DRAWINGS

Proposed Relocation Road

Ban Mae Kha

Ban Hong Pru

Ban Khlong Thap Ma

Khlong Thap Ma

Main Dam

Saddle Dam

N

KEY MAP

Axis of Saddle Dam

Axis of Dam

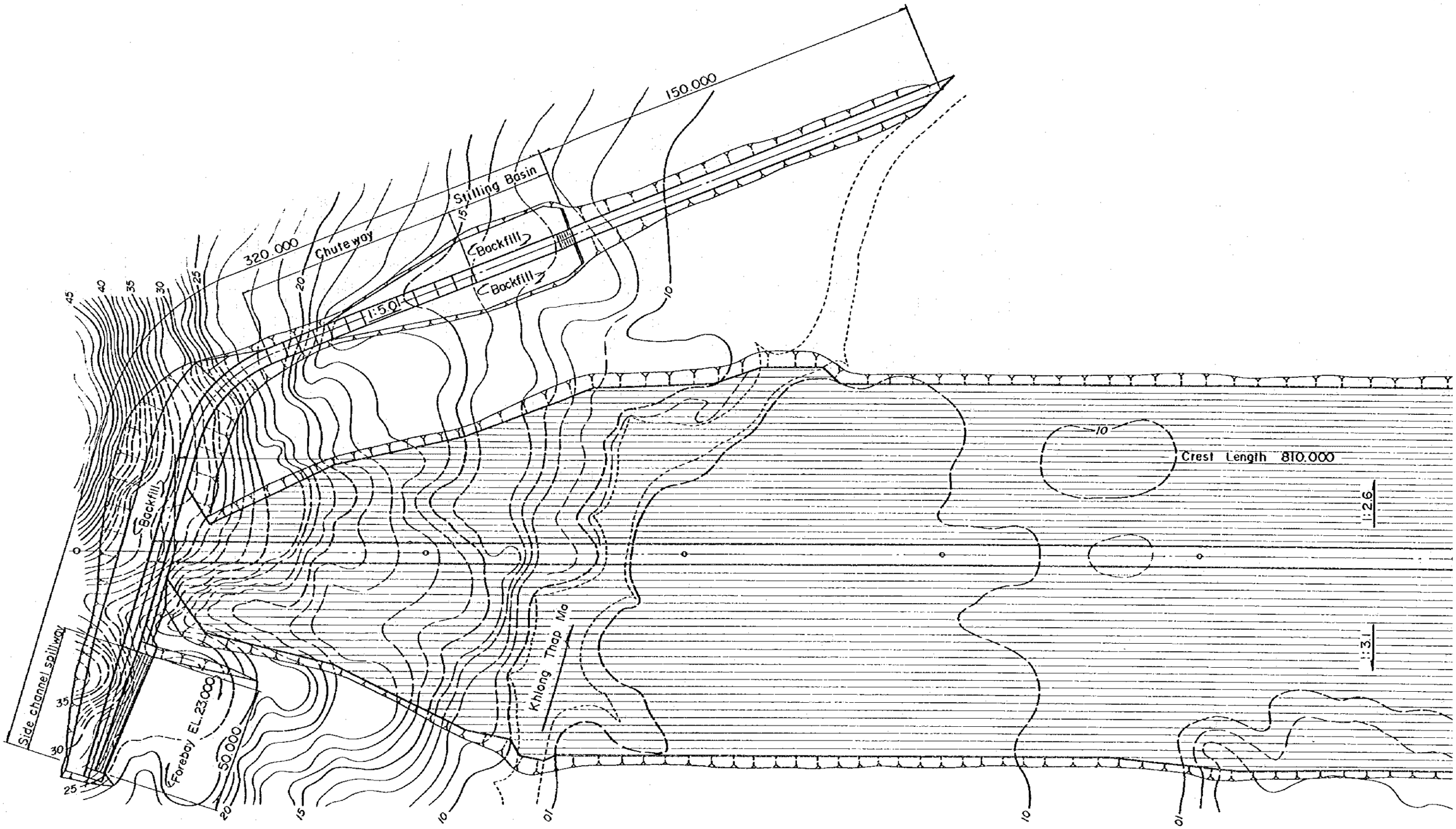
N12°-45'

E101°-12'

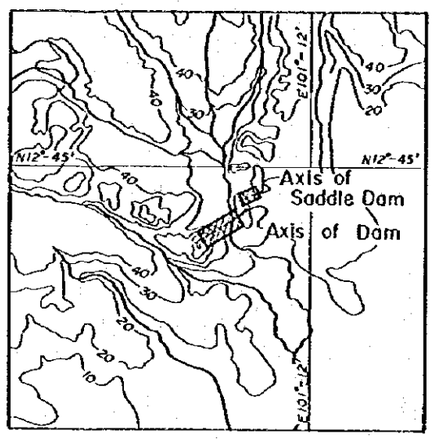
0 1 2 km

SCALE

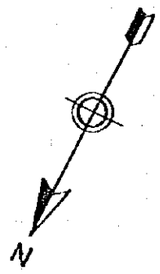
KINGDOM OF THAILAND THE EAST COAST WATER RESOURCES DEVELOPMENT PROJECT PHASE II	KHLONG THAP MA MAP OF RESERVOIR AREA
JAPAN INTERNATIONAL COOPERATION AGENCY	DWG No. I-1

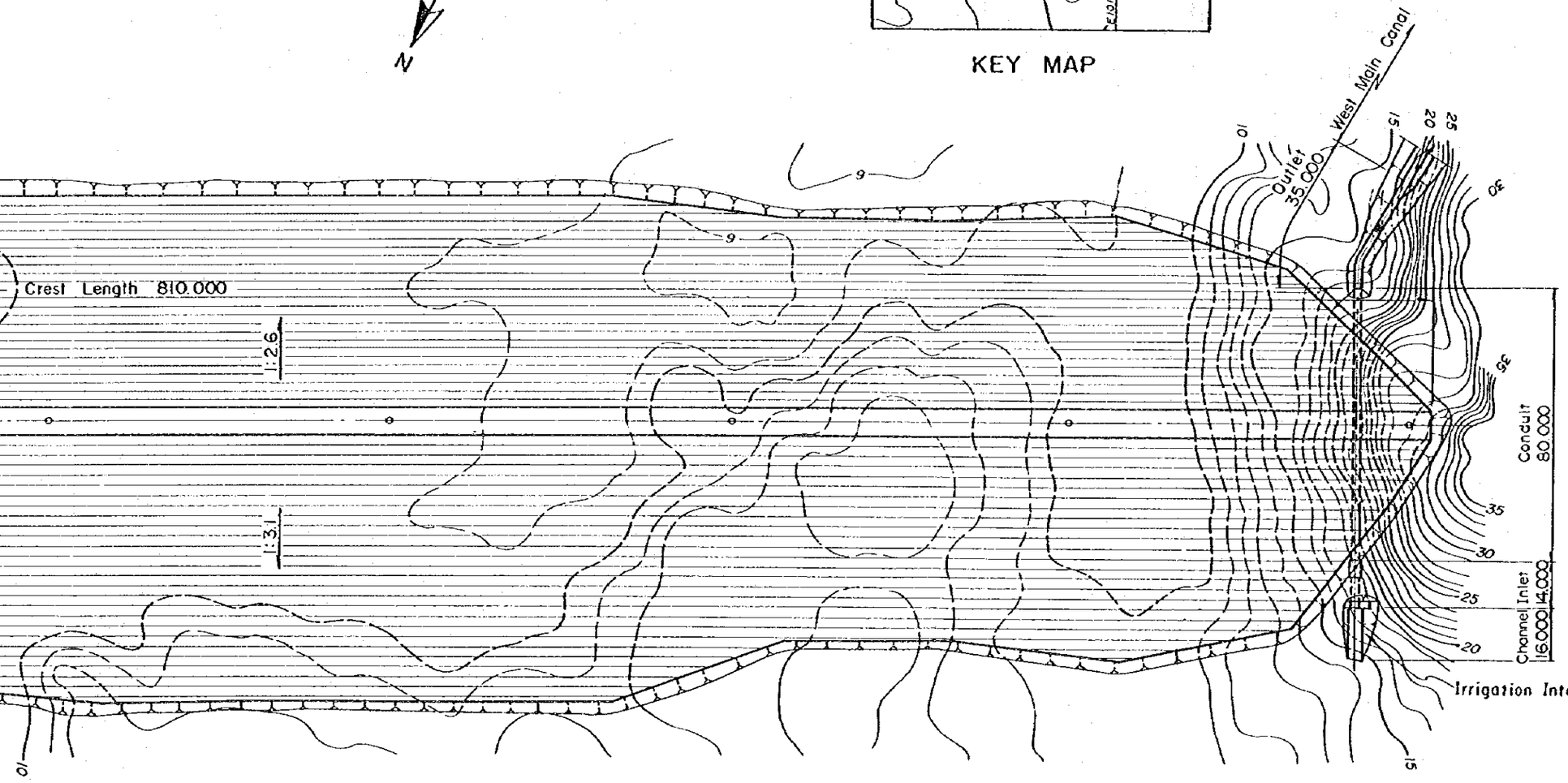

150.000
Stilling Basin
320.000
Chute way
Backfill
Backfill
1:50
Backfill
Crest Length 810.000
1:2.6
1:3.1
Side channel spillway
Foreboy EL.23.000
50.000
Khlong Thap Mo

PLAN



KEY MAP

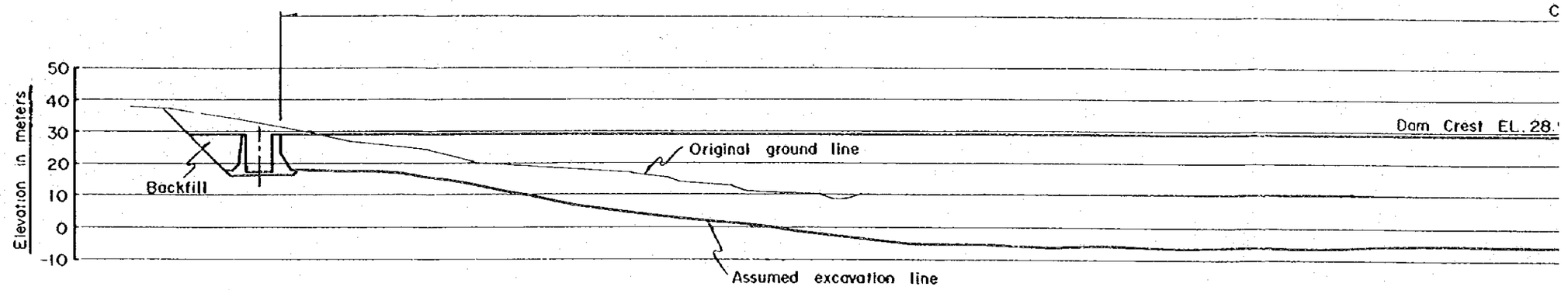




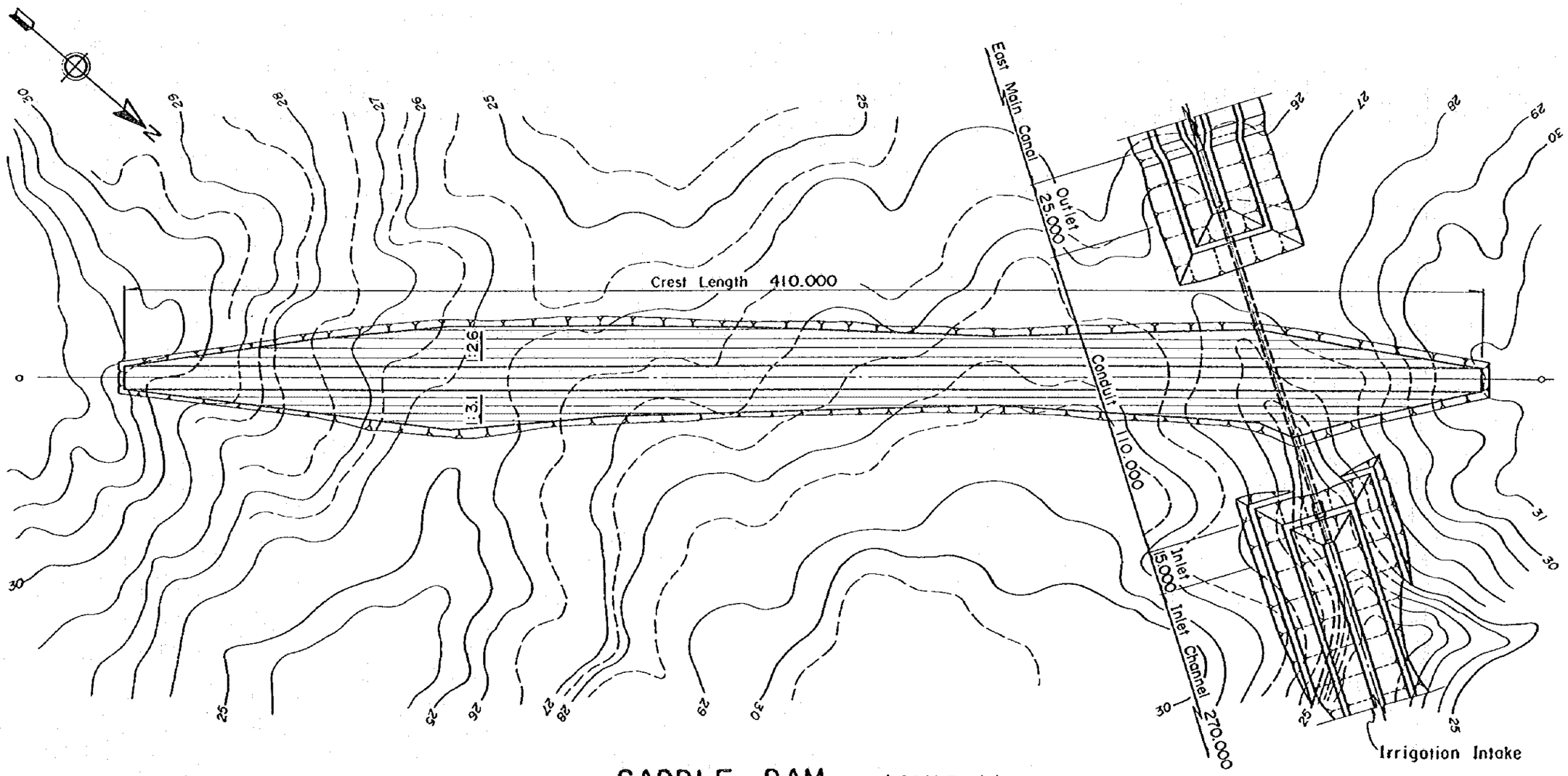
PLAN

SCALE 0 20 40 60 m

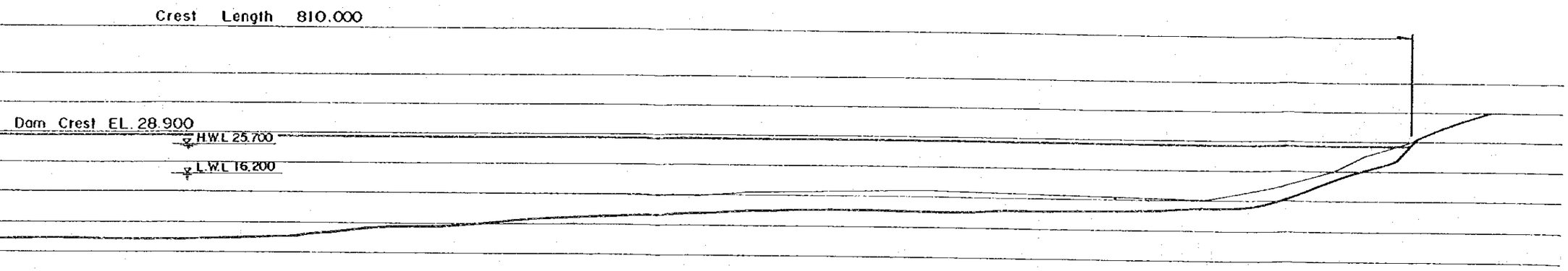
KINGDOM OF THAILAND THE EAST COAST WATER RESOURCES DEVELOPMENT PROJECT PHASE II	KHLONG THAP MA DAM PLAN, PROFILE AND TYPICAL CROSS SECTION
JAPPAN INTERNATIONAL COOPERATION AGENCY	DWG NO. 1 - 2



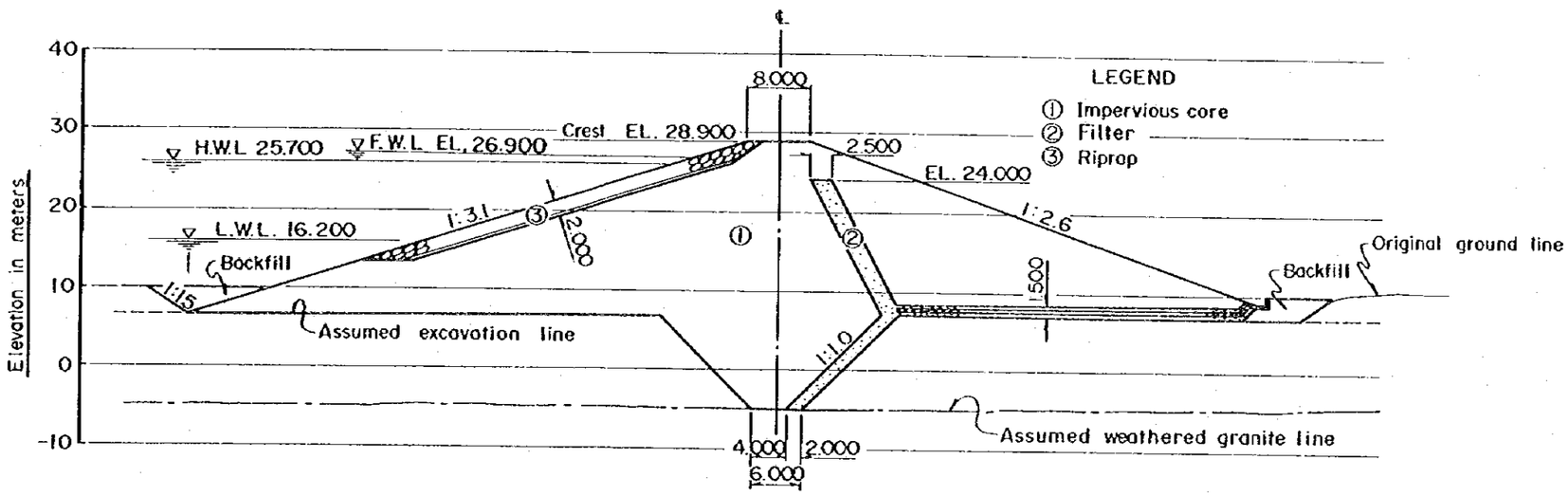
PROFILE OF



SADDLE DAM (SCALE A)



OFILE OF MAIN DAM (SCALE A)

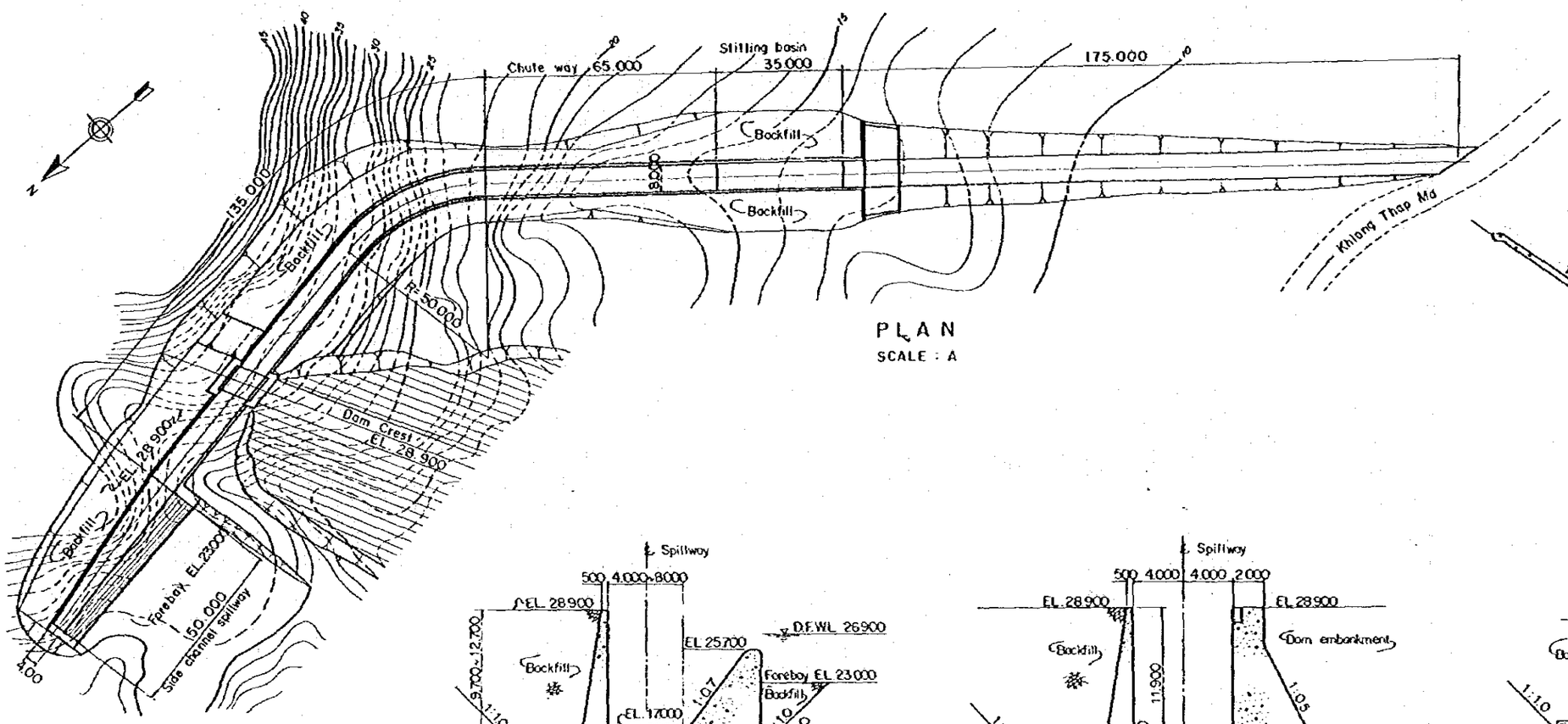


SCALE A 0 20 40 60 m

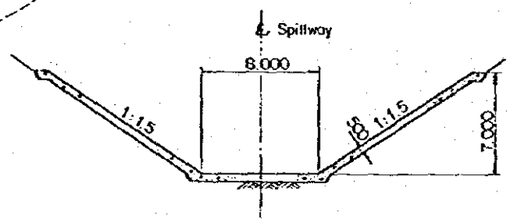
SCALE B 0 10 20 30 m

TYPICAL CROSS SECTION (SCALE B)

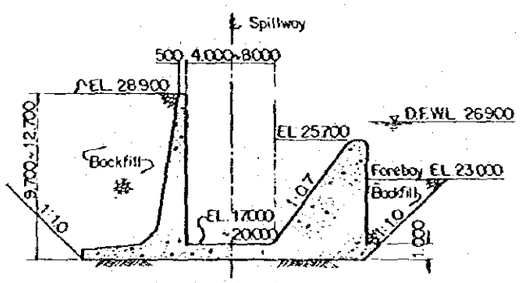
KINGDOM OF THAILAND THE EAST COAST WATER RESOURCES DEVELOPMENT PROJECT PHASE II	KHLONG THAP MA DAM PLAN, PROFILE AND TYPICAL CROSS SECTION
JAPPAN INTERNATIONAL COOPERATION AGENCY	DWG NO. I - 3



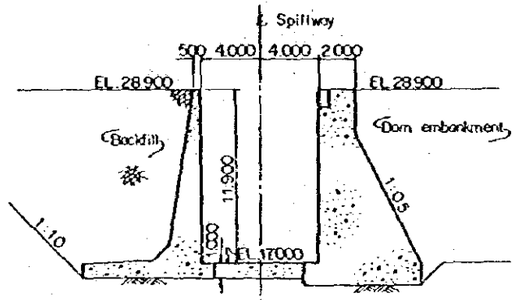
PLAN
SCALE : A



SECTION E-E
SCALE : B

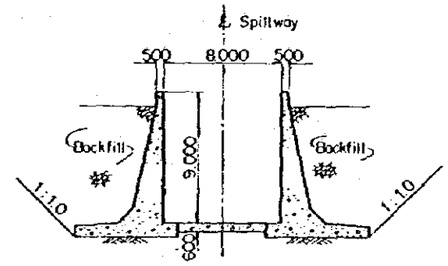


SECTION A-A
SCALE : B

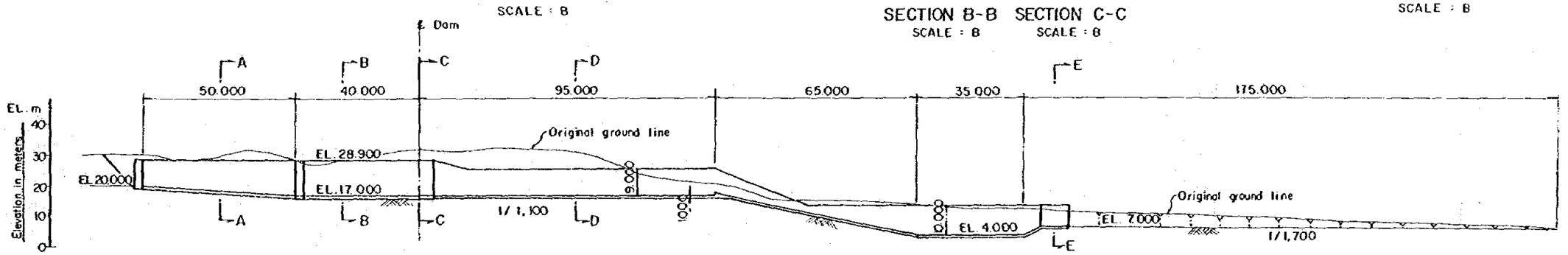


SECTION B-B
SCALE : B

SECTION C-C
SCALE : B



SECTION D-D
SCALE : B



PROFILE
SCALE : A

SCALE : A 0 50m
SCALE : B 0 10m

KINGDOM OF THAILAND THE EAST COAST WATER RESOURCES DEVELOPMENT PROJECT PHASE II	KHLONG THAP MA SPILLWAY PLAN AND PROFILE
JAPAN INTERNATIONAL COOPERATION AGENCY	DWG NO. 1 ~ 4

LEGEND

- Thap Ma Dam
- Intake Facilities
- Main Canal
- Lateral Canal
- Main Inspection Road
- Drainage Canal
- Project Boundary
- Turnout
- Farm Turnout
- Check Structure
- Drop
- Culvert
- Syphon
- Cross Drain
- Spillway
- Over Chute

To Pattaya

To Sattahip

WEST MAIN CANAL

EAST MAIN CANAL

Khlong Thap Ma

Khlong Yai River

Route 36

Route 3

Route 344

RAYONG

Rayong River

SCALE 0 1 2km

LOCATION OF EACH PROJECTS

BANGKOK

STUDY AREA

KEY MAP

Chon Buri

Si Racha

Sattahip

Rayong

Khlong Luang Area

KHLONG LUANG RIVER BASIN AREA

EAST COAST BASIN AREA

RAYONG RIVER BASIN AREA

Thap Ma Area

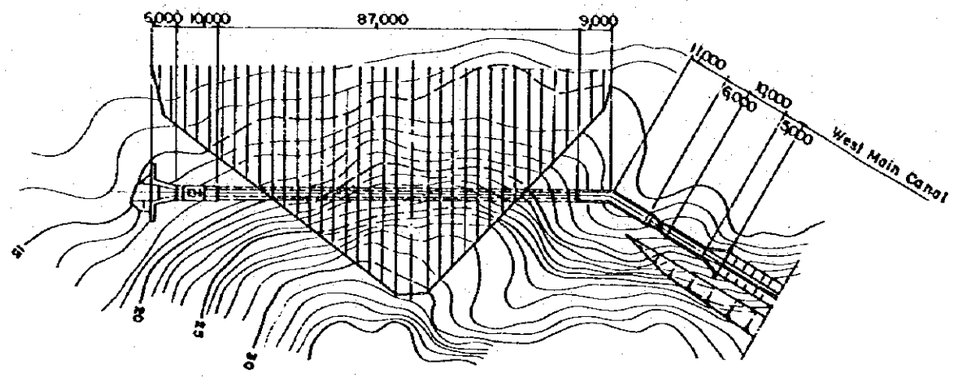
Ban Khai Extension Area

Ban Khai Existing Area

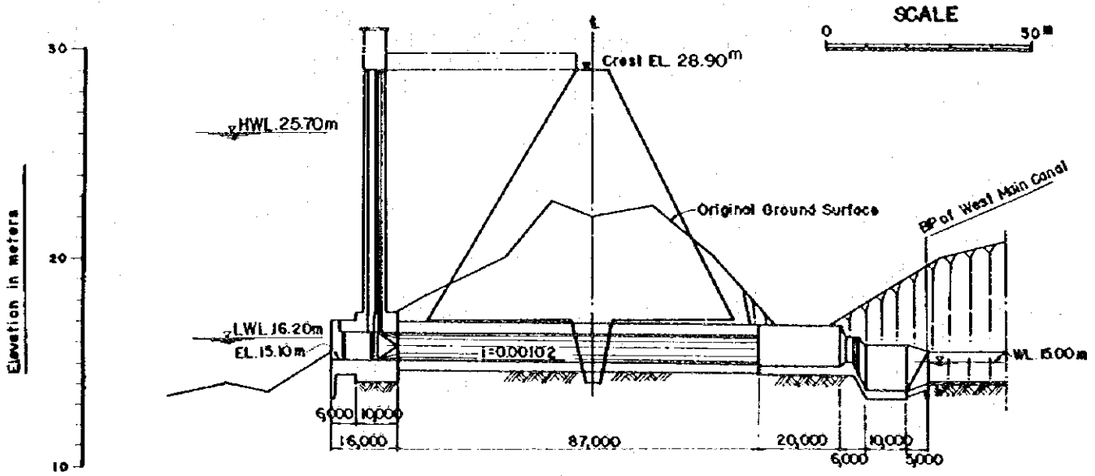
SCALE 30km

KINGDOM OF THAILAND THE EAST COAST WATER RESOURCES DEVELOPMENT PROJECT PHASE II	KHLONG THAP MA LAYOUT MAP OF IRRIGATION SCHEME
JAPAN INTERNATIONAL COOPERATION AGENCY	DWG NO. 2 - 1

Intake Facilities for West Main Canal



PLAN

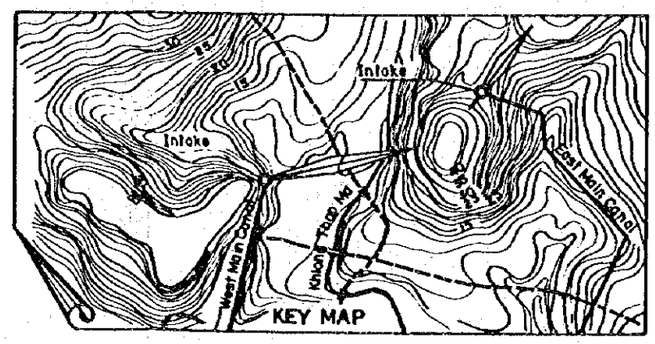


PROFILE

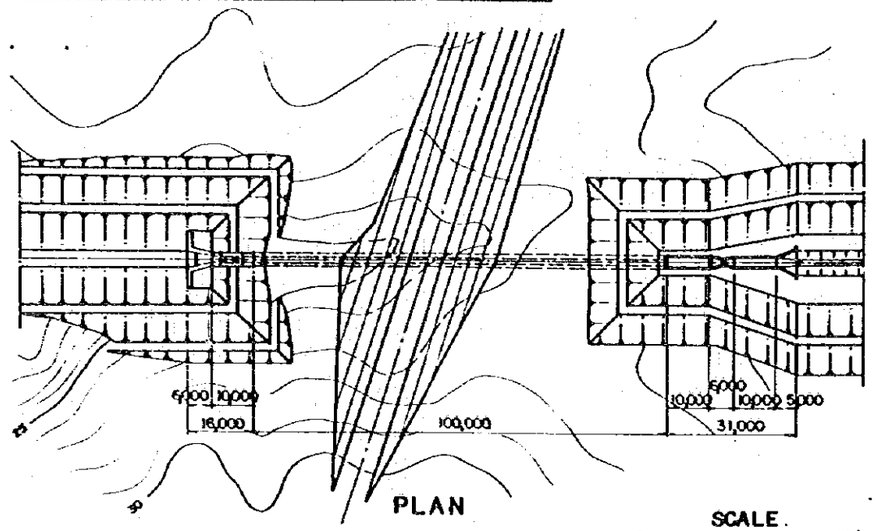
FEATURES OF INTAKE FACILITIES

1. West Main Canal
   1) Intake Tower — 2.0 x 1.3 x 13.9 m
      Pressure Gate — 1.3 x 1.3 m
      Bed EL. — EL. 15.1 m
      Design Intake Discharge — 1.63 m³/sec
   2) Conduit
      Type — Open Channel Type
      Length — 87.0 m
      Diameter — φ 1.3 m
      Gradient — I = 0.00102
   3) Outlet
      Length — 41.0 m
      Parshall Flume — W = 4 ft Type
      Head WL of Main Canal — WL. 15.0 m

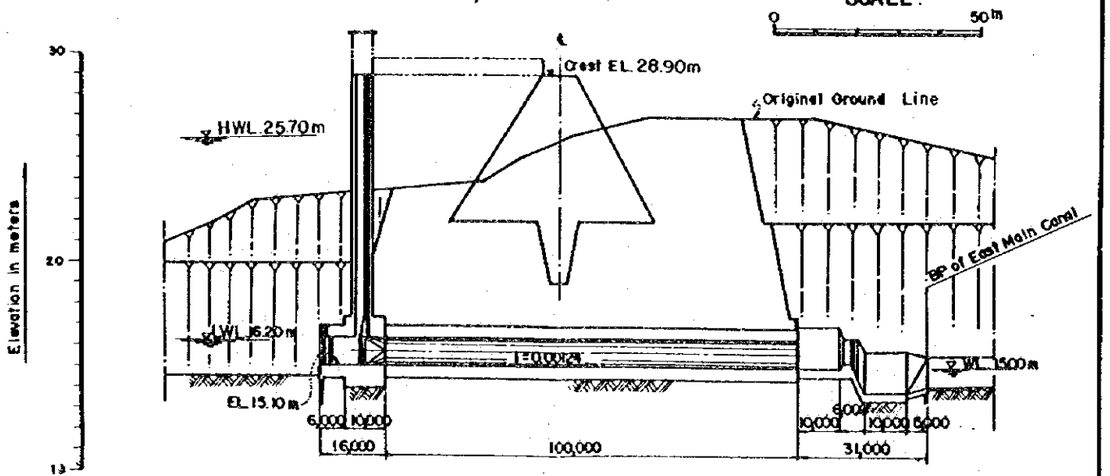
2. East Main Canal
   1) Inlet
      Inlet Channel — 270 m
      Intake Tower — 2.0 x 1.3 x 13.9
      Pressure Gate — 1.3 x 1.3 m
      Bed EL. — EL. 15.1 m
      Design Intake Discharge — 1.80 m³/sec
   2) Conduit
      Type — Open Channel Type
      Length — 100 m
      Diameter — φ 1.3 m
      Gradient — I = 0.00124
   3) Outlet
      Length — 31.0 m
      Parshall Flume — W = 4 ft Type
      Head WL of Main Canal — WL. 15.0 m



Intake Facilities for East Main Canal



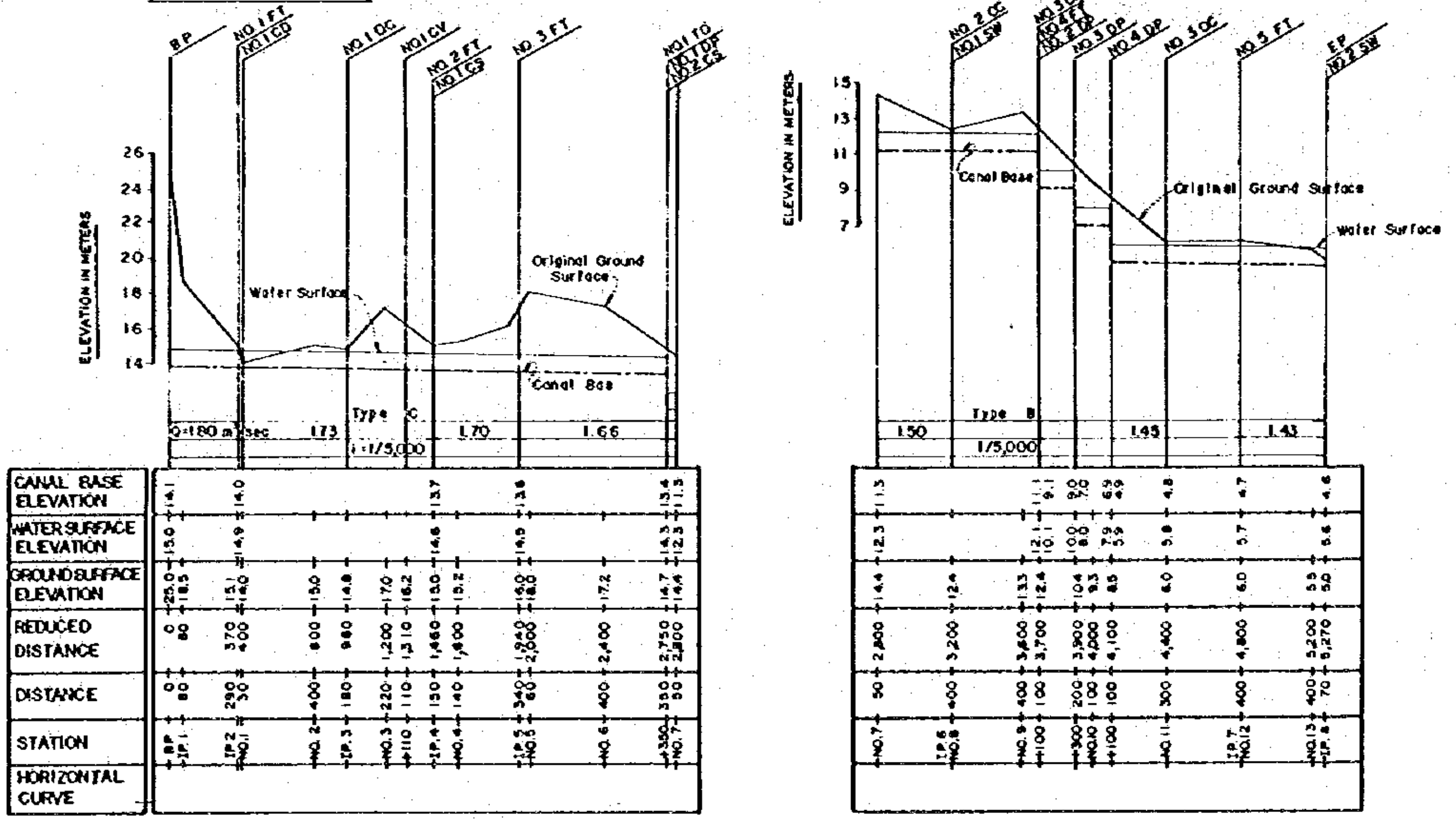
PLAN

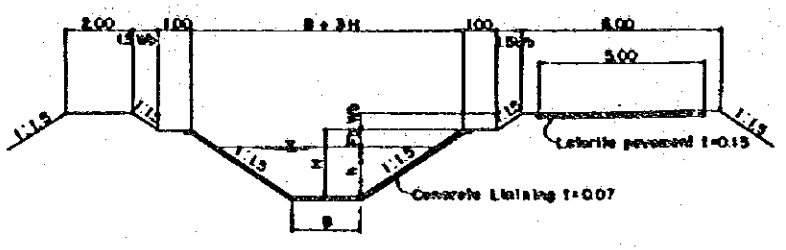


PROFILE

KINGDOM OF THAILAND THE EAST COAST WATER RESOURCES DEVELOPMENT PROJECT PHASE II	KHLONG THAP MA IRRIGATION INTAKE STRUCTURES PLAN AND PROFILE
JAPAN INTERNATIONAL COOPERATION AGENCY	DWG NO. 2 – 2

East Main Canal



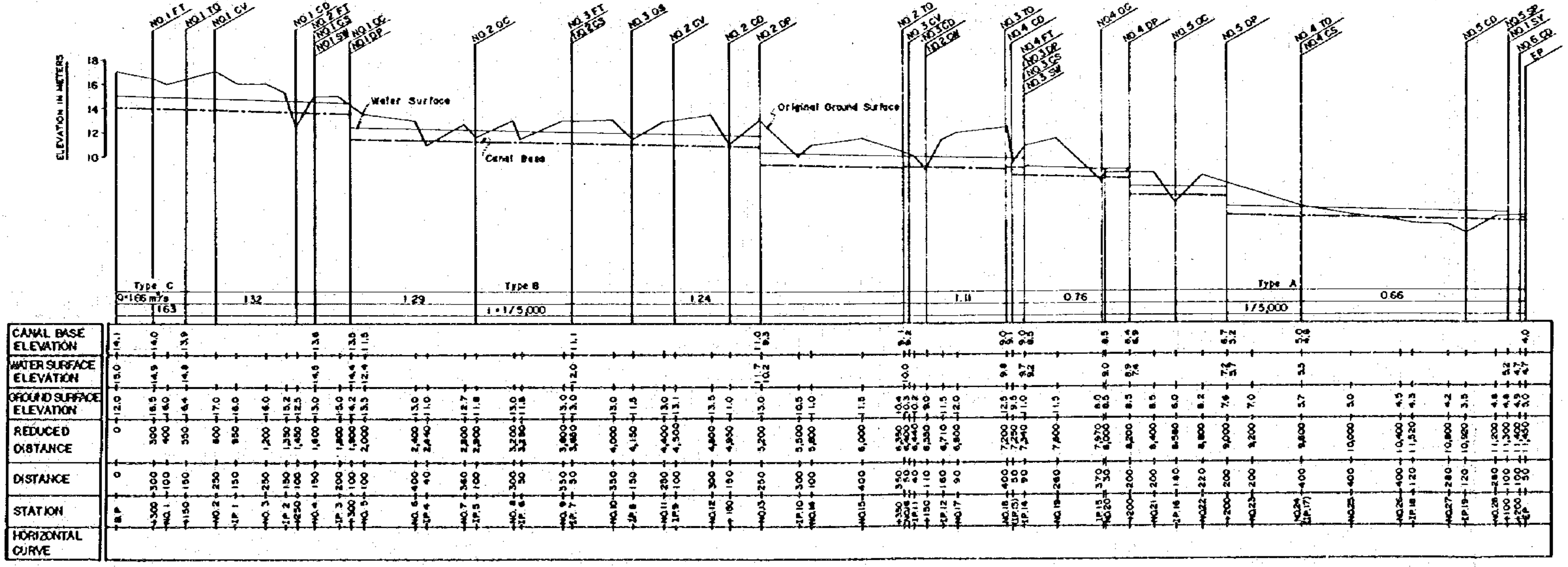


MAIN CANAL & MAIN INSPECTION ROAD

(Unit : m)

Canal Type	B	H	Wb
A	1.0	1.0	0.2
B	1.0	1.2	0.2
C	1.5	1.5	0.3
D	1.5	1.8	0.3
E	2.0	1.8	0.3
F	2.0	2.0	0.5
G	2.5	2.5	0.5

West Main Canal



ABBREVIATION

TO : Turnout
FT : Farm Turnout
CS : Check Structure
DP : Drop Structure
SY : Inverted Syphon
BG : Bridge
CV : Culvert
SW : Spillway
OC : Over Chute
CD : Cross Drain
BP : Beginning Point
IP : Intersection Point
EP : End Point

SCALE
0 10 20m

KINGDOM OF THAILAND
THE EAST COAST WATER RESOURCES
DEVELOPMENT PROJECT PHASE II

JAPAN INTERNATIONAL COOPERATION AGENCY

KHLONG THAP MA
MAIN IRRIGATION CANAL
LONGITUDINAL PROFILE

DWG NO. 2 - 3

APPENDIX

APPENDIX I

KHLONG THAP MA DAM AND IRRIGATION SCHEME

DRAFT TERMS OF REFERENCE FOR
ENGINEERING SERVICES

1. BACKGROUND AND OBJECTIVE

1.1 The Government of Kingdom of Thailand (the Government) is intending to implement the Khlong Thap Ma Dam and Irrigation Scheme (the Scheme), which is located in Rayong Province. The Scheme aims at constructing a multiple-purpose dam on the Khlong Thap Ma river and developing irrigation and drainage system for 2,400 ha (net) of lands. The Scheme includes the following components:

Multiple-purpose Dam

(i) A main dam, an earth-fill type, 20.4 m high above the river bed, 810 m long and spillway.

(ii) A saddle dam, an earth-fill type, 3.3 m high above the original ground surface, 420 m long.

Irrigation and Drainage System

(i) Two intake structures.

(ii) Two main canal systems, approximately 16.6 km in total length, including various appurtenant structures.

(iii) Lateral canal systems, approximately 38 km in total length, including various canal structures.

(iv) Approximately 39 km long drainage channel, incuding an improvement of existing small streams.

(v) On-farm development over 2,400 ha of lands.

1.2 The Government will engage the Consultants for a period of approximately ____ months to prepare the detailed design, drawings and tender documents for the construction and implementation of the Scheme, including detailed surveys, field investigations and laboratory tests and whatever else is required to meet the objective.

2. EXECUTIVE AGENCY

2.1 The Government will appoint Royal Irrigation Department (RID) as an executive agency for the performance of the engineering services.

2.2 The Center for the Integrated Plan of Operation (the CIPO) of National Economic and Social Development Board will be appointed by the Government as a coordinator of all the other activities to be taken by the Eastern Seaboard Committee.

3. SCOPE OF WORKS

3.1 Review of Data and Report

The Consultant shall review the available reports and documents relevant to the Scheme, including evaluation on validity of the previous surveys and investigations, hydrological and other design studies. Based on the review, the Consultant shall prepare a detailed programme for the additional surveys and investigations required for the performance of the detailed design of the Scheme.

3.2 Detailed Surveys and Investigations

The detailed surveys and investigations may consist of, but not be limited to the following:

(a) Geological investigation, including drilling, field permeability tests, standard penetration test, grouting and other field tests.

(b) Soil and foundation investigations.

(c) Investigation on quality and quantity of materials for embankment fill.

(d) Investigations of materials for concrete aggregates, filter and rock riprap.

(e) Topographical and geological surveys and mapping on the site of major structures.

(f) Aerial-photo mapping covering the entire irrigation service area.

(g) Hydrological investigation.

(h) Investigations on environmental and ecological impacts.

3.3 Detailed Design

The Consultant shall prepare the detailed design of the various components of the Scheme.

3.3.1 The Consultant shall prepare several alternatives of the dam design based on the detailed surveys and investigations and recommend the best alternative for the detailed design considering both technical and economical aspects.

3.3.2 The detailed design of the dam and its appurtenant structures and irrigation and drainage facilities shall include complete and detailed drawings and design computations relating to hydraulics, structures and foundations.

3.3.3 The design drawing shall be prepared in necessary and sufficient details for international bidding.

3.3.4 The Consultant shall carry out the laboratory test of spillway and other major facilities deemed to be model-tested.

3.3.5 The Consultant shall prepare the bill of quantities for the respective component of the Scheme and shall thereafter estimate the construction cost, which shall be divided into foreign currency component and local currency component. The unit prices to be used should be supported by detailed analysis and based on competitive prices prevailing in the local and international market.

3.4 Report, Drawings and Tender Documents

3.4.1 The Consultant shall prepare the under-listed documents for each component of the Scheme:

(a) Design Report

(b) Detailed Design Drawings

(c) Tender Documents, including:
- Pre-qualification Document
- Instruction to Tenderers
- Form of Tender

- Form of Bid Bond
- General Conditions of Contract
- General Specifications
- Technical Specifications
- Bill of Quantities
- Form of Agreement
- Form of Performance Bond

The above report, drawings and documents shall be submitted by the Consultant in draft form for review by the RID.

3.4.2 The Consultant shall submit an Inception Report, summarizing the result on review of the previous studies and available documents and the plan of operation.

3.4.3 The Consultant shall submit quarterly progress report of his work to the RID throughout the period of the services.

4. REPORTING

4.1 Inception Report (20 copies)

Within ____ months after commencement of the services.

4.2 Draft Design Report, Draft Design Drawings and Draft Tender Documents (20 copies)

Within ___ months after the Inception Report.

4.3 Final Design Report, Final Design Drawing and Final Tender Documents (50 copies)

Within ___ months after receipt of comments on the draft documents by the RID.

4.4 Quarterly Progress Report (10 copies)

At the end of each three-month period after commencement of the services.

APPENDIX II

ADDITIONAL SURVEYS & INVESTIGATION

1. Future Survey and Investigation

The following survey and investigation are deemed necessary for the performance of detailed design of the respective scheme.

(1) Topographic Survey

	Description	Unit	Quantity
(a)	Dam & Reservoir		
	Topo-mapping	10^6 m^2	300
(b)	Irrigation and Drainage System		
	Aerial-photo-mapping	km^2	100
	Topo-mapping	km^2	1.5
	Route alignment survey		
	Main canal	km	53
	Lateral canal	km	34
	Drain	km	37

(2) Geological Investigation

	Description	Unit	Quantity
(a)	Core Drilling with S.P.T. and Permeability Test, @ 30 m, at Damsite	m	1,500
(b)	Trench Cutting at Damsite	m	400

(3) Material Survey

Description	Quantity	
(a) Borrow Area for Earth Embankment		
Test Pit	5 m x 3 spots	(15 m)
Auger Boring	5 m x 15 spots	(75 m)
(Core Drilling)	(75 m)	
Moisture Content	10 Nos. x 18 spots	(180 Nos.)
Specific Gravity	3 Nos. x 18 spots	(54 Nos.)
Gradation	- ditto -	
Atterberg's Limit	- ditto -	
Compaction	- ditto -	
Triaxial Comp. ($\overline{CU}$)	- ditto -	
Permeability	- ditto -	
(b) Borrow Area for Drain Material		
Specific Gravity	3 Nos.	
Gradation	9 Nos.	
Relative Density	9 Nos.	
Triaxial Comp. ($\overline{CU}$)	3 Nos.	
(c) Foundation		
Test Pit	5 m x 3 spots	(15 m)
Sampling	3 Nos. x 3 spots	(9 Nos.)
Moisture Content	5 Nos. x 3 spots	(15 Nos.)
Specific Gravity	5 Nos. x 3 spots	(15 Nos.)
Gradation	- ditto -	
Atterberg's	- ditto -	
Triaxial Comp. ($\overline{CU}$)	- ditto -	
Triaxial Comp. ($\overline{UU}$)	- ditto -	
Consolidation	- ditto -