Fig - 9 Observation period of rainfall (daily)

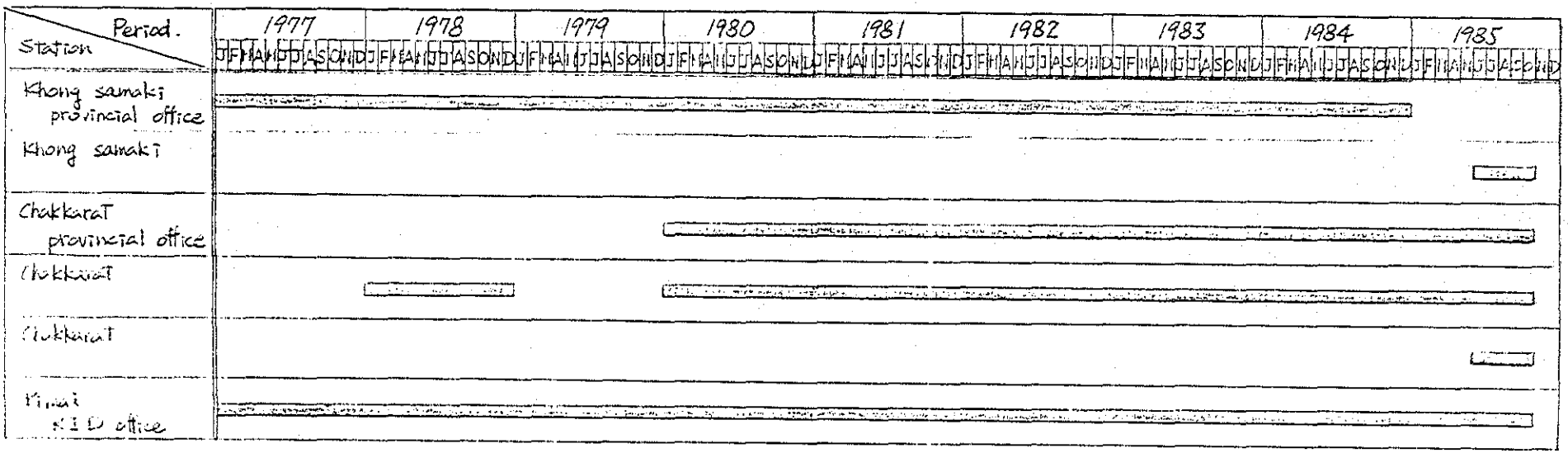
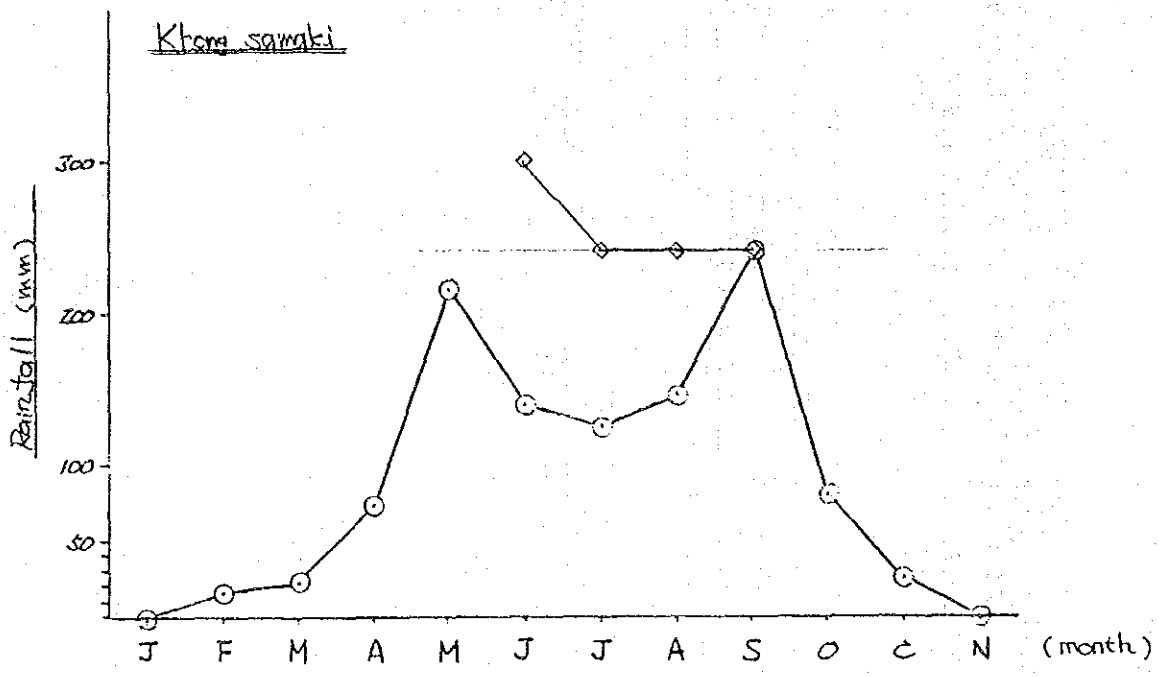
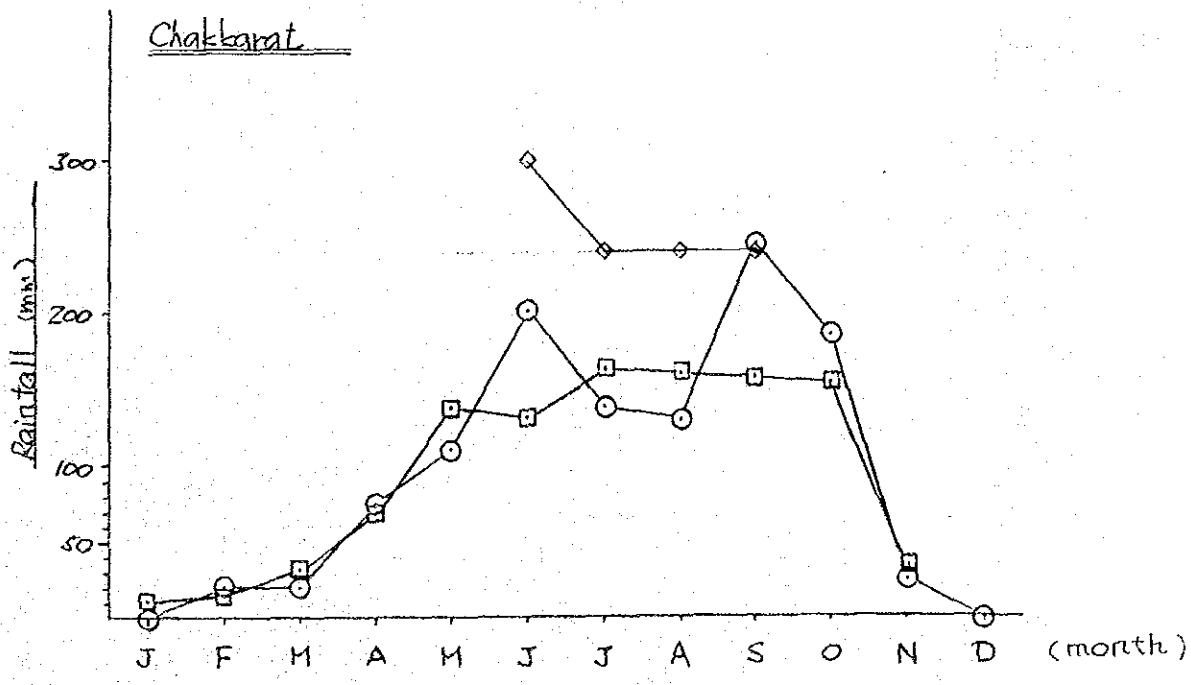


Fig-10 Monthly rainfall



◇——◇ water requirement

○——○ Rain fall



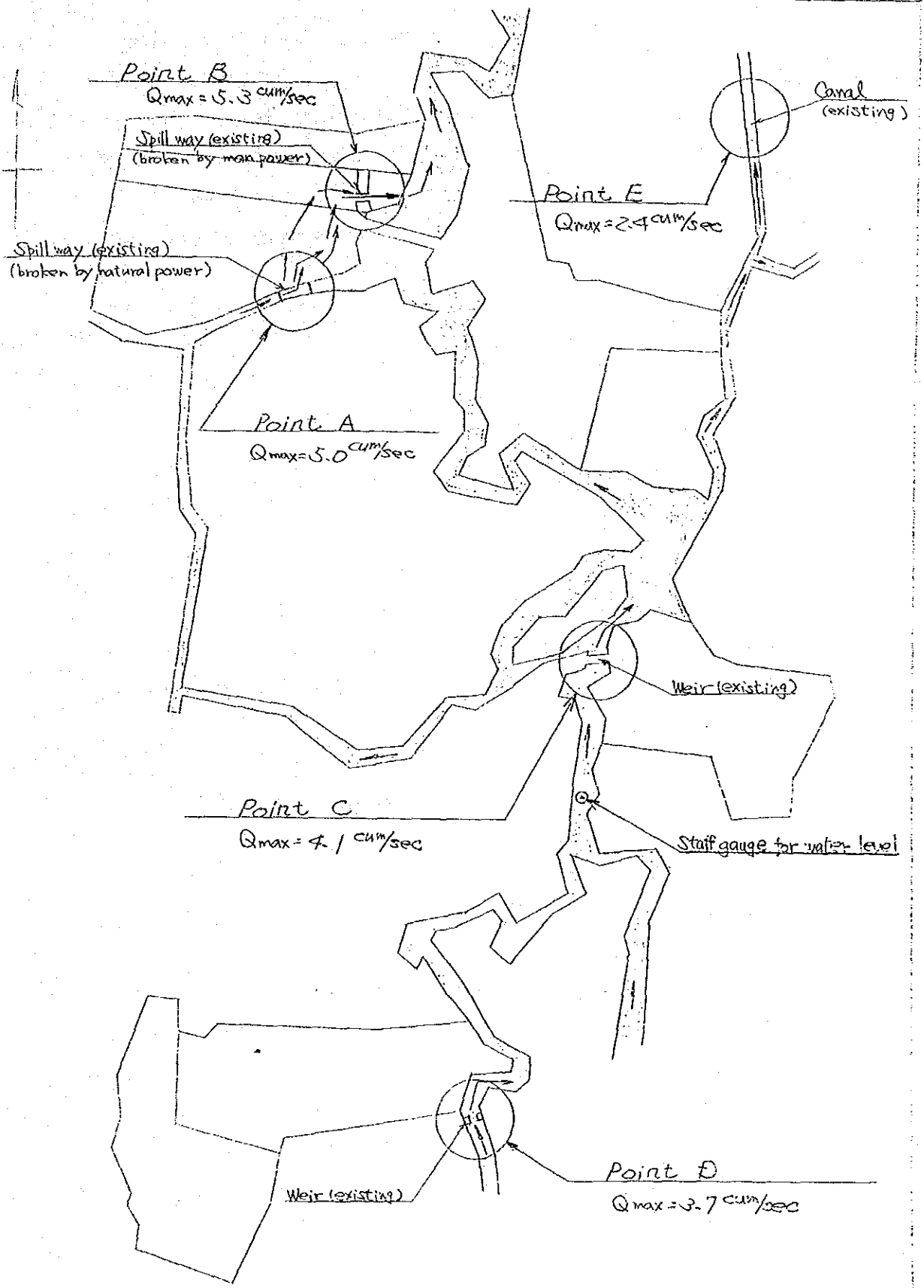
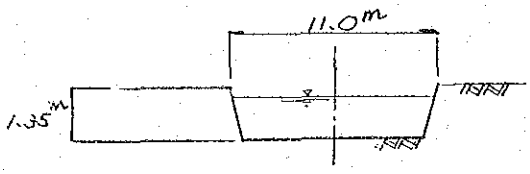


Fig-11 Location of check discharge scale 1 : 5,000

- continue -



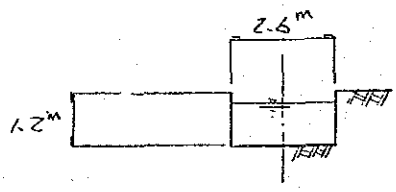
• Cross sectional area : $A_{max} = 11.0^{m} \times 1.35^{m}$
$\fallingdotseq 15^{58m}$

• Velocity of flow $T = 0.33^{m/sec}$
(Velocity is calculated in existing flow depth $= 0.85^{m}$)

Discharge (max) is as follows.

• Discharge $Q = A \times T$
$= 15^{58m} \times 0.33^{m/sec}$
$\fallingdotseq 5.0^{cum/sec}$ (Q_{max})

Point A (see fig 11)



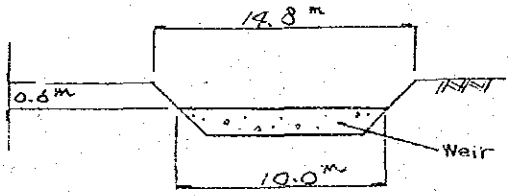
Discharge (Q_{max}) is as follows.

• $Q = CBH^{3/2}$

here C ; over flow coefficient
B ; canal bed length (m)
H ; over flow depth (m)

$Q = 1.7 \times 2.6^{m} \times 1.2^{m}$
$\fallingdotseq 5.3^{cum/sec}$

Point B (see fig 11)



Discharge (Q_{max}) is as follows.

$Q = AV$

here A ; cross sectional area
V ; velocity of flow
(use existing flow depth $= 0.32^{m}$)

$A = \frac{1}{2}(14.8^{m} + 10.0^{m}) \times 0.6^{m}$
$= 7.44^{58m}$

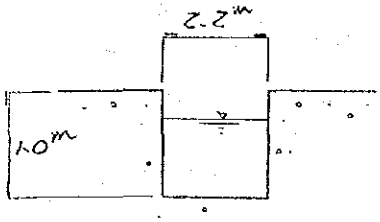
- continue -

$V = 0.55\ m/sec$

$Q = 7.44^{58m} \times 0.55^{m/sec}$

$\fallingdotseq 4.1^{cum/sec}$

Point C (see fig 11)



Discharge (Q max) is as follows.

$Q = CBH^{3/2}$

here C ; overflow coefficient

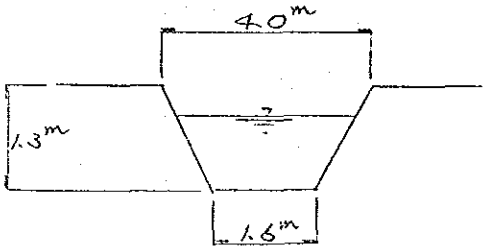
B ; canal bed length (m)

H ; overflow depth (m)

$Q = 1.7 \times 2.2^{m} \times 1.0^{m}$

$= 3.7^{58m/sec}$

Point D (see fig 11)



Discharge (Qmax) is as follows.

$Q = A\,V$

here A ; cross sectional area

V ; velocity of flow

(use existing flow depth = 1.2m)

$A = 1/2\,(4.0^{m} + 1.6^{m}) \times 1.3^{m}$

$= 3.64^{58m}$

$V = 0.65\ m/sec$

$Q = 3.64^{58m} \times 0.65^{m/sec}$

$\fallingdotseq 2.4^{cum/sec}$

Point E (see fig 11)

Calculation of Flow capacity in existing canal

Fig-12 Rainfall and water level (Chakarat River 1985)

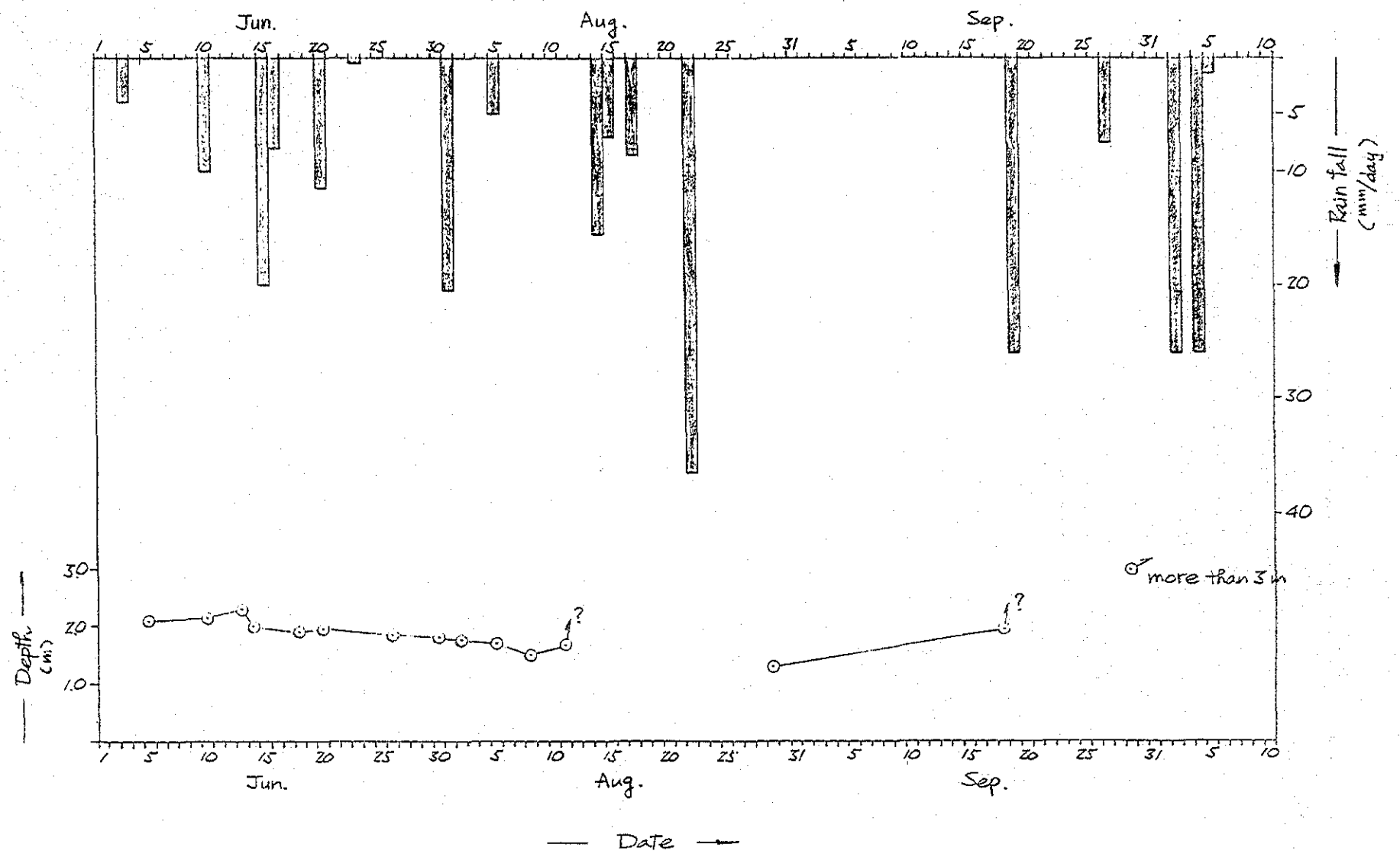


Fig 13-1

RUNOFF RECORD AT CHAKKARAT

Period : May ~ Dec , 1982

Remark : May. Jun. Jul. ..... NOT WATER FLOW

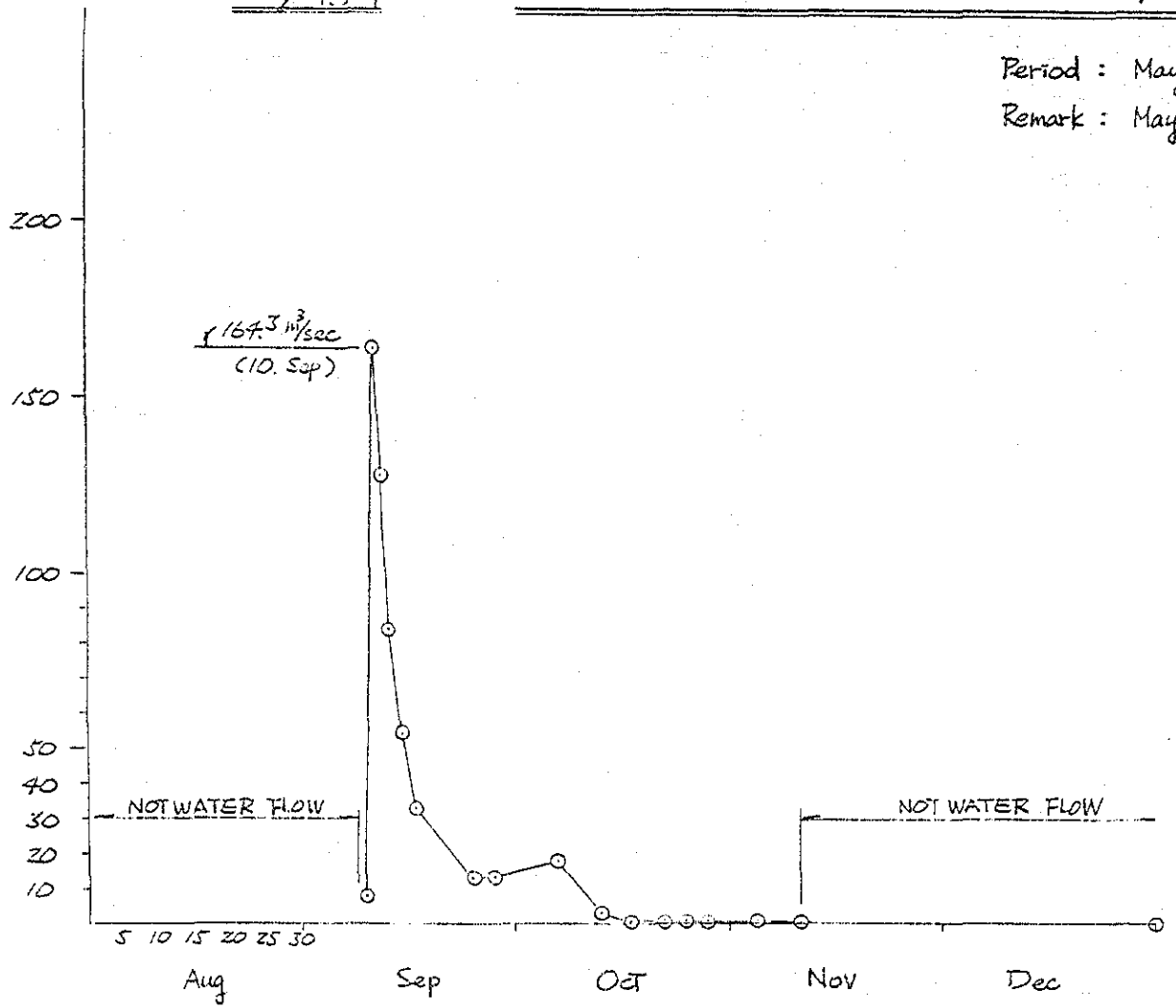


Fig-13-2

RUNOFF RECORD AT CHAKKARAT

Period : Jan ~ Dec , 1983

Remark : Jan ~ Jul ..... no water

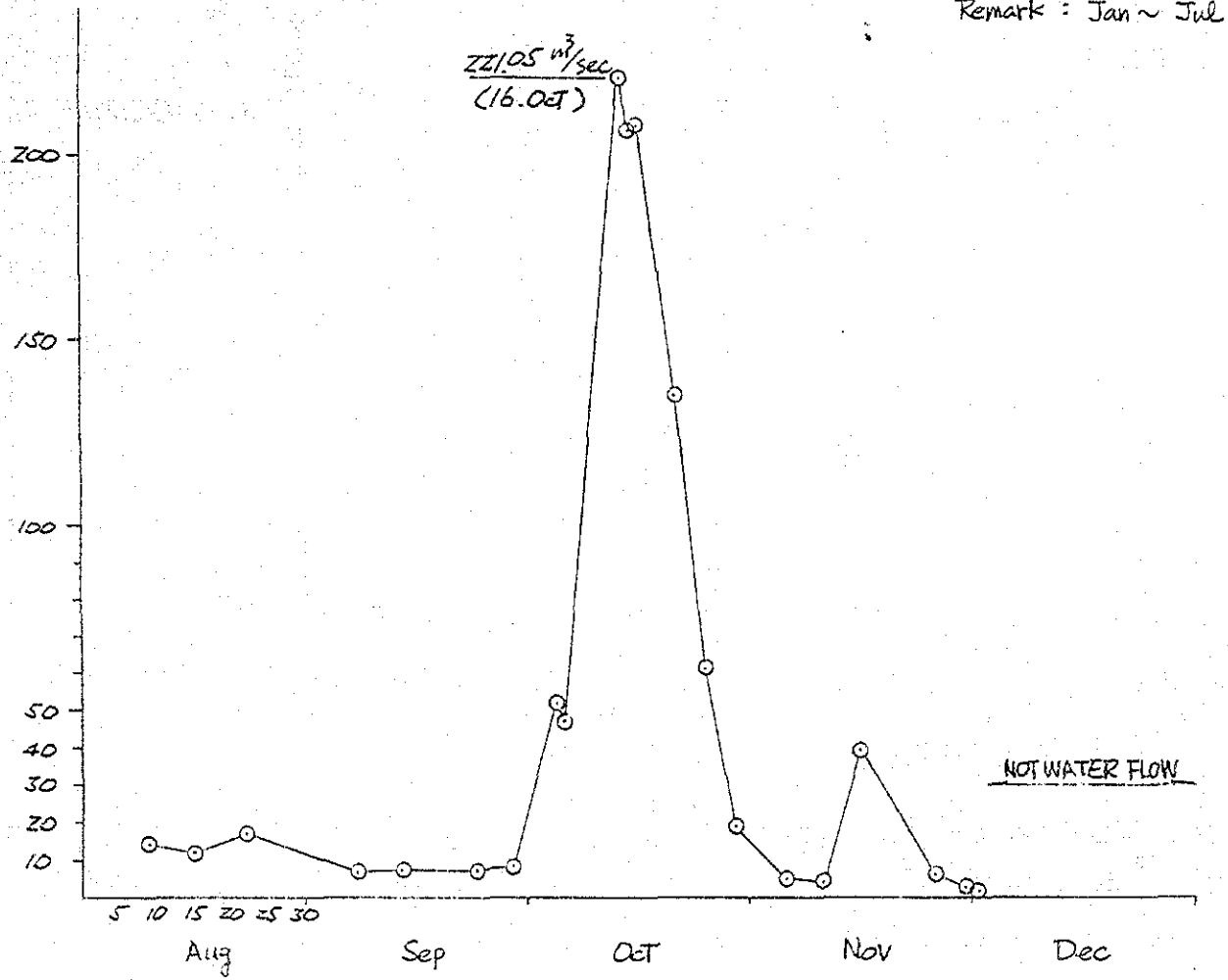


Fig-13-3 RUNOFF RECORD AT CHAKKARAT

Period : Jan ~ Dec, 1984

Remark : Jan ~ Jul ..... no water

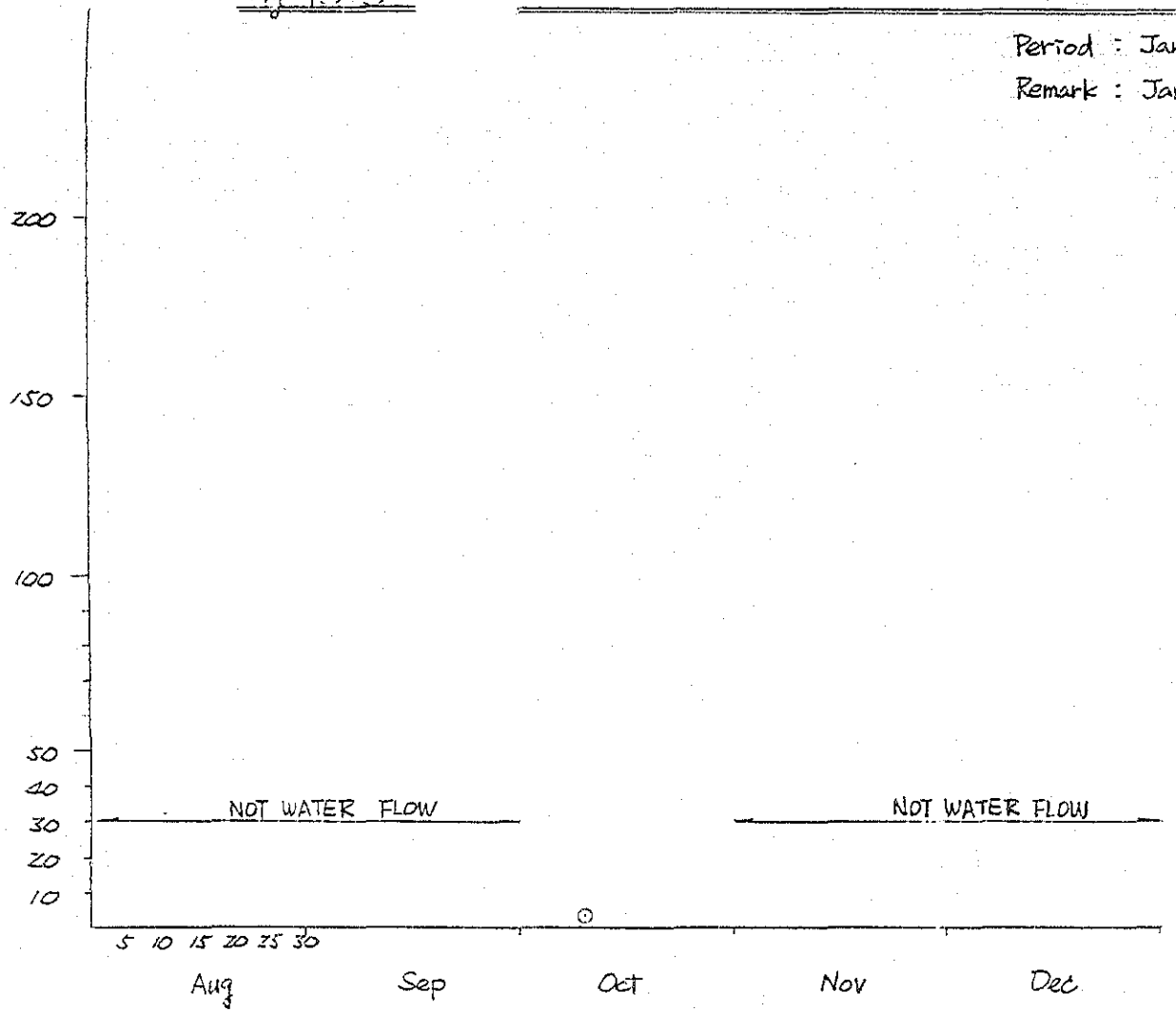


Fig-13-4

RUNOFF RECORD AT CHAKKARAT

Period : Jan ~ Sep , 1985
Remark : Jan ~ Jul ····· no water

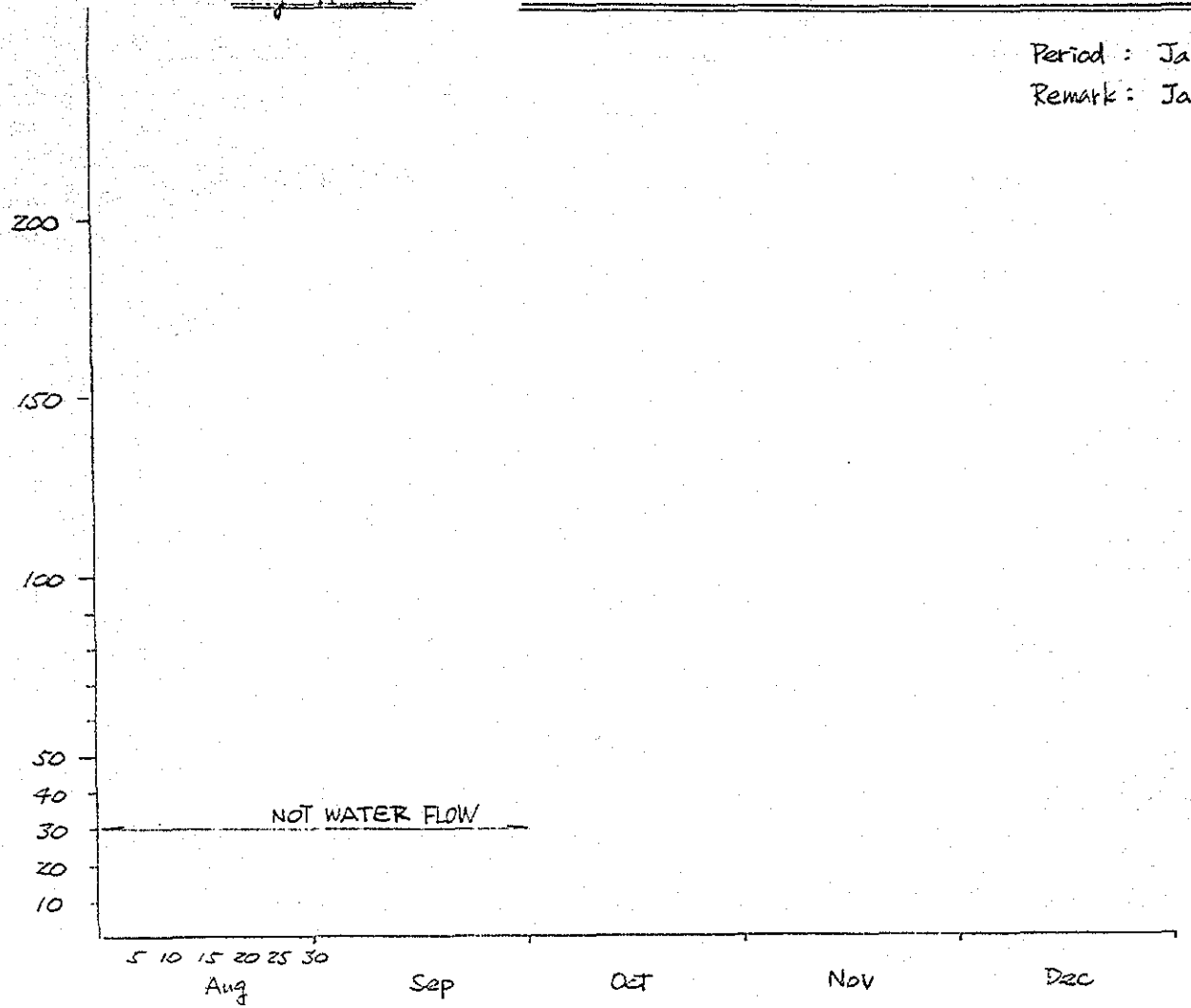
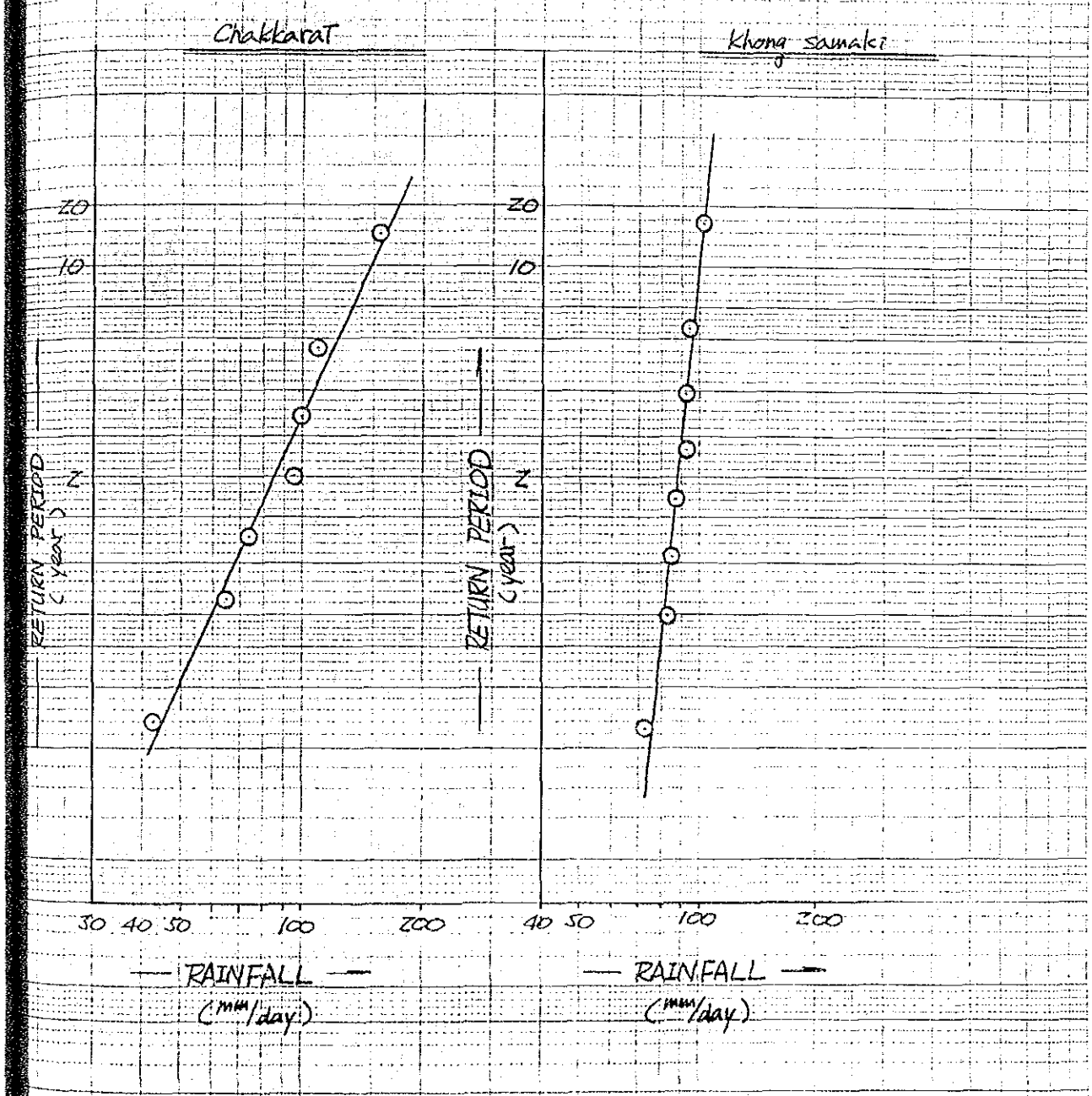


Fig. 14 PROBABILITY ANALYSIS



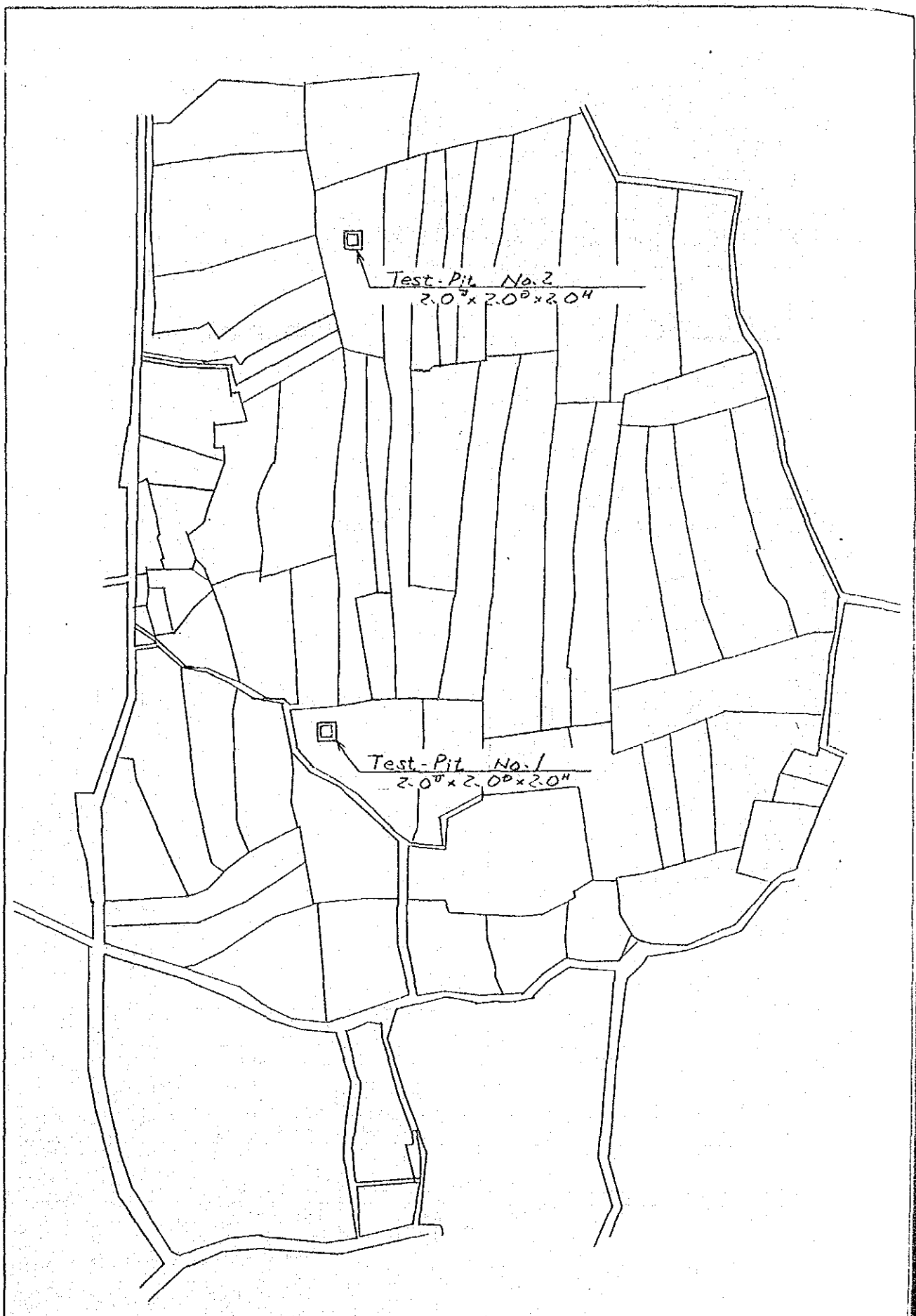


Fig. 15 Location of Test pits

Scale 1:1000

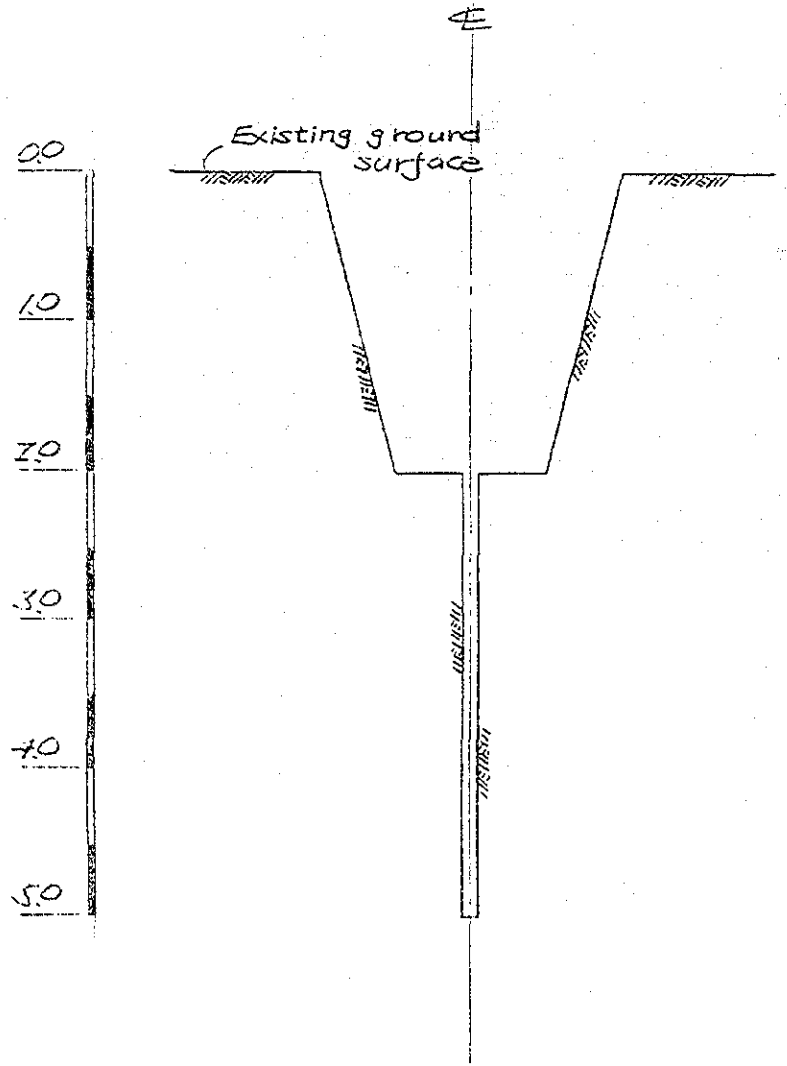


Fig-16 Standard section of Test pits

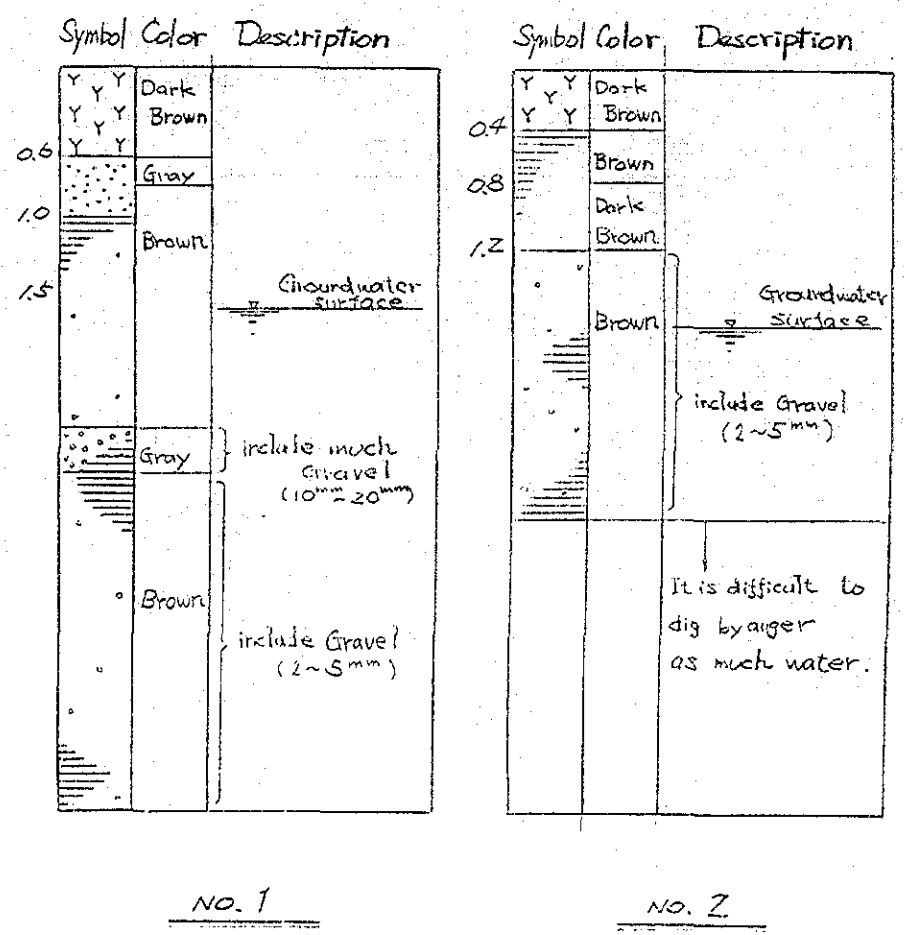
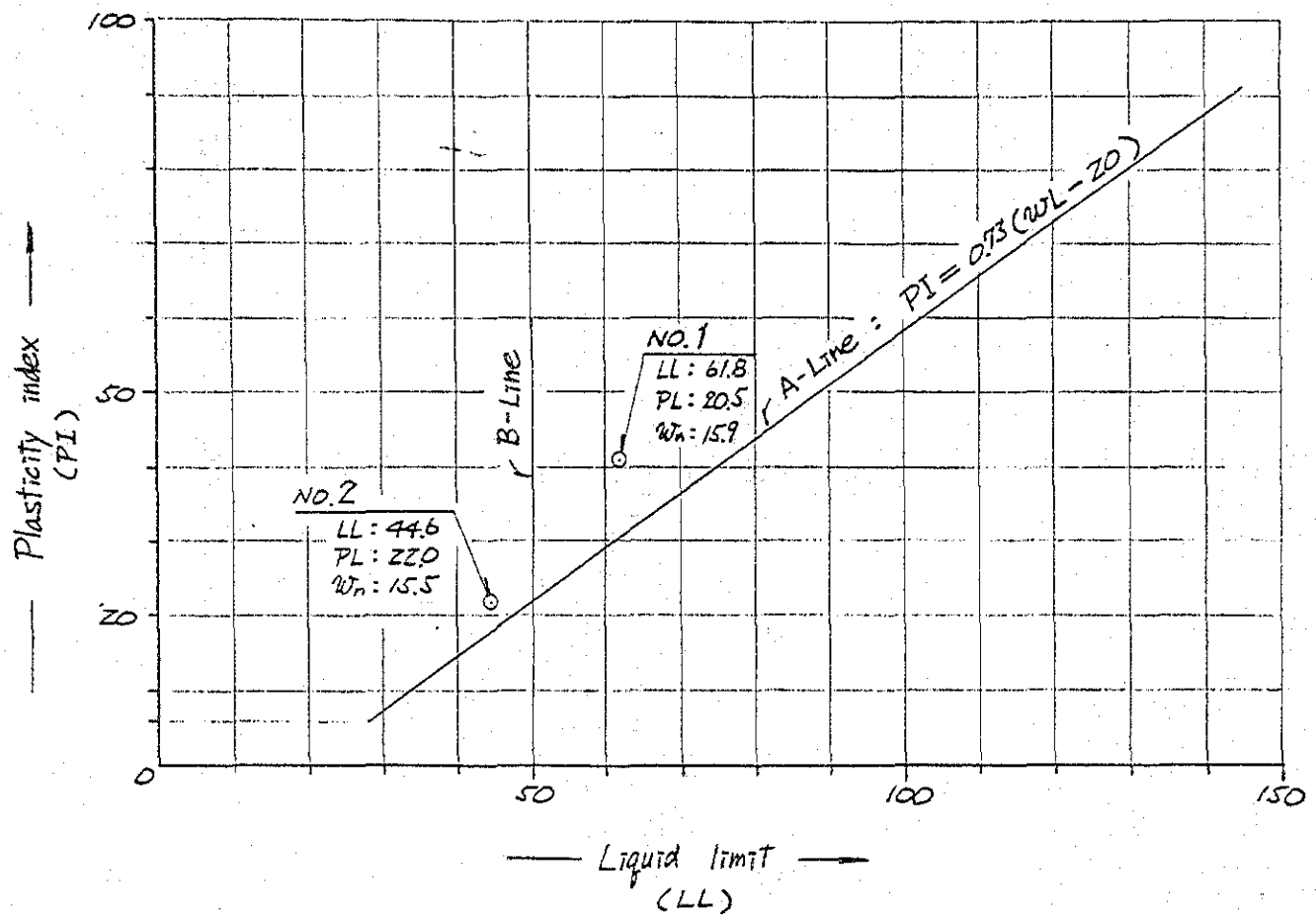


Fig-17 Columnar section of Test pits

: Organic Soil
: Sand
: Clay
: Gravel

Fig - 18 CONSISTENCY LIMITS



Consistency index

NO.1 CI = 1.3

NO.2 CI = 1.3

Liquidity index

NO.1 LI = -0.3

NO.2 LI = -0.1

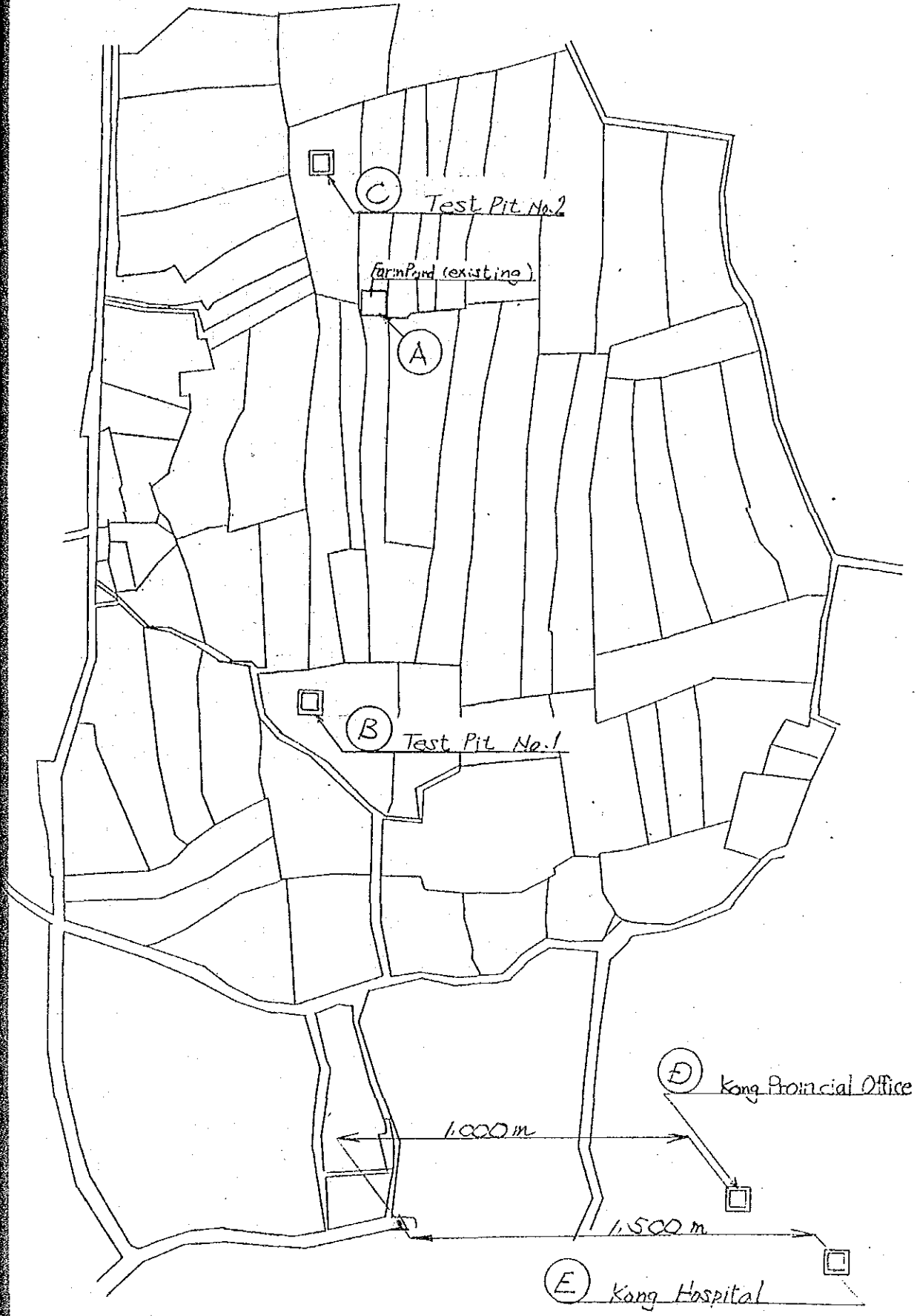


Fig-19-1 Location of Water sample scale 1:1000
(Kong Saimaki)

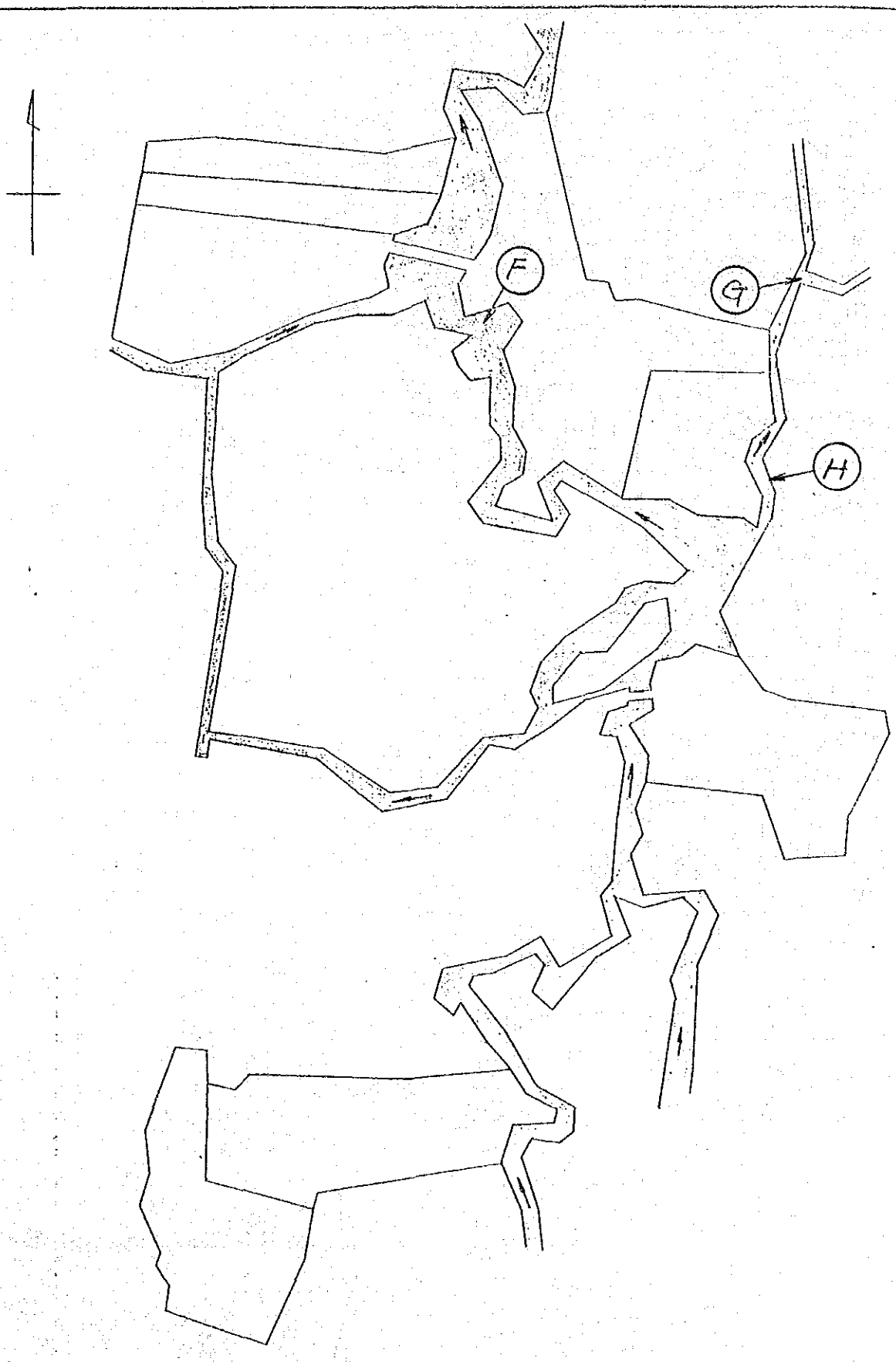
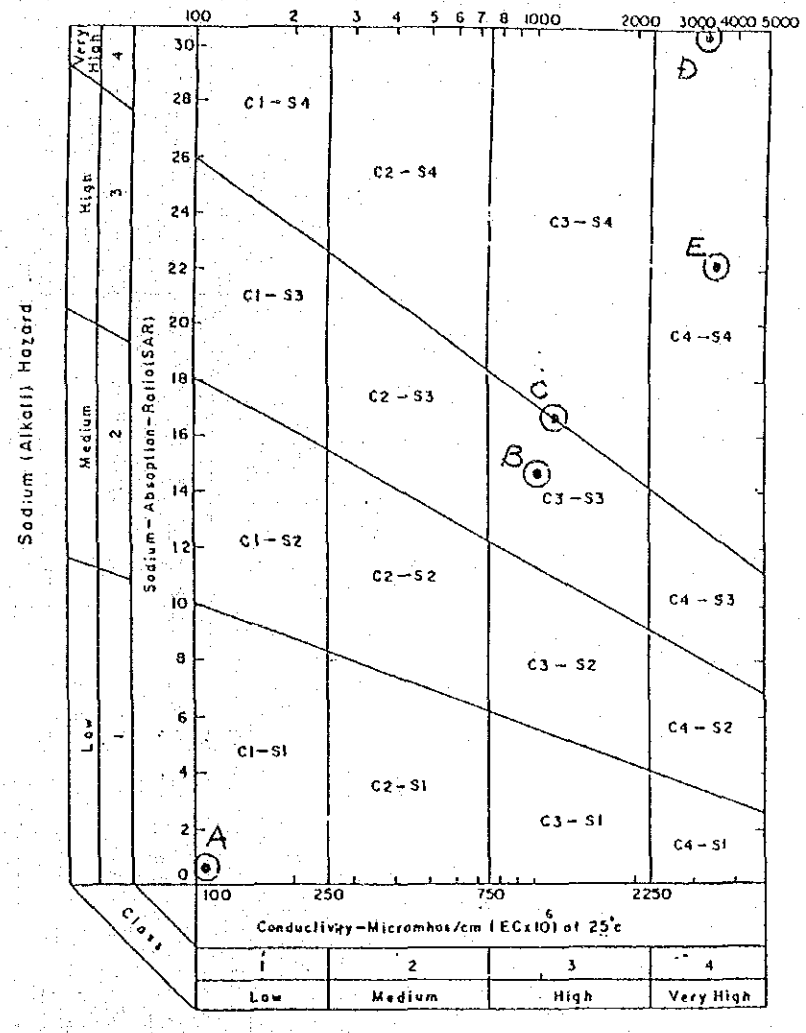


Fig-19-2 Location of Water samples (Chalarat) scale 1 : 5,000

Fig 20 WATER QUALITY CLASSIFICATION



S_1	Low sodium water can be used for irrigation in almost all soils with little danger of the development of harmful levels of exchangeable sodium. However, sodium sensitive crops such as stonefruit trees and avocados may accumulate injurious concentrations of sodium.	C_1	Low salinity water can be used for irrigation with most crops on most soils with little likelihood, that soil salinity will develop. Some leaching is required but this occurs under normal irrigation practices, except in soils of extremely low permeability.
S_2	Medium water will present an appreciable sodium hazard in fine textured soils having high cation exchange capacity, especially under low leaching conditions unless gypsum is present in the soil. This water may be used on coarse textured or organic soils with good permeability.	C_2	Medium salinity water can be used if a moderate amount of leaching occurs. Plants with moderate salt tolerance can be grown in most cases without special practices for salinity control.
S_3	High sodium water may produce harmful levels of exchangeable sodium in most soils, and will require special soils management; good drainage, high leaching, and organic matter conditions. Gypsiferous soils may not develop harmful levels of exchangeable sodium from such waters. Chemical amendments may be required for replacement of exchangeable sodium, except that amendments may not be feasible in the case of waters of very high salinity.	C_3	High salinity water cannot be used on soils with restricted drainage, even with adequate drainage, special treatment for salinity control may be required, and plants with good salt tolerance should be selected.
S_4	Very high sodium water is generally unsatisfactory for irrigation pruposes, except at low and perhaps medium salinity where the solution of calcium from the soil or used of gypsum or other amendments may make the use of these waters feasible.	C_4	Very high salinity water is not suitable for irrigation under ordinary conditions, but may be used occasionally under very special cercumstances. The soils must be permeable, drainage condition must be adequate, irrigation water must be applied in excess to provide consierable leaching and very salt-tolerance crops should be selected.

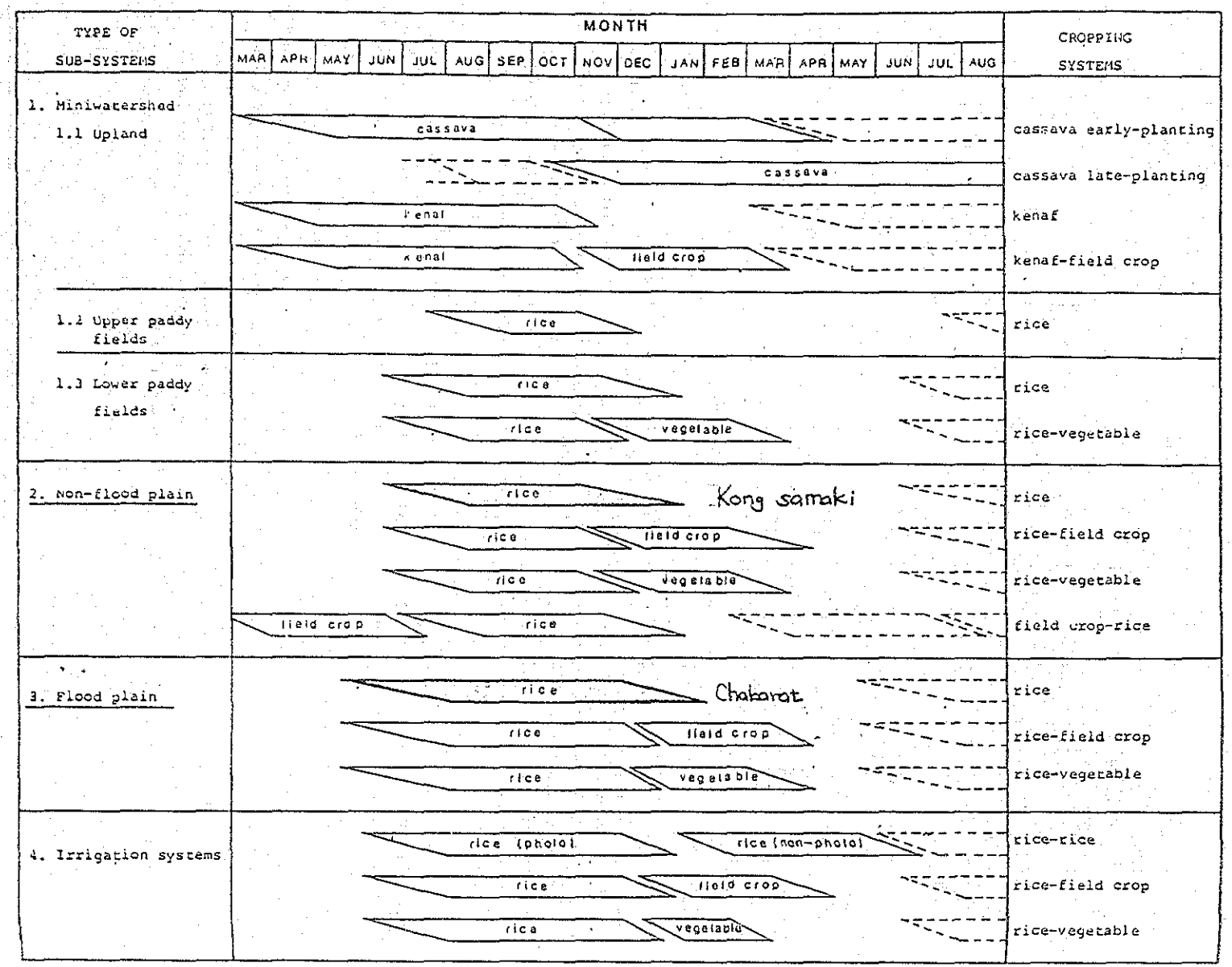


Figure 5.4. Calendar of the existing cropping systems in the Korat Triangle.

Remarks : 1. Field crop = short duration (< 120 days).

2. Vegetable grown after rice need watering from shallow wells or farm ponds.

Fig. 21 Cropping patterns of rice

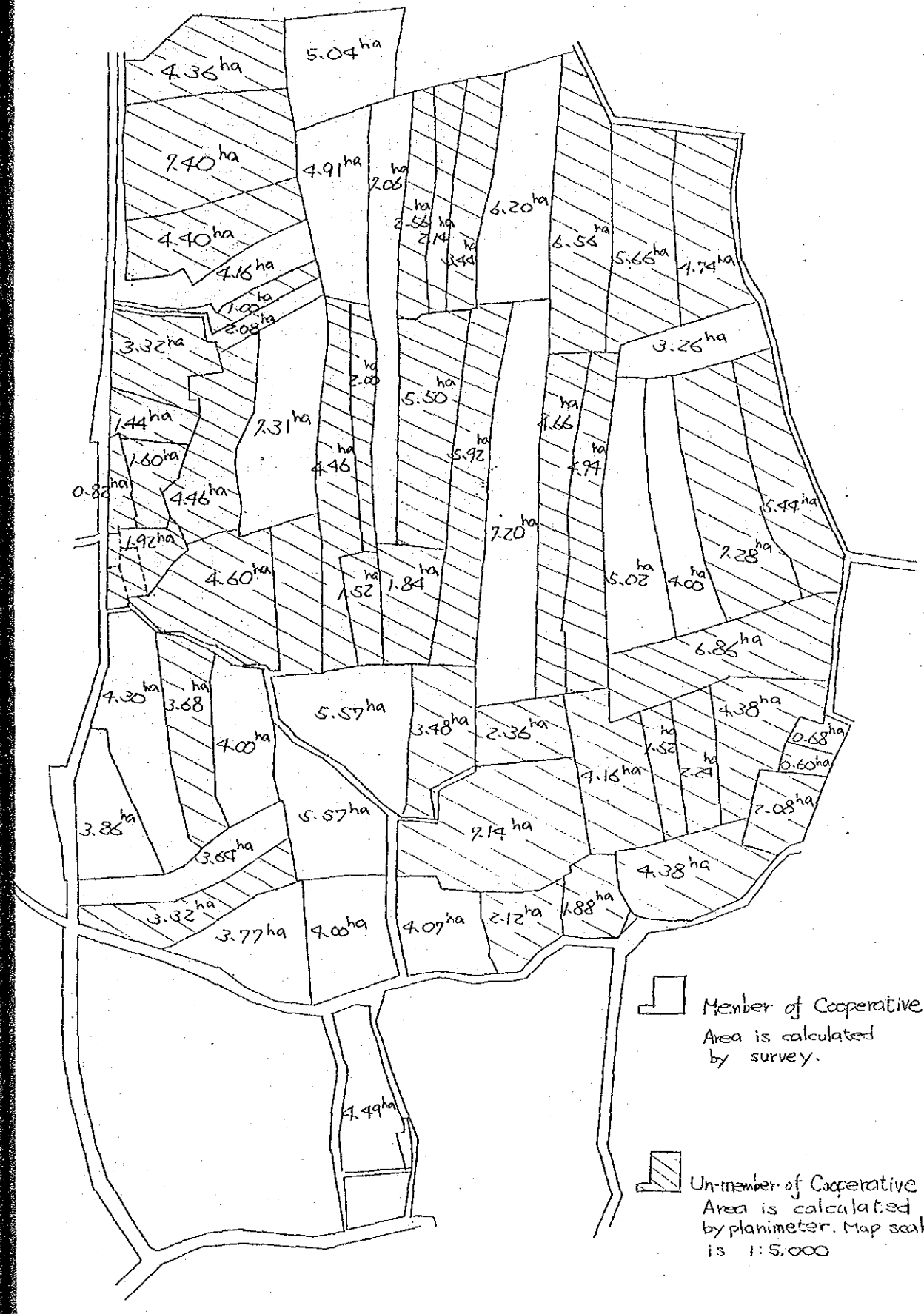


Fig-22 Area of Paddy Field (Kong samki)

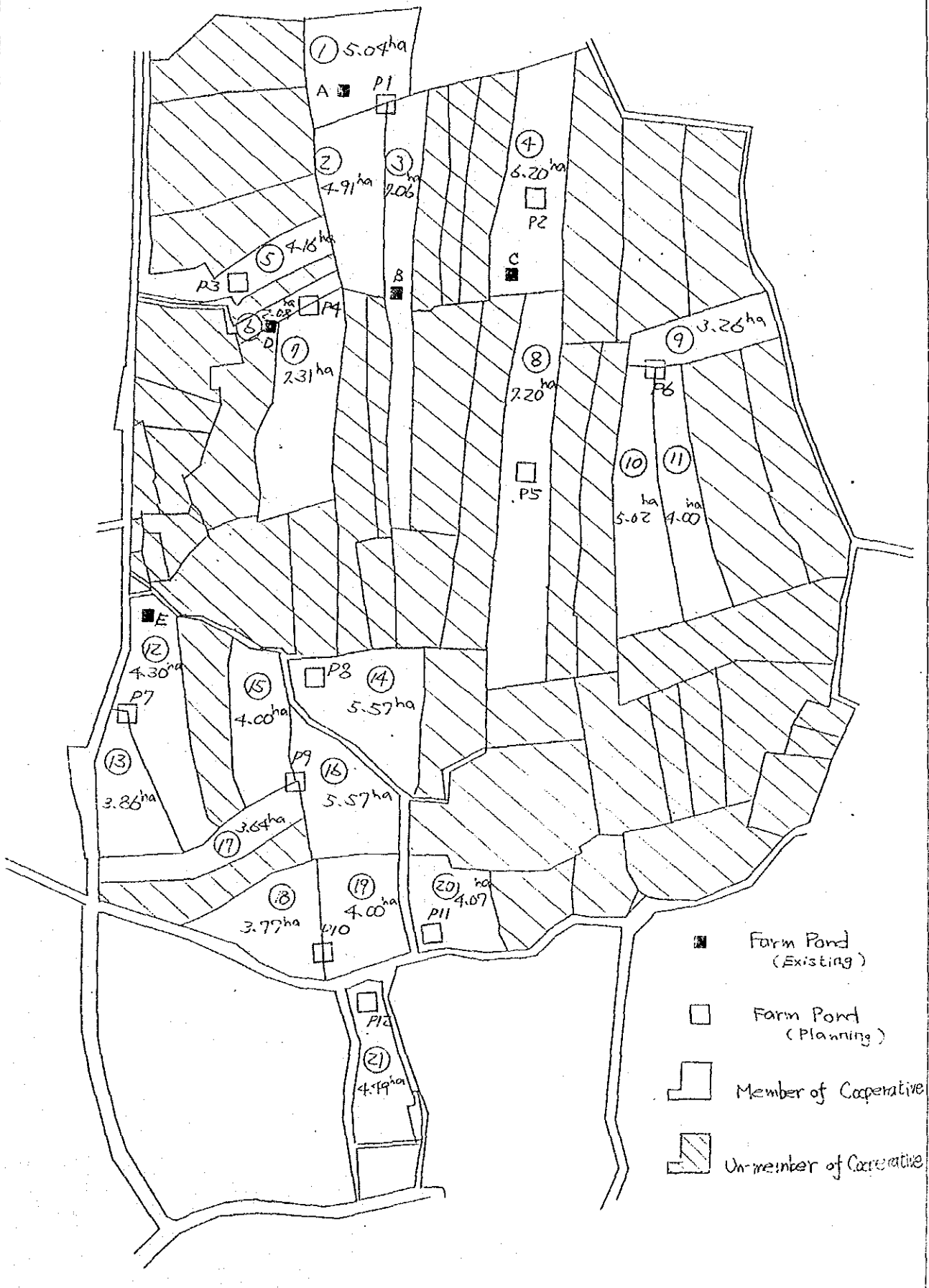
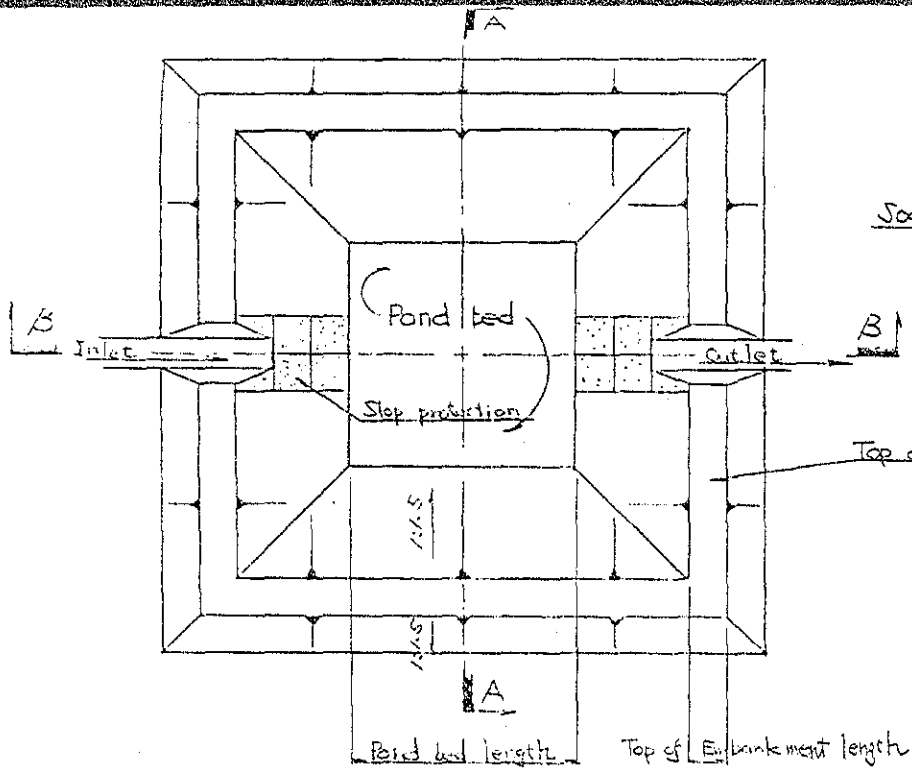
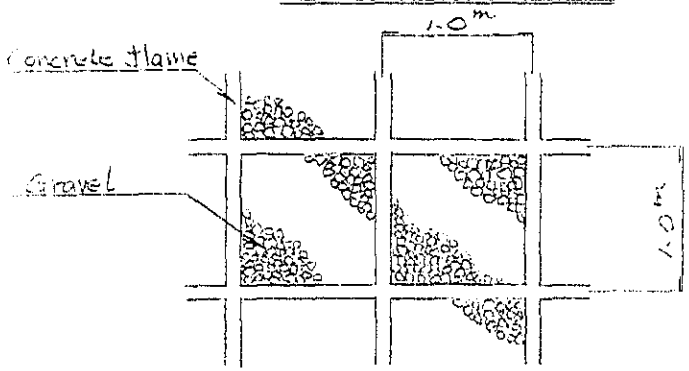


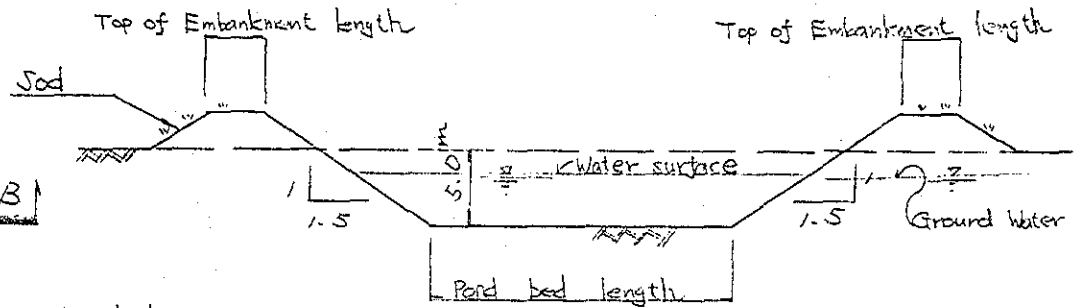
Fig-23 Location of Farm pond (Kong saimaki)



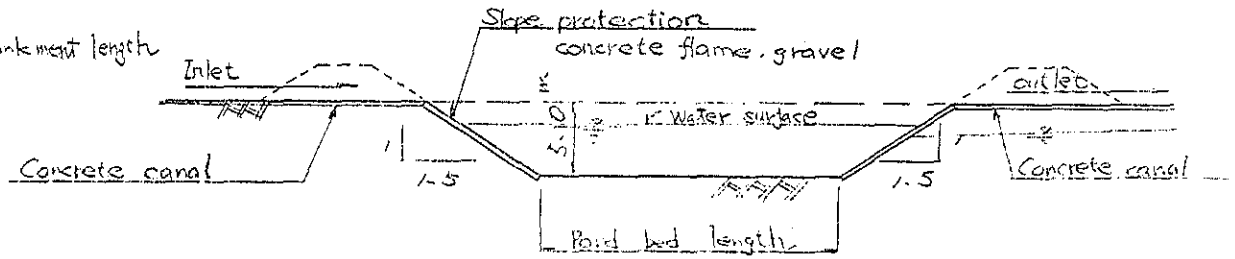
Plane



Concrete-flame, Gravel

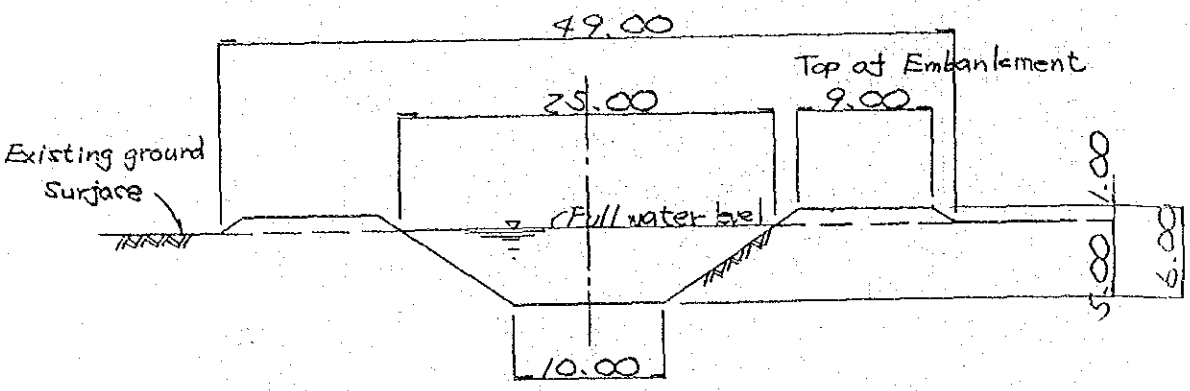


Section A-A

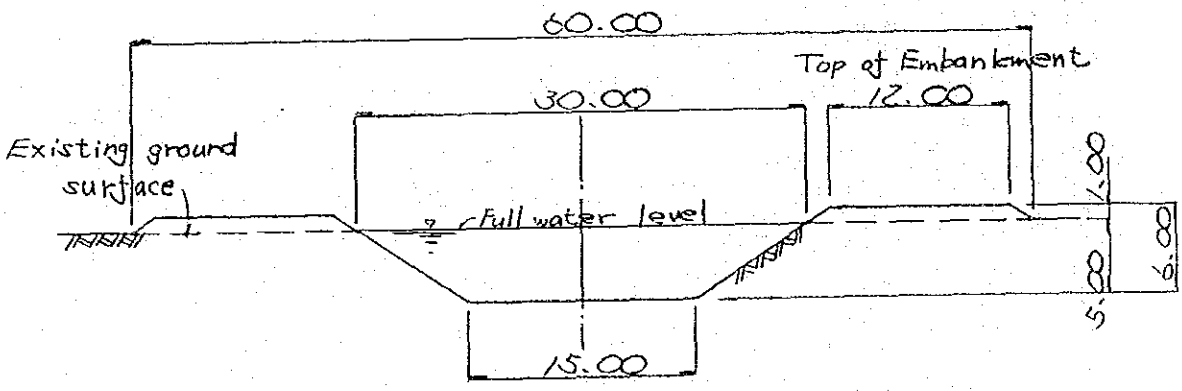


Section B-B

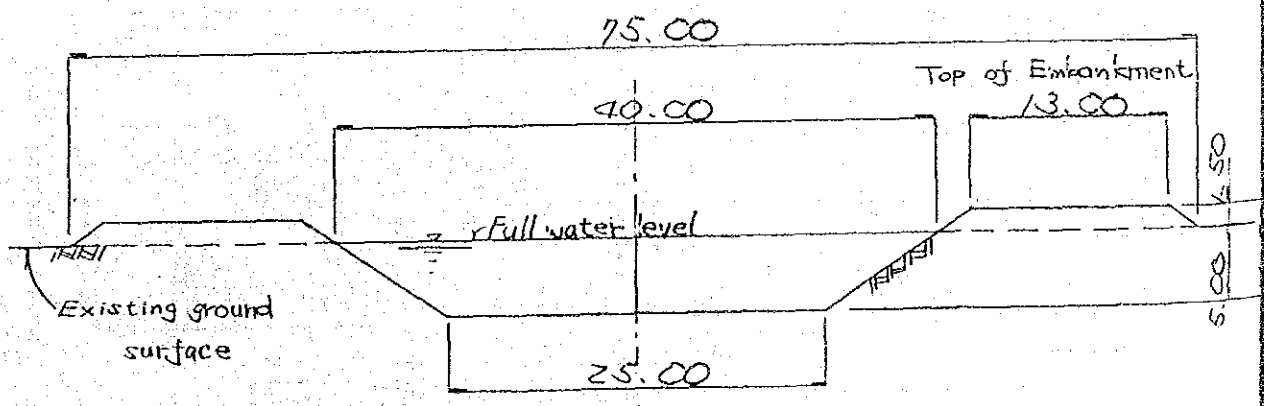
Fig-24 Plan of Farm-Ponds



TYPE A



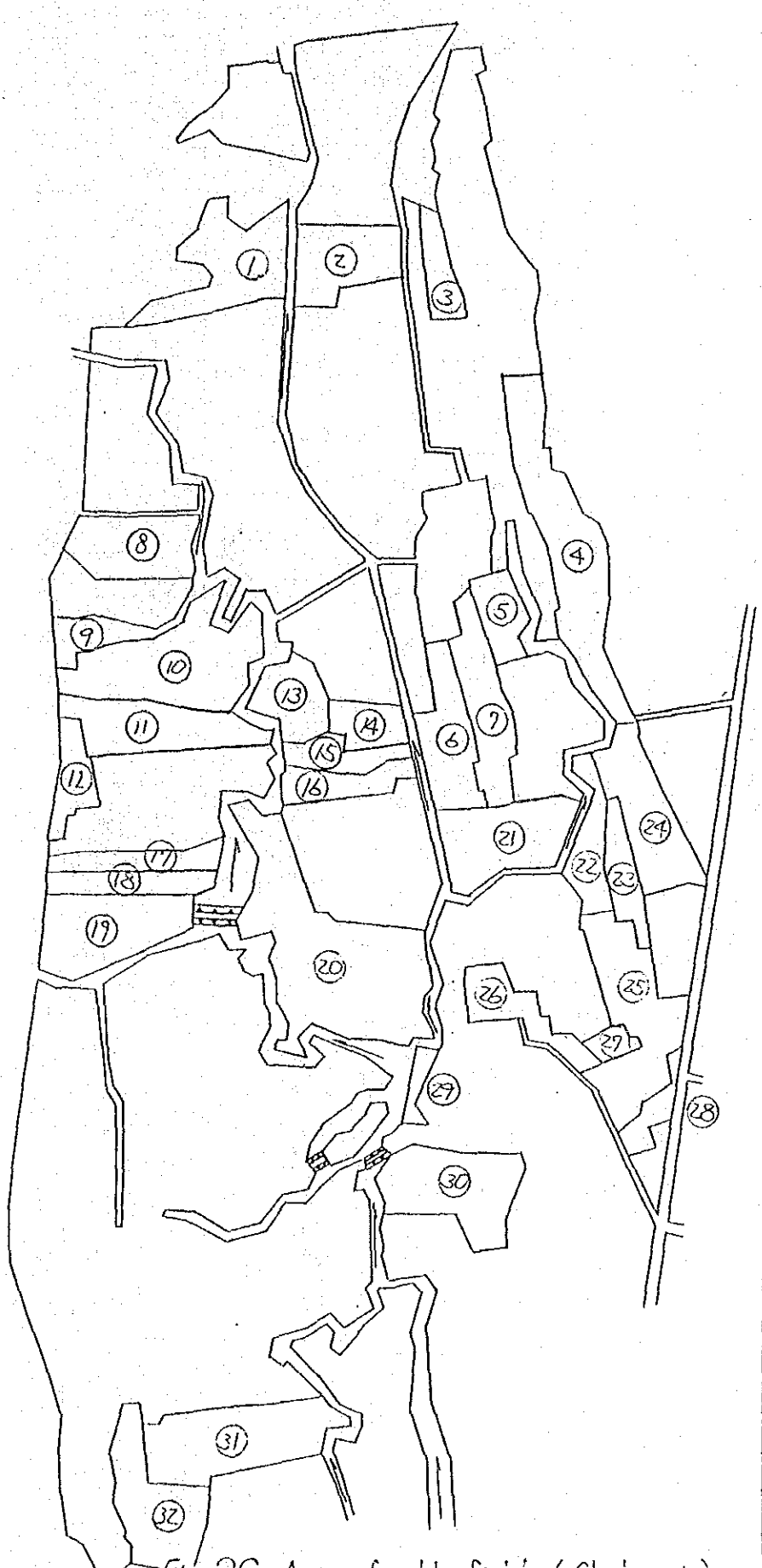
TYPE B



TYPE C

Fig - 25 Standard sections of Farm ponds

scale 1:500



NO.	Area of paddy field
①	1.88 ha
②	1.38
③	0.50
④	3.28
⑤	0.70
⑥	1.63
⑦	1.45
⑧	1.55
⑨	0.75
⑩	2.88
⑪	1.63
⑫	0.50
⑬	0.88
⑭	0.55
⑮	0.68
⑯	0.63
⑰	0.83
⑱	0.63
⑲	2.20
⑳	3.50
㉑	1.70
㉒	0.88
㉓	0.53
㉔	1.88
㉕	2.50
㉖	0.95
㉗	0.25
㉘	0.43
㉙	0.20
㉚	1.75
㉛	2.33
㉜	1.25
TOTAL	43.18 ha

Fig-26 Area of paddy field (Chakarat)

Area of paddy field down stream from A site

NO.	Area of paddy field
⑧	1.55 ha
⑨	0.75
⑩	2.88
⑪	1.63
⑫	0.50
⑬	0.88
⑮	0.68
⑯	0.63
⑰	0.83
⑱	0.63
⑲	2.20
Total	13.16 ha

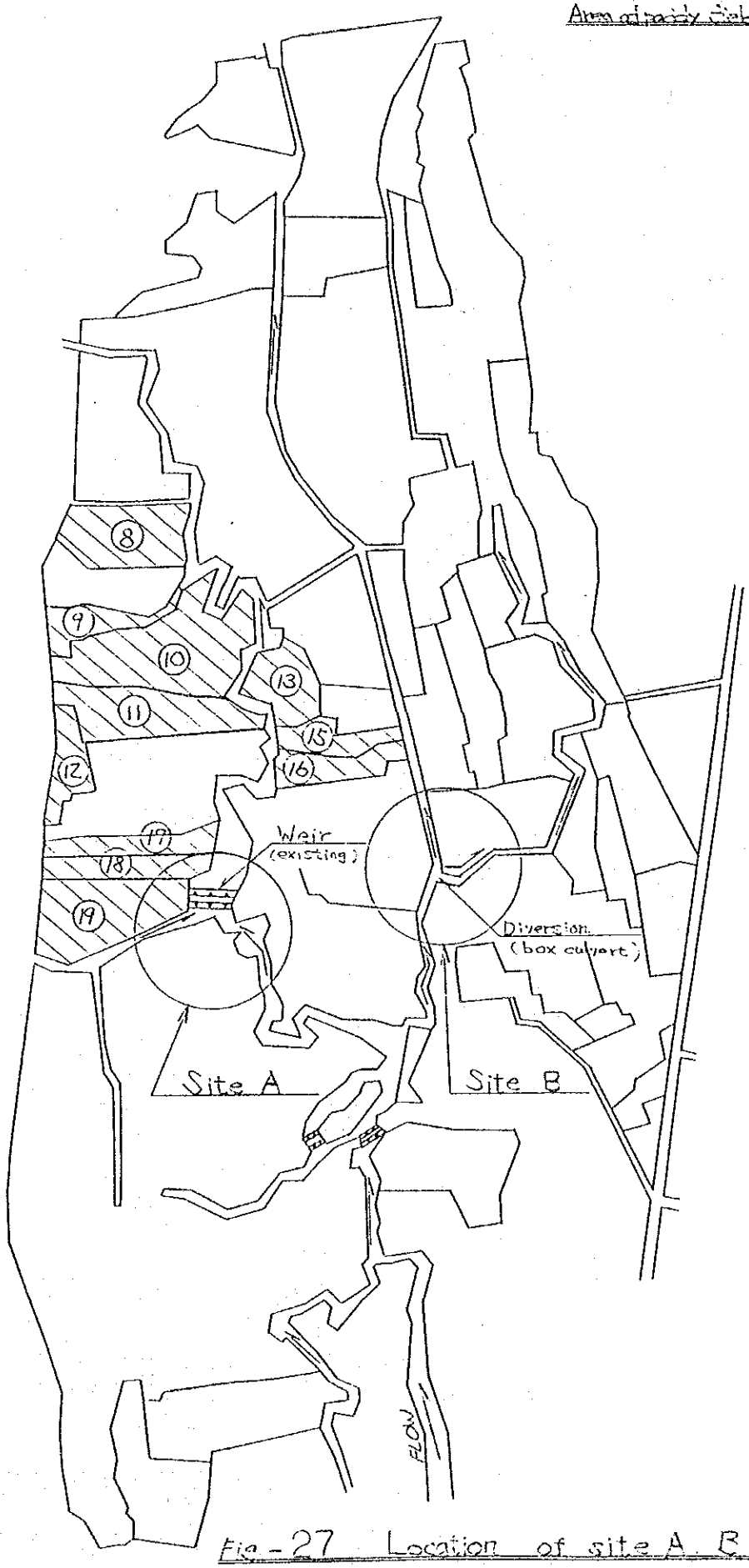
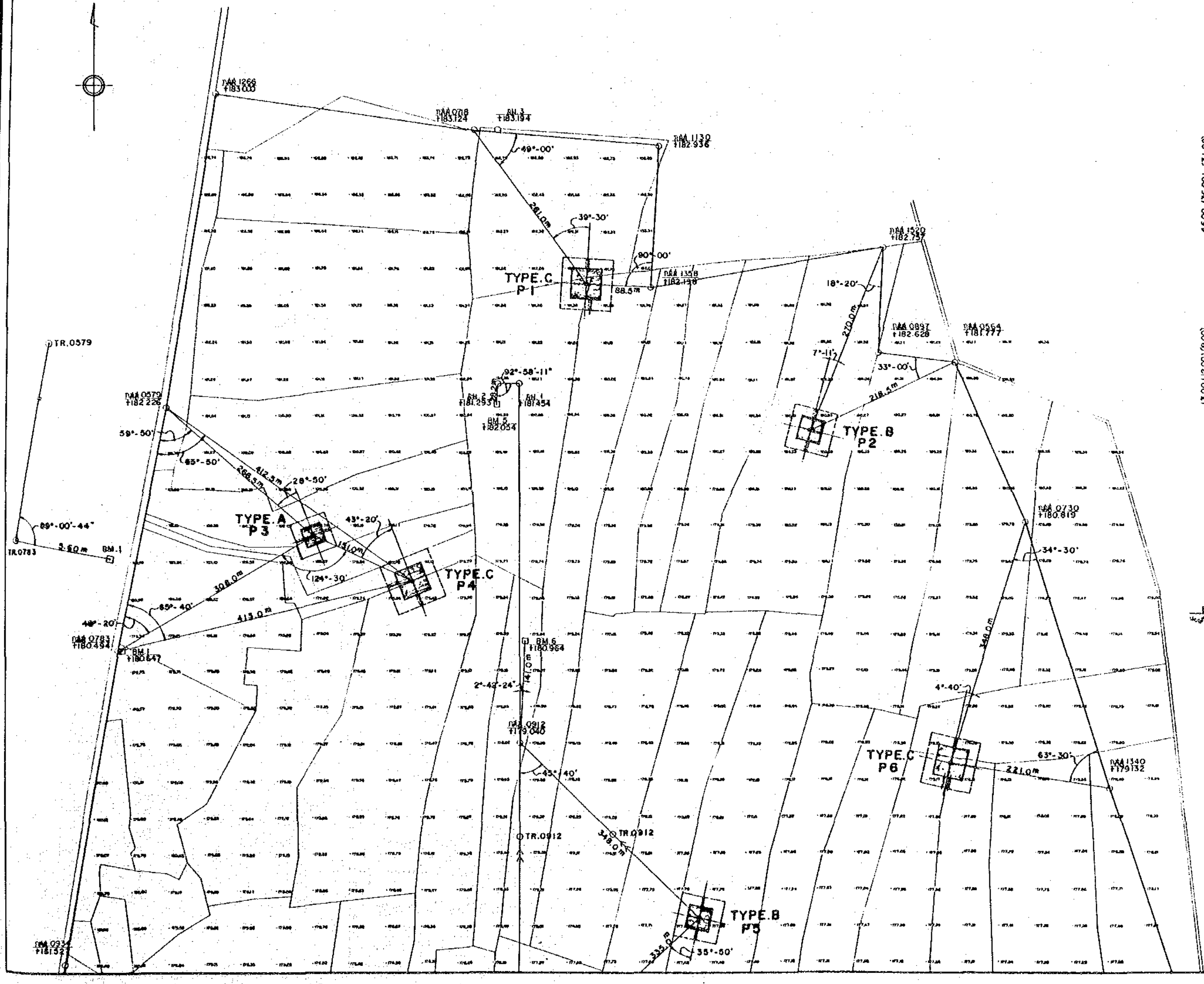


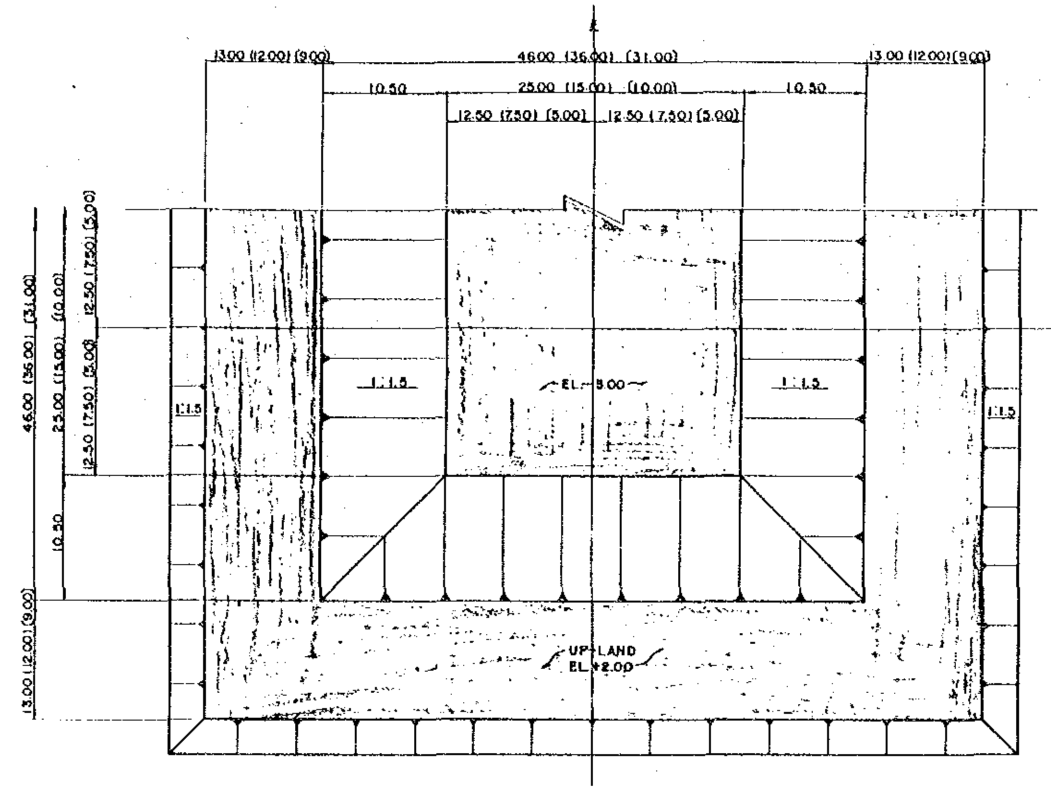
Fig - 27 Location of site A, B

第３編　図　面　集

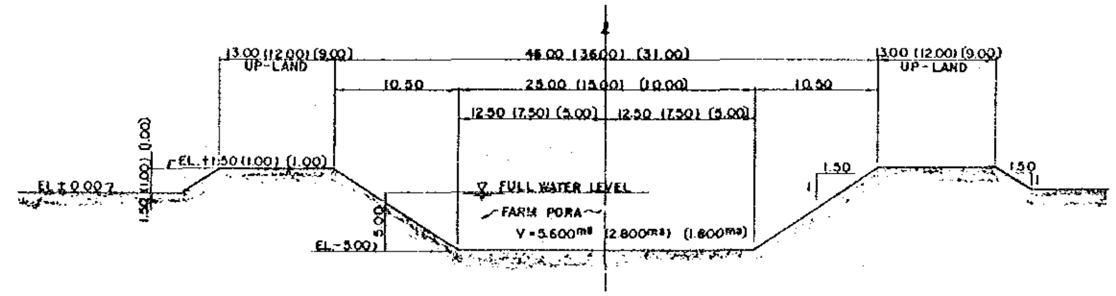
***** DRAWINGS LIST *****

DRAWING NO.	T I T L E	
1	LOCATION OF FARM POND	(1)
2	LOCATION OF FARM POND	(2)
3	PLAN OF FARM POND	(1)
4	PLAN OF FARM POND	(2)
5	PLAN OF INLET	
6	GENERAL PLAN OF OUTLET WORKS	
7	PLAN OF OUTLET WORKS	(1)
8	PLAN OF OUTLET WORKS	(2)
9	EARTHWORK CROSS SECTION	(1)
10	EARTHWORK CROSS SECTION	(2)
11	EARTHWORK CROSS SECTION	(3)
12	GENERAL PLAN OF DIVERSION WORKS	
13	PLAN OF DIVERSION WORKS	(1)
14	PLAN OF DIVERSION WORKS	(2)
15	ARRANGEMENT OF REINFORCEMENT	
16	EARTHWORK CROSS SECTION	(1)
17	EARTHWORK CROSS SECTION	(2)
18	DETAIL OF SLUICE GATE	(1)
19	DETAIL OF SLUICE GATE	(2)





PLANE OF FARM POND



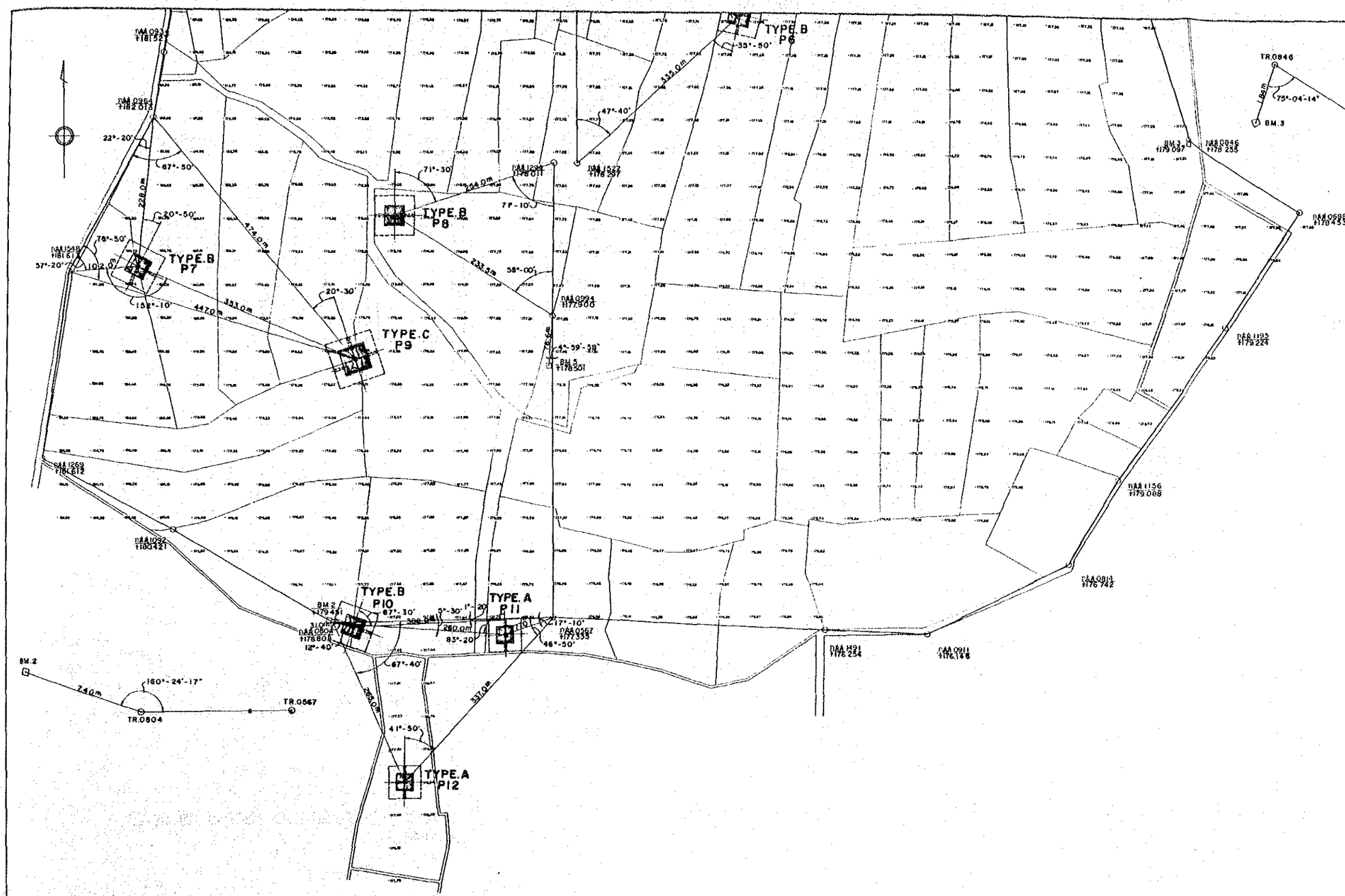
STANDARD SECTION (TYPE C)

SCALE 1: 250

THE VALUE OF ( ) IS SHOWN TYPE-B

THE VALUE OF ( ) IS SHOWN TYPE-A

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
LOCATION OF FARM POND (I)	
PREPARED BY	DRAWING NO. 1
CHECKED NO.	



TYPE.A

NO.	EXISTING GROUND LEVEL	FULL WATER LEVEL	POND BOTTOM LEVEL	TOP-LARD LEVEL	THE NUMBER OF INLETS
P 3	EL. 180.30	FWL 180.20	EL. 175.20	EL. 181.20	2
P11	EL. 177.40	FWL 177.00	EL. 172.00	EL. 178.00	2
P12	EL. 177.00	FWL 177.00	EL. 172.00	EL. 178.00	2

TYPE.B

NO.	EXISTING GROUND LEVEL	FULL WATER LEVEL	POND BOTTOM LEVEL	TOP-LARD LEVEL	THE NUMBER OF INLETS
P 2	EL. 180.40	FWL. 180.30	EL. 175.30	EL. 181.30	2
P 5	EL. 177.60	FWL. 177.50	EL. 172.50	EL. 178.50	2
P 7	EL. 180.80	FWL. 180.60	EL. 175.60	EL. 181.60	2
P 8	EL. 179.60	FWL. 178.80	EL. 173.80	EL. 179.80	2
P10	EL. 179.50	FWL. 178.10	EL. 173.10	EL. 179.10	2

TYPE.C

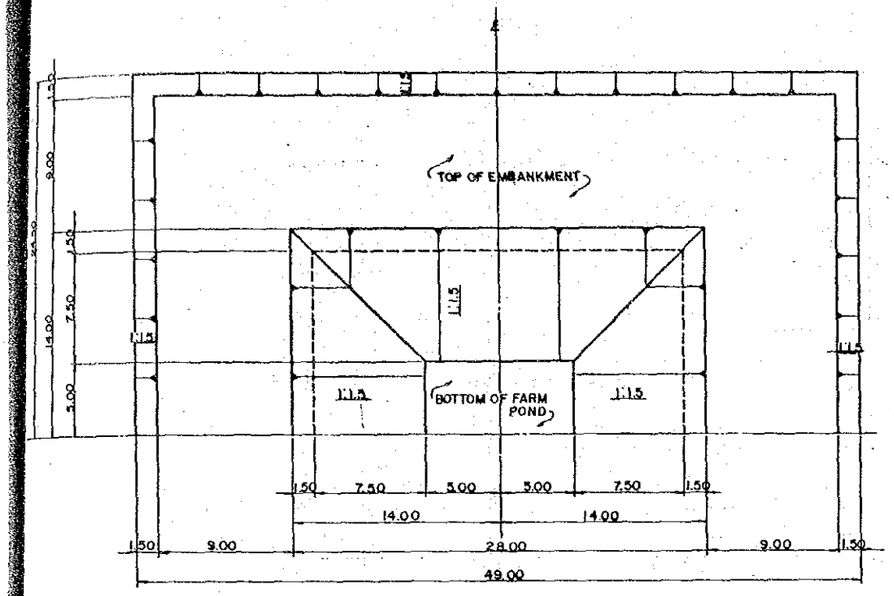
NO.	EXISTING GROUND LEVEL	FULL WATER LEVEL	POND BOTTOM LEVEL	TOP-LARD LEVEL	THE NUMBER OF INLETS
P 1	EL. 181.90	FWL. 181.40	EL. 176.40	EL. 182.90	3
P 4	EL. 179.80	FWL. 179.60	EL. 174.60	EL. 181. 10	2
P 6	EL. 178. 20	FWL. 178.00	EL. 173.00	EL. 179. 50	3
P 9	EL. 179.20	FWL. 178.70	EL. 173.70	EL. 180. 20	3

JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR
AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND

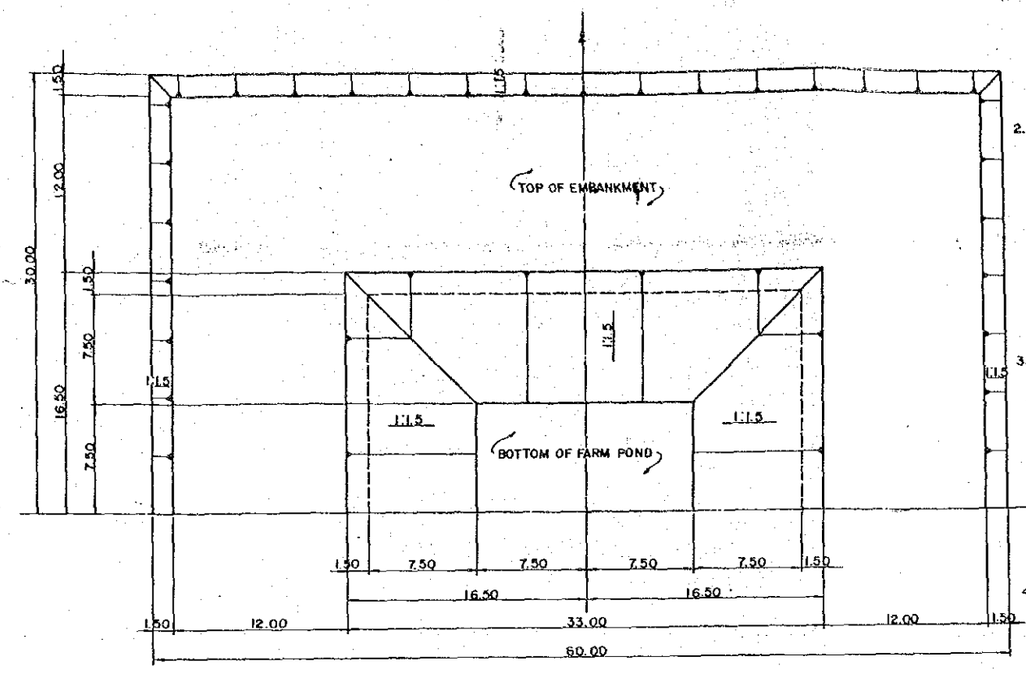
LOCATION OF FARM POND (2)

PREPARED BY	DRAWING NO.
CHECKED NO,	2



PLANE OF FARM POND TYPE. A

SCALE 1:200



PLANE OF FARM POND TYPE. B

SCALE 1:200

NOTE.

1. BEFOR THE COURSE OF COMPACTION THE CONTRACTOR SHALL TEST THE STANDARD COMPACTION TEST ACCORDING TO ASTM D-698-66T METHOD A OR JIS A 1210-1970.

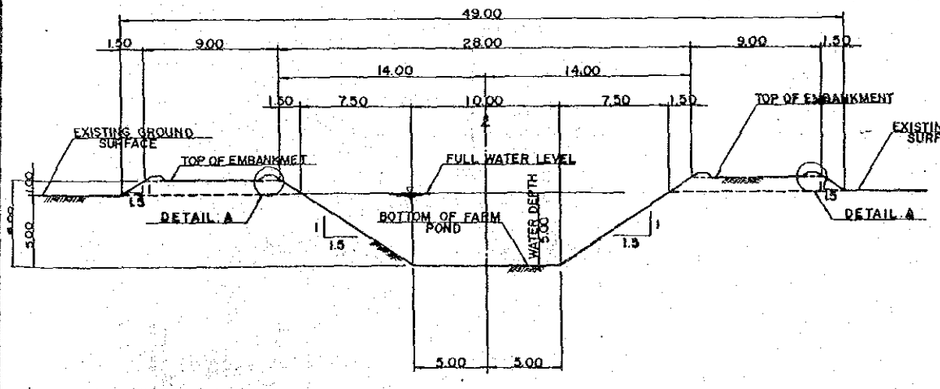
2. THE SAMPLING PLACES FOR THE STANDARD COMPACTION TEST ARE INDICATED BY THE INSPECTION COMMITTEE. AND THE CONTRACTOR SHALL TAKE MORE THAN 3 (THREE) SAMPLES FOR STANDARD COMPACTION TEST AT ANY PLACE INDICATED BY THE INSPECTION COMMITTEE.

3. THE CONTRACTOR SHALL SUBMIT THE RESULTS OF THE STANDARD COMPACTION TEST TO THE INSPECTION COMMITTEE. ACCORDING TO WHICH. THE INSPECTION COMMITTEE WILL DECIDE THE WORKABLE RANGE OF MOISTURE CONTENT FOR THE COMPACTION.

4. THE CONTRACTOR SHALL COMPACT EARTH IN CASE ACTUAL MOISTURE CONTENT IS OUT OF THE WORKABLE PANGE. SHOULD THE CONTRACTOR TO COMPACT EARTH IN THE ABOVE MENTIONED STATE. THE CONTRACTOR OBTAIN THE PRIOR PERMISSION OF THE INSPECTION COMMITTEE.

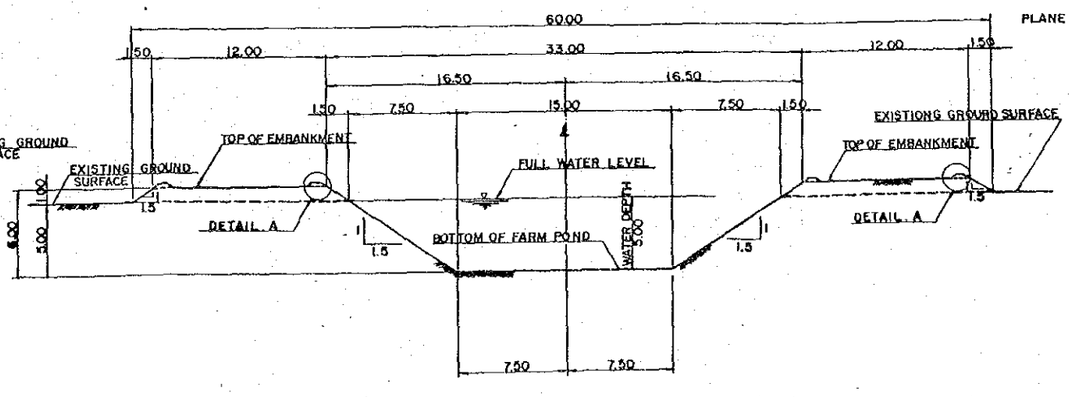
5. DATAIL. A IS SHOWN IN DRAWING NO. 4

6. EMBANKMENT (DETAIL.A) IS OMITTED IN PLANE OF FARM POND.



STANDARD SECTION OF FARM POND TYPE. A

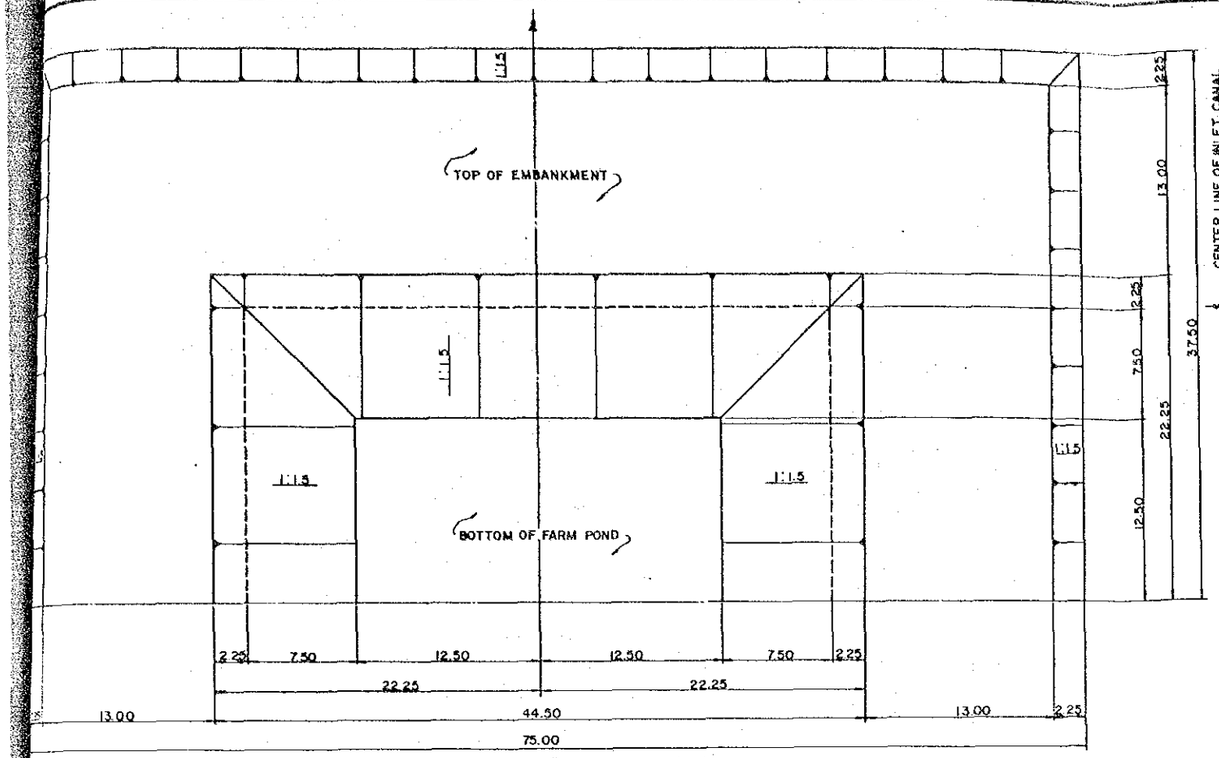
SCALE 1:200



STANDARD SECTION OF FARM POND TYPE. B

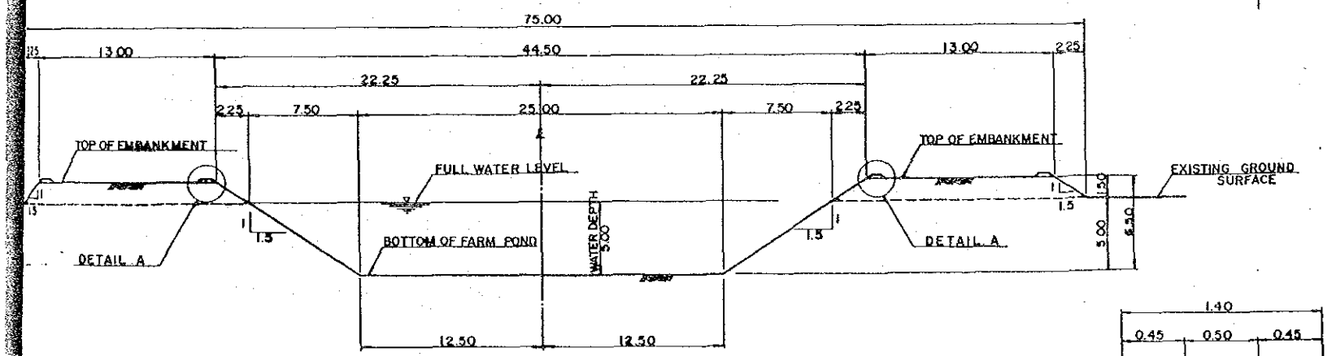
SCALE 1:200

JAPAN-INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
PLAN OF FARM POND (1)	
PREPARED BY	DRAWING NO. 3
CHECKED NO.	



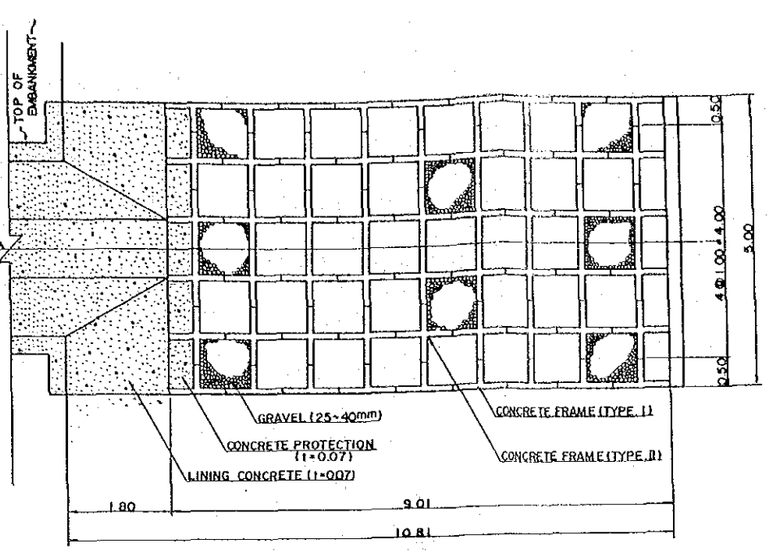
PLANE OF FARM POND TYPE C

SCALE 1:200



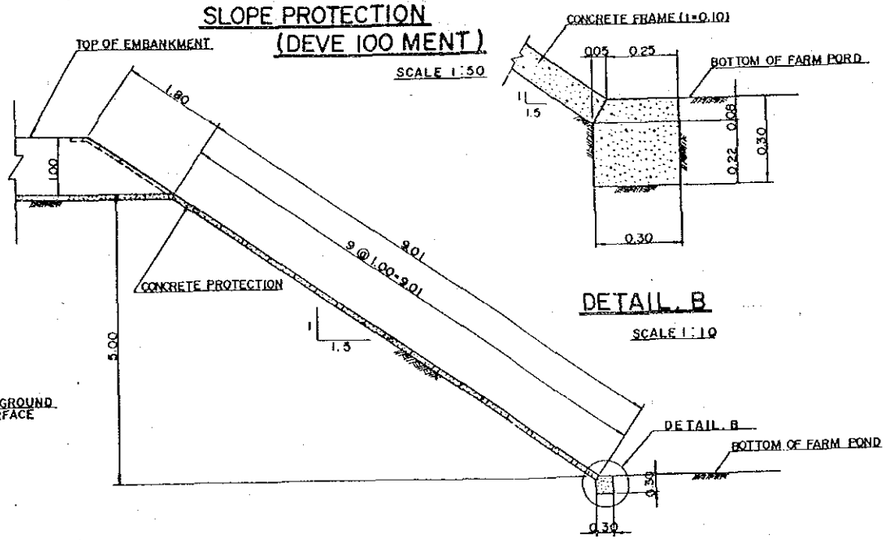
STANDARD SECTION OF FARM POND TYPE C

SCALE 1:200



SLOPE PROTECTION (DEVE 100 MENT)

SCALE 1:50

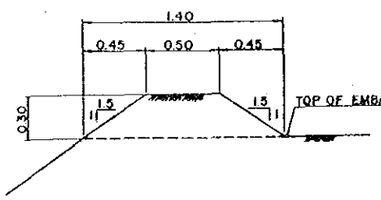


LONGITUDINAL SECTION OF SLOPE PROTECTION

SCALE 1:50

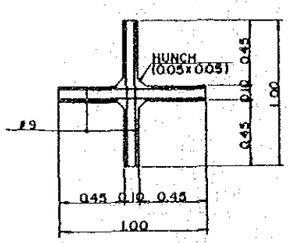
DETAIL B

SCALE 1:10



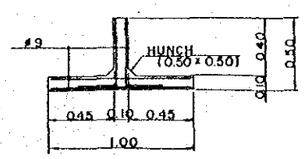
DETAIL A

SCALE 1:20



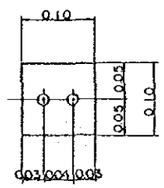
CONCRETE FRAME (TYPE I)

SCALE 1:20



CONCRETE FRAME (TYPE II)

SCALE 1:20

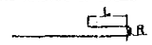


CONCRETE FRAME STANDARD SECTION

SCALE 1:4

NOTE.

1. ABBREVIATION AND SYMBOL
   - ℄ : CENTER LINE
2. ALL REINFORCING STEEL TO BE PLAIN BAR WITH HOOKS EACH (AS FOLLOWS)
   - R = 2.5 ϕ
   - L : LONGER THAN 6cm AND 4 ϕ
   - ϕ : DIAMETER OF STEEL BAR
   - R : BEND RADIUS OF STEEL BAR



LENGH OF LAP AND ANCHORAGE (USE SR 30)

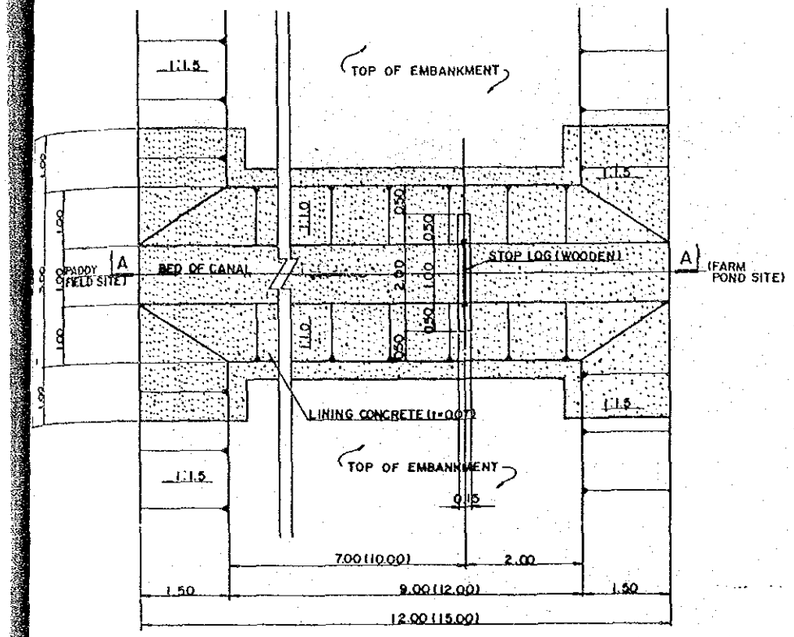
36 BAR DIAMETER (WITH HOOKS)

JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND

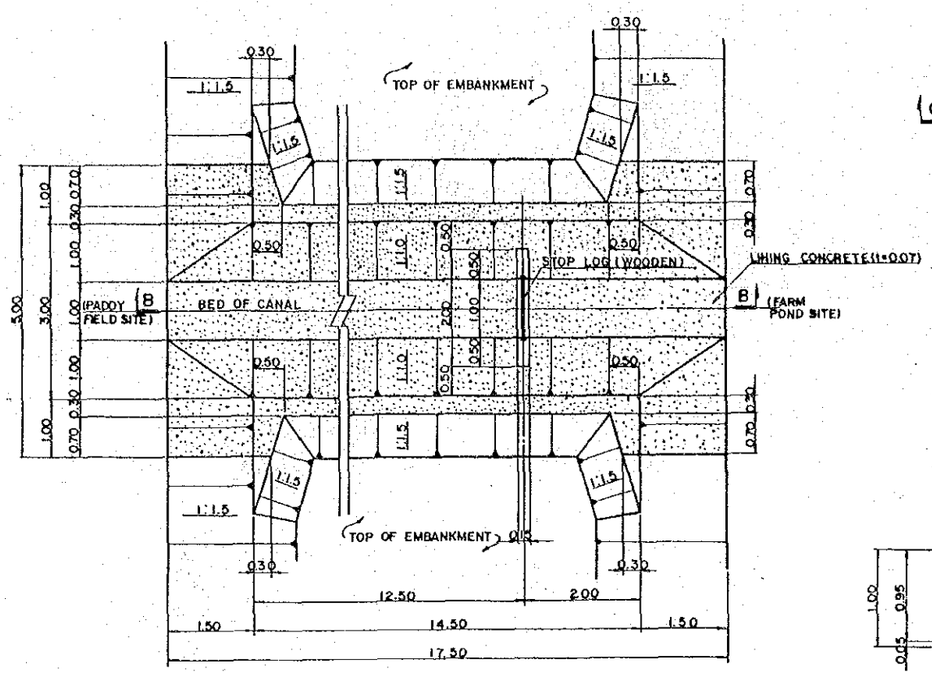
PLAN OF FARM POND (2)

PREPARED BY	DRAWING NO.
CHECKED NO.	4



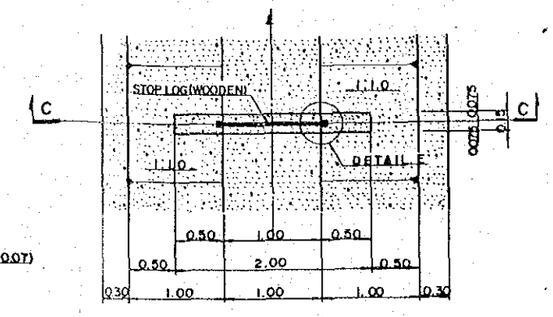
PLANE OF INLET (EMBANKMENT HEIGHT = 1.0m)

SCALE 1:50



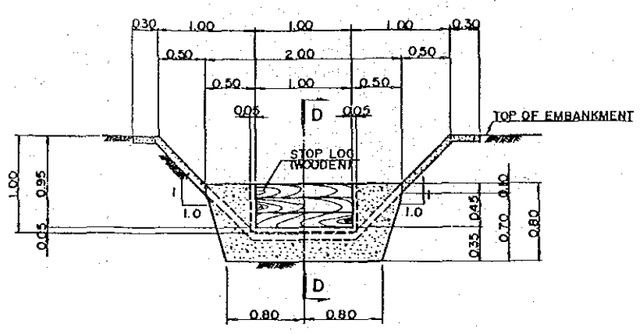
PLANE OF INLET (EMBANKMENT HEIGHT = 1.5m)

SCALE 1:50



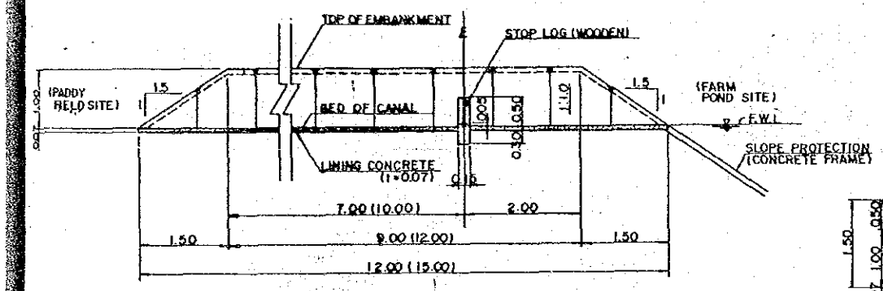
PLANE OF FLASH BOARD WEIR

SCALE 1:30



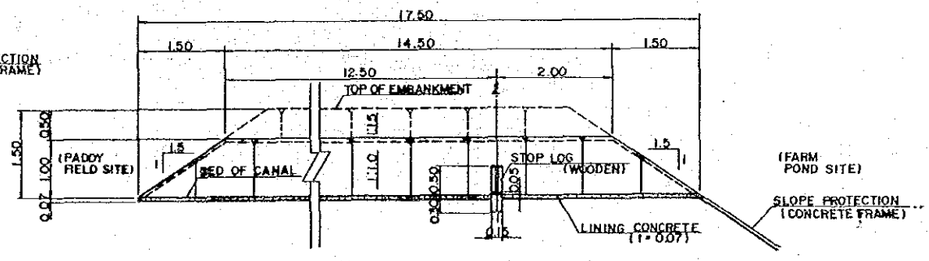
SECTION C – C

SCALE 1:30



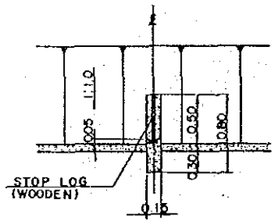
LONGITUDINAL (SECTION A – A)

SCALE 1:50



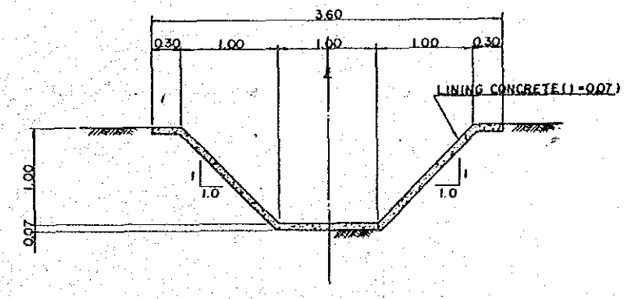
LONGITUDINAL (SECTION B – B)

SCALE 1:50



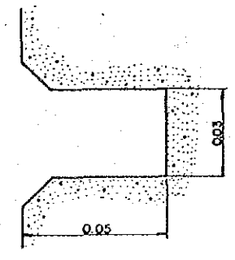
SECTION D – D

SCALE 1:30



STANDARD SECTION

SCALE 1:30



DETAIL E

SCALE 1:1

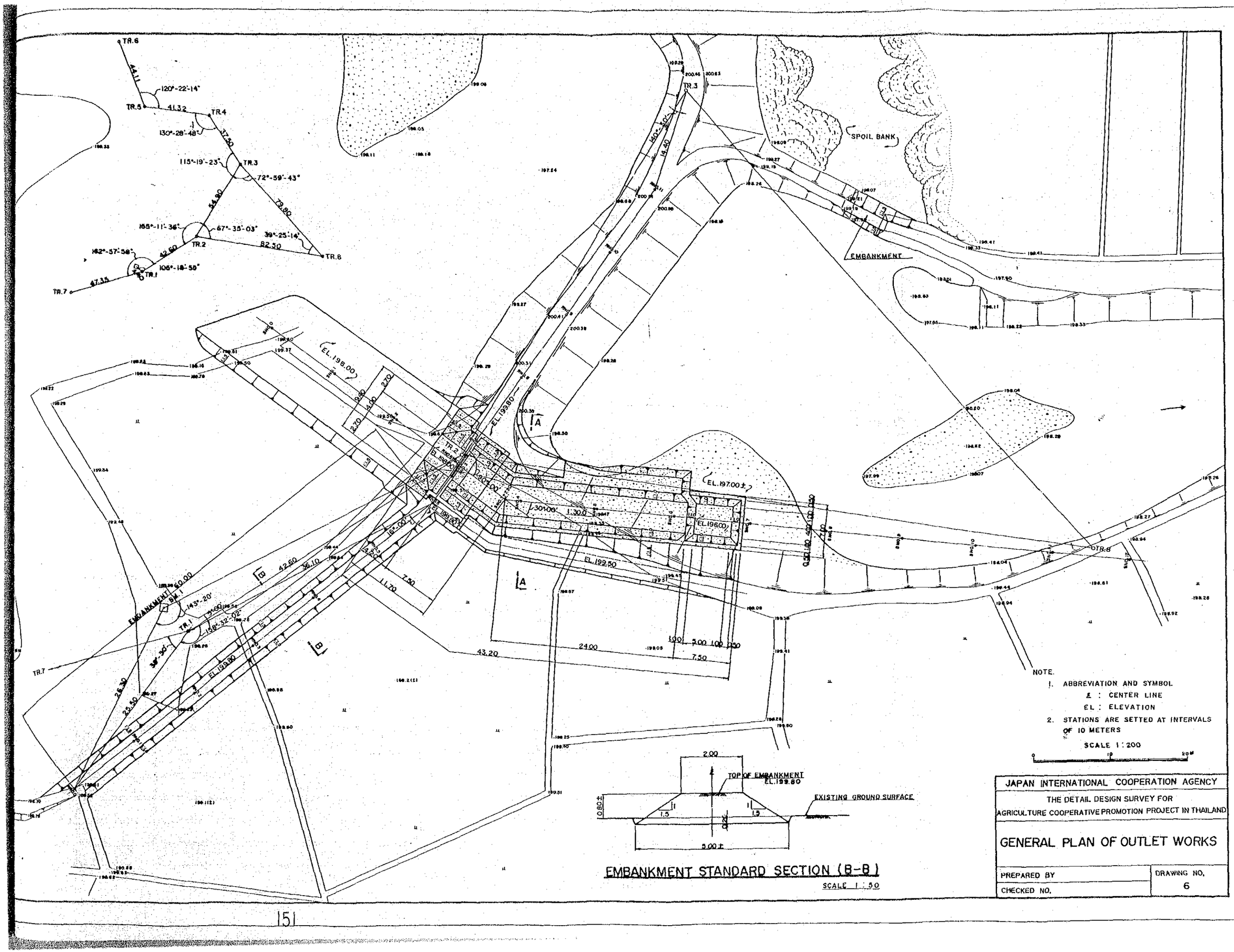
NOTE.

1. ABBREVIATION AND SYMBOL

℄ : CENTER LINE

2. WOODEN PARTS SHALL BE TREATED WITH WATERPROOF CHEMICAL FOR AGENT.

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
PLAN OF INLET	
PREPARED BY	DRAWING NO. 5
CHECKED NO,	



NOTE.

1. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL : ELEVATION
2. STATIONS ARE SETTED AT INTERVALS OF 10 METERS

SCALE 1 : 200

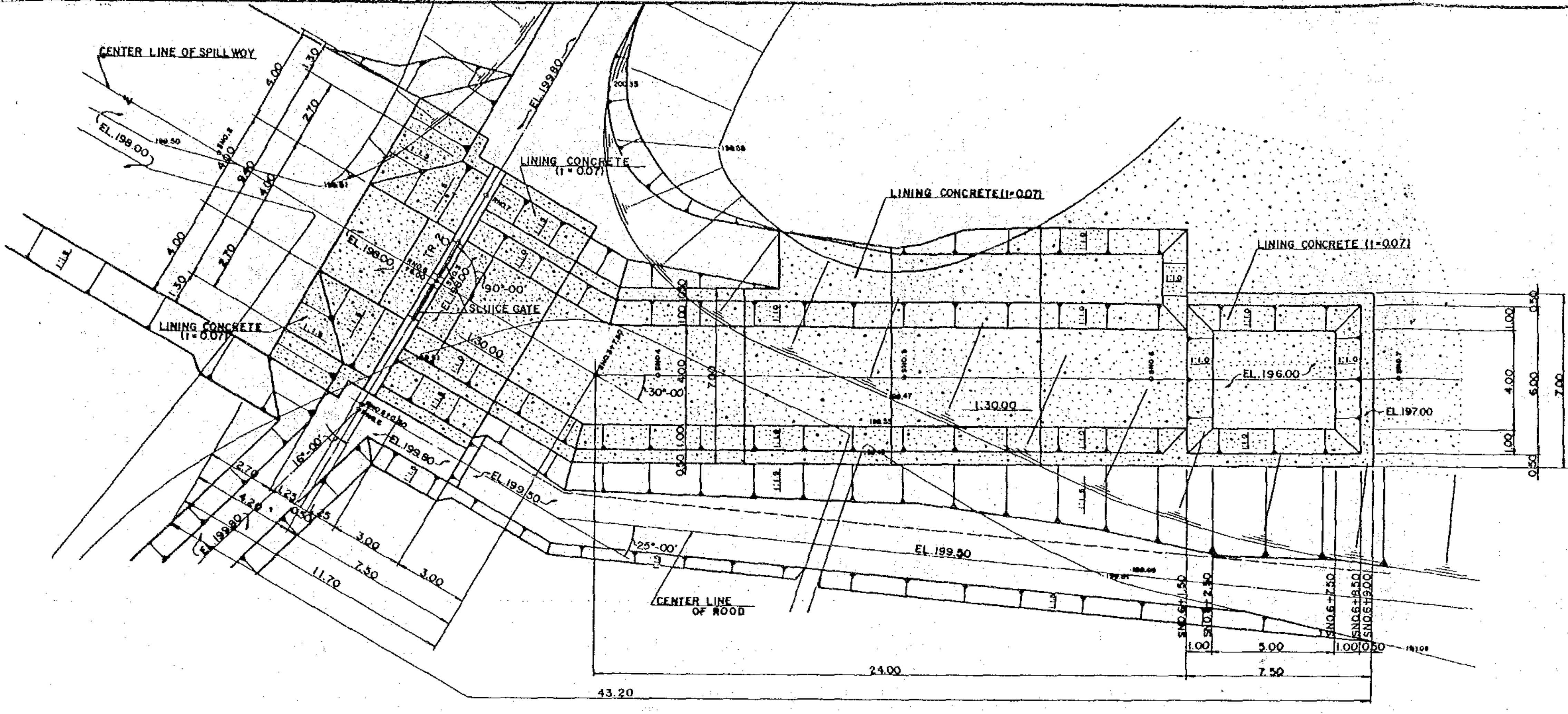
0 10 20M

JAPAN INTERNATIONAL COOPERATION AGENCY

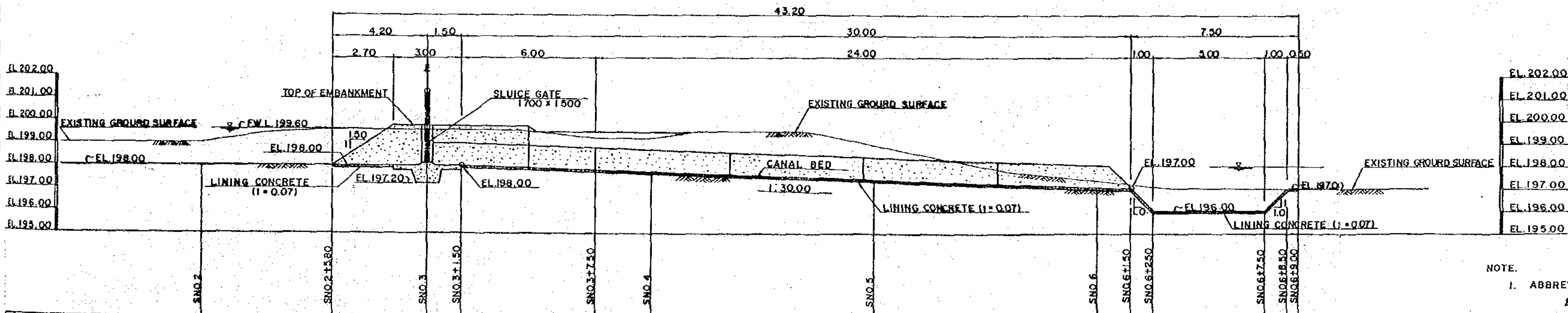
THE DETAIL DESIGN SURVEY FOR
AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND

GENERAL PLAN OF OUTLET WORKS

PREPARED BY	DRAWING NO.
CHECKED NO.	6



PLANE OF SPILLWAY SCALE 1:100



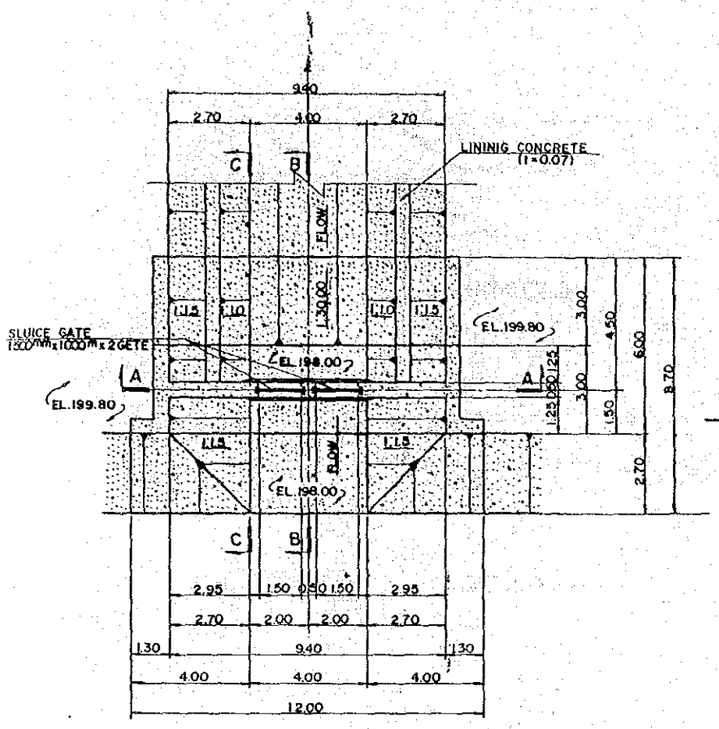
SLOPE	LEVEL									1:30 (3.333%)			1:1.0	LEVEL		1:1.0			
CANAL BED ELAVATION	198.00	198.00		198.00	198.00	198.88	197.80	197.72	197.55	197.38	197.82	197.05	197.00	196.00	196.00	196.00	197.00	197.00	197.00
EXISTING GROURD ELAVATION	198.0	199.5	199.6	199.6	199.6	198.5	198.2	198.2	198.5	198.9	198.0	197.3	197.0	197.0	197.0	197.0	197.0	197.0	197.0
ACCUMULATED DISTANCE	0.00	5.00	5.80	10.00	11.50	15.00	17.50	20.00	25.00	30.00	35.00	40.00	41.50	42.50	45.00	47.50	48.50	49.00	50.00
DISTANCE	0.00	5.00	0.80	4.20	1.50	3.50	2.50	2.50	5.00	5.00	5.00	5.00	1.50	1.00	2.50	2.50	1.00	0.50	1.00
STATION	SNO.2	+5.00	+5.80	SNO.3	+1.50	+5.00	+7.50	SNO.4	+5.00	SNO.5	+5.00	SNO.6	+1.50	+2.50	+5.00	+7.50	+8.50	+9.00	SNO.7
CARVE							IA = 30°-00'												

LONGITUDINAL SECTION SPILLWAY SCALE 1:100

NOTE.

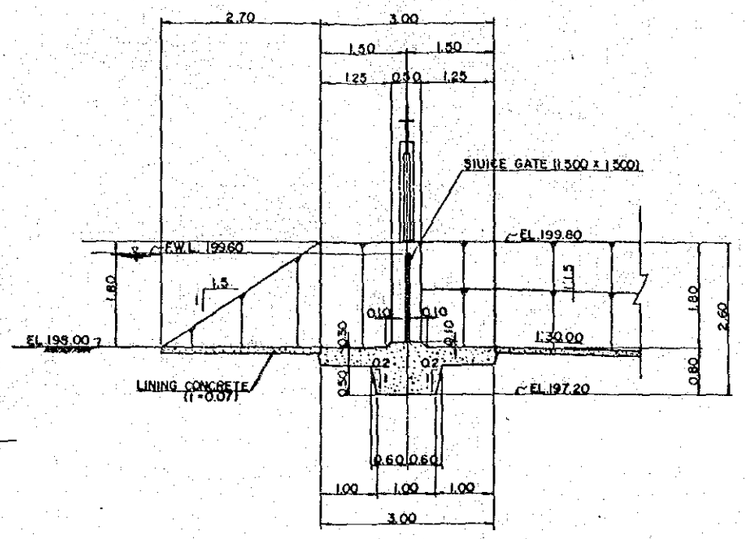
1. ABBREVIATION AND SYMBOL
   - ℄ : CENTER LINE
   - EL : ELEVATION
2. STATIONS ARE SETTED AT INTERVALS OF 10 METERS

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
PLAN OF OUTLET WORKS (1)	
PREPARED BY	DRAWING NO. 7
CHECKED NO.	



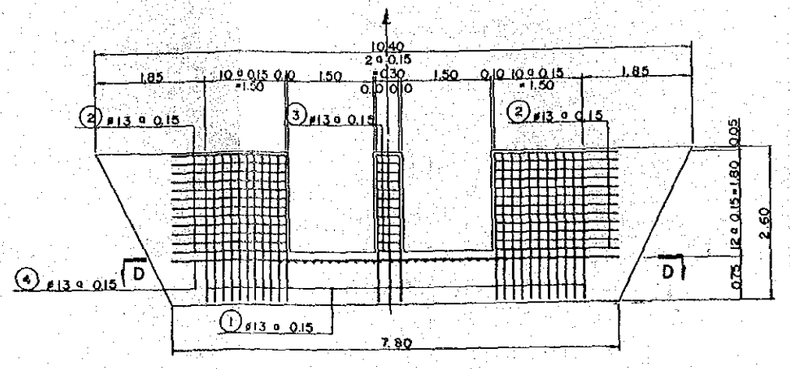
PLANE OF SPILLWAY

SCALE 1:100



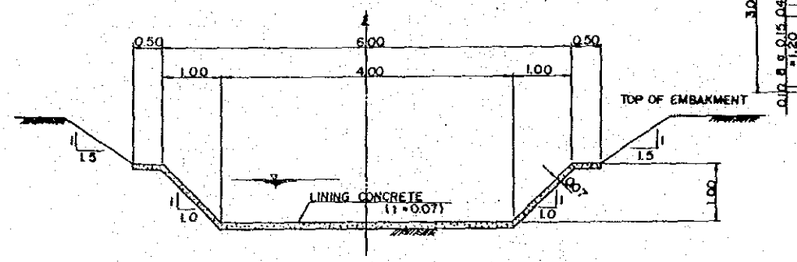
SECTION B—B

SCALE 1:50



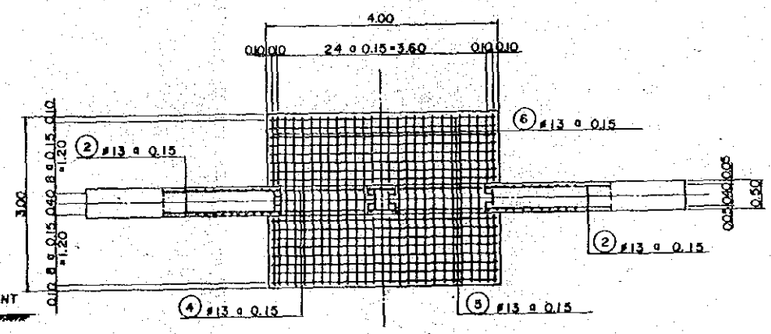
REINF. OF SECTION A—A

SCALE 1:50



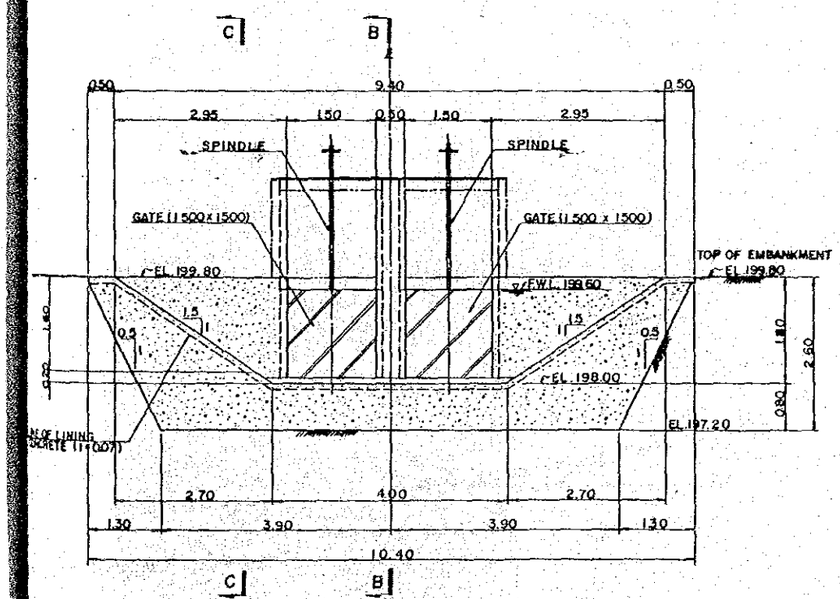
SPILL WAY STANDARD SECTION

SCALE 1:50



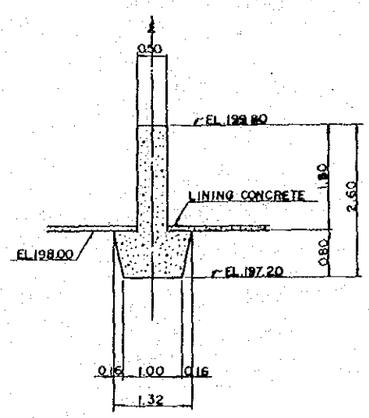
REINF. OF SECTION D—D

SCALE 1:50



SECTION A—A

SCALE 1:50



SECTION C—C

SCALE 1:50

NOTE.

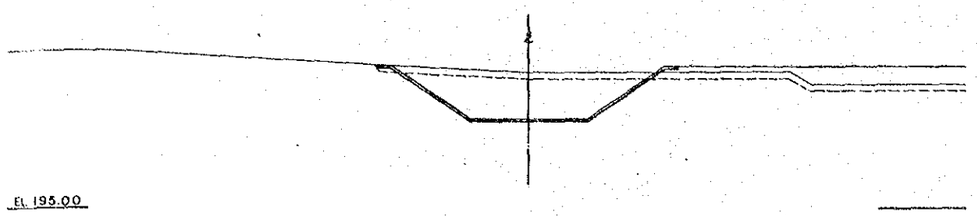
1. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL: ELEVATION
2. ALL REINFORCING STEEL TO BE PLAIN BAR WITH HOOKS FACH (AS FOLLOWS)
   R = 2.5 ϕ
   L : LONGER THAN 6cm AND 4 ϕ
   ϕ : DIAMETER OF STEEL BAR
   R : BEND RADIUS OF STEEL BAR

LENGH OF LAP AND ANCHORAGE (USE SR30)

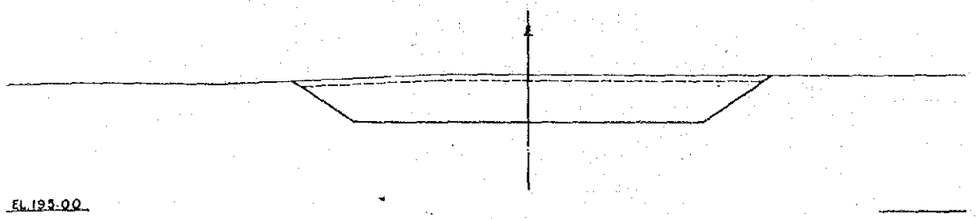
35 BAR DIAMETER (WITH HOOKS)

COVER FOR REINFORCING TO BE 5cm MINIMUM

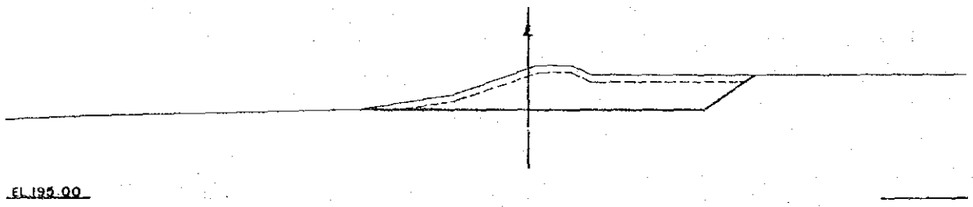
JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
PLAN OF OUTLET WORKS	
PREPARED BY	DRAWING NO. 8
CHECKED NO.	



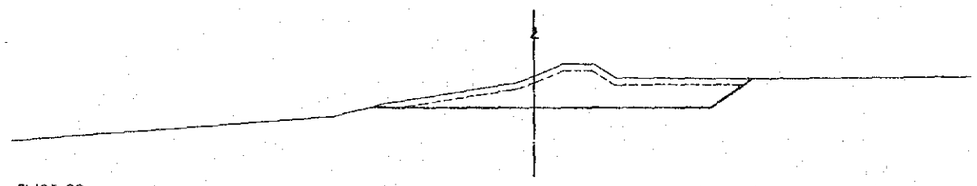
SNO.2+8.50



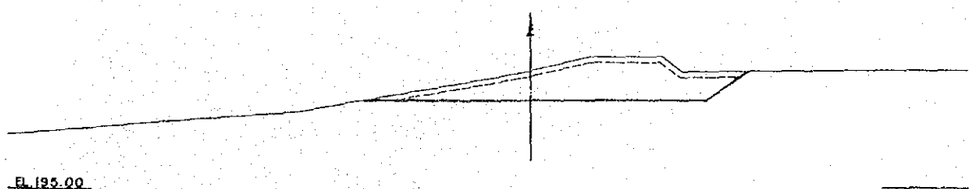
SNO.2+5.30



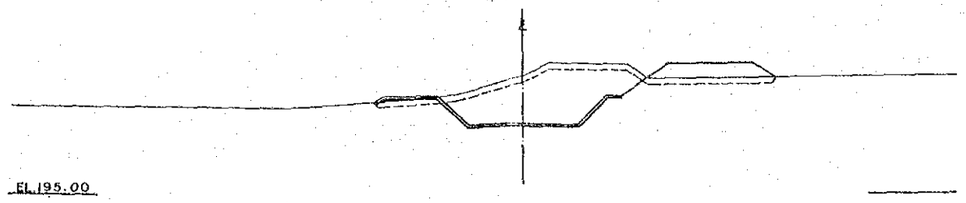
SNO.2



SNO.1



SNO.0



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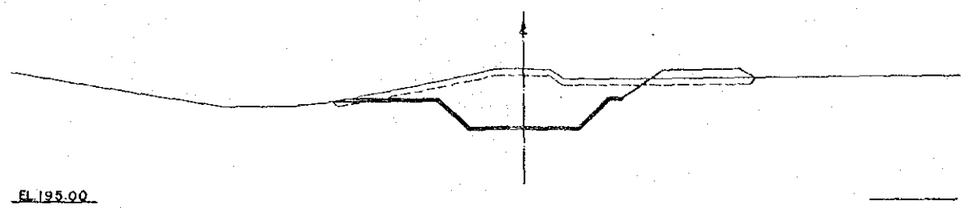
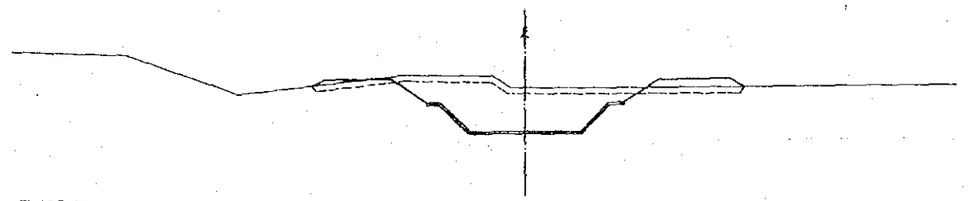
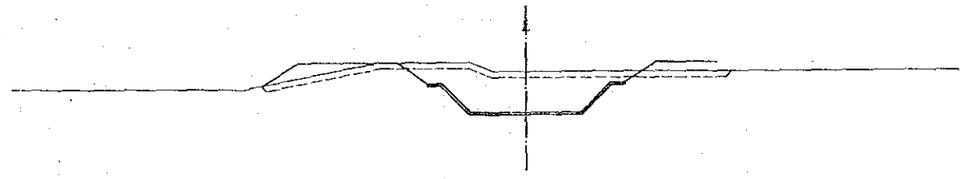


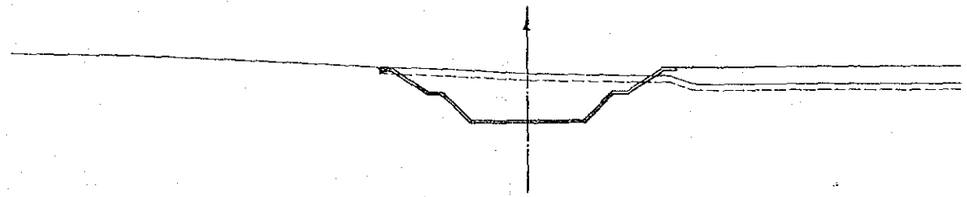
SNO4+5.00



SNO.4



SNO.3+7.50



SNO.3

EARTHWORK CROSS SECTION

SCALE 1:100

NOTE.

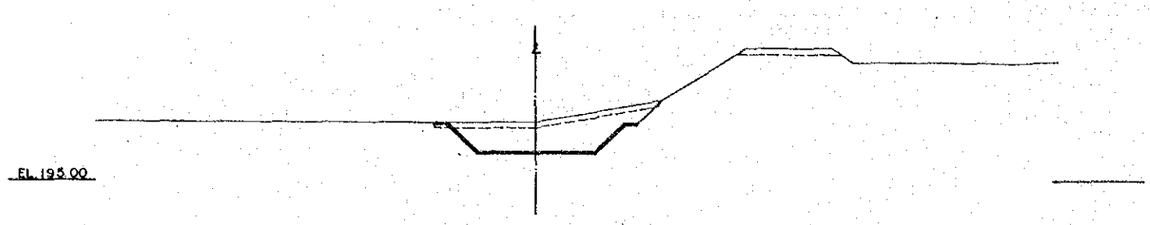
1. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL : ELEVATION
2. STATION NO. ARE SHOWN IN DRAWING NO. 6

JAPAN INTERNATIONAL COOPERATION AGENCY

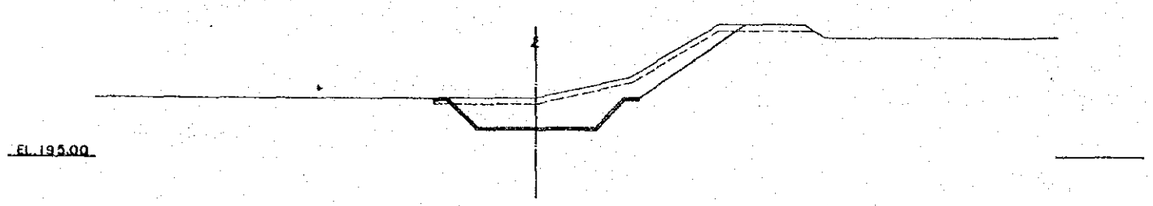
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND

EARTHWORK CROSS SECTION (1)

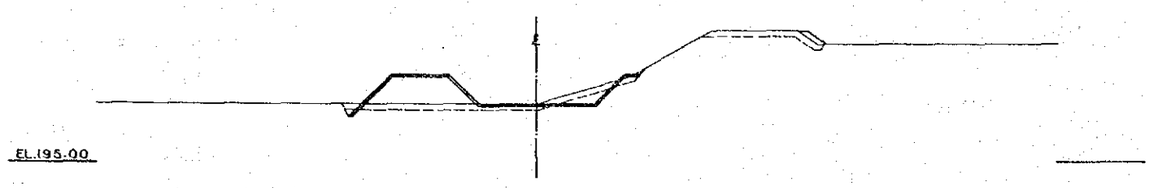
PREPARED BY	DRAWING NO.
CHECKED NO,	9



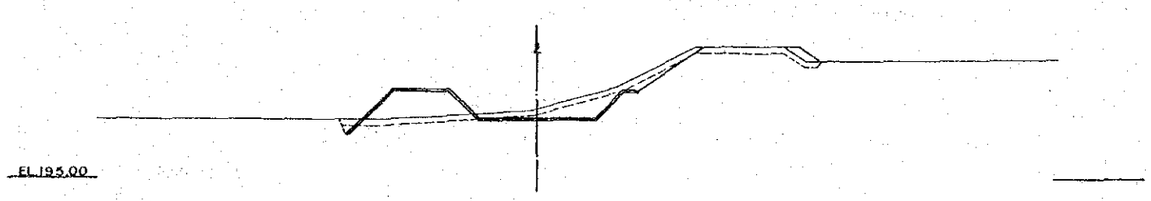
SNO.6+7.50



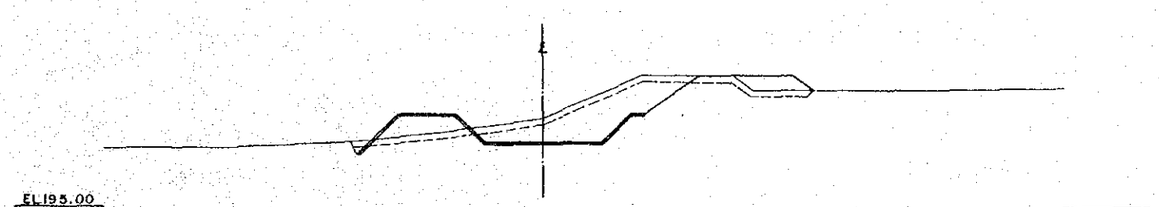
SNO.6+2.50



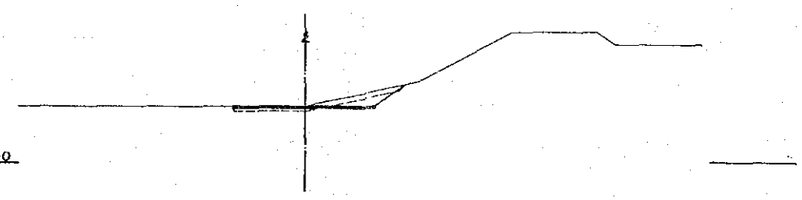
SNO.6+1.50



SNO.6



SNO.5+5.00



SNO.6+8.50

EARTHWORK CROSS SECTION

SCALE 1:100

NOTE.

1. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL: ELEVATION
2. STATION NO. ARE SHOWN IN DRAWING NO. 6

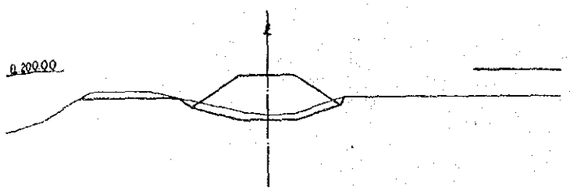
JAPAN INTERNATIONAL COOPERATION AGENCY

THE DETAIL DESIGN SURVEY FOR
AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND

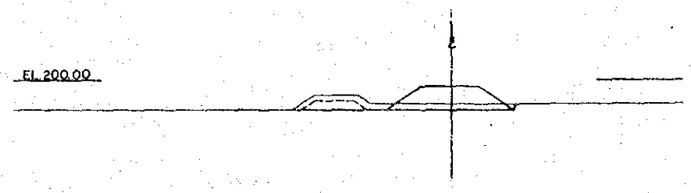
EARTHWORK CROSS SECTION (2)

PREPARED BY	DRAWING NO.
CHECKED NO.	10

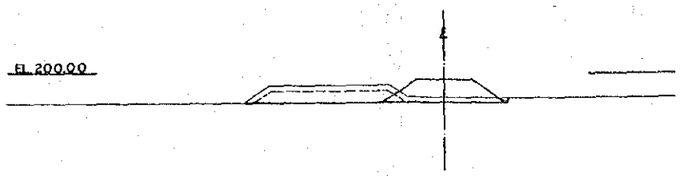
RNO. 4



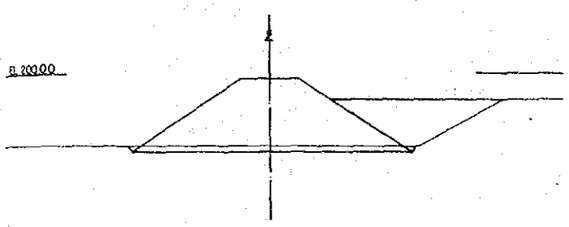
RNO. 1 + 5.00



RNO. 3 + 5.0



RNO. 5 + 8.0



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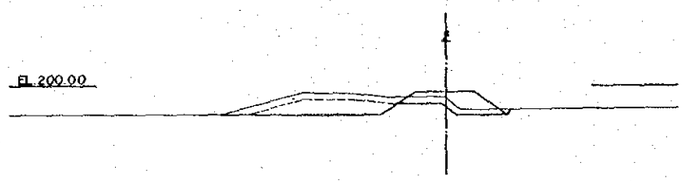
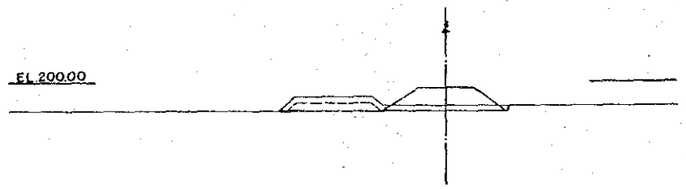
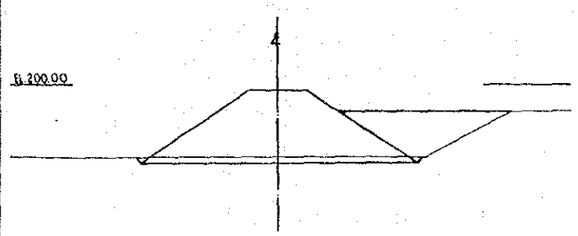


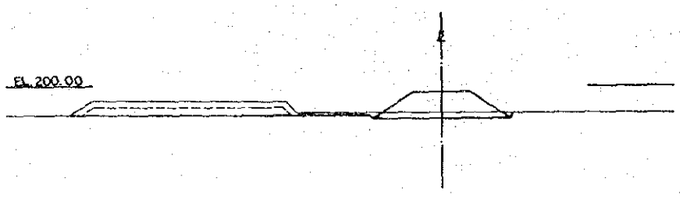
RNO. 3



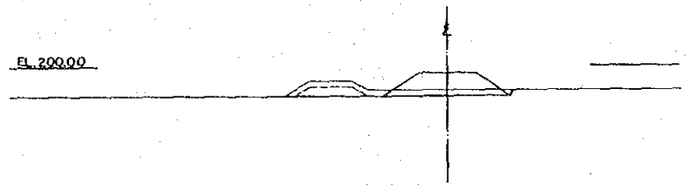
RNO. 5 + 5.0



RNO. 0 + 5.0



RNO. 2 + 5.0



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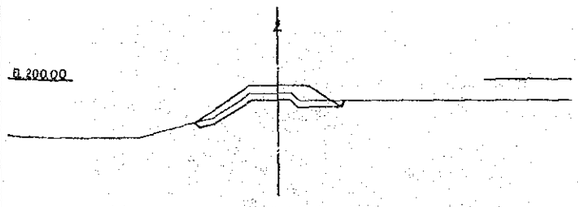

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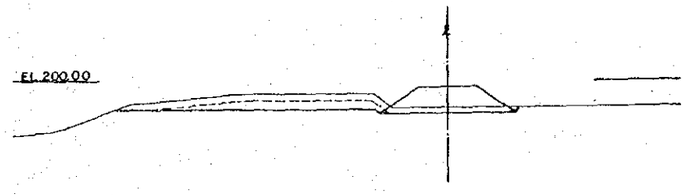

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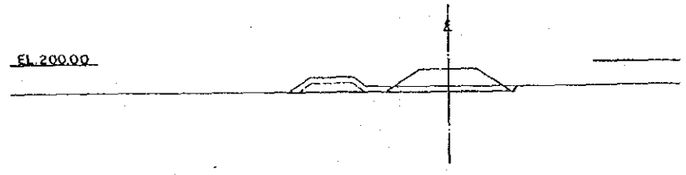


RNO. 4 + 5.00

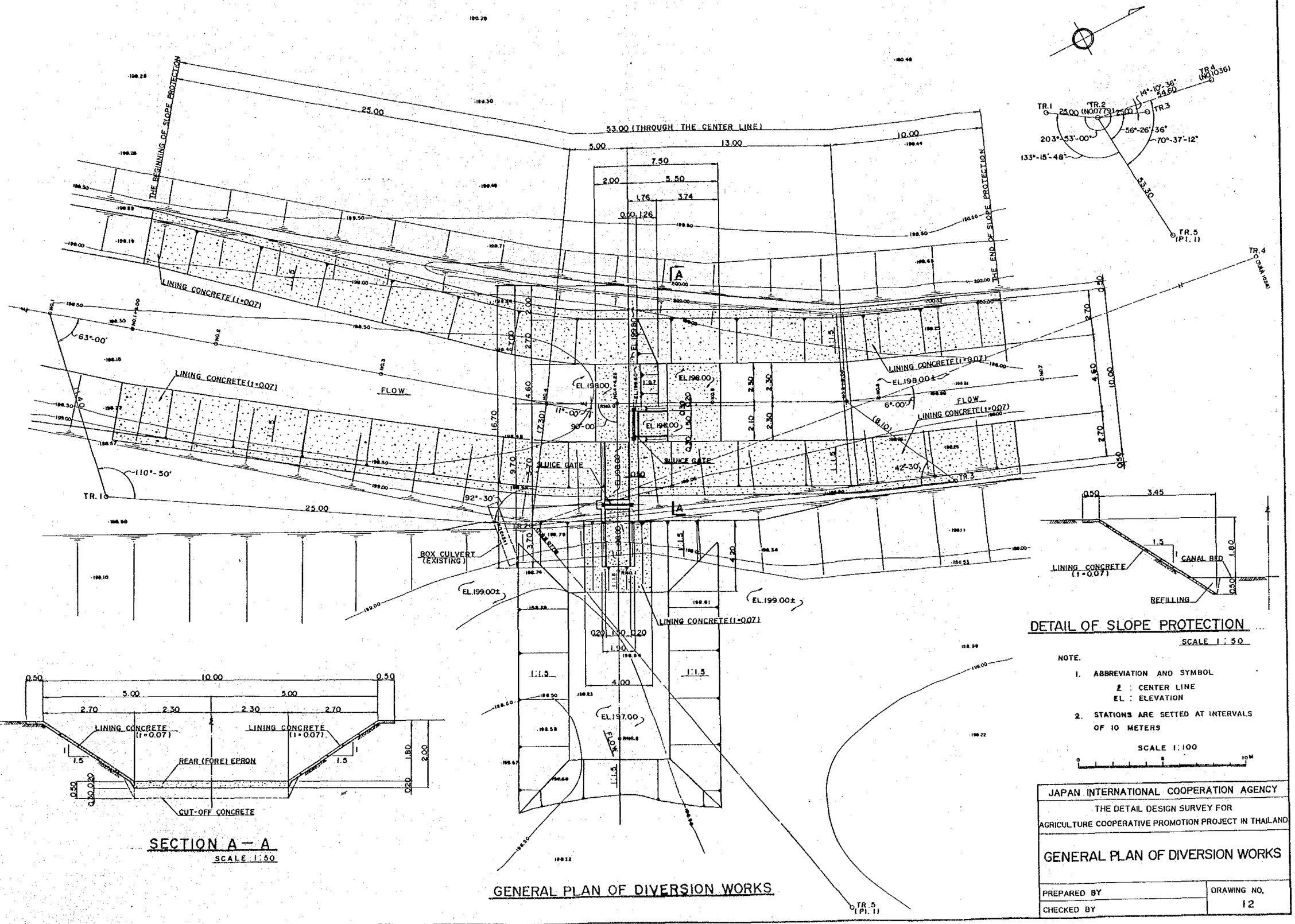
EARTHWORK CROSS SECTION

SCALE 1:100

NOTE.

1. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL : ELEVATION
2. STATION NO. ARE SHOWN IN DRAWING NO. 6

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
EARTHWORK CROSS SECTION (3)	
PREPARED BY	DRAWING NO. 11
CHECKED NO.	



SECTION A — A

SCALE 1:50

GENERAL PLAN OF DIVERSION WORKS

DETAIL OF SLOPE PROTECTION

SCALE 1:50

NOTE.

1. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL : ELEVATION
2. STATIONS ARE SETTED AT INTERVALS OF 10 METERS

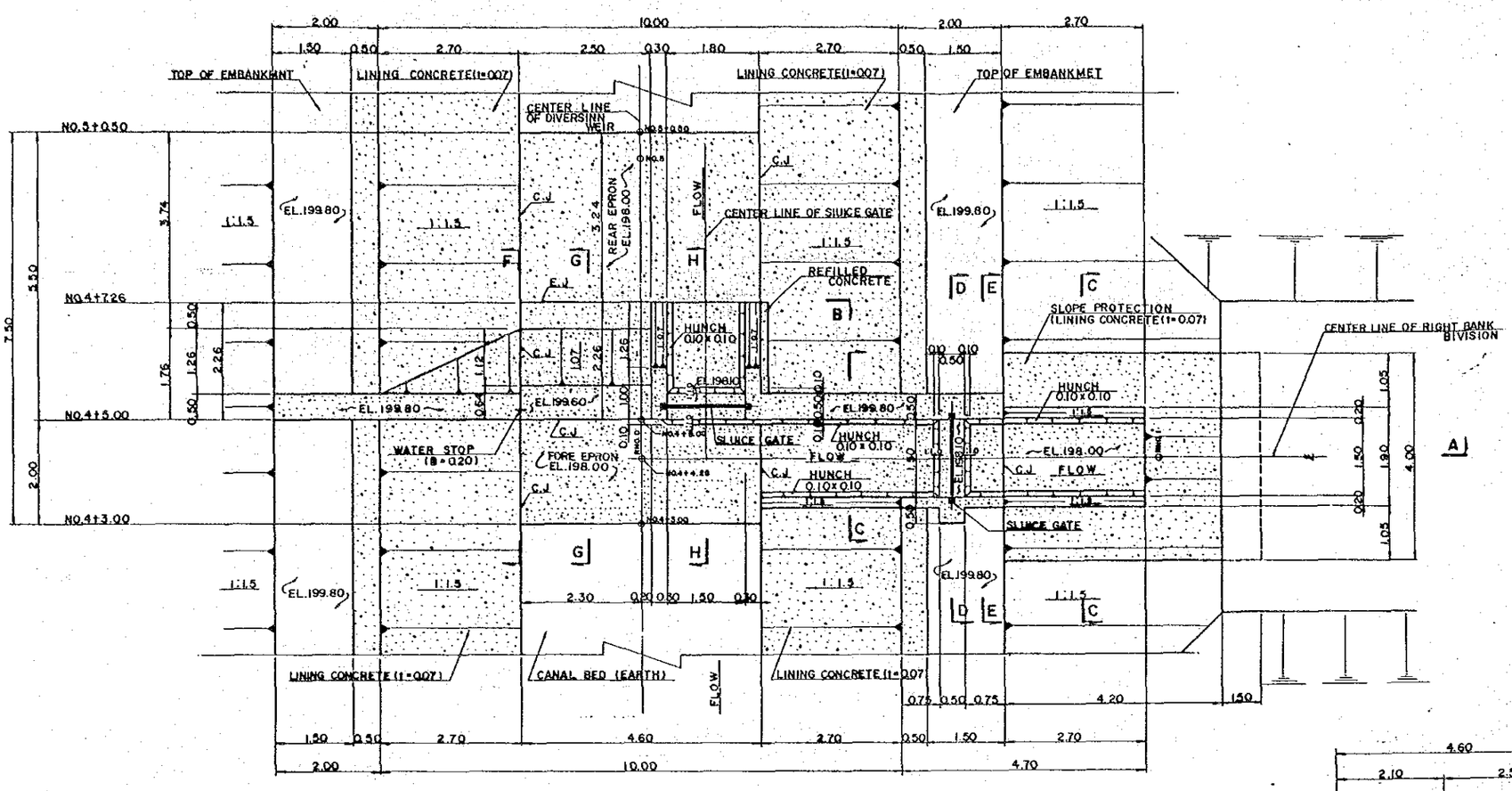
SCALE 1:100

0 5 10M

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
GENERAL PLAN OF DIVERSION WORKS	
PREPARED BY	DRAWING NO. 12
CHECKED BY	

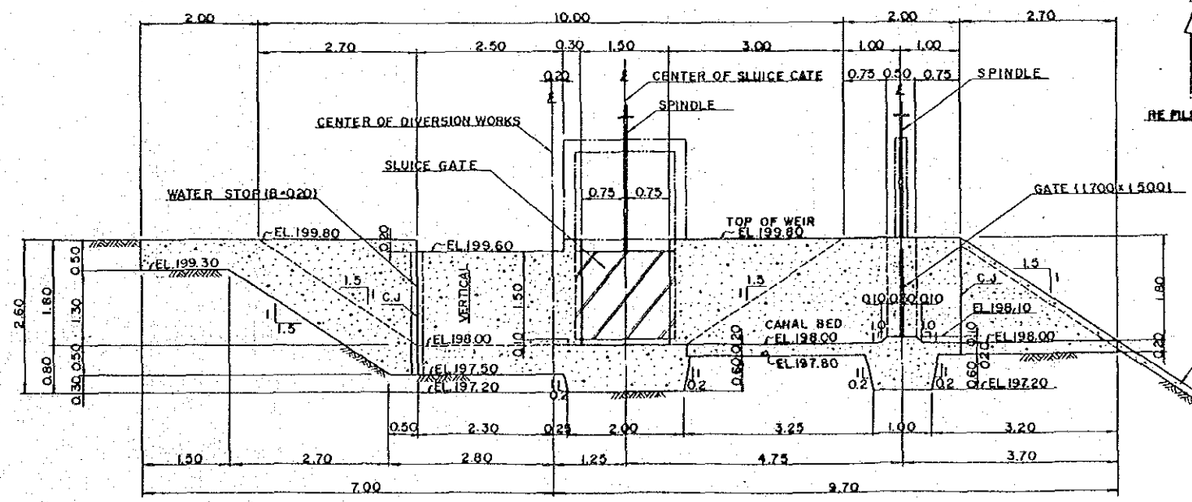
NOTE.

1. ABBREVIATION AND SYMBOL
   - ℄ : CENTER LINE
   - EL. : ELEVATION
   - C.J : CONTRACTION JOINT
   - E.J : EXPANSION JOINT
2. THE EDGES OF CONCRETE ARE TREATED WITH CORNER CUT - OFF (0.03×0.03)
3. JOINT TREATMENT
   - C.J ..... OIL PAINT
   - E.J ..... ELASTIC FILLER



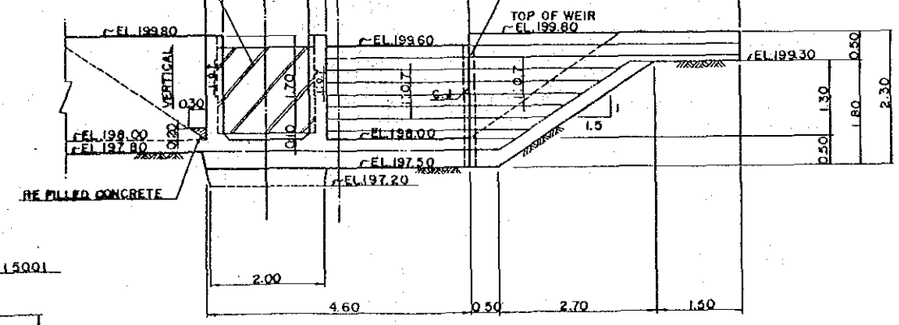
PLANE OF DIVERSION WORKS

SCALE 1:50



LONGITUDINAL SECTION (A-A)

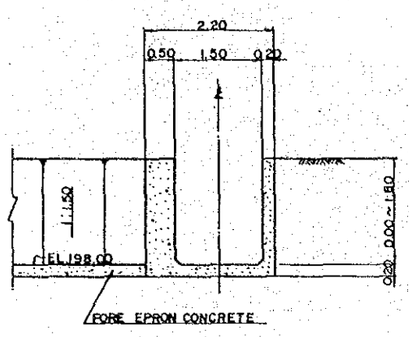
SCALE 1:50



SECTION B-B

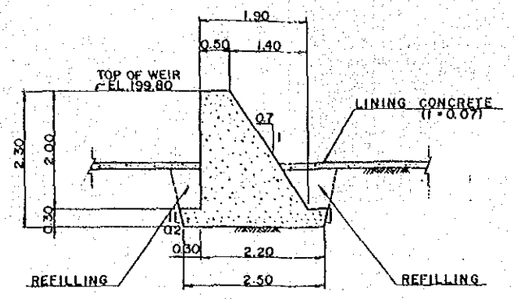
SCALE 1:50

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
PLAN OF DIVERSION WORKS (1)	
PREPARED BY	DRAWING NO. 13
CHECKED NO.	



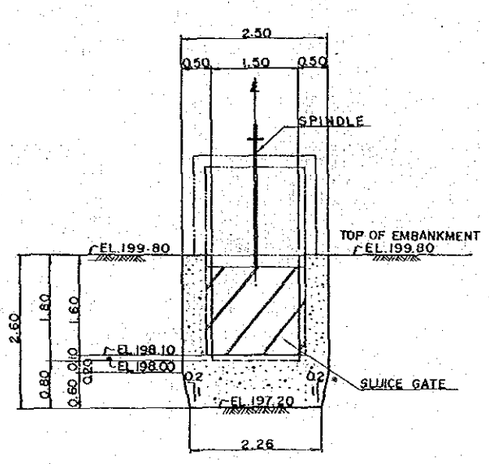
SECTION C-C

SCALE 1:50



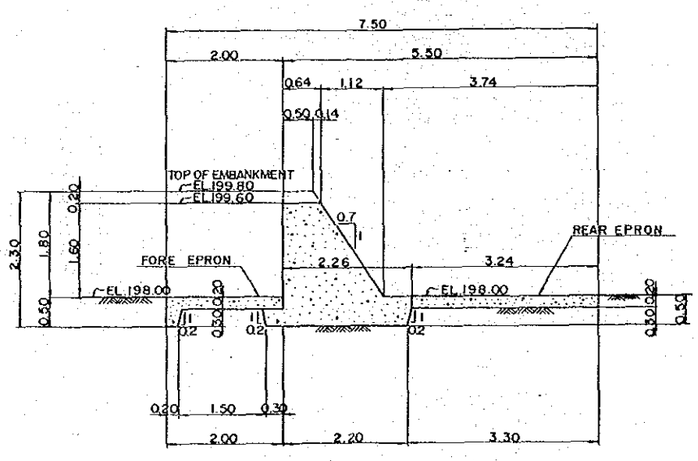
SECTION F-F

SCALE 1:50



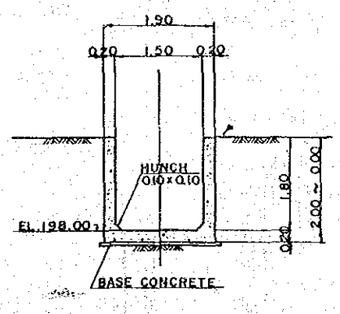
SECTION D-D

SCALE 1:50



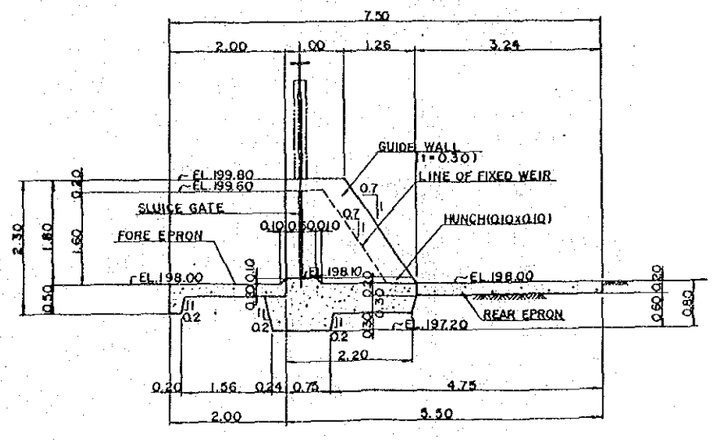
FIXED WEIR STANDARD SECTION (SECTION G-G)

SCALE 1:50



SECTION E-E

SCALE 1:50



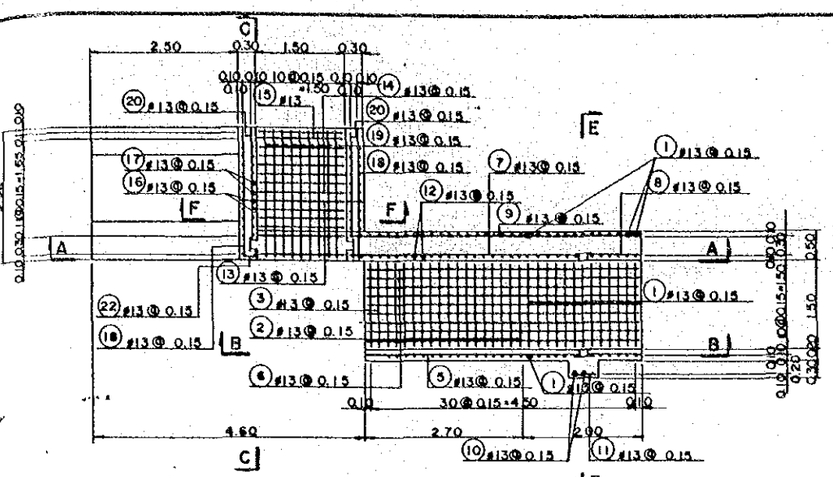
SECTION N-N

SCALE 1:50

NOTE.

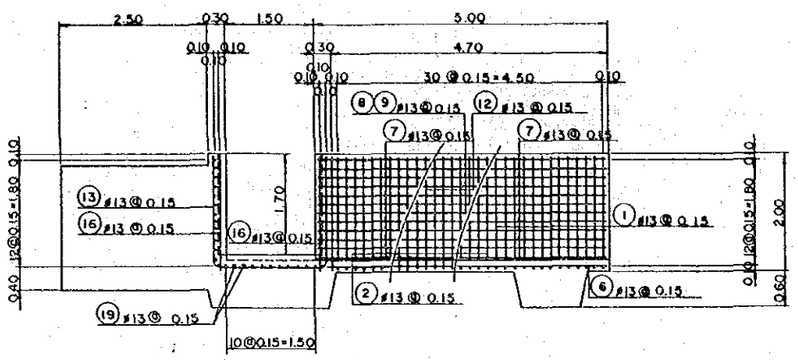
1. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL : ELEVATION
2. THE EDGES OF CONCRETE ARE TREATED WITH CORNER CUT-OFF (0.03 x 0.03)
3. DETAIL OF SLUICE GATE IS SHOWN IN DRAWING NO.18

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
PLAN OF DIVERSION WORKS (2)	
PREPARED BY	DRAWING NO. 14
CHECKED NO.	



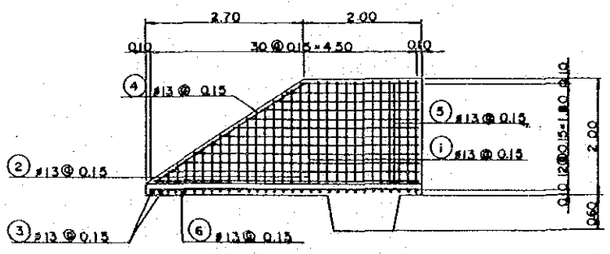
PEINF. OF PLANE

SCALE 1 : 50



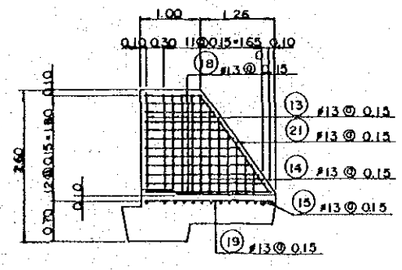
SECTION A — A

SCALE 1 : 50



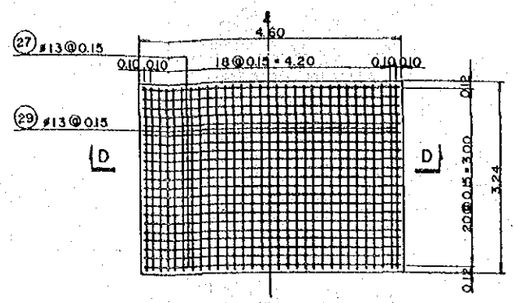
SECTION B — B

SCALE 1 : 50



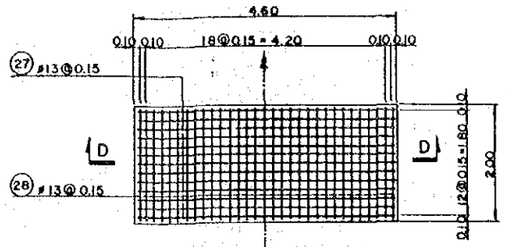
SECTION C — C

SCALE 1 : 50



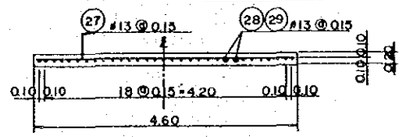
REINF. OF REAR EPRON

SCALE 1 : 50



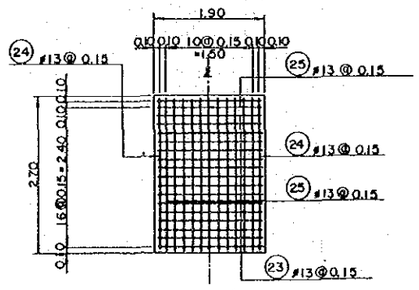
REINF. OF REAR EPRON

SCALE 1 : 50



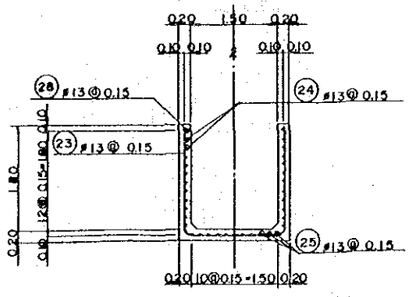
REINF. OF EPRON (SECTION D-D)

SCALE 1 : 50



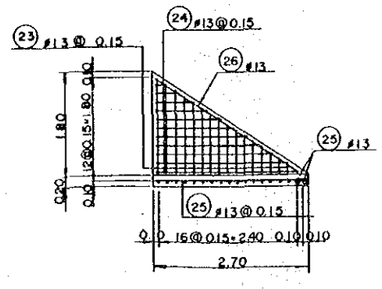
REINF. OF INVERT

SCALE 1 : 50



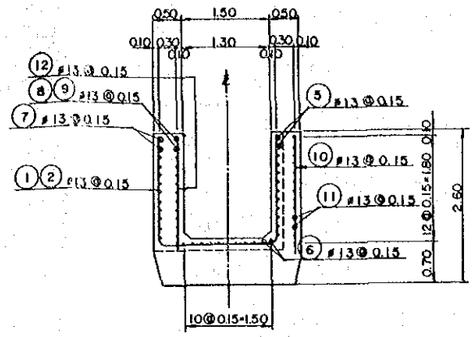
REINF. OF STANDARD SECTION

SCALE 1 : 50



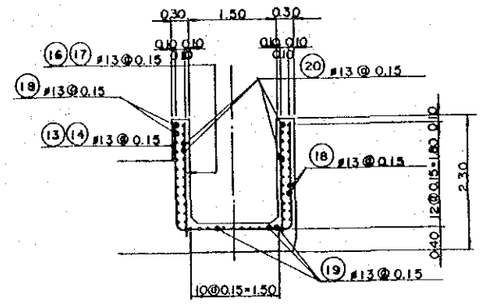
REINF. OF SIDEWALL

SCALE 1 : 50



SECTION E — E

SCALE 1 : 50



SECTION F — F

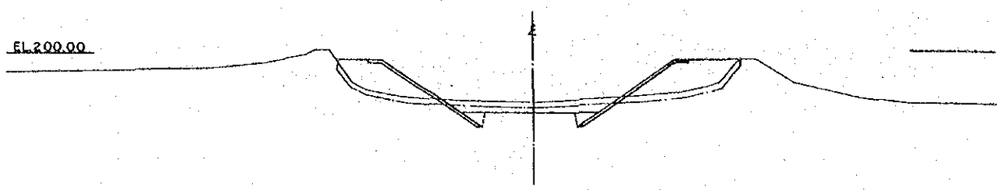
SCALE 1 : 50

NOTE.

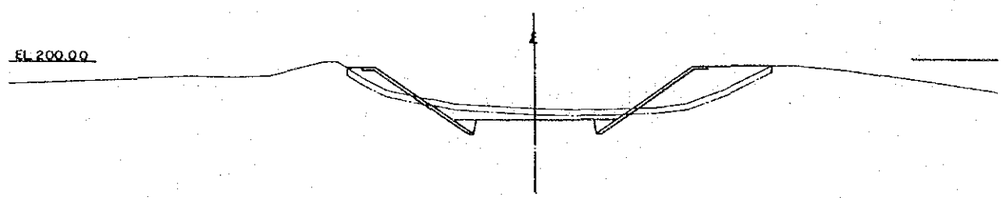
1. ABBREVIATION AND SYMBOL
   - ℄ : CENTER LINE
   - EL : ELEVATION
2. ALL REINFORCING STEEL TO BE PLAIN BAR WITH HOOKS FACH (AS FOLLOWS)
   - R = 2.5 ϕ
   - L : LONGER THAN 6cm AND 4 ϕ
   - ϕ : DIAMETER OF STEEL BAR
   - R : BEND RADIUS OF STEEL BAR

- LENGH OF LAP AND ANCHORAGE (USE SR30)
- 35 BAR DIAMETER (WITH HOOKS)
- COVER FOR REINFORCING TO BE 5cm MINIMUM

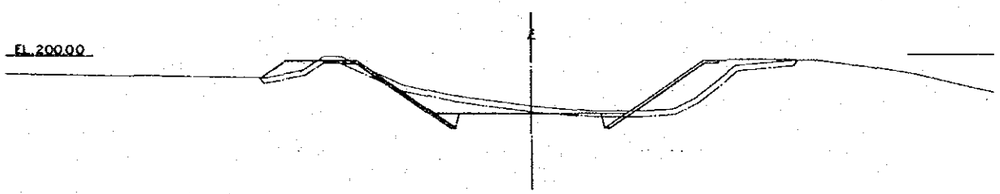
JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
ARRENGEMENT OF REINFORCEMENT	
PREPARED BY	DRAWING NO. 15
CHECKED NO,	



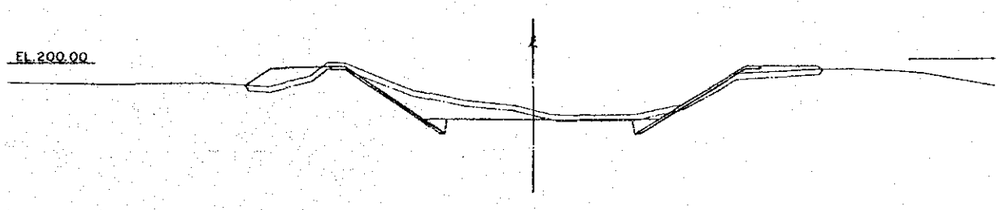
NO. 4



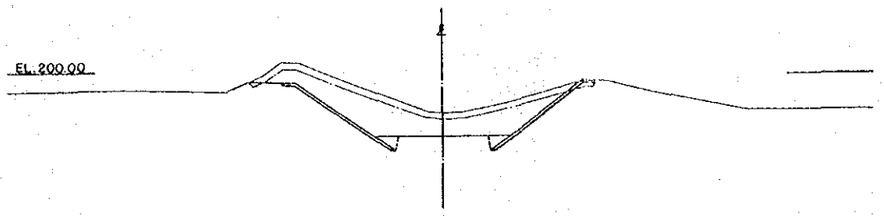
NO. 3



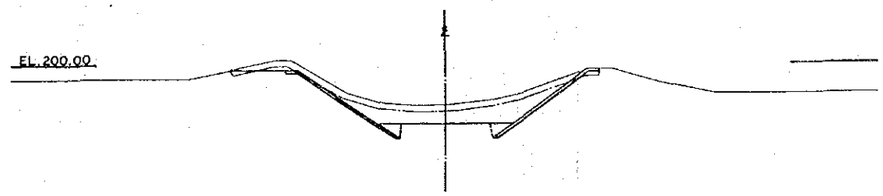
NO. 2



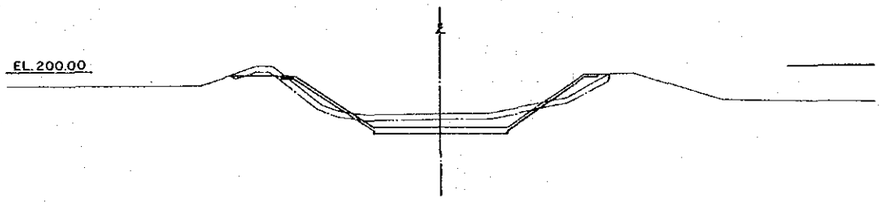
NO. 1



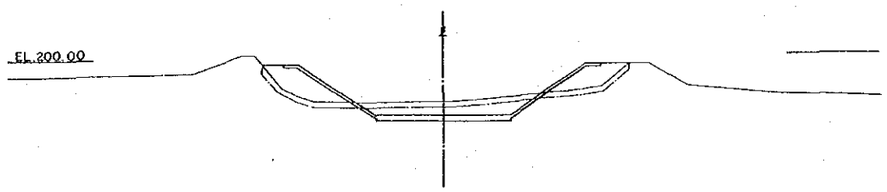
NO.6+8.00



NO.5+8.00



NO.5+0.50



NO.4+3.00

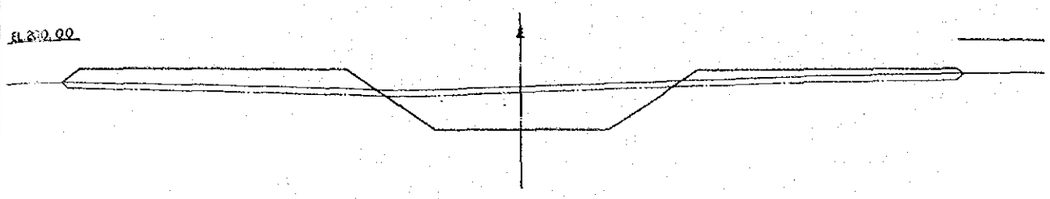
EARTHWORK CROSS SECTION

SCALE 1:100

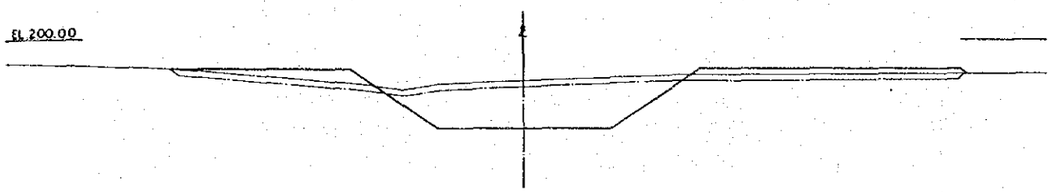
NOTE.

1. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL : ELEVATION
2. STATION NO. ARE SHOWN IN DRAWING NO. 12

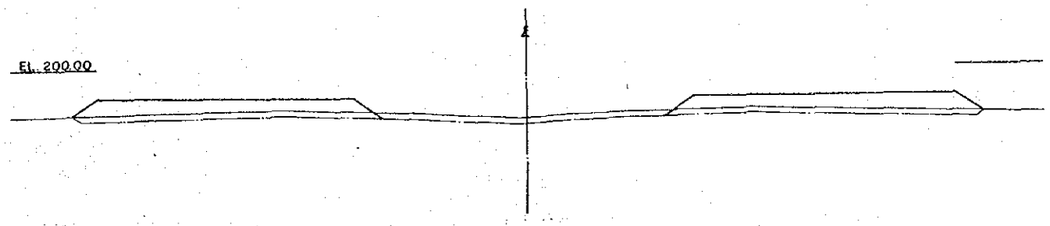
JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
EARTHWORK CROSS SECTION (1)	
PREPARED BY	DRAWING NO. 16
CHECKED NO.	



RNO. 1 + 6.20



RNO. 1 + 1.20



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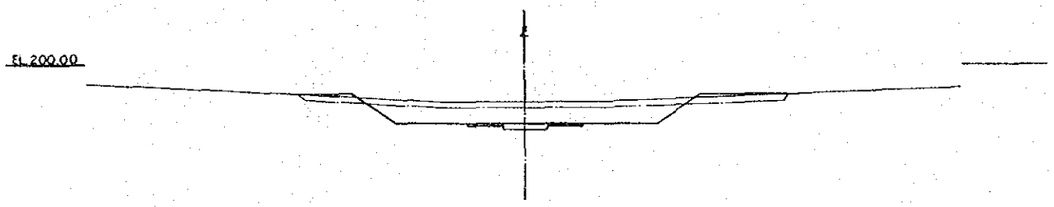
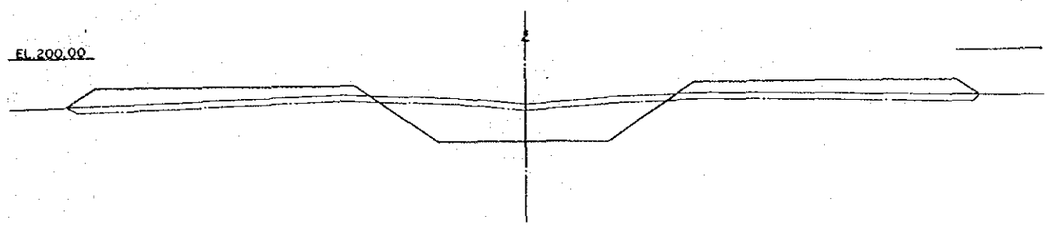


RNO.0 + 9.70



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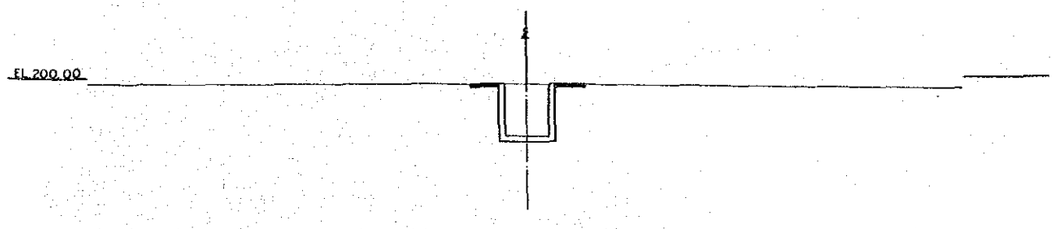


RNO.0 + 7.00

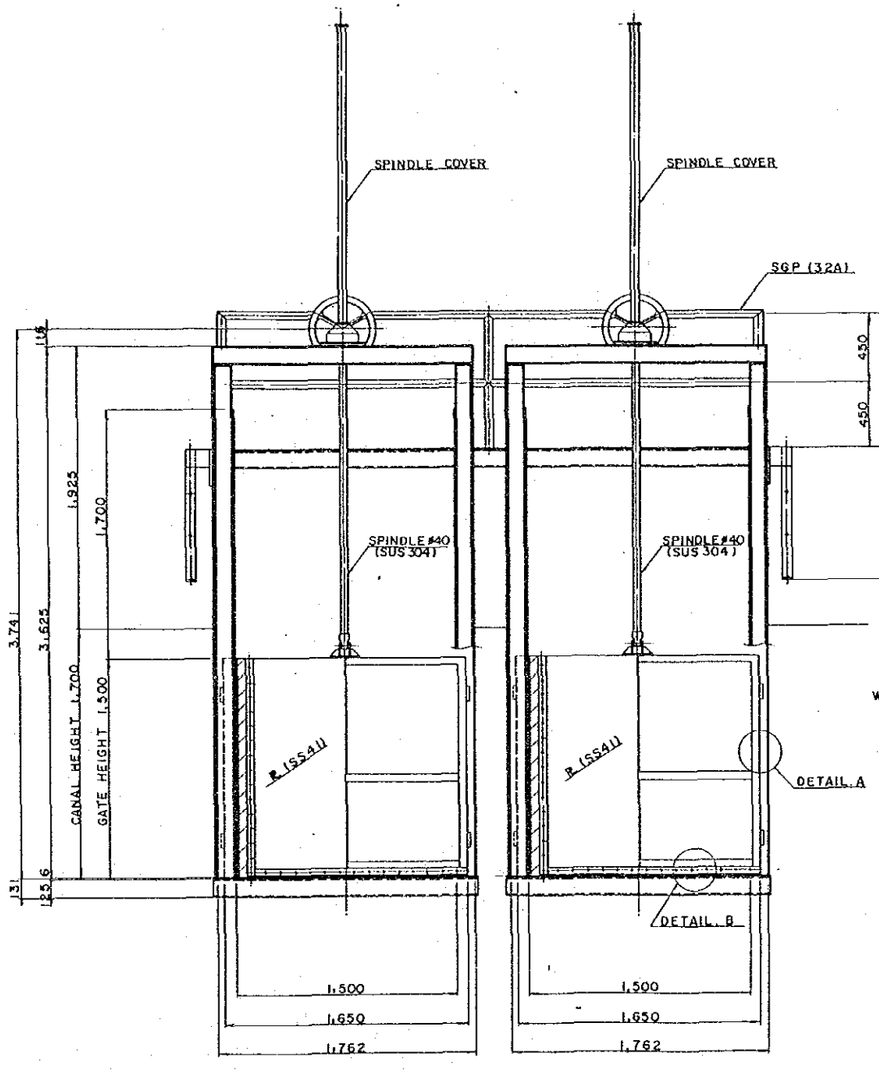
EARTHWORK CROSS SECTION

SCALE 1:100

NOTE.

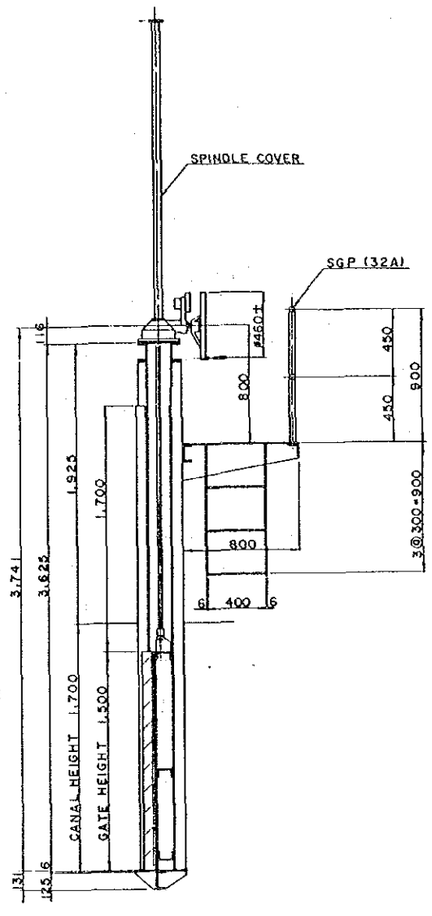
1. ABBREVIATION AND SYMBOL
   ℄ : CENTER LINE
   EL. : ELEVATION
2. STATION NO. ARE SHOWN IN DRAWING NO. 12

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
EARTHWORK CROSS SECTION (2)	
PREPARED BY	DRAWING NO. 17
CHECKED NO.	



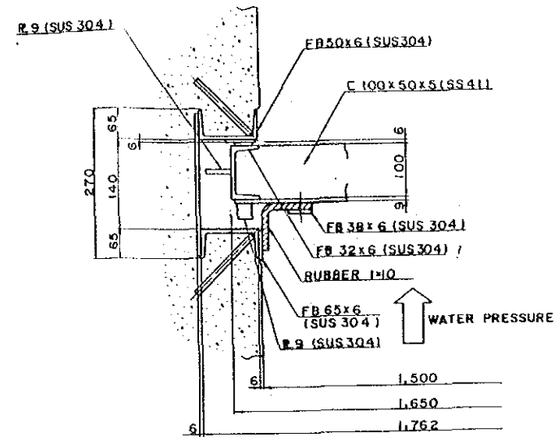
FRONT VIEW

SCALE 1:20



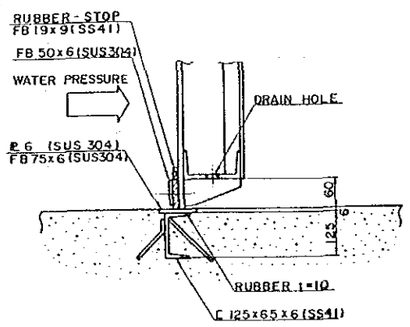
SECTIONAL VIEW

SCALE 1:20



DETAIL A

SCALE 1:5



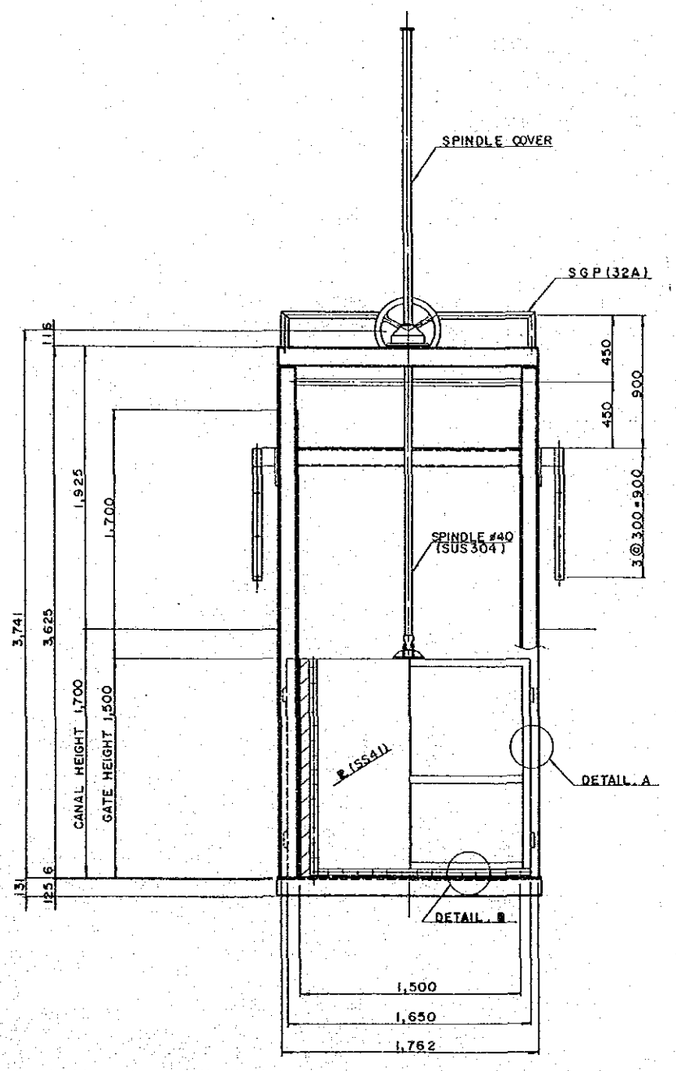
DETAIL B

SCALE 1:5

NOTE.

1. PAINTING
   EPOXY RESIN
2. GATE TYPE
   SLUICE GATE (3 SECTION WATERTIGHT.
   HAND-OPERATED BEVEL GEAR)
3. ALL DIMENSIONS ARE SHOWN
   IN MILLIMETERS UNLESS
   OTHERWISE INDICATED.

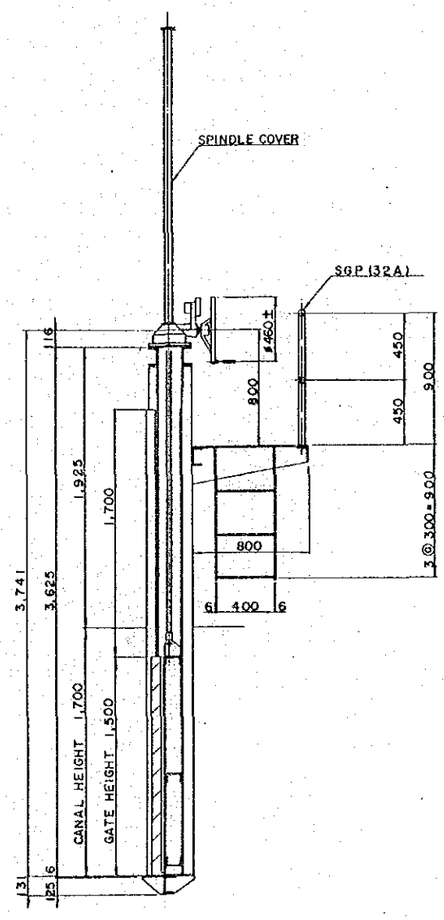
JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
DETAIL OF SLUICE GATE (1)	
PREPARED BY	DRAWING NO. 18
CHECKED NO.	



FRONT VIEW

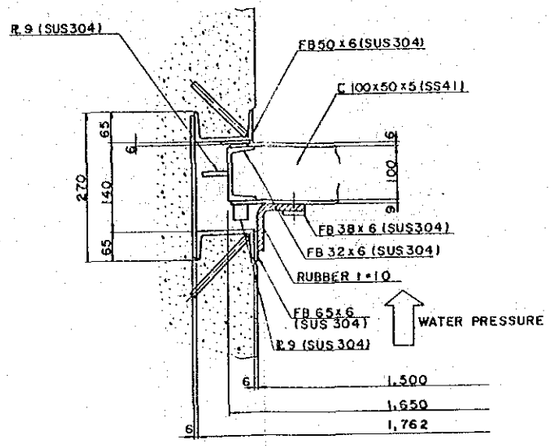
SCALE 1:20

WATER PRESSURE



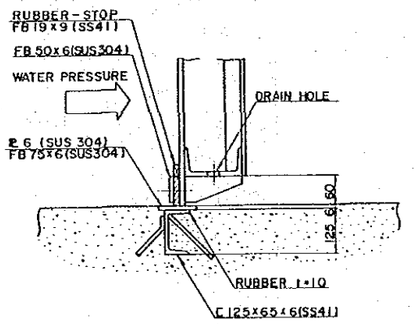
SECTIONAL VIEW

SCALE 1:20



DETAIL A

SCALE 1:5



DETAIL B

SCALE 1:5

NOTE.

1. PAINTING
   EPOXY RESIN
2. GATE TYPE
   SLUICE GATE-(3 SECTION WATERTIGHT. HAND-OPERATED. BEVEL GEAR)
3. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE INDICATED.

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
DETAIL OF SLUICE GATE (2)	
PREPARED BY	DRAWING NO. 19
CHECKED NO.	

第４編　契約図書案

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

Bangkok Office

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 Kong Samaki and Chakarat, Nakorn Ratchasima Prefecture.

This Constract 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), 1986 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 words 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 Agency, 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 writing 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 Contract 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), 1986 at (hour) o'clock p.m./(a.m.) at JICA Bangkok Office.

Attendance for Contractors 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, Bangkok Office, at (hour) o'clock p.m./(a.m.) (Thailand) Standard Time on (month) (day), 1986.

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

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 develop the water resource in necessary for the project for the accelate motivation of the farmers.

1.2 Location of the site

The Kong Samaki job site is located at north northeast of Nakorn Ratchasima City and about 80 km off. The Chakarat job site is located at east of the City and about 40 km off.

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 implementation of the Works to secure full collaboration. Should 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 conciliate 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 Work schedule, the approval from the Inspection Committee shall be obtained prior to the modification of the schedule.

1. Preparation of facilities and transportation of equipment etc. to the job site
2. Farm pond at Kong Samaki job site
3. Appertenant structures at Kong Samaki job site
4. Outlet work at Chakarat job site
5. Division work at Chakarat job site
6. Appertenant structure at Chakarat job site
7. Appertenant structures
8. 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 equipments such as Bulldozer, Back-hoe shovel, and so forth for the project, the Contractor shall use the said heavy equipments for this construction works.

The Inspection Committee has the right to modify the unit costs of the item about earth work used heavy equipments, 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 Cooperation Agency, Bangkok Office.

Date ---------- 1986

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 ---------- 1986, 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 _____ 1986 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 this Contract:-

1. Terms and conditions of this contract
2. Pledge agreement
3. Technical specification
4. Bill of Quantities
5. 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 be 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 Forty (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 150 days (completion time) from the date hereof which will become due on _____ 1984 (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 by 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 paya 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 descirbed 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 Kasetsart University, the JICA, the Inspection Committee or the officers of Thai Covernment 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 hehalf 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, c/o Japanese Embassy
	1674 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 Internation Cooperation Agency

---------- Contractor

---------- Witness

Mr. Shizuo SATO, Team Leader,
Agricultural Cooperative Promotion Project

---------- Witness

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.