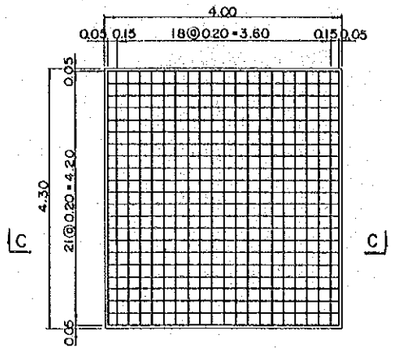
CHECKED BY

DRAWING NO. 22



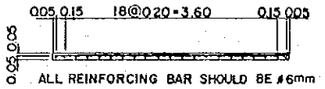
PLAN

SCALE 1:20



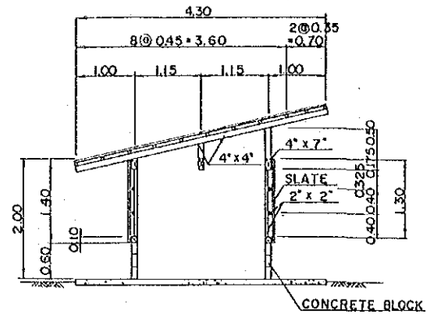
REINT OF BASE CONCRETE

SCALE 1:50



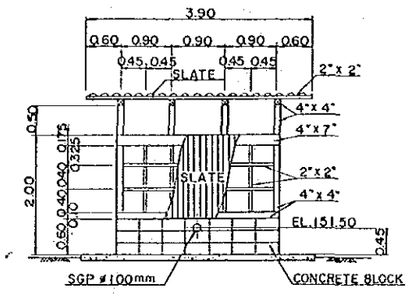
SECTION C—C

SCALE 1:50



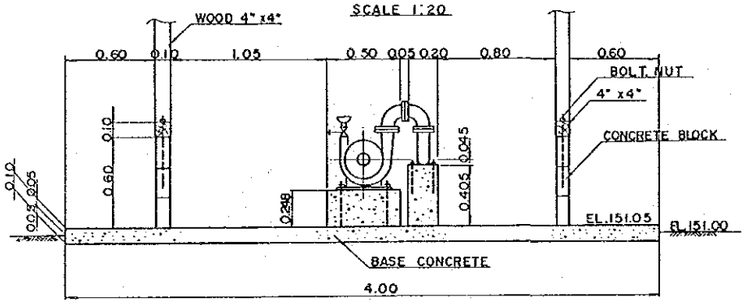
SECTION E—E

SCALE 1:50



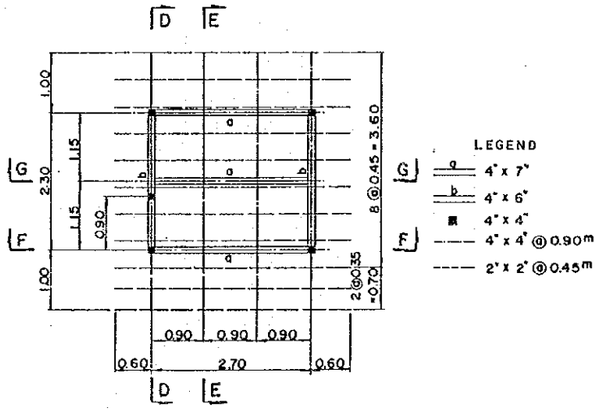
SECTION F—F

SCALE 1:50

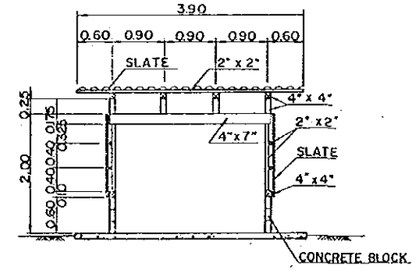


SECTION A—A

SCALE 1:20

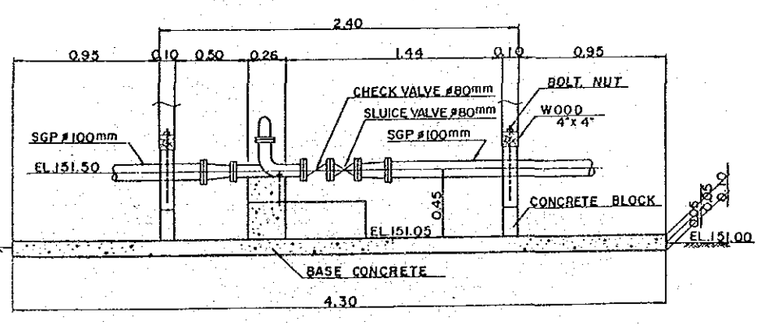


PLAN OF ROOF



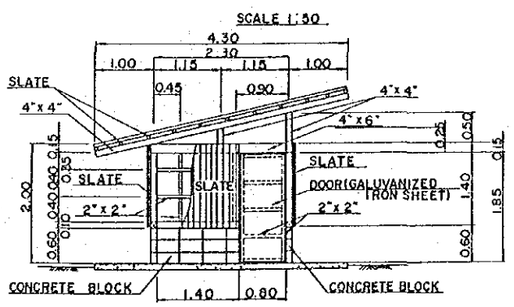
SECTION G—G

SCALE 1:50



SECTION B—B

SCALE 1:20



SECTION D—D

SCALE 1:50

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
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EL : ELEVATION

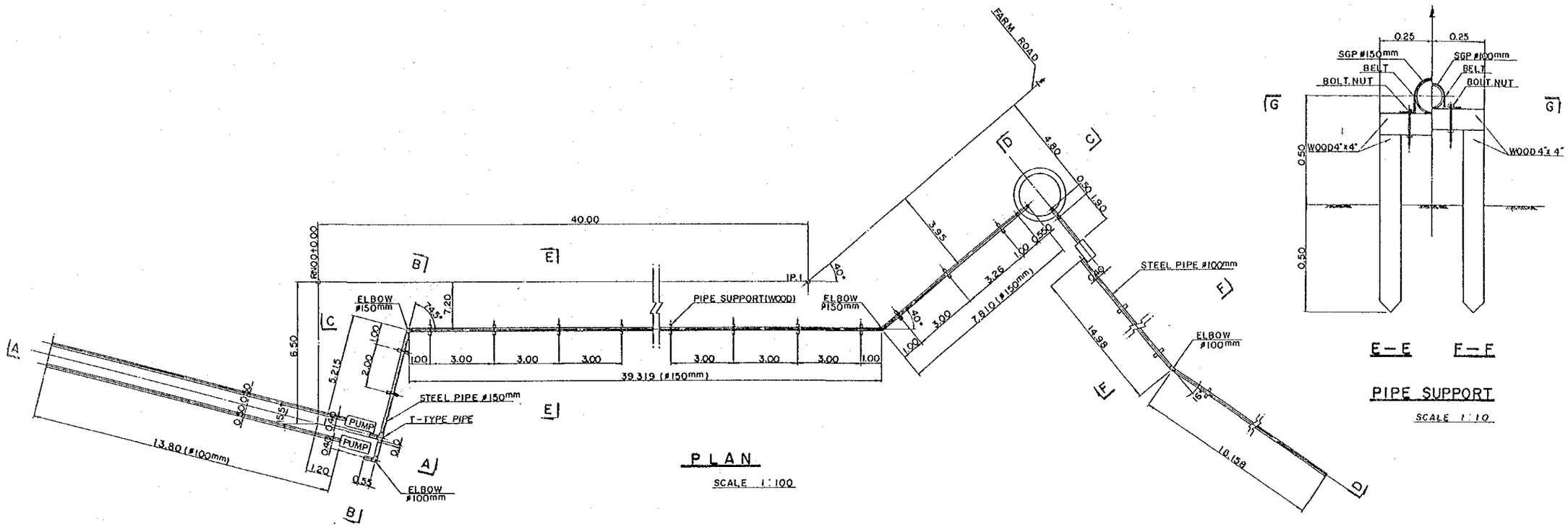
JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR

AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

PLAN OF PUMP STATION (2)

PREPARED BY	DRAWING NO.
CHECKED BY	23



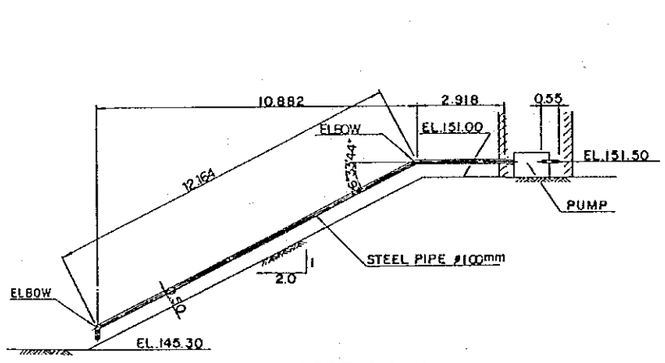
PLAN

SCALE 1:100

E—E F—E

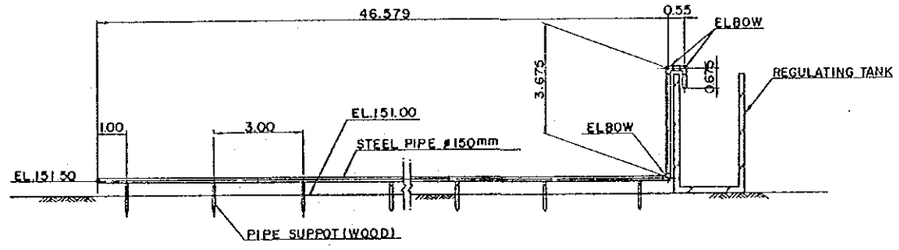
PIPE SUPPORT

SCALE 1:10



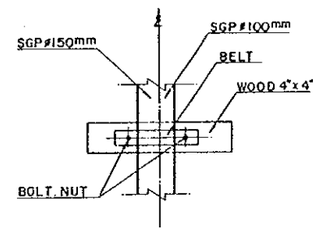
SECTION A—A

SCALE 1:100



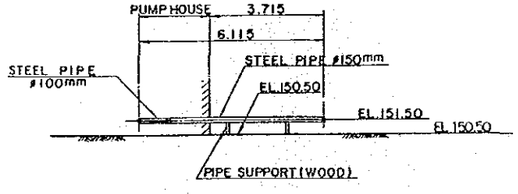
SECTION C—C

SCALE 1:100



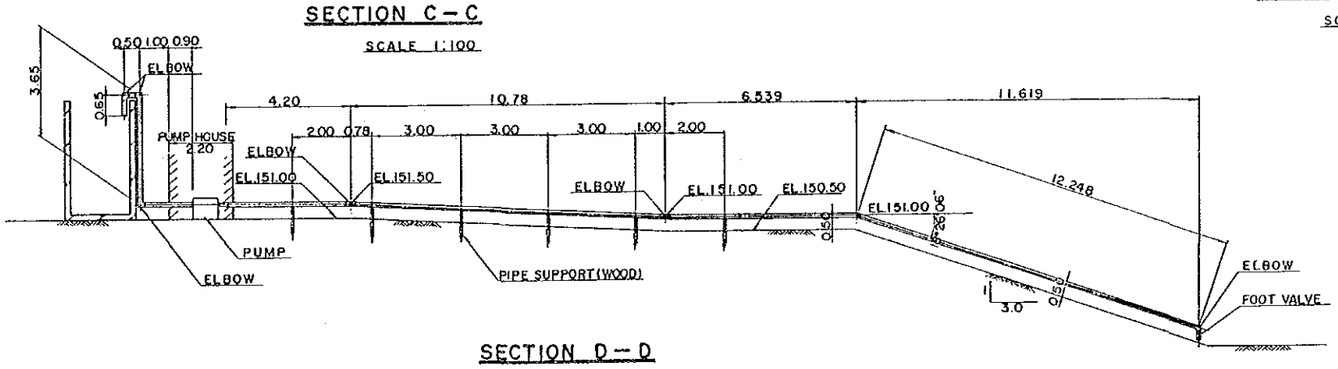
SECTION G—G

SCALE 1:10



SECTION B—B

SCALE 1:100



SECTION D—D

SCALE 1:100

NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
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℄ : CENTER LINE
EL : ELEVATION

JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR

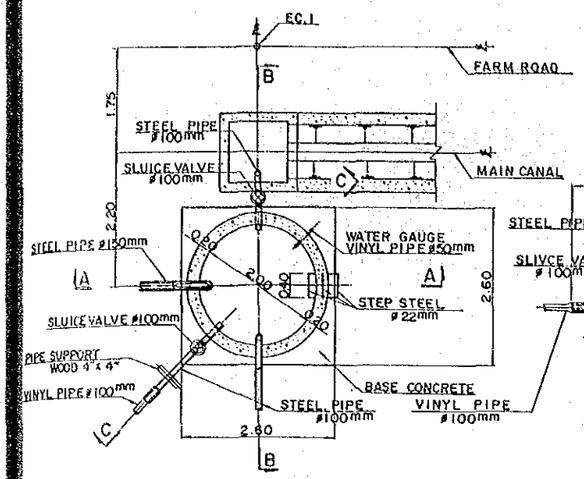
AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

PLAN OF PIPE WORKS

PREPARED BY

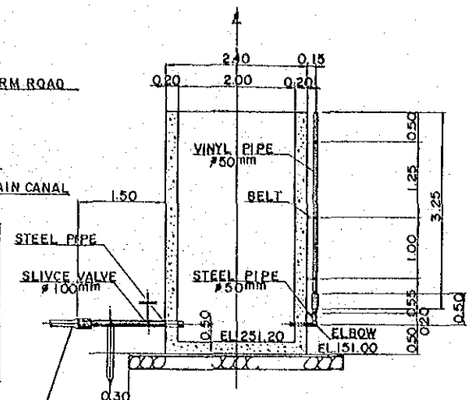
CHECKED BY

DRAWING NO. 24



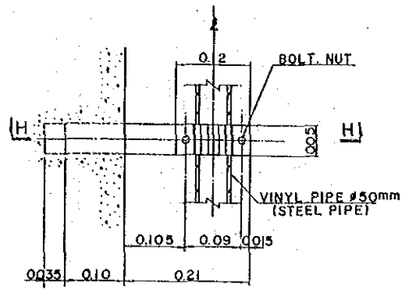
REGULATING TANK PLAN

SCALE 1:50



SECTION C-C

SCALE 1:50



BELT TYPE A

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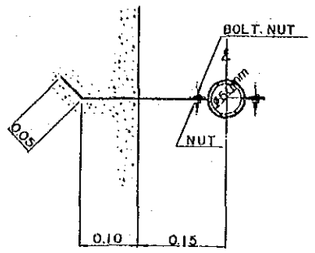
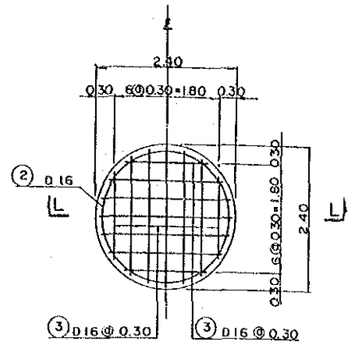


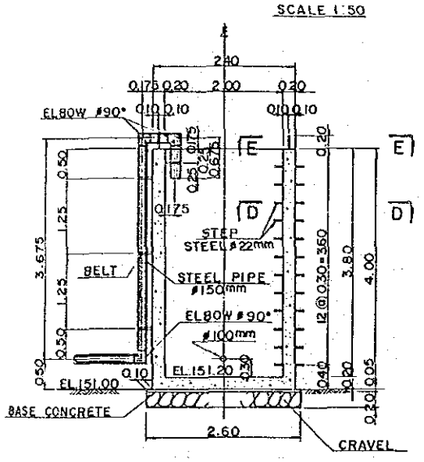
SECTION H-H

SCALE 1:5



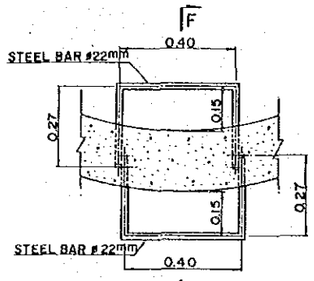
REINF. OF INVERT SECTION K-K

SCALE 1:50



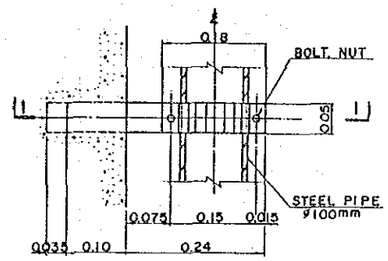
SECTION A-A

SCALE 1:50



SECTION D-D (STEP)

SCALE 1:10



BELT TYPE B

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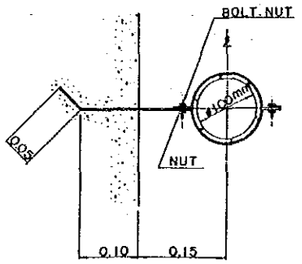
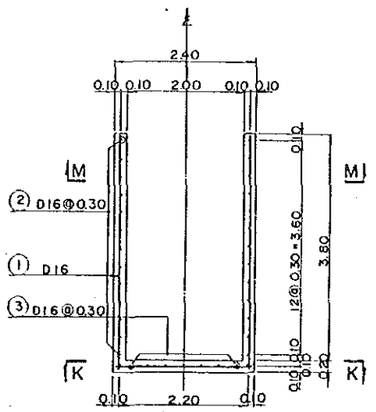


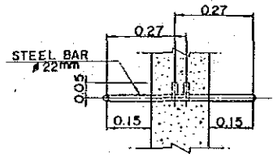
SECTION I-I

SCALE 1:5



SECTION L-L

SCALE 1:50



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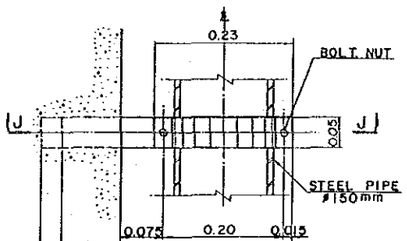
SCALE 1:10



BELT TYPE C

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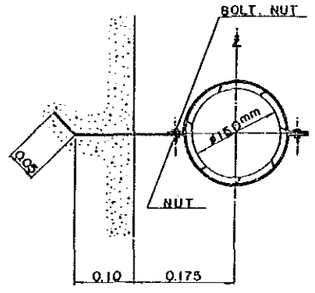
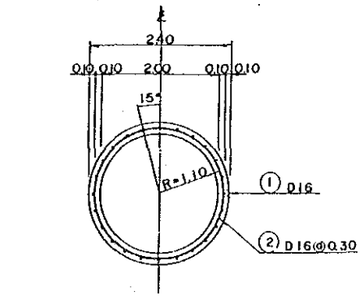


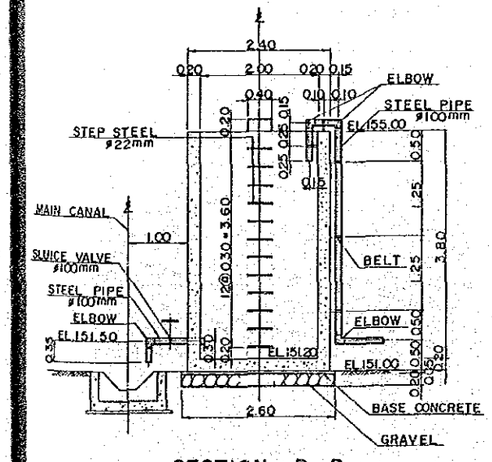
SECTION J-J

SCALE 1:5



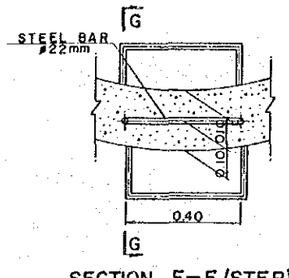
SECTION M-M

SCALE 1:50



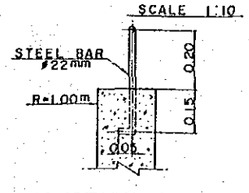
SECTION B-B

SCALE 1:50



SECTION E-E (STEP)

SCALE 1:10



SECTION G-G

SCALE 1:10

NOTE:
1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL : ELEVATION
3. ALL REINFORCING STEEL IS TO BE DEFORMED BAR

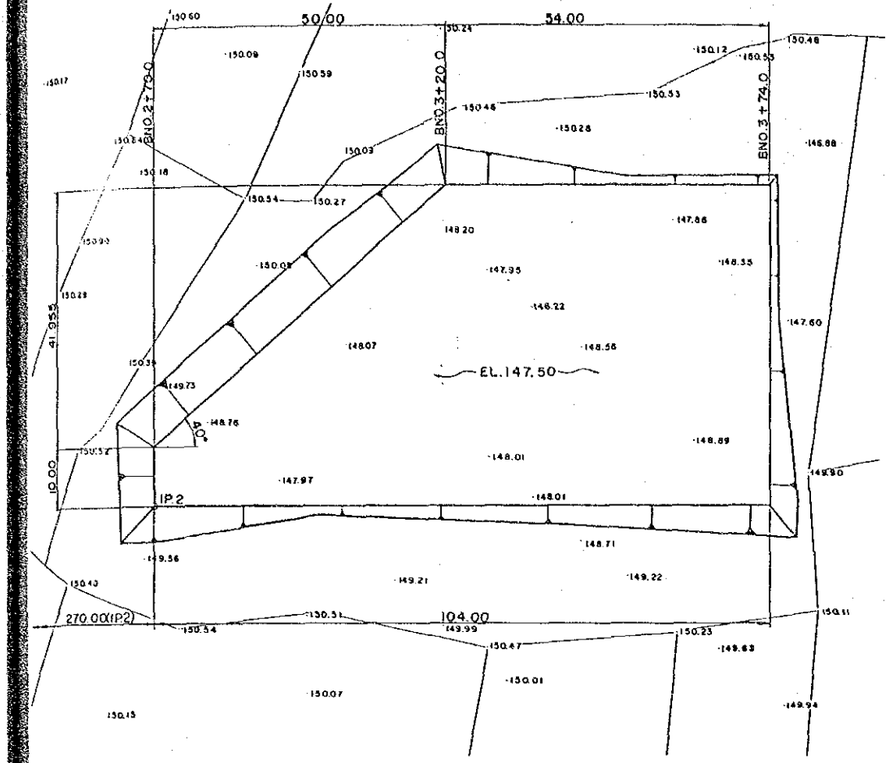
JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR

AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

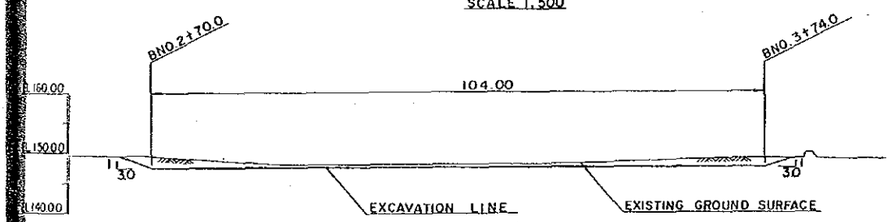
PLAN OF REGURATING TANK

PREPARED BY	DRAWING NO.
CHECKED BY	25



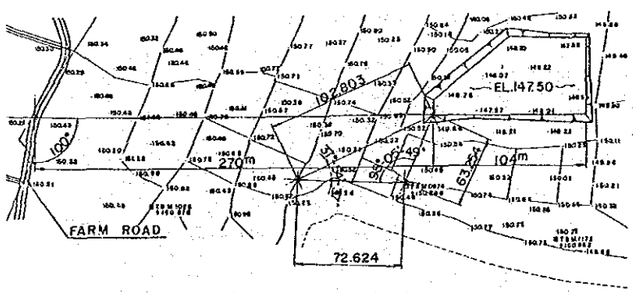
PLAN

SCALE 1:500



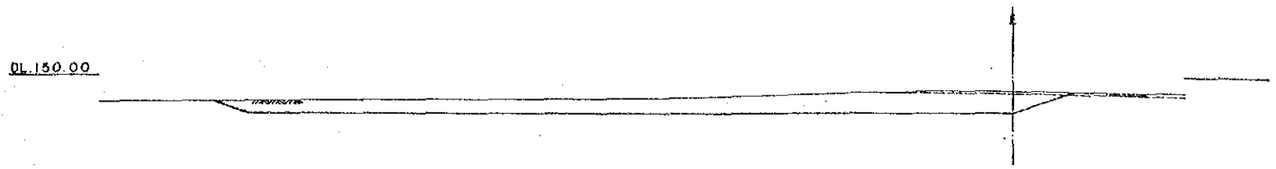
LONGITUDINAL SECTION

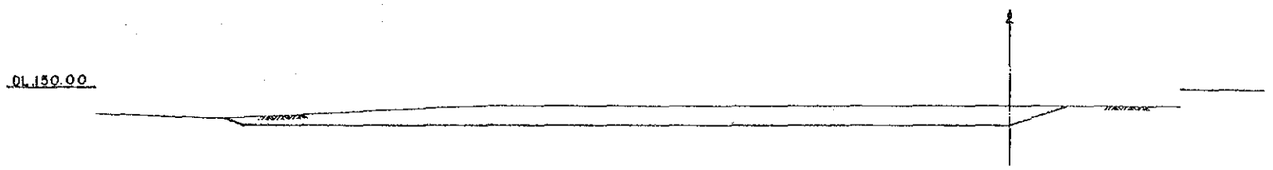
SCALE 1:500

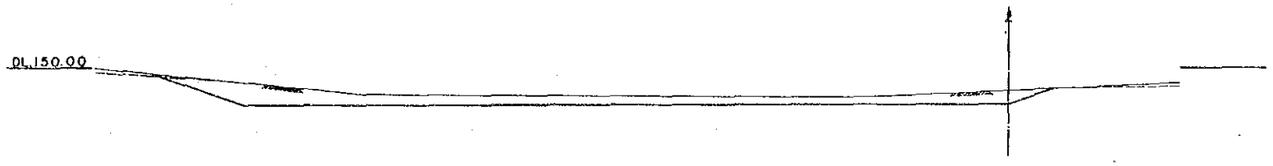


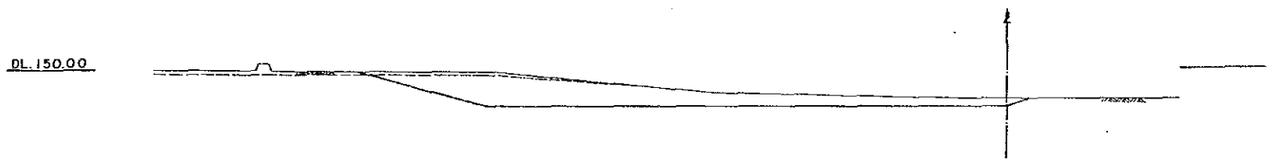
LOCATION

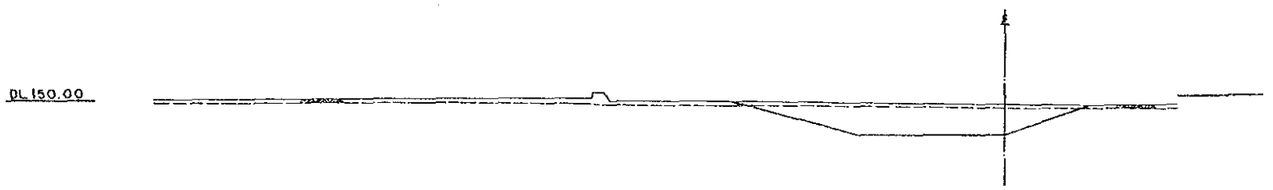
SCALE 1:2,000











NOTE: 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ : CENTER LINE
EL : ELEVATION
DL : DATUM LINE

JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR

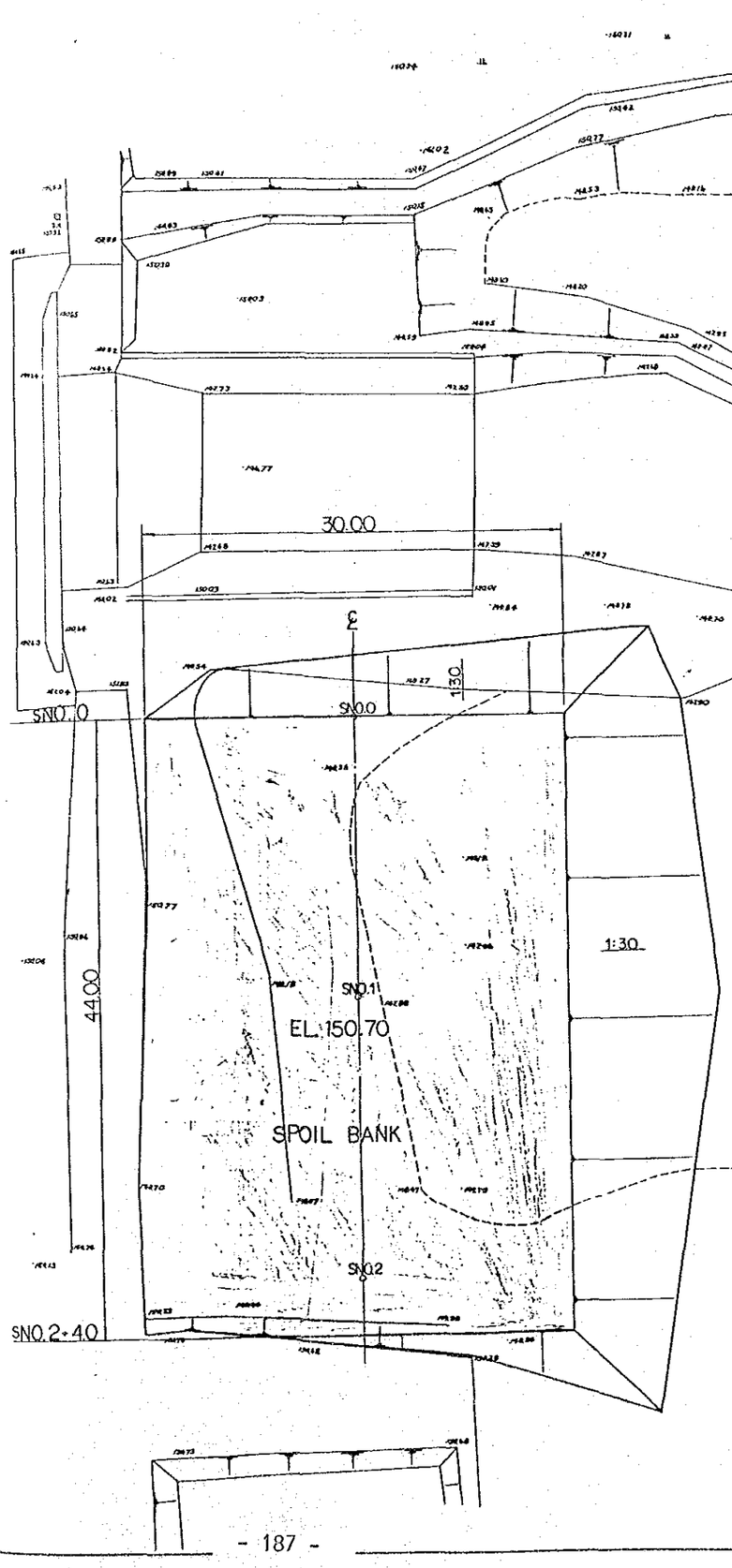
AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

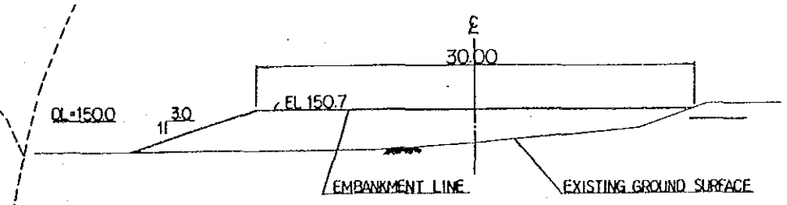
PLAN OF BORROW AREA

PREPARED BY

CHECKED BY

DRAWING NO. 26





STANDARD SECTION
SCALE 1:200

NOTE 1. ALL DIMENSIONS ARE SHOWN IN METERS UNLESS OTHERWISE INDICATED
2. ABBREVIATION AND SYMBOL
℄ CENTER LINE
EL ELEVATION
DL DATA LINE

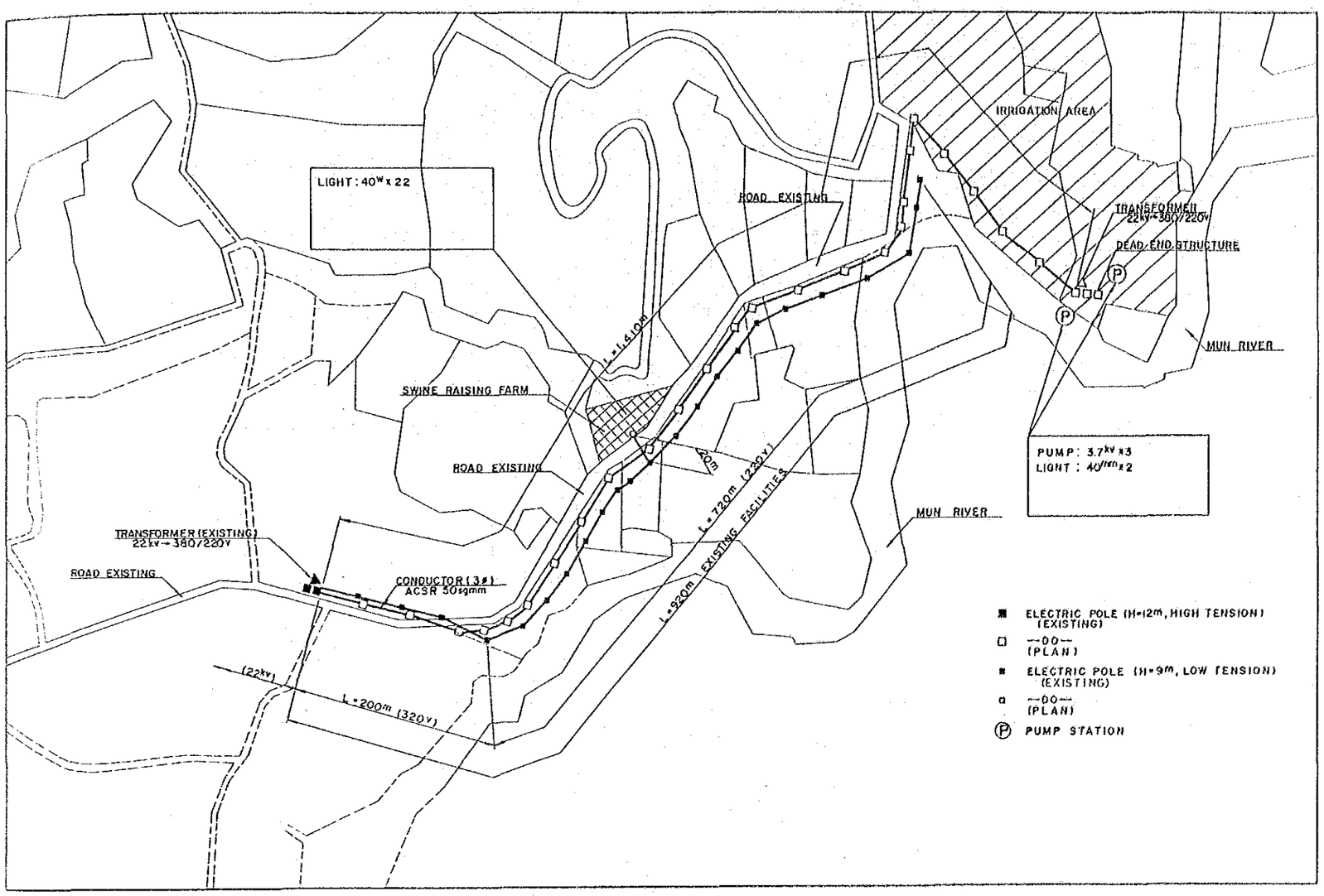
JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

PLAN OF SPOIL BANK

SCALE 1:200

PREPARED BY	DRAWING NO.
CHECKED BY	27



PLAN OF ELECTRIC FACILITIES

MATERIAL ELECTRIC FACILITIES

ITEM	QUANTITY	UNIT
1. CONCRETE POLE(H=12m) AND ATTACHMENTS (TANGENT STRUCTURE 0°~5°)	7	SET
2. CONCRETE POLE (H=12m) AND ATTACHMENTS (SMALL ANGLE STRUCTURE 5°~30°)	19	SET
3. CONCRETE POLE (H=12m) AND ATTACHMENTS, DEAD END STRUCTURE	2	SET
4. CONCRETE POLE (H=9m) AND ATTACHMENTS, DEAD END STRUCTURE	1	SET
5. ARM INSTALLATION	1	SET
6. CONCRETE SLAD	10	SET
7. CONDUCTOR ACSR 50 mm²	4.23	km
8. CONDUCTOR AL, BARE 35 mm²	20	m
9. CABLE AL, COMPACT STANDARD 35 mm²	20	m
10. RACK, SECONDARY 2 x 200 m	1	SET
11. SIDE GUY SUB-TOTAL	1	SET
12. TRANSFORMER AND ATTACHMENTS (INCLUDE ELECTRIC POLE)	1	SET

0 10 20 30 40m
SCALE 1:2,500

JAPAN INTERNATIONAL COOPERATION AGENCY
THE DETAIL DESIGN SURVEY FOR
AGRICULTURAL COOPERATIVE PROMOTION PROJECT IN THAILAND

PLAN OF ELECTRIC FACILITIES

PREPARED BY
CHECKED BY
DRAWING NO. 28

BID DOCUMENTS

C O N T E N T S

* Invitation for Bids

* Instruction to Bidders

* Terms and Condition of this Contract

* Pledge Agreement

* Contract

* Technical Specification

* Proposal

Bid Documents

For

Construction of Model Infrastructure

On

Agricultural Cooperative Promotion Project

in

Thailand

JAPAN INTERNATIONAL COOPERATION AGENCY

JAPAN INTERNATIONAL COOPERATION AGENCY

BANGKOK OFFICE

INVITATION TO BID NO. _____

The Japan International Cooperation Agency, Bangkok Office hereby invites sealed written bids for the Construction of Model Infrastructure on Agricultural Cooperative Promotion Project (the Project) which is situated in Phimai, Nakorn Ratchasima Prefecture.

This Contract will include, among others, the following;

1. Terms and Conditions of this Contract
2. Pledge Agreement
3. Technical Specification
4. Bill of Quantities
5. Drawings

Bids shall be addressed to Mr. Michimoto GOTO, Resident Representative, Japan International Cooperation Agency, Bangkok Office, c/o Embassy of Japan, 1674, New Petchburi Road, Bangkok, Thailand, and marked "Sealed Proposal, Nakorn Ratchasima Model Infrastructure".

The date for the opening of bids will be held at _____ o'clock p.m. (a.m.), _____ Standard Time on (month) _____ (day) _____, 1987 at the JICA, Bangkok Office _____

_____

Mr. Michimoto GOTO

Resident Representative of JICA
Bangkok Office

IB-01 PREPARATION OF BIDS

All bids shall be submitted in an original and three (3) copies on or before the hour and date fixed for receipt of bids, in accordance with the Invitation for Bids, and shall conform to the following requirements;

a) One copy of proposal shall be marked "Original". The original and copies of bids shall be submitted in its entirety with all blanks in the proposal properly filled in.

b) Bids prices shall be written in words as well as in figures. In case of discrepancy between the words and figures, the price in works shall prevail.

c) The proposal must be signed by the Bidder with his usual signature and shall show his full business address.

IB-02 BASIS ON WHICH BIDS ARE REQUESTED

The form of the Contract to be awarded is on fixed unit price basis of payment to the Contractor, as specifically set forth in these Contract Documents. Bids are requested on the above basis and a proposal which is on any other basis will not be considered.

Quotation of prices shall be made in Thai Baht and the Contractor shall be paid in Local Currency.

IB-03 BID SECURITY

The original, but not the copies of each bid, shall be accompanied by a proposal bond in an amount equivalent to (10) % of the total bid price in the form of cash or certified

check, as a guarantee that the successful bidder will, within ten (10) days from receipt of the notice of award, enter into Contract with the Japan International Cooperation Agency, Bangkok Office, and complete faithful performance of the work specified in these Contract Documents. In case the successful bidder fails for any reason to execute such Contract within the stipulated time, the bid security shall be forfeited to the Japan International Cooperation Agnecy, Bangkok Office, as liquidated damages.

The bid securities will be returned without interest after the successful bidder has signed the Contract.

IB-04 DELIVERY OF BIDS

Bids shall be directly delivered to JICA Bangkok Office, to Mr. Michimoto GOTO on or before the hour and date set for the opening of bids.

IB-05 WITHDRAWAL OF BIDS

A bidder will be allowed to withdraw his bid prior to the time set for the opening of bids if he communicate his purpose in writting to the Japan International Cooperation Agency, Bangkok Office, and his bid shall be returned to him unopened. No bid can be withdrawn for any reason whatsoever after the opening of bids has been made.

IB-06 BIDDER'S RESPONSIBILITY

The Bidders shall be responsible for having taken steps to carefully examine all of the Contract Documents and also to have fully informed themselves as to all conditions, local and otherwise, affecting the carrying out of the Contract Works. Failure to do so will be at the Bidder's risk.

IB-07 DATA TO BE SUBMITTED WITH PROPOSAL

All proposal shall contain the following documents:

a) A construction schedule showing the detailed proposal plan of operation and construction of each main item in the Bill of Quantities from start to completion of the Contract Work. The schedule shall be in a bar chart form with weeks shown as the least unit of time and each main item on a separate horizontal line. The schedule shall also show expected monthly accomplishment and financial requirements based on the Bill of Quantities.

b) A list of equipment proposed to be used for the performance of the Conctract Work. This list shall specifically enumerate the number, type and capacity.

IB-08 INTERPRETATION OF CONTRACT DOCUMENTS

If the prospective Bidder is in doubt as to the true meaning of any part of the Contract Documents, the Bidder may submit to the Japan International Cooperation Agency, Bangkok Office, a written request for interpretation allowing suffecient time for a reply to reach him before submission of his bid. Any interpretation of the proposed documents will be made only by a Supplemental Notice duly issued.

IB-09 PRE-BIDDING CONFERENCE

A pre-bidding conference will be scheduled on (month) (day), 1987 at (hour) o'clock p.m./(a.m.) at JICA Bangkok Office

Attendance for Conctractors is desirable but not mandatory.

IB-10 COMPARISON OF BIDS

In making its selection, the Japan International Cooperation Agency, Bangkok Office will not be bound to award a Contract to the Bidder submitting the Bid with the lowest indicated cost, but will take into consideration the bid prices, unbalanced bids, guaranteed completion time and other relevant consideration.

IB-11 AWARD OF CONTRACT

Bids will be opened in the presence of the Bidders who may desire to attend such opening by the Japan International Cooperation Agency, Bagnkok Office, at (hour) o'clock p.m./(a.m.) (Thailand) Standard Time on (month) (day) , 1987.

Promptly after the opening of the bids the Japan International Cooperation Agency, Bangkok Office will undertake a detailed study and appraisal of the proposal submitted. The Contract will be awarded to the Bidder whose proposal is considered to be the most advantageous to the Japan International Cooperation Agency, Bangkok Office. The Japan International Cooperation Agency, Bangkok Office reserves the right to reject any and all bids received.

IB-12 BID DOCUMENTS

Bid documents shall include the following;

a) Invitation for Bids
b) Instruction to Bidders
c) Terms and Conditions of this Contract
d) Pledge Agreement
e) Contract
f) Technical Specification
g) Proposal
h) Bill of Quantities
i) Drawings

TERMS AND CONDITIONS
OF THE CONTRACT

For

Construction of Model Infrastructure

on

Agricultural Cooperative Promotion Project

in

Thailand

BANGKOK OFFICE

JAPAN INTERNATIONAL COOPERATION AGENCY

TERMS AND CONDITIONS OF THE CONTRACT

Section 1 General Information

1.1 Objective

According to the Record and Discussions signed July 6, 1984, technical cooperation concerning Agricultural Cooperative Promotion Project in Thailand (the Project) will be carried out.

The objective of the works are to constructed the irrigation facilities and integrated swine raising facilities for the purpose of promoting the compound farming management.

1.2 Location of the site

The job site is located at about 60 km northeast of Nakorn Ratchasima City.

1.3 Collaboration

Accordingly the objective of technical cooperation, the counterpart agency of JICA, the Agricultural Cooperative Promotion Department, is executing several experiments around the job site. Prior to or during the course of the works, the Contractor shall make the good relation with the Agricultural Cooperative Department for the satisfactory implmentation of the Works to secure full collaboration. Sould it happen that the relation between the Agricultural Cooperative Promotion Department and the Contractor is disturbed, the Contractor shall inform the Inspection Committee who will consiliate the both parties.

Section 2 Submission of Notices

2.1 Work schedule

The Contractor shall submit the Work schedule in following item before the commencement of the Works at the job site. If the Contractor intends to change the Works schedule, the approval from the Inspection Committee shall be obtained prior to the modification of the schedule.

1. Preparation of facilities and transportaion of equipment etc. to the job site
2. Pumping stations
3. Pond
4. Irrigation canals
5. Farm roads
6. Well
7. Appertenant structures
8. Swine raising facilities
9. Clearing away

Also the Contractor shall submit the machineries scheme including the numbers, and kind of machineries and using period of them.

2.2 Notices

The JICA and the Contractor shall submit the notices to each other, as necessary, in accordance with Article 19 in the Construction Contract Document within reasonable time except that special articles are provided in the Contract Document and Terms and Conditions of this Contract.

Section 3 Field Test and Inspection

The field tests in accordance with the Technical specifications and the demands from the Inspection Committee shall be the responsibility for the Contractor. The charges for such field test shall be included in the total amount of the construction cost, and the Contractor is not entitled to claim any amount of the field test charges.

Section 4 Modification of Plan

In case the JICA estimates the cost for the modification in accordance with Article 14, and if there are two portions, one for the increase and the other for the decrease of the counstruction cost resulting from such modification, the JICA shall have the right to offset them in the payment and pay or claim the difference between the increase and decrease of the construction cost as the case may be.

Section 5 Release from the Works

After the final acceptance of the Works by the JICA, the Contractor shall remove its own temporary facilities, office, warehouses, construction roads, electric wiring, surplus material, debris and so forth which were provided by the Contractor within 10 (ten) days. Upon approval of the Inspection Committee for the removal of the above-mentioned facilities etc., the Contractor will be released from its responsibility of the Works but remains responsible under 1 (one) year guarantee of the Works as specified in Article 11 in this Contract.

Section 6 General Obligations of the Contractor

6.1 Temporary office and residence

In case the Contractor intends to build the temporary office, residence and so forth, the Contractor shall submit the plan to the Inspection Committee for approval at least 10 (ten) days in advance of the commencement of the Works.

The Contractor is required to always keep the buildings and facilities in good condition and to make proper drainage and sanitary system. Should the Contractor build them outside of the job site, the Contractor shall arrange with the owner of such land and at its own expense.

6.2 Fuel storage

In area of temporary office and residence, the fuel tank capacity shall not exceed 1,000 liters and shall be far away from the housing area.

Fuel storage and transportation shall be done with care and shall have a good system of fire prevention. If storage licence is required, the Contractor shall arrange for obtaining it.

6.3 Other facilities

All necessary facilities for the Works and the Contractor's convenience shall be provided and maintained in good condition by the Contractor.

Section 7 Additional Works

In case that the Government of Japan provides the Government of Kingdom of Thailand with the heavy equipment such as Bulldozer, Back-hoe shovel, and so forth for the project, the Contractor shall use the said heavy equipment for this construction works.

The Inspection Committee has the right to modify the unit costs of the item about earth work used heavy equipment , the additional works of the balance price between Construction cost written the Contract and Construction cost estimated by Inspection Committee again are ordered by the Inspection Committee.

Section 8 General Text

The Contractor shall implement the Works in accordance with the Contract Documents in broad sense such as the Contract in narrow sense, Terms and Conditions of Construction Contract, Technical Specification and Guideline for Supervision. Should the events occur that the both parties can not reach agreement on the interpretation of the above-mentioned Contract Documents in broad sense, both parties shall negotiate with sincerity and good faith for settlement of any disagreement, failing which the decision of the JICA shall prevail.

PLEDGE AGREEMENT

To Japan International Coopration Agency, Date _____ 1987
Bangkok Office

We _____, the Contractor hereby agree that all equipment, materials and supplies brought to the job site under the Construction Contract made with the JICA dated on _____ 1987, shall be pledged by us with the JICA as security for our execution of Works, and shall not be removed at any time without prior approval of the JICA in writing.

We further agree that should there by any loss or damage to pledged equipment, materials and supplies kept at the job site, the JICA shall bear no responsibility whatsoever for such loss or damage.

_____

CONTRACT

FOR

CONSTRUCTION OF MODEL INFRASTRUCTURE

ON

AGRICULTURAL COOPERATIVE PROMOTION PROJECT

IN THAILAND

BANGKOK OFFICE

JAPAN INTERNATIONAL COOPERATION AGENCY

CONTRACT

For Construction of Model Infrastructure on Agricultural Cooperative Promotion Project in Thailand

This Contract is executed on the _____ day of _____ 1987 at the JICA Bangkok Office between

Japan International Cooperation Agency, Bangkok Office by Mr. Michimoto GOTO Title Resident Representative as its authorized representative of the JICA Bangkok Office, hereinafter called "the JICA" of the one part, and _____ whose office is situated at _____ Road _____ Tambon _____ Amphoe _____ Changwat _____ Tel. _____ Represented by _____ Nationality _____ Title _____ hereinafter called "the Contractor", of the other part.

Both parties mutually agree under the terms of this Contract as follows:-

Article 1 Purpose of agreement and Contract Price

The JICA agrees to employ the Contractor and the Contractor agrees to perform the Works for the construction of Model Infrastructure on Agricultural Cooperative Promotion Project Located at _____ For the total amount of _____ Baht. (_____), hereinafter called "Contract Price".

The following documents shall form integral part of the Contract:-

---

Terms and conditions of this contract

Pledge agreement

Technical specification

Bill of Quantities

Drawings

Article 2 Performance Bond

As a security for the faithful performance of the Works under this Contract, the Contractor has on the execution of this Contract deposited a performance bond with the JICA _____ Baht (_____)in cash, or in lieu thereof a Bank Guarantee issued by the _____ bearing the number _____ and dated _____ in the amount of _____ Baht (_____) which represents five (5) percent of the Contract Price, the name of the issuing bank and the form of the bank guarantee are to be approved by the JICA.

The JICA will return the performance Bond in cash or the Bank Guarantee to the Contractor as the case may be at the end of the twelve (12) months after final acceptance of the Works by the JICA as stipulated in Article 15 of this Contract, provided that the completed Works shall not show any defect or damage caused through the fault of the Contractor, or through the fault of any new Contractor in the case of termination of Contract by the JICA under Article 4.

Should the Contractor by in default, the JICA shall have the right to demand payment from all or any part of the performance bond. In addition, the Contractor shall remain liable for the full loss sustained by the JICA.

Article 3 Payment

The JICA agrees to effect payments for the Works to the Contractor in the following manner:-

a. Advance Payment, to be effected upon the bringing of equipment and materials required for the Works and properly stored at the job site by the Contractor and of value estimated by the Inspection Committee. _____ _____ which corresponds to Thirty (30) percent of the Contract Price shall be paid upon signing of this Contract.

b. Interim Payment, to be effected according to the progress of the Works satisfactorily executed by the Contractor and accepted by the Inspection Committee. _____ _____ which corresponds to Thirty (30) percent of the Contract Price shall be requested for payment at _____.

c. Final Payment, to be effected upon the satisfactory completion of the Works by the Contractor and accepted by the Inspection Committee.

The remainder of _____ _____ which corresponds to Forth (40) percent of the Contract Price, shall be paid after the Final Certificate by the JICA for payment to the Contractor.

Payment under (b) and (c) shall be effected within _____ day after the respective acceptance of the Works by the Inspection Committee.

Taxes payable by the Contractor, if any, shall be deducted at source by the JICA on each payment.

It is expressly understood that payments by the JICA do not mean acceptance reponsibilities under this Contract.

Article 4 Completion Time

The Contractor agrees to commence the Works at the site within ten (10) days from the date of signing of this Contract (commencement date) and the Contractor agrees to satisfactorily complete the Works within _____ days (completion time) after the date hereof which will become due on _____ 1987 (completion date).

If the Contractor fails to commence the Works by the above commencement date, or should in the course of the construction any event occur which may reasonably cause the JICA to believe that the Contractor will not be able to complete the Works on the completion date, or should the Contractor fail to complete the Works by the completion date, or should the Contractor fail to meet any of the Contract requirements, the JICA shall have the right to terminate this Contract by giving written notice to the Contractor.

However, in case that the Contractor fails to complete the Works by the completion date, or to meet any of the Contract requirements, if the Inspection Committee thinks that the Contractor has the ability for completion of the Works within reasonably extended period, the Contractor may be permitted by the JICA to continue the Works beyond the completion date but within the within time.

Article 5 Penalty

In case that the Contractor is in default as mentioned in Article 4, the Contractor agrees to be responsible to the JICA as follows:-

5.1 In case of the termination by the default of commencement for the Works, the Contractor shall pay a penalty of twenty Thounsand Baht (20,000.00) Baht) per day counting from the commencement date until the new Contract is completely executed with a new Contractor for this Works, the period of which is included the time spent for finding the new Contractor and excuting the new Contract etc.

5.2 In case the JICA thinks that the Contractor will not be able to complete the Works within the completion time and thereby terminates this Contract, the Contractor shall pay a penalty of twenty Thousand Baht (20,000.00 Baht) per day counting the number of days in the same manner as prescribed in 5.1 above. However, the JICA may reduce such number of days according to the ratio between the completed Works and the total Works as may be decided by the Inspection Committee.

5.3 In case the Contractor fails to complete the Works by the completion date or to meet any Contract requirement, the Contractor shall pay a penalty of twenty Thousand Baht (20,000.00 Baht) per day counting from the date following the completion date until the Works satisfactorily completed and accepted by the Inspection Committee.

Article 6 Compensation

If the JICA sustains any losses as direct or indirect damages caused by the Contractor's failure, the Contractor shall compensate the JICA for such losses. The parties agree that time is essential for the completion of the Works.

Article 7 The JICA's right for default

The JICA has the sole and absolute right to decide whether to terminate the Contract, to impose only the penalty on the Contractor or to claim the compensation for the damage as stated in Article 5 or Article 6. The money due to the JICA exercising its right under this article shall be retained and deducted from any money due to the Contractor but yet unpaid, including from the performance bond. If the total amount of the loss is larger than the money above-mentioned, the Contractor agrees that the JICA has the right to retain the construction equipment, materials and supplies etc. and demand payment of the balance from such equipment etc. or proceeds of sale thereof.

Article 8 Contractor's responsibility on termination of this Contract

After the Contract has been terminated in accordance with the foregoing Article 4, the JICA shall have the right to employ another Contractor (hereinafter called the "New Contractor") to carry on the remaining parts of the Works, and the payment for the Contractor that fail to complete the work shall be made out of the necessary Contract price for the remaining Works. Should the remaining amount after payment of the advance and interim payment from the Contract price, be insufficient to effect payment to the new Contractor, the difference between such remaining amount and actual cost estimated by the JICA for the satisfactory completion Works carried out by the new Contractor, shall be deemed as direct loss sustained by the JICA, and the Contractor shall pay such difference to the JICA within ten (10) days from the date of request by the JICA, failing which interest at the rate of eighteen (18) percent per annum shall be charged thereon.

Article 9 Inspection Committee

The Inspection Committee, authorized to act on behalf of the JICA will be appointed by the JICA and the Inspection Committee is entitled to do all things that the JICA may do so. The Inspection Committee shall control and supervise the Works all the times whether it is in the preparation or implementation of the Works and the Contractor shall promptly furnish all necessary facilities for proper inspections of the Works in accordance with the Inspection Committee's request. At any moment the Inspection Committee can request the Contractor to stop the Works, if necessary and the Contractor shall have no claim on the JICA for extension of the completion time due to such suspension of the Works under this Article.

The Inspection will not be deemed as the acceptance of the Works, and the Contractor shall not be relieved from his responsibility to meet the Contract requirements by the fact that the Inspection Committee exercise their duties. Should it be found that the Works have not been satisfactorily performed in the faithful manner, the Contractor shall correct any part of the Works indicated by the Inspection Committee within the period specified by the Inspection Committee.

Article 10 Prohibition for the equipment removal

Should the Contractor fail to complete the Works during the completion time or the Inspection Committee thinks that the Contractor will not be able to satisfactorily complete the Works, any equipment and materials brought to the site for use on the Works shall not be removed without the prior approval of the Inspection Committee in writing.

Article 11 Rectification of the defective construction

For a further period of One (1) year after satisfactory completion and final acceptance of the Works by the JICA, whether completed by the Contractor or by the new Contractor in case of termination of Contract under Article 4, any damage to the Works which is caused by the Contractor's fault, either because of defective workmanship or the use of inferior materials or any other cause, shall be made good as necessary by the Contractor to the satisfaction of the JICA at no extra cost.

In case of the termination of the Contract, the JICA may decide which part of the Works should come under the Contractor's responsibility, and requests the Contractor to make good of the damaged Works. Should the Contractor fail to do so within period specified after receipt of written request to do so from the JICA, the JICA shall bave the right to employ another Contractor to carry out such work and the Contractor agrees to bear all expenses incurred.

Article 12 Discrepancies among the Contract Documents

If, prior to or during the course of the Works, any discrepancies are found in the drawings and/or the Technical Specifications etc. attached to this Contract, the Contractor shall follow the ruling given by the Inspection Committee at no additional cost to the JICA.

Article 13 Construction Method and Temporary Works

The construction method including implementation schedule and plan of the temporary works such as installation of temporary facilities, offices, ware houses, construction roads, electric wiring, etc. shall be submitted by the Contractor and approved by the Inspection Committee at least 10 (ten) days in advance of the commencement of the Works.

Should the cost of the above temporary works be estimated in the unit cost of each work items of Bill of Quanities in this Contract, and the Contractor is not entitled to claim any amount of charges for the temporary works.

Article 14 Modification of Plan

If the Inspection Committee finds it necessary to make modification of construction design, quantities and/or materials and so forth during the course of construction, the JICA has the right to order the modification of the Works to the Contractor, and such order shall be made in writing from the Inspection Committee to the Contractor.

The JICA agrees to adjust upwards or downwards the necessary expense for such modification to the Contractor, which will be estimated by unit price in the bill of quantities of this Contract in case of modification of quantities of construction works. In the case of additional works which are not quoted by unit price in the bill of quantities of this Contract, the Inspection Committee will make estimation thereof and the JICA will pay to the Contractor for such additional works accordingly. But if the Contractor does not agree to such estimation, the Contractor is then entitled to negotiate with the JICA. Also the extension of the completion time due to the modification shall be given by the JICA who shall have the sole right to decide the number of days of such extension.

Article 15 Acceptance of the Works

When the entire Works have been completed, the Contractor shall submit the invoice in written form indicating the Work actually completed to the Inspection Sommittee. If there are compliance with drawings or Technical Specifications, the JICA shall accept the Works as the final acceptance of satisfactory completion Works within ten (10) days after the receipt of the written form and it shall be deemed that the final acceptance has been made on such date of the receipt of the written form.

On the other hand, should non-compliance with drawings or Technical specifications or defects be found in the Works executed by the Contractor, the Inspection Committee will have the right not to accept the Works and to order the rectification of the Works. If the required period for the rectification of the Works is beyond the completion date, the Contractor shall not be relieved from its responsibility to pay the penalty as stipulated under clause 5.3, and after the completion of rectification of the Works, then the final acceptance will be made in the same manner as described in the first paragraph of this Article.

During the course of construction, whether in the compretion time or of extended time specified in the last paragraph of Article 4, the JICA has the right to accept a part of the Works already completed in the written form which shall be considered as a part of final acceptance. However, both parties shall negotiate with each other for the maintenance and usage of the accepted part of the Works, and the contractor is not entitled to request the extension of the completion time due to any interruption caused by the use of such accepted Works by the JICA,
the Inspection Committee or the officers of Thai Government authorities, or any delay in repairing such accepted Works.

Article 16 Construction Engineer

The Contractor shall appoint a construction engineer at his own expence for the supervision of the Works performance, who shall be authorized to act on behalf of the Contractor, and the instructions given to him shall be deemed as given to the Contractor. Such construction engineer shall be a well English-speaking person and accepted by the JICA, who shall stay at the job site all the time and shall not leave without obtaining the prior approval of the Inspection Committee. If the Contractor replaces the construction engineer, the Contractor shall obtain the prior approval from the Inspection Committee in writing.

Article 17 Replacement of Labour, Engineer and Foreman

The Inspection Committee may request the Contractor to remove any of the Contractor's labours, foremen or engineers if it appears to the Inspection Committee that such labour, foreman or engineer is incompetent for his job or is not suitable or is not capable of handling his workmen or staff, and the Contractor shall promptly replace any such labour, foreman or engineer. No extra cost or claim for extension of time will be allowed because of such replacement.

Article 18 Sub-Contractor

The Contractor shall not sub-contract or assign any portion of the Works under this Contract without obtaining the prior approval of the JICA who has the sole right to decide which portion of the Works may be sub-contracted or assigned to the Sub-Contractor. However, the Contractor shall be fully responsible for the Works done by the Sub-Contractor.

Article 19 Notice

All Notices required by this Contract shall be effective only at the time of receipt thereof, and only when received by the parties concerned at following address:-

The JICA Bangkok Office,
1674/1 New Petchburi Road, Bangkok.

The Contractor

All Notices required by the terms of this Contract shall be made in writing in English Language, and delivered by registered mail or hand delivery.

Article 20 Dispute

In the event of any dispute arising from the interpretation and performance of the terms of this contract, both parties agree to make the best attempt with sincerity and in good faith to negotiate and amicably settle such dispute, failing which the parties agree to refer such dispute to arbitration under Thai Commercial Arbitration Rules and Regulation, Bangkok, by 2 arbitrators, each of which is to be appointed by each party. If either party fails to appoint its arbitrator within seven (7) days or should the arbitrators fail, within fifteen (15) days after their appointment, to agree upon the decision of the dispute or no decision is reached on the appointment of an umpire, then the dispute shall be brought before the Court the Thainland for decision under the laws and procedures of the Kingdom of Thailand.

This Contract is executed in duplicate of the same tenor, one of the original copy to be kept by JICA and the other original copy to be kept by the Contractor. Both the JICA and the Contractor have set their signatures and affixed the seals thereto in the presence of the witnesses.

---------- JICA

Mr. Michimoto GOTO, Resident Representative,
Bangkok Office, Japan International Cooperation Agency

---------- Contractor

---------- Witness

---------- Witness

TECHNICAL SPECIFICATIONS

FOR

CONSTRUCTION WORK OF THE MODEL INFRASTRUCTURE

ON

THE AGRICULTURAL COOPERATIVE PROMOTION PROJECT

IN

THAILAND

BANGKOK OFFICE

JAPAN INTERNATIONAL COOPERATION AGENCY

TECHNICAL SPECIFICATIONS

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PART 13. SWINE RAISING FACILITIES CONSTRUCTION WORKS

TECHNICAL SPECIFICATIONS

PART 1 SPECIAL PROVISION

1-01 The Contractor shall execise utmost care so that his construction operations will not damage any existing structure except such structures as specified to be dismantled. Any damages on the such existing structure or facilities shall be made good by the Contractor at his expense.

1-02 If it is necessary in the prosecution of the work to interrupt or obstruct the drainage of the surface, the flow of artificial drains and the flow of irrigation canal, the Contractor shall provide for the same during the progress of the work in such a way that no damage shall result to either public or private interest. For any neglect to provide for either natural or artificial irrigation or drainage which he may interrupted, he shall be held liable for all damages which may result therefrom during the progress of the work.

1-03 The Contractor is expected to visit the location of the work and make his own estimate of the facilities needed for the work. In the successful execution of the contract, the Contractor is expected to familiarize himself with local conditions, availability of labour, transportation facilities, uncertainties of weather, and other contingencies. From investigations, made at site, it is believed that topographical conditions are approximatedly as shown on the drawings, but the nature of the materials and the depth of satisfactory foundations, are not guaranteed. It is expressly understood that JICA will not responsible for any deduction, interpretation, or conclusions made by the Contractor. JICA does not guarantee that other materials will not be encountered or that the proportions of the several materials will not vary from those indicated by the drawings.

1-04 Elevation referred to the datum plane are to be determined from bench marks established by JICA or the Inspection committee at the site of the work.

1-05 The Inspection Committee will establish the necessary survey monuments and bench marks at convenient points in the area covered by this contract for use of the Contractor in laying the lines and grades required for the proper conduct and execution of the work. All stakes, bench marks, etc., placed by the Inspection Committee in laying out the work shall be carefully guarded and preserved by the Contractor, and in such case stakes or marks are misplaced or rendered useless through the carelessness or negligence of the Contractor or his agents, employees or workmen, they will be replaced by the Inspection Committee at the expense of the Contractor.

1-06 The Contractor shall execute the work to the lines and grades given by the drawings and/or the Inspection Committee. The Contractor shall, at his own expense, furnish all stakes, templates, pattern, platforms and labor that may be required in setting or laying out any part of the work.

PART 2 GENERAL CONSTRUCTION FACILITIES

2-01 SCOPE

This part covers the construction and/or maintenance of access roads, setting up of Contractor's camp facilities, providing camp security and the disposition of the Contractor's various facilities at the end of the contract.

2-02 ROADS

(a) The Contractor shall improve, repair and widen, if necessary, existing roads to satisfactorily meet his haulage requirements. He shall also construct all other roads within the construction area which he deems necessary in the prosecution of his work. The improving, widening and maintaining of existing roads and constructing and maintaining new roads shall be made without cost to JICA, and same shall be the responsibility of the Contractor during and up to the completion of all construction work under the contract.

2-03 CONTRACTOR'S CAMP FACILITIES

(a) If the Contractor deems necessary, he shall grade his camp site; construct his office, employees' housing, warehouses, machine and repair shops, fuel storage tanks; and provide such other facilities that the Contractor deems necessary for maintaining health, peace and order in the camp and work area.

(b) The location, construction, operation and maintenance of such camps and facilities shall be subject to the approval of the Inspection Committee. At least ten (10) calendar days to the date on which the Contractor desires to begin to work on in feature of camp construction, the Contractor shall submit for the approval of the Inspection Committee drawings and specifications, in sufficient detail to permit determination of suitability of the construction in compliance with these specification, and no camp construction of any kind shall be undertaken until such drawings and specifications have been approved by the Inspection Committee.

2-04 CAMP SECURITY

The Contractor shall provide his own security force to the extent that the deems necessary for maintaining peace and order in the camps and work areas and to safeguard materials and equipment.

2-05 DISPOSITION OF CAMP AND CONSTRUCTION FACILITIES

After the completion of the work covered by the Contract, the entire camp of the Contractor, including its water supply system, quarters, warehouses, shops and other facilities therein; and all other temporary installations at work areas shall be removed by the Contractor and the site shall be cleaned.

PART 3 CARE OF WATER DURING CONSTRUCTION

3-01 SCOPE

In accordance with specifications contained in this part, the Contractor shall care the water during construction so that construction work can be performed in areas free from water. Care of water during construction shall include provision for drainage and pumping system for dewatering the foundation areas and the construction of temporary bulkheads necessary for the protection of construction operations from encroachment by water.

3-02 DRAINAGE AND PUMPING

The Contractor shall be responsible for dewatering the foundation areas so that work may be carried on in a suitably dry condition, draining and/or pumping all water during the process of construction until its completion. The Contractor shall construct drainage ditches, holes, or culverts; furnish, operate, and maintain at his own expense all necessary pumps, to keep all work areas in amply dry condition, and prior to final acceptance of the work by the Contracting Officer, the Contractor shall remove, fill or plug all temporary drainage structures and pumping equipments at his expense.

PART 4 OPEN EXCAVATION AND FOUNDATION PREPARATION

4-01 SCOPE

In accordance with the Specifications, contained in this part, and as shown on the drawings, or otherwise directed by the Inspection Committee the Contractor shall perform all required open excavation and foundation preparation pertinent to the construction work.

4-02 OPEN EXCAVATION

(a) General

Open excavation under these Specifications consists of the removal, hauling, dumping, and satisfactory disposal of all materials from required excavations for farm road, irrigation and drainage canals and miscellaneous excavations for other structures included under this contract. Open excavation shall be performed to the lines and grades shown on the drawings or established by the Inspection Committee. The Inspection Committee may modify slopes of excavation to fit conditions encountered during construction. Such changes or modifications shall not considered by the Contractor as a basis for additional compensation over and above the unit prices bid. All necessary precautions shall be taken to preserve the ground outside the specified lines and grades in the soundest possible condition.

(b) Foundation in Loose Material

When the surfaces of excavation upon or against which concrete or embankment fill is to be placed consist of loose materials, the said loose materials shall be removed or replaced with suitable materials and compacted in a manner satisfactory to the Inspection Committee. The cost of removing the loose materials shall be paid for under the pertinent bid items for open excavation. The cost for the replacement with suitable materials and the compaction of the same shall be paid for under the pertinent bid items for fill.

4-03 DISPOSITION OF EXCAVATED MATERIALS

(a) Spoil Areas

The Contractor shall submit for the approval of the Inspection Committee locations, areas, drawings and other necessary specifications of spoil area which the Contractor proposes to use for the work under this Contract, and any kind of disposition shall not be undertaken before obtaining the said approval. Excavated material not suitable for fill or otherwise not needed shall be wasted in approved spoil areas. Spoil piles shall be constructed to the stable slopes of the material being wasted. Any spoil pile exceeding two (2) meters in height shall not be performed. Spoil material shall be spread and graded so that surface drainage will not be concentrated and will not create and/or accelerate undesirable erosion in spoil areas.

4-04 DEMOLITION, REMOVAL, AND DISMANTLING

When specified in the drawing or the Inspection Committee, existing concrete structures, such as concrete masses, stones, etc., shall be demolished and disposed of accordingly.

4-05 FOUNDATION PREPARATION

(a) Fill on Earth

All horizontal and sloped earth surfaces, upon which embankment material is to be placed or other foundation surfaces whose locations are specifically indicated by the Inspection Committee, shall consist of undisturbed or compacted material and shall be clean, damp, free from standing or running water and free from organic matter; and shall be suitable as a foundation for the material to be placed upon them.

(b) Concrete

All horizontal and sloped earth surfaces upon which concrete is to be placed shall be undisturbed or of approved compaction, clean and damp, free from standing or running water, and shall be otherwise suitable as a foundation for the concrete to be placed upon them.

PART 5 FILL AND BACKFILL

5-01 SCOPE

In accordance with the specifications contained in this part and as shown in the drawings or otherwise directed by the Inspection Committee the Contractor shall furnish and place the earth fill for construction work, backfill for related structures. Any work of fill and backfill shall not be commenced without prior approval of the Inspection Committee. The slope of the embankment shall be finished to the designed gradient by providing fixed rules.

5-02 BACKFILL

Backfill, as used herein, is defined as refill for structures. The materials used for backfill for structues shall be free from roots, stones of more than five (5) centimeters in diameter, and other objectionable materials and subject to the approval of the Inspection Committee. Backfill materials shall be placed in layers, each layer being not more than twenty (20) centimeters thick before compaction, thoroughly compacted by means of power tempers or by other means of approved by the Inspection Committee.

5-03 FILL

(a) Lines and Grades

The fills shall be constructed to the lines, grades and cross sections indicated on the drawings, unless otherwise directed by the Inspection Committee. The Inspection Committee may increase or decrease the slopes of the fill or make such other changes in the design as may by deemed necessary to produce a stable structure. Change in quantities of materials, resulting from prescribed changes in section, shall not make cause for claims for increased unit prices. Generally, a tolerance of plus or minus 0.05 meter from the slope lines and

grades shwon on the drawings will be allowed in the finished surfaces of the embankments except that the tolerances shall not be continuous over an area greater than twenty (20) square meters.

(b) Conduct of the Work

1. The Contractor shall maintain and protect the fills in a satisfactory condition at all times until final completion and acceptance of all work under the Contract. Any approved fill material which rendered unsuitable after being placed in the fills shall be replaced by the Contractor and no additional payment will be made there. The Contractor shall excavate and remove from the fills any material which the Inspection Committee considers objectionable and shall also dispose of such material and refill the excavated as directed, all at no additional soct to JICA. The Contractor may be required to remove at his own expense any fill material placed outside of prescribed slope lines.

2. When the excavation of suitable fill material from required excavation and approved borrow sources progresses at a faster rate than placement in the fills, such excavated materials may stockpiled at approved locations until use is authorized. No separate payment will be made for stockpiling or reloading and hauling of this material to its place in the fills and all costs in connection therwith shall be included in the applicable contract unit price for the fill materials.

5-04 MATERIALS

(a) Sources

The Contractor shall submit for the approval of the Inspection Committee locations, areas, drawings and other necessary specifications of borrow areas which the Contractor proposes to use for obtaining fill material. Materials for fills shall be secured from required excavations and from the borrow areas as approved. There is no guarantee that all the materials

in/any borrow area will be suitable for use in the fills and the Contractor shall move or modity his operations to avoid unsuitable material. The Contractor shall maintain and operate sufficient excavating and hauling equipment so that an adequate amount of fill material from all sources is available as required. Operations in borrow areas shall not be on danger roads, buildings, or structures. Borrow areas shall be graded to provide drainage from all parts of the excavated areas. When operations in a borrow area have terminated, the area shall be dressed to a neat and orderly appearance, as approved by the Inspection Committee. Any additional material needed shall be obtained from sources approved by the Inspection Committee.

(b) Suitability

Materials containing brush, roots, sod or other perishable material will not be considered suitable for fills. The suitability of the materials shall be subject to the approval of the Inspection Committee.

5-05 PLACEMENT

(a) General

No fill material shall be placed on any part of the fill foundations until such areas have been inspected and approved by the Inspection Committee and until after completion of foundation preparation as specified in PART 4. The gradation and distribution of materials shall be such that the fills will be free from lense, pockets, and streaks.

(b) Earth Fill

The fill material shall be dumped and spread in horizontal layers having an uncompacted thickness of not over 20 cm. When material is spread, chunks larger than 10 cm in size shall be broken down by approved means or removed.

5-06 COMPACTION

(a) General

After a layer of fill material has been dumped and spread, it shall be compacted by hand operated mechanical tampers or by other compaction machine approved by the Inspection Committee, to a density more than 85 percent of the maximum dry density of the material or to a density specified by the Inspection Committee.

(b) Fill on or against Culverts and Concrete Structure

No fill shall be placed on or against concrete surface before a period of fourteen days has elapsed after placing the concrete. Before passage of hauling equipment over the top of culverts or other structures will be permitted, the depth of fill over the concrete shall be sufficient to permit such passage without harmful stresses or vibrations in the structure. Fill placed around and over culverts or other structures shall be compacted by hand operated mechanical tampers or by man power to a density equal to that specified for the other earth fill.

5-07 ADDITIONAL COMPACTION

If, in the opnion of the Inspection Committee, the desired compaction of portion of the embankment is not secured, addtional compaction operation shall be made over the surface area of such designated portion until the desired compaction has been obtained, without additional cost to JICA.

5-08 QUALITY CONTROL

If it is required, tests, for moisture content and density, all necessary tests will be made by the Inspection Committee, and from these tests, corrections, adjustments, and modifications of methods, materials, and moisture contents may be made in order to secure satisfactory density of the fill materials. The Contractor shall provide necessary unskilled labor in obtaining and preserving samples.

PART 6 CONCRETE WORKS

6-01 SCOPE

In accordance with the Specifications contained herein and as shown on the detail drawings or otherwise directed, the Contractor shall -

(a) Furnish all materials, and manufacture, transport, place, finish, protect and cure concrete;

(b) Furnish, construct, erect and dismantle forms;

(c) Construct expansion and contraction joints and furnish and place waterstops, joint fillers, and sealing compound, if required; and

(d) Prepare, clean, cut, bend and place steel reinforcement.

6-02 CEMENT

(a) General

Cement for mortar and concrete work shall be Portland Cement which conforms to the requirements of the Standard Specifications for Portland Cement (A.S.T.M. Designation C150-69).

(b) Storage

Cement shall be stored in a dry, weather tight and properly ventilated warehouse with adequate provisions for the prevention of absorption of moisture. All storage facilities shall be subject to approval and shall be such as to permit easy access fot inspection and indetification. Cement which has been stored for more than one month or which are suspected to be damp shall not be used unless otherwise approved by the Inspection Committee.

6 -03 FINE AGGREGATE

(a) Composition

Fine aggregate shall be natural sand not including organic matter and other foreign substances.

(b) Quality

Fine aggregate shall consist of hard, tough, durable, uncoated particles. The shape of the particles shall be generally rounded or cubical and reasonably free from flat or elongated pieces. The fine aggregate shall conform to the following specific requirements:

1. Grading - Fine aggregate shall be well graded from fine to coarse and the gradation shall conform to the following requirements as delivered to the mixers:

Sieve Designation U.S. Std. Square Mesh	Cumulative Percentage by Weight Passing
No. 4	95 - 100
No. 16	60 - 75
No.100	2 - 10

In addition to the grading limits shown above, the fineness modulus shall be in the range from 2.30 to 3.00.

(c) Storage

Fine aggregate shall be stored in such a manner as to avoid the inclusion of any foreign material in the concrete. Sufficient live storage shall be maintained at all times to permit continuous placement of concrete at the rate specified.

6-04 COARSE AGGREGATE

(a) Composition

Coarse aggregate shall consist of gravel, crushed gravel or rock, or a combination of gravel and crushed gravel or rock.

(b) Quality and Grading

1. Quality - Coarse aggregate shall consist of hard,

tough, durable, clean and uncoated particles. All foreign materials and dust shall be removed by adequate processing. The particle shape of the smallest size of crushed coarse aggregate shall be generally rounded or cubical, and the coarse aggregate shall be reasonably free from flat and elongated particles in all sizes.

2. Grading - The coarse aggregate shall be well graded from fine to coarse. The grading of the aggregate as delivered to the mixer shall be as follows:

Sieve Designation U.S. Std. Sq. Mesh	Per Cent by Wt. Passing Individual Sieves 3/4" Max.
1 "	100
3/4"	90 - 100
3/8"	20 - 55

3. Size - Unless otherwise directed, the maximum sizes of coarse aggregate to be used in the various parts of the work shall be 3/4 inch.

4. Storage - Storage of coarse aggregates shall be as that specified in Paragraph 6-03 (c) for fine aggregates.

6-05 AGGREGATE SAMPLES

Samples of the aggregate shall be furnished at a point designated by the Inspection Committee for his approval at least ten (10) days in advance of the time when the placing of concrete is expected to begin.

6-06 WATER

Water used in mixing concrete shall be fresh, clean and free form injurious amount of oil, acid, alkali, salts, or organic matter.

6-07 PROPORTIONING OF CONCRETE

(a) The Contractor shall design the mix proportion for every class of concrete placing for the approval of the Inspection Committee. The Contractor shall carry out the mix test in case being requested by the Inspection Committee. The test is to be made at the expense of the Contractor.

(b) The compressive strength of the age of 28 days shall be as follows and desirable mix proportion is also indicated.

Class	Minimum 28 days Compressive strength	Mixing proportion by volume cement: fine aggregates: coarse aggregates
A (Reincorced concrete)	210 kg/cm^2	1 : 2 : 3
B (Plain concrete)	160 kg/cm^2	1 : 2 : 4
C (Concrete layer)	135 kg/cm^2	1 : 3 : 4

Other proportions for mixed design may be indicated by the Indprction Committee at the site of work, if it is necessary.

6-08 MIXING

(a) Equipment

Concrete shall be mixed by portable concrete mixer unless otherwise approved by the Inspection Committee.

(b) Measurement

The measurement of every ingredient of concrete shall be made in weight. Nevertheless, the measurement in volume is admitted subject to the approval of the Inspection Committee.

(c) Mixing Time and Method

The mixing time of concrete shall be more than two (2) minutes and less than five minutes. Over mixing, requiring the introduction of additional water to preserve the required consistency, will not be permitted. The mixer shall be completely emptied before receiving the materials for the succeeding batch and shall be kept clean and washed out after stopping work at the end of each shift.

On commencing work, the first batch shall contain sufficient excess of cement, sand and water to coat the inside of the drum to avoid the reduction of the required mortar content of the mix.

6-09 CONVEYING

(a) General

Concrete shall be conveying from mixer fo forms, as rapidly as practicable, by methods which will prevent segragation or loss of ingredients. There shall be no vertical drop greater than 1.5 meters except where suitable equipment is provided to prevent segregation and where specifically authorized. Belt conveyors, chutes or other similar equipment in which the concrete is delivered to the structure in a thin, continuously exposed flow, will not be permitted except for very limited or isolated sections of the work. Such equipment shall be arranged to prevent objectionable segregation.

6-10 PLACING

(a) Approval

Approval of the Inspection Committee shall be obtained before starting any concrete pour.

(b) General

Concrete shall be worked into the corners and angles of the forms and around all reinforcement and embedded items without permitting the material to segregate. Not more than

three (3) cubic meters shall be deposited in one pile for compaction. Free water shall be collected in depressions away from the forms and removed by bailing prior to placement of additional concrete. All concrete placing equipment and methods shall be subject to approval.

(c) Cooling of Aggregates

The aggregate shall be cooled by wetting if it is drier than the condition known as saturated, surface dry.

(d) Concrete on Earth Foundation

All concrete shall be placed upon clean, damp surface free from standing or running water. Prior to placing concrete, the earth foundation shall be satisfactorily compacted in accordance with approved methods.

(e) Concrete on Other Concrete

Surface upon or against which concrete is to be placed shall be clean, free form oil, standing or running water, mud, drummy rock, objectionable coatings, debris, and loose, semi-detached or unsound fragments. To insure a firm and tight bond between fresh concrete and other concrete, concrete surfaces, where necessarty, shall be chipped or roughened as directed by the Inspection Committee. All surfaces shall be wetted thoroughly to keep them in a completely moist condition before placing concrete. All approximatedly horizontal surfaces shall be convered with a layer of mortar of the same cement-sand ration as used in the concrete mix before the concrete is placed.

6-11 FORMS

(a) General

Forms shall be used, wherever necessary, to confine the concrete and shape it to the required lines, or insure against contamination of the concrete. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete, and shall be maintained rigidly in

correct position. Forms shall be sufficiently tight to prevent loss of mortar from the concrete. Forms for exposed surfaces against which backfill is not to be placed shall be lined with a form grade plywood or sheet steel. Steel panel forms may also be used.

(b) Cleaning and Oiling of Forms

At the time concrete is placed in the forms, the surfaces of the forms shall be free from incrustations of mortar, grout, or other foreign material that would contaminate the concrete or interfere with the fulfillment of the Secifications' requirements relative to the finish of formed surfaces. Before concrete is placed, the surfaces of the forms shall be oiled with a commercial form oil that will effectively prevent sticking and will not stain the concrete surfaces.

(c) Removal of Forms

Forms shall be removed as soon as practicable in order to avoid delay in curing and to make possible earliest pracicable repair of surface imperfections, but in no case shall they be removed before approval. Any needed repair or treatment shall be performed at once, and shall be followed immediately by the specified curing. Forms shall be removed with care so as to avoid injury to the concrete, and any concrete so damaged shall be repaired.

6-12 CURING AND PROTECTION

(a) General

All concrete shall be moist cured for a period of not less than seven (7) consecutive days by an approved method or combination of methods applicable to local conditions, except that the curing period may be reduced to three days for concrete made with high-early-strength cement. The Contractor shall have all equipment needed for adequate curing and protection of the concrete on hand and ready to install before actual concrete placement begins.

(b) Water Curing

Concrete shall be kept wet by covering with an approved, watersaturated material or by a system of perforated pipes or mechanical sprinklers or by any other approved method which will keep all surfaces continuously (not periodically) wet. Water for curing shall be generally clean and free from any element which might cause objectionable staining or discoloration of the concrete.

6-13 REPAIR OF CONCRETE

Repair of imperfections in formed concrete shall be completed within twenty four (24) hours after removal of forms at no addtional cost to JICA. Fins shall be neatly removed from exposed surfaces. Concrete that is damaged or honeycombed must be removed to sound concrete and replaced with drypack, mortar, or concrete as hereinafter specified. Where large bulges and abrupt irregularities protrude, the protrusions shall be reduced by bush-hammering and grinding. Drypack filling shall be used for holes left by the removal of fasteners from the ends of form tie rods.

6-14 DRYPACK MORTAR

Drypack shall consist of a mixture (by dry volume or weight) of one (1) part cement to 2½ parts of sand conforming to Paragraph 6-03, Fine Aggregate, except that in gradation, 100% shall pass a No.16 sieve. Only enough water shall be used to produce a mortar which, when used, shall stick together on being molded into a ball by a slight pressure of the hands, and shall not extrude water but will leave the hands damp.

6-15 STEEL REINFORCEMENT

(a) General

The Contractor will furnish all steel reinforcement in accordance with the drawings and these specifications. The Contractor shall prepare, clean, cut, bend and place all

reinforcements, as shown on the detail drawings or as otherwise directed. The Contractor shall furnish all chains, supports and ties. All reinforcement shall be reasonably free from loose, flaky rust and scale, and free from oil, grease and other coating which might destroy or reduce its bond with concrete.

(b) Relationship of Reinforcement to Concrete Surfaces

The distance from the edge of the main reinforcement to the concrete surface shall be 5 cm except such portions as shown in the drawings. The concrete covering the stirrups, spacer bars, and similar secondary reinforcement may by reduced by the diameter of such bars, unless otherwise indicated.

(c) Lapping

Lapping length at joints of the reinforceing bar shall be at least thirty times of the diameter of bar and shall be bound by steel wire.

(d) Supports

All reinforcements shall be secured in place by use of metal or concrete supports, spacers or ties. Such supports shall be of sufficient strength to maintain the reinforcement in place throughout the concreting operation. The supports shall be used in such a manner that they will not be exposed or contribute in any way to the discoloration or deterioration of the concrete.

PART 7 PUMPING STATION CONSTRUCTION WORKS

7-01 SCOPE

The scope under this part shall consist of furnishing of all laber, materials equipment and supplies neede for the installation of pump and related equipment and constructing of pumping house in accordance with the Drawings and these Specifications or as directed by the Engineer.

The pump and related facilities, and suction and discharge pipes shall be supplied by the JICA.

7-02 EARTHWORK AND STRUCTURE EXCAVATION

Earthwork shall conform to the requirements specified in PART 4 and 5.

7-03 CONCRETE WORK

Concrete work shall conform to the requirements specified in PART 6.

7-04 REINFORCING STEEL BARS

All reinforcing steel bars shall conform to the requirement specified in PART 6.

7-05 BRICK MASONRY

(a) The work under this clause consisits of all brick masonry work shown in the Drawing.

(b) Local products can be used and it shall be the first class.

(c) All bricks shall be laid after applying mortor.

7-06 CARPENTRY

(a) The work under this clause consists of all carpentry work shown in the Drawing.

(b) Local timber can be used, and it should be the first class.

(c) All frame works shall be jointed by optimum jointing method.

7-07 ROOFING

Local materials can be used and the construction method shall conform to Thai specifications.

7-08 INSTALLATION OF PUMP AND RELATED STRUCTURES

The installation of pump and related facilities shall be made strictly in accordance with the manufacturer's technical instruction.

PART 8 POND WORKS

8-01 SCOPE

The scope under this part shall consist of the preparation works, excavation, compaction of foundation, embankment in accordance with the Drawings and Specifications or as directed by the Engineer.

8-02 EARTH MATERIALS FOR EMBANKMENT

The excavated earth materials shall be used for the embankment material for the farm ponds, and if those excavated soil are deemed unsuitable for the purpose, the embankment materials shall be horrowed from pits with soils in suitable texture.

8-03 COMPACTION

Foundation of the farm ponds shall be compacted with roller carefully, and also the dike section shall be compacted with roller. Thickness for one compaction shall be spread sbout 30 cm in spread.

Also compaction water shall be sprinkled for keeping optimum moisture content of the materials.

8-04 SLOPE PROTECTION

Finishing work of embankment slopes shall be made by compacted with hand rammer for protection of slopes from erosion.

PART 9 IRRIGATION CANAL WORKS

9-01 SCOPE

The scope under this part consist of excavation, embankment and concrete lining for main and lateral irrigation canals, all in accordance with the Drawings and these Specifications or as directed by the Engineer.

9-02 EARTH WORK

Earth works for irrigation canals shall be in accordance with PART 4 and 5.

9-03 CONCRETE WORK

Where shown on the Drawings or as directed by the Engineer, the Contractor shall construct a lining for the irrigation canals. Concrete lining shall be constructed in accordance with the applicable provision as Section 3 and the relevant Drawings.

PART 10 ROAD WORKS

10-01 SCOPE

The scope under this part shall cover the construction of farm road, the work shall include grubbing clearing embankment, excavation, and slope tamping and laterite paving, all in accordance with the Drawings and these Specifications, or as directed by the Engineer.

10-02 EARTH MATERIALS

The farm road base shall be formed with those earth materials as surplus in excavation of pond.

10-03 COMPACTION

The base of the embankment shall be compacted with roller and thickness of one compaction shall be about 30 cm inspread. During compaction, water shall be sprinkled for keeping optimum moisture content of the materials.

10-04 LATERITE PAVEMENT

The laterite materials, which should be selected for pavement, shall be used for paving materials of the farm road.

PART 11 WELL CONSTRUCTION WORKS

11-01 SCOPE

The scope under this part shall cover the preparation work as clearing and setting-up for the boring sites and boring work in accordance with the Drawings and Specification or as directed by the Engineer.

11-02 BORING

The hole shall be made at a depth and a diameter as shown on the Drawings or as directed by the Engineer. The hole through overburden or unstable materials shall be cased and/or treated with cementation to prevent the caving-in of the hole. The hole shall be made by manpower. Confirmation of the depth shall be done in the presence of the Engineer.

11-03 INSTALLATION OF CASING

(a) Casing pipe shall be ready-made reinforced concrete pipe which shall conform to the Standard Specifications approved by the Engineer.

PART 12 OTHER RELATED CONSTRUCTION WORKS

12-01 SCOPE

This part covers the construction of all concrete structures such as regulating basin diversion facilities and turn-out in accordance with the Drawings and Specifications or as directed by the Engineer.

12-02 CONSTRUCTION METHOD

(a) All concrete structure construction shall conform to the requirement specified in PART 4 and 5.

(b) All construction shall be completed to the specified lines, grades, and dimensions. All timber, metal or other accessories necessary for its completion as shown in the drawings shall be placed and attached.

(c) The dimension of each structure shown in the drawings will be subject to changes as may be found necessary to adopt the structures to the actual field conditions disclosed by the excavation.

PART 13 SWINE RAISING FACILITIES CONSTRUCTION

13-01 SCOPE

The scope under this part shall consist of furnishing of all laber, materials and equipment for the construction of swine raising facilities in accordance with the Drawings and these Specifications or as directed by the Engineer.

13-02 EARTHWORK AND STRUCTURE EXCAVATION

Earthwork shall conform to the requirements specified in PART 4 and 5.

13-03 CONCRETE WORK

Concrete work shall conform to the requirements specified in PART 6.

13-04 REINFORCING STEEL BARS

All reinforcing steel bars shall conform to the requirement specified in PART 6.

13-05 BRICK MASONRY

(a) The work under this clause consists of all brick masonry work shown in the Drawing.

(b) Local products can be used and it shall be the first class.

(c) All bricks shall be laid after applying mortor.

13-06 CARPENTRY

(a) The work under this clause consists of all carpentry work shown in the Drawing.

(b) Local timber can be used, and it should be the first class.

(c) All frameworks shall be jointed by optimum jointing method.

13-07 ROOFING

Local materials can be used and the construction method shall conform to Thai Specifications.

13-08 INSTALLATION OF INDOOR LIGHTING

The installation of indoor lighting shall be made strictly in accordance with the manufacture's technical instruction.

PROPOSAL

To: Mr.
The Resident Representative
Japan International Cooperation Agency, Bangkok Office
c/o Embassy of Japan
1674, New Petchburi Road, Bangkok

P-01 BILL OF QUANTITIES AND BID PRICES

The undersigned Bidder having carefully examined in their entirely the Contract Documents for the Construction of the Model Infrastructure on the Agricultural Cooperative Promotion Project, hereby offers and proposes to perform all of the construction and services, to furnish all equipments, materials, supplies, labor and other items described in the Contract Documents, all for the unit or lump sum prices stated in words and figures in the following quantities:

- Bill of Quantities to be attached herein -

P-02 GUARANTEE OF COMPLETION

The undersigned Bidder guarantee to effected the commencement, prosecution and completion of the Contract Works.

P-03 BID SECURITY

I hereby certify that all statements herein are made on behalf of _____;
Dated this _____ day of _____ 1987.

_____

Title _____

Firm's Address _____

_____

CONTRACT

FOR SUPPLY AND DELIVERY OF LOCAL PROCUREMENT

This Contract is executed and delivered this _____ between

_____

_____

represented by Mr. _____ and herein called "Seller" and

Japan International Cooperation Agency (JICA)
Bangkok Office, C/O Embassy of Japan, Bangkok

represented by Mr. Michimoto GOTO, the Resident Representative and herein called "Buyer"

The Seller and the Buyer mutually agrees as follows:

1. Contract Documents

   The following documents are attached to this Contract and are incorporated and made a part of this Contract, as though fully written out and set forth herein: Seller's ESTIMATE NO._____ dated _____.

2. Agreement for sale

   The Seller agrees to sell, and the Buyer agrees to be _____ _____ as are described in the Contract documents, Total amount Baht _____(_____).

3. Delivery Site Location: _____ _____ .

4. Time for Delivery: Not later than _____.

5. Payment

   The payment to the Seller shall be made within 15 days after the date of acceptance.

6. Guaranty for the equipment: for 1 year.

7. Integration

The Seller and the Buyer agree that this Contract, including the Contract Document, expresses all of the agreement, understanding, Promises, and convenience of the parties, and that it integrates, combines, and supersedes all prior and contemporaneous negotiations understanding, and agreements, whether written or oral, and that no modification or alteration of this Contract shall be valid or binding on either party, unless expressed in written and executed with the same formality as this Contract, except as may otherwise be specifically provided in this Contract.

8. Jurisdiction

The proper law governing this Contract shall be the law in force in the Kingdom of Thailand.

9. Counterparts

This Contract is executed in duplicate, one for the Seller and one for the Buyer. The Contract shall become effective on the date of signing the Contract.

Seller:

Buyer:

Mr. Michimoto GOTO
JICA Resident Representative

THE LEASE CONTRACT OF EQUIPMENT

This Contract is executed on the __(day)__ day of (month) 1986 at the __(place)_____ between

The Cooperatives Promotion Department, Department of Agricultural and Cooperatives by Mr. CHERN BAMRUNGWONG Title DIRECTOR GENERAL hereinafter reffered to as "the CPD" of one part, and

_____(name)_____ whose office is situated at _____

_____(place)_____

Tel_____ Represented_____(name)_____ Nationality _____ Title _____ hereinafter reffered to as "the Contractor", of the other part.

Article 1

Both parties mutually agree under the terms of this Contract for the construction work of Model Infranstructure on Agricultural Cooperative Promotion Project in Thailand as follows:-

the name of equipements	:	see attachment paper
the number, type and capacity	:	- do -
the lease period	:	_____ days (from _____ to _____)
the rent charge	:	_____ Baht
the period payment	:	_____ 1986

Article 2

The contractor is required to always keep the equipment in good condition. The Contractor shall be at the expense in all respects of the transportation for the delivery and return of the equipments, and so on.

Article 3

The Contractor shall not rent the equipments to stranger again, and give the equipments to pledge.

Article 4

In case the equipments are lost and/or broken up, the Contractor shall submit the report to the CPD about the above in detail and follow the ruling given by the CPD.

Article 5

In the case the equipments are lost and/or broken up, which is caused by the Contractor's fault, the Contractor shall make good of the damaged equipments under the Contractor's responsibility or be claimed the compensation for the damage.

Article 6

The Conractor shall return the borrowed equipment as follows:-

i) In case the CPD is necessary to use the equipments through unavoidable circumstance.
In case the Contractor default the contract.

ii) In case the CPD thinks that the Contractor is disqualified from the rent of equipments.

Article 7

In case of the Contractor return the equipment to CPD prior to the lease period, the Contractor is not entitled to claim any amount of charges except that the reason for return is in acccordance with stated in Article.

Article 8

i) In case the Contractor fails to return the equipments by the completion date which is caused by the Contractor's fault, the Contractor shall pay a penalty of _____ Baht per day counting from the commencement date until the retired date.

ii) In case the Contractor fails to payment the rent charge, the Contractor shall pay a penalty of _____ Baht per day counting from the commencement date until the payment date.

Article 9

The CPD and the Contractor agree that this Contract, including the Contract Document, expresses all of the agreement, understanding, Promises, and convenience of the parties, and that it integrates, combines, and supersedes all prior and contemporaneous negotiations understanding, and agreements, whether written or oral, and that no modification or alteration of this Contract shall be valid or binding on either party, unless expressed in written and executed with the same formality as this Contract, except as may otherwise be specifically provided in this Contract.

Article 10

The proper law governing this Contract shall be the law in force in the Kingdom of Thailand.

Article 11

This Contract is executed in duplicate, one for the CPD and one for the Contractor. The Contract shall become effective on the date of signing the Contract.

the CPD	the Contractor
_____	_____
Mr. CHERN BAMRUNGWONG DIRECTOR GENERAL	Mr.