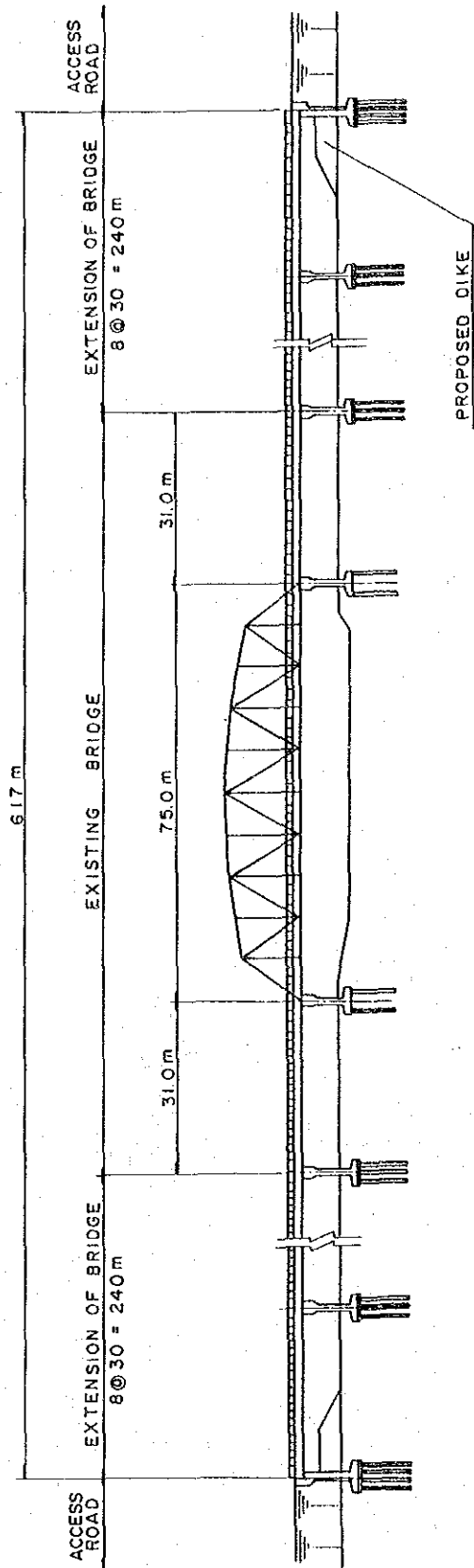


LONGITUDINAL PROFILE



LOCATION MAP

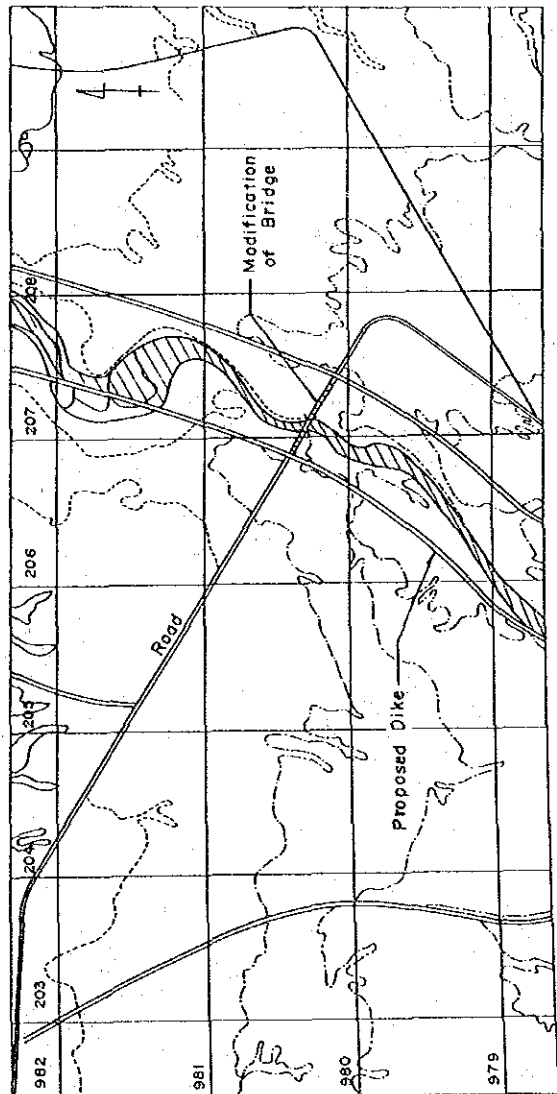


図 5. 1 - 21 プエルトチャマ橋延長図

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



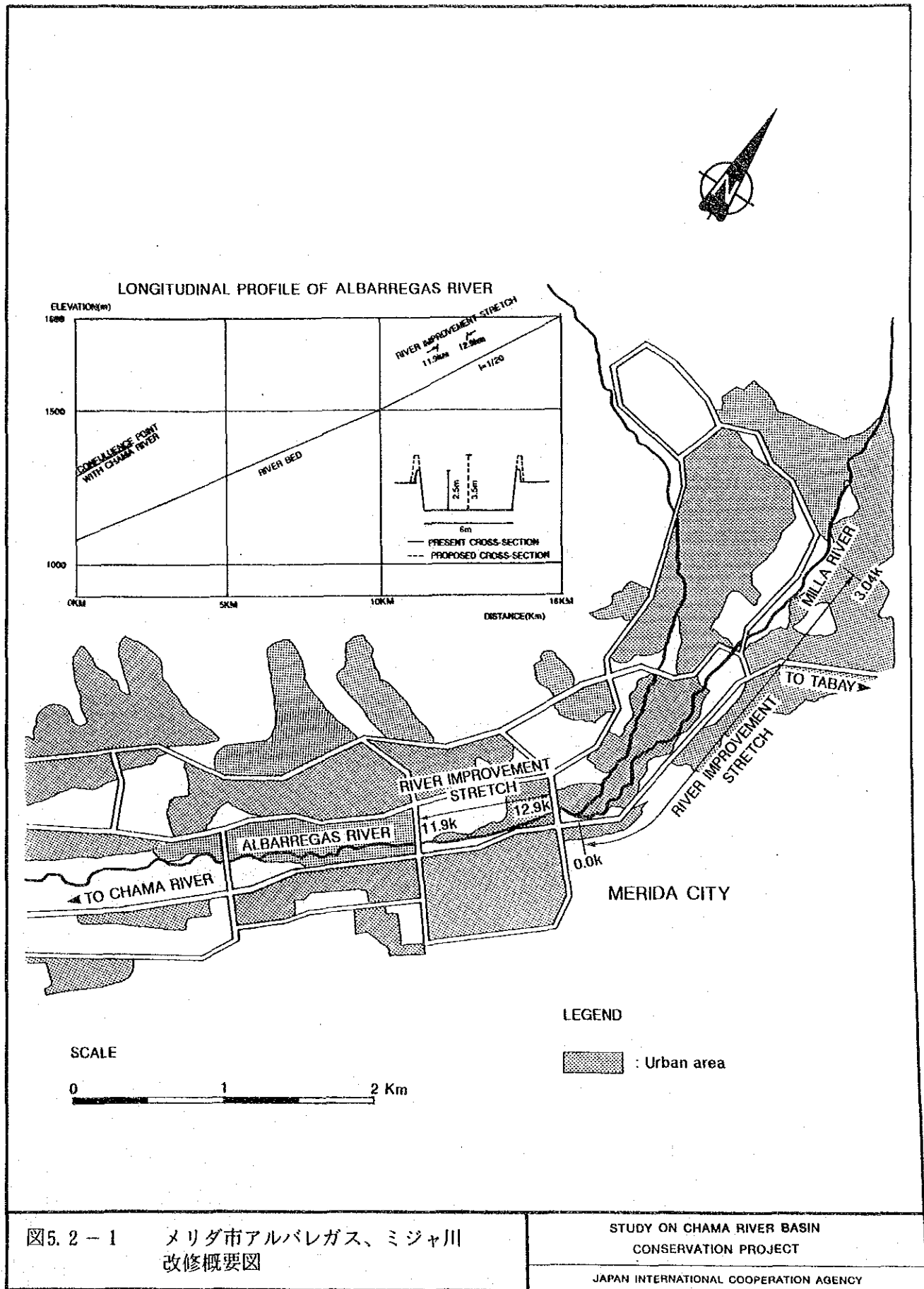


図5.2-1 メリダ市アルバレガス、ミジャ川  
改修概要図

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



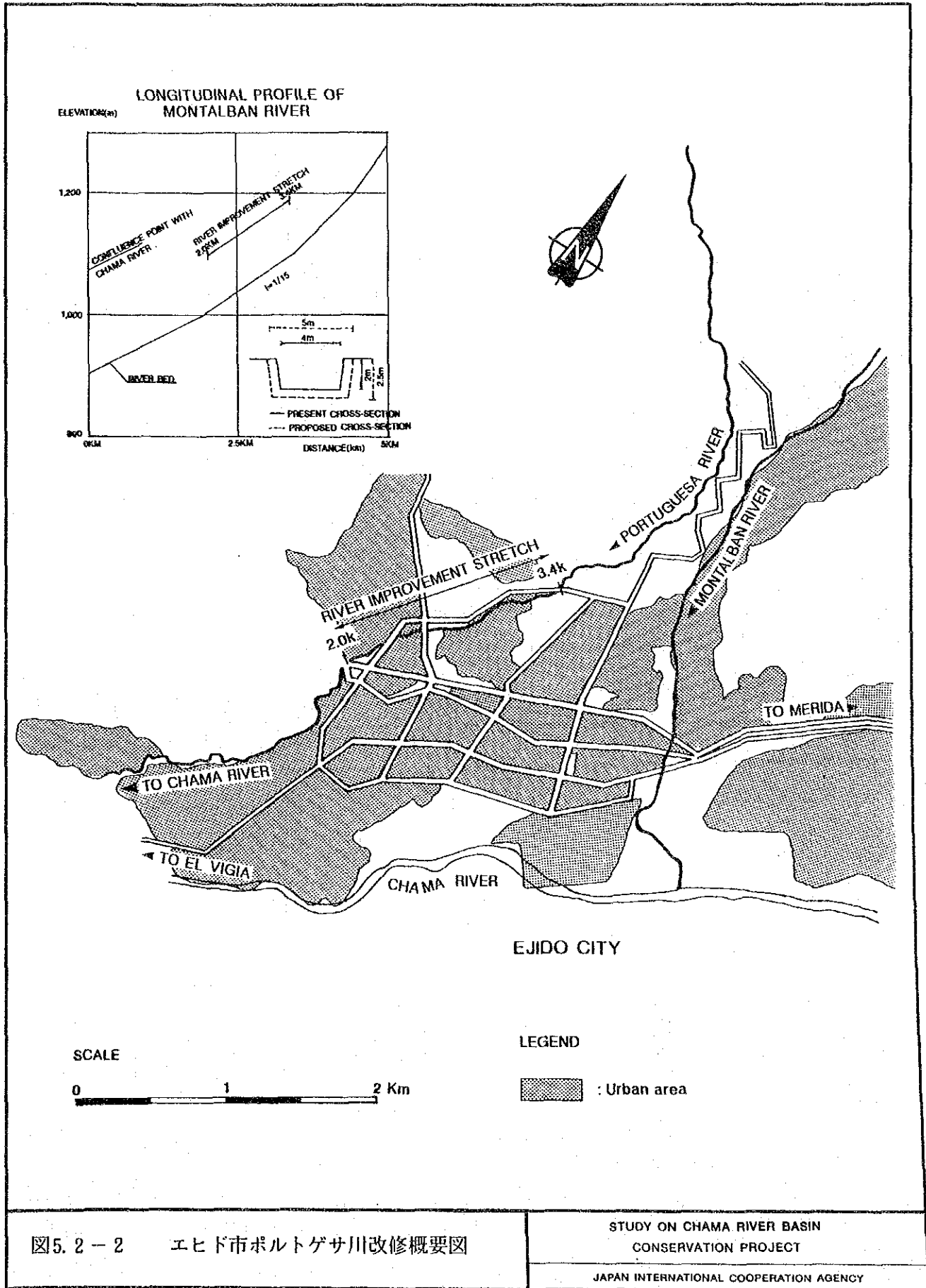


図5.2-2 エヒド市ポルトゲサ川改修概要図

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



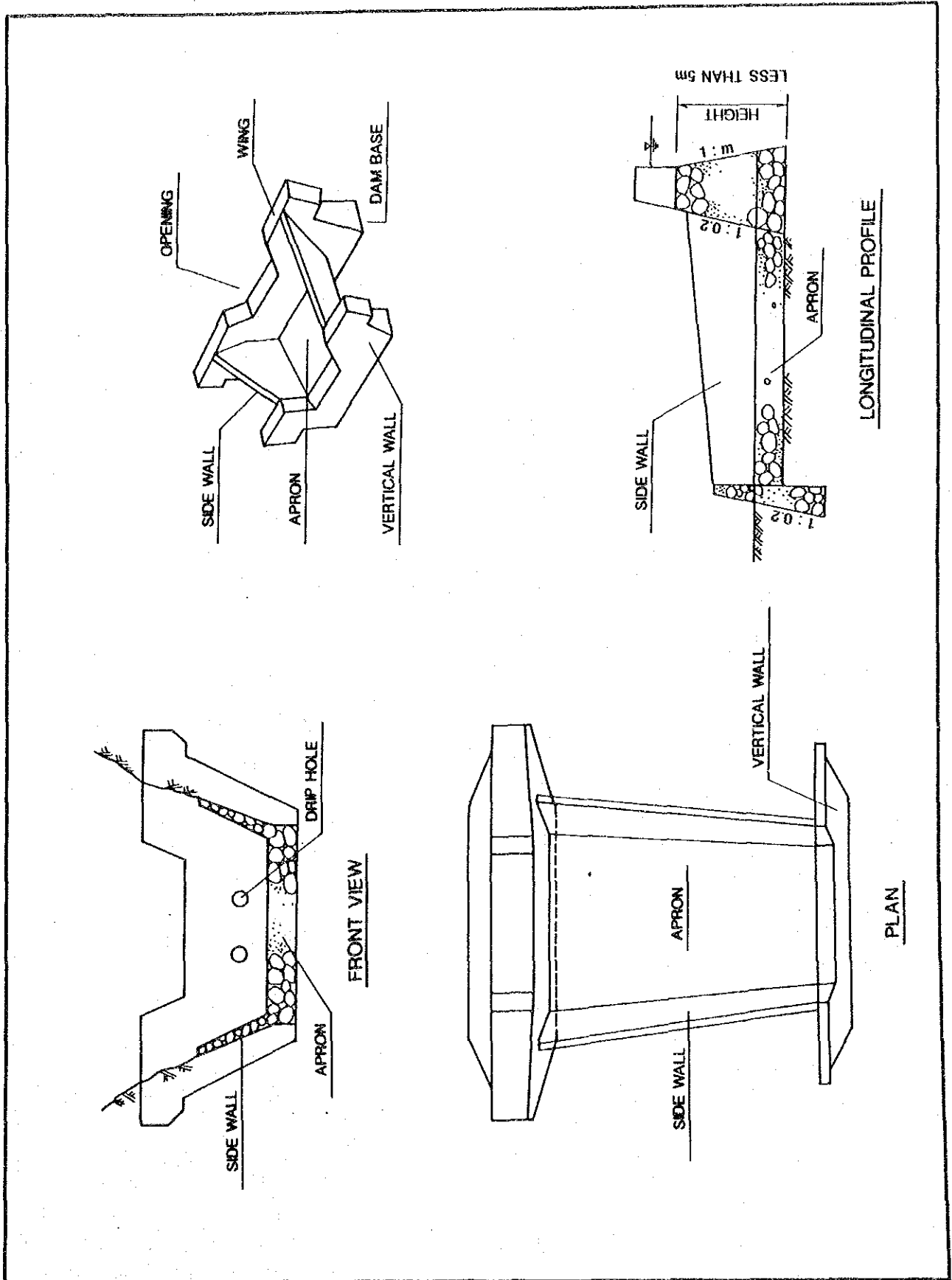


図5.2-3 チェックダム標準構造図

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY





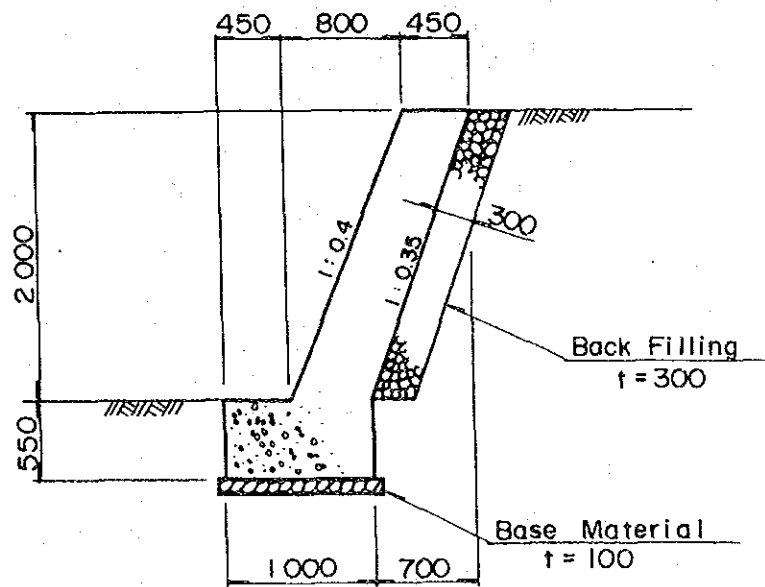


図5.2-4 道路保護のための擁壁標準構造図

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



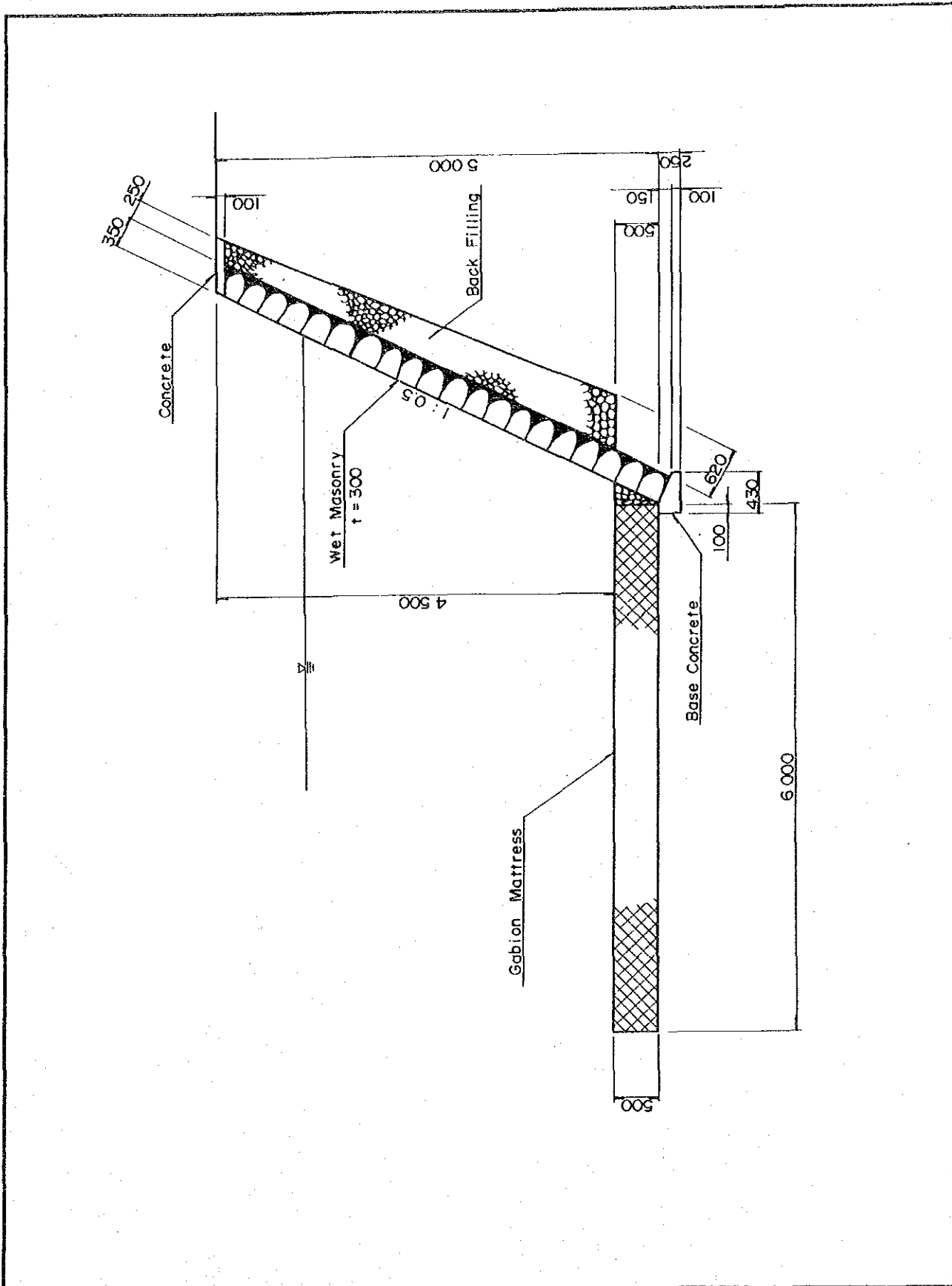


図5.2 - 5 護岸標準構造図

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



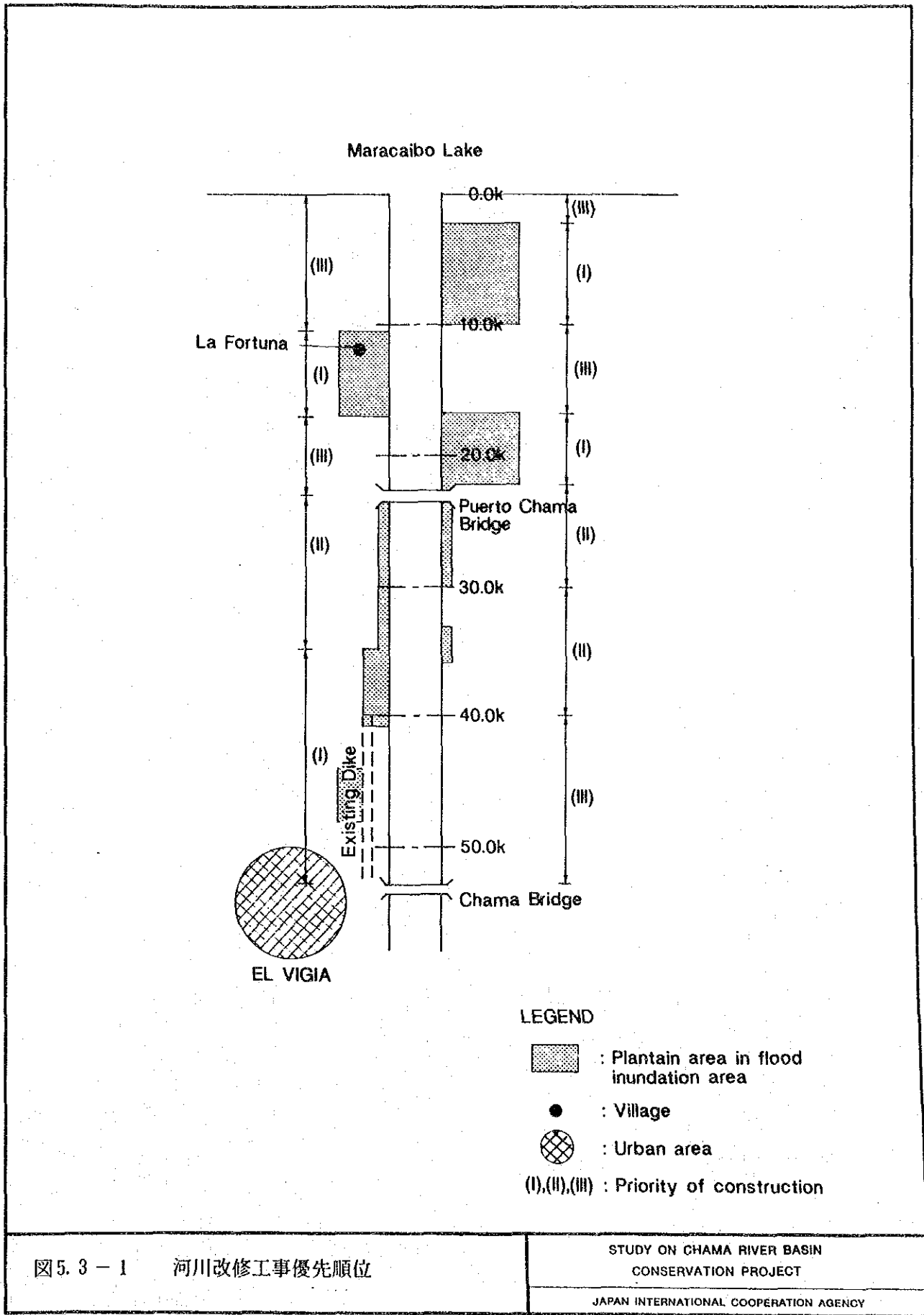


図5.3-1 河川改修工事優先順位

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



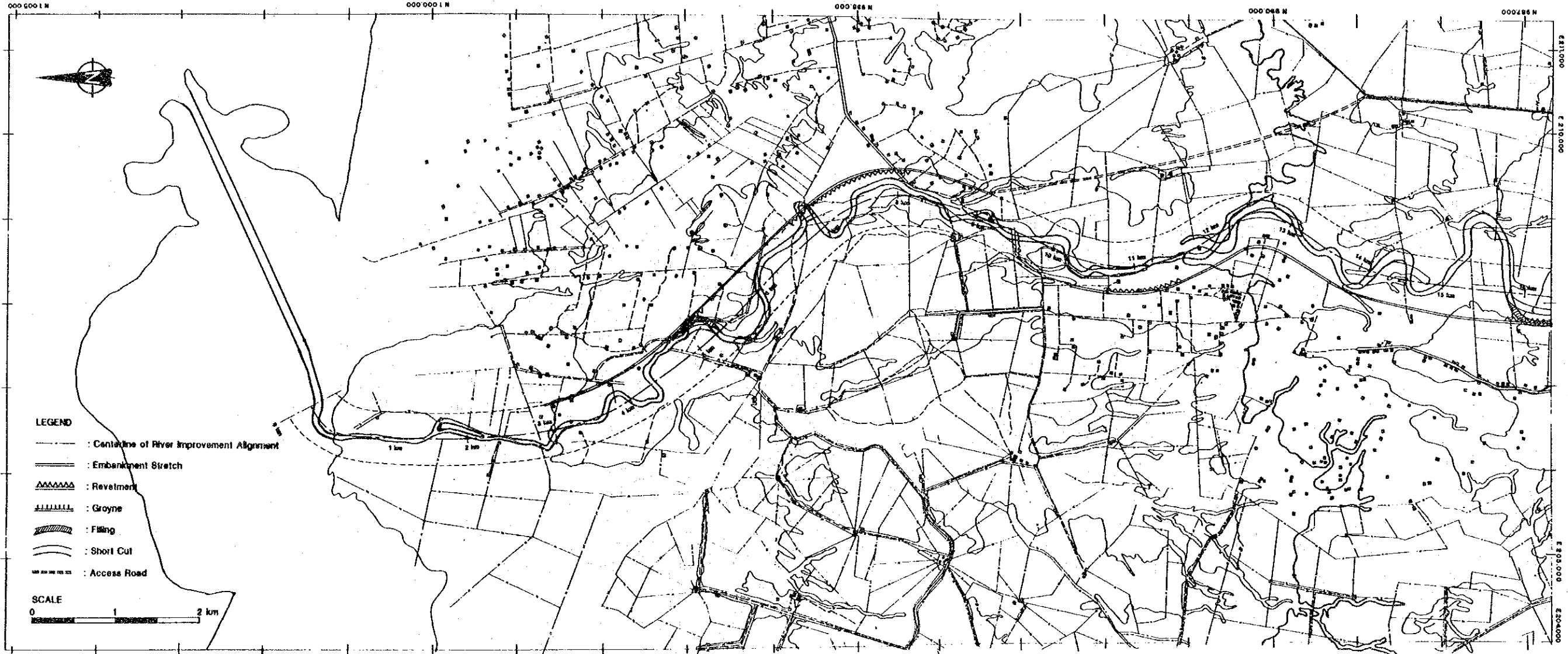
ITEM	UNIT	QUANTITY	PHASE 1 (1991-2000)	PHASE 2 (2001-2010)	PHASE 3 (2011-2020)
<b><u>BASIN-WIDE PROJECT</u></b>					
1. Sediment Control					
Sabo Dam (C-1, N-1, C-5)	m <sup>3</sup>	142,100			
(C-2 - C-4)	m <sup>3</sup>	84,600			
(C-6 - C-9)	m <sup>3</sup>	91,400			
Continuous Dam	no.	110	(18 nos.)	(44 nos.)	(48 nos.)
Retaining Wall	no.	1,400	(340 nos.)	(450 nos.)	(610 nos.)
2. Flood Control					
Reinforcement of Existing Dike	km	12.0*			
River Improvement (Phase 1)	km	24.7*			
River Improvement (Phase 2)	km	31.4*			
River Improvement (Phase 3)	km	40.3*			
Puerto Chama Bridge Extension	m <sup>2</sup>	6,100			
<b><u>LOCAL PROJECT</u></b>					
1. Sediment Control					
Check Dam	no.	88			
Retaining Wall	m	750			
Revetment	m	720			
2. Flood Control					
River Improvement of Albarregas River					
River Improvement of Milla River					
River Improvement of Portuguesu River					
			PHASE 1 = Bs1,103 million (@ Bs110x10yrs)	PHASE 2 = Bs1,415 million (@ Bs142x10yrs)	PHASE 3 = Bs1,033 million (@ Bs103x10yrs)

\* Cumulative length of both banks.

図5.3-2 マスタープラン施工計画図

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

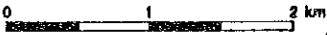
JAPAN INTERNATIONAL COOPERATION AGENCY



LEGEND

- : Centaline of River Improvement Alignment
- == : Embankment Stretch
- ▲▲▲▲▲ : Revetment
- ||||| : Groyne
- ▨ : Filling
- ~ : Short Cut
- - - : Access Road

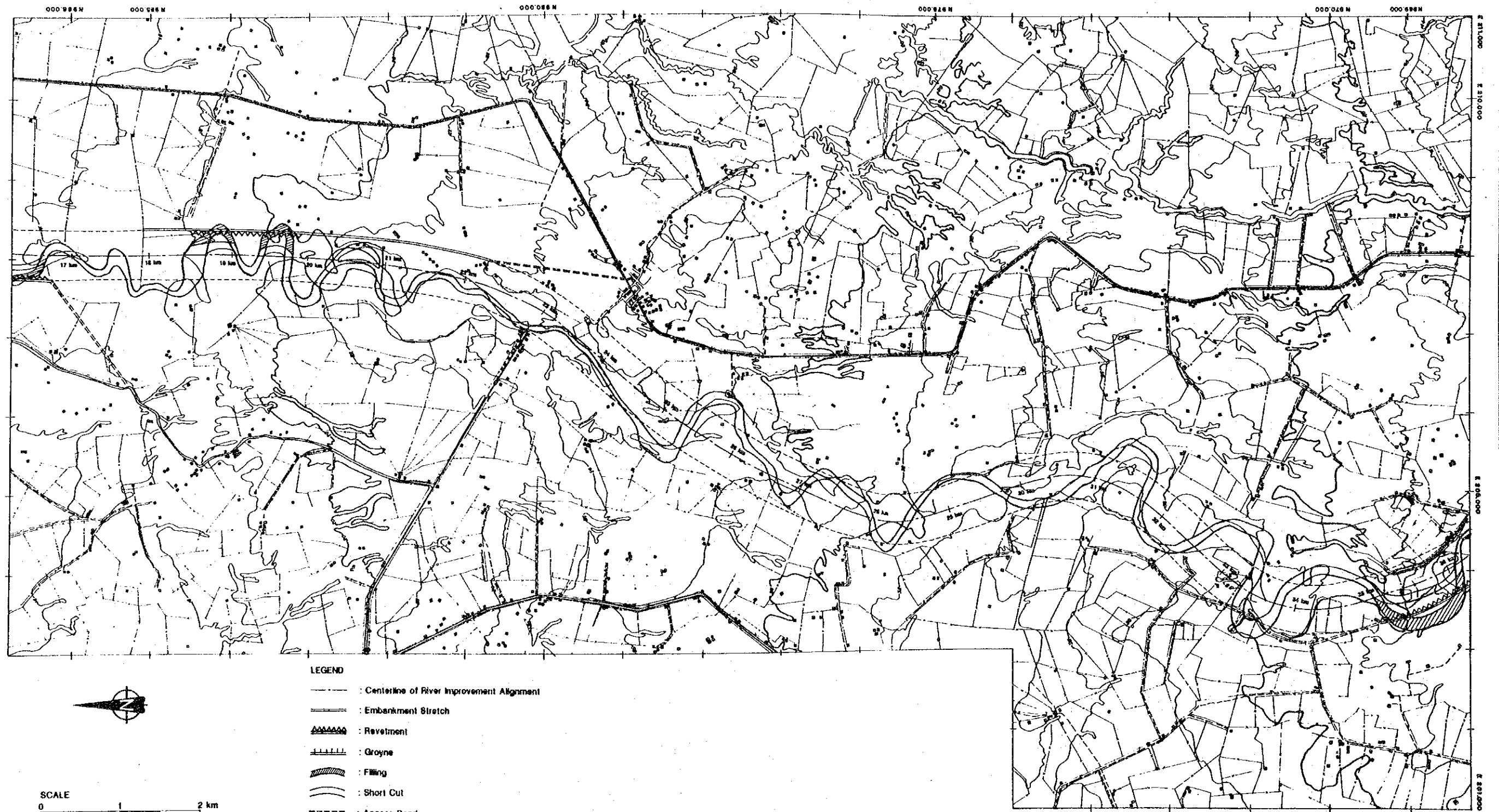
SCALE



STUDY ON CHAMA RIVER BASIN  
 CONSERVATION PROJECT  
 JAPAN INTERNATIONAL COOPERATION AGENCY

図6.1-1(1/3) アクションプラン河川改修  
 計画図



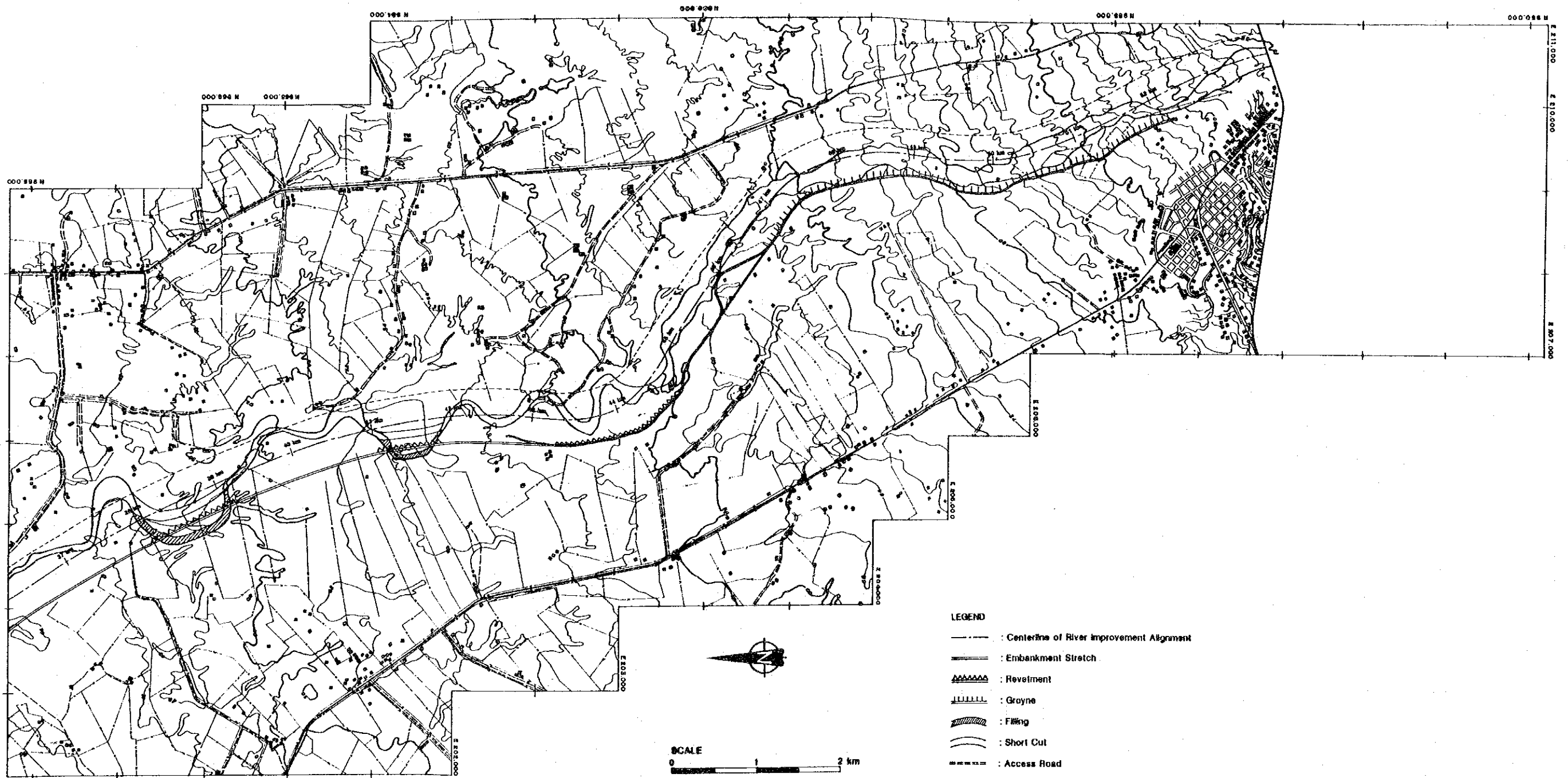


- LEGEND**
- : Centerline of River Improvement Alignment
  - : Embankment Stretch
  - ▲▲▲▲▲ : Revetment
  - ||||| : Groyne
  - ▨▨▨ : Filling
  - : Short Cut
  - : Access Road

SCALE  
0 — 2 km

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT  
JAPAN INTERNATIONAL COOPERATION AGENCY

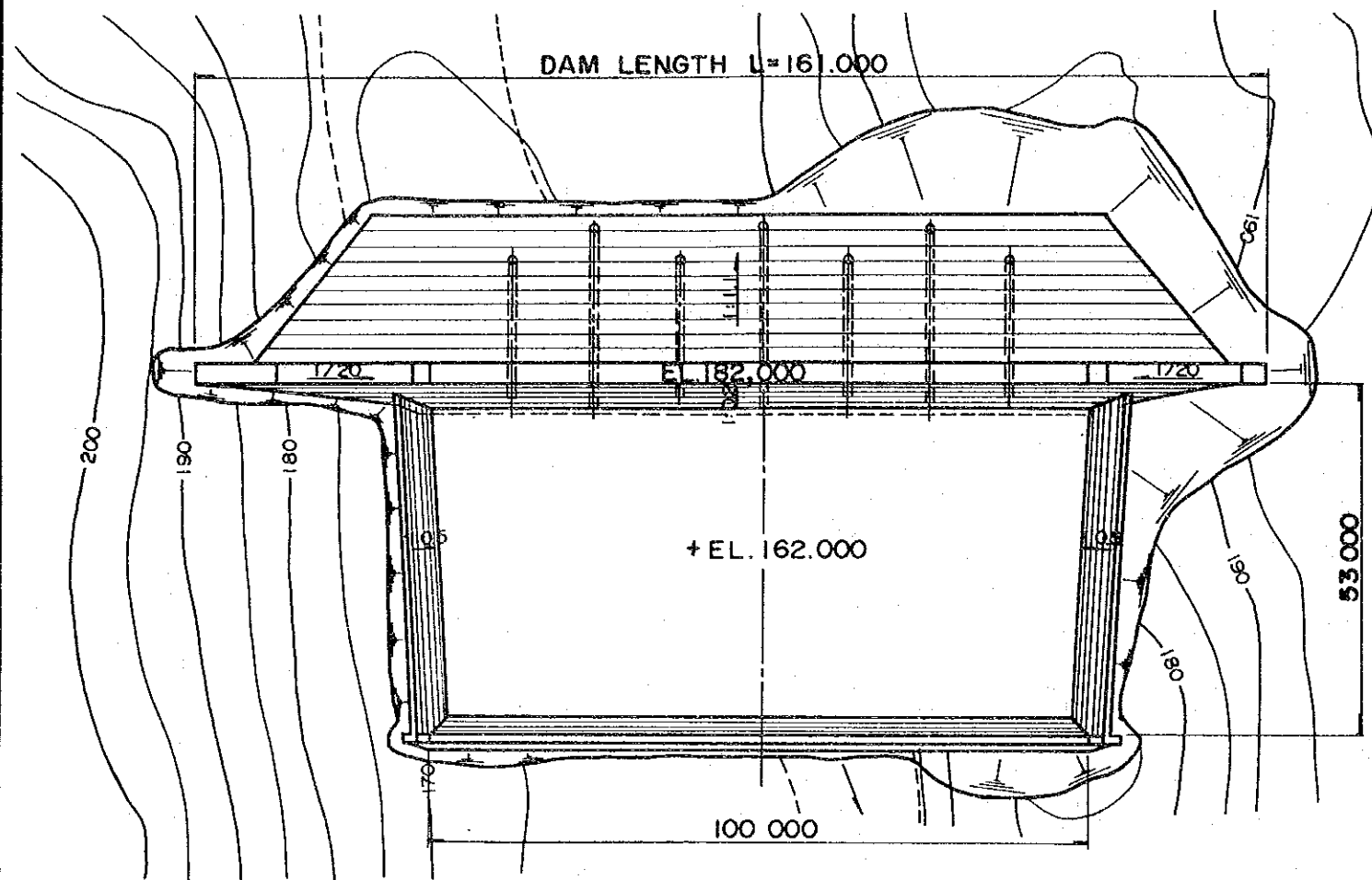
図6.1-1(2/3) アクションプラン河川改修  
計画図



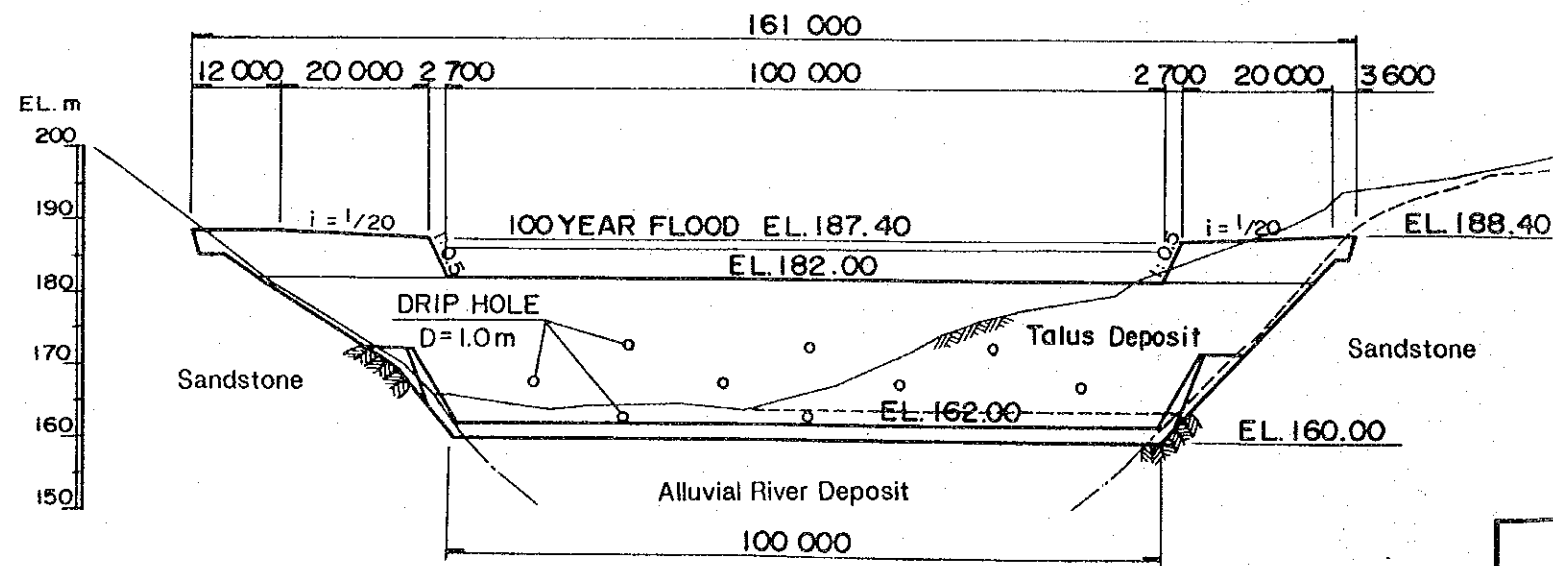
STUDY ON CHAMA RIVER BASIN  
 CONSERVATION PROJECT  
 JAPAN INTERNATIONAL COOPERATION AGENCY

図6.1-1(3/3) アクションプラン河川改修  
 計画図

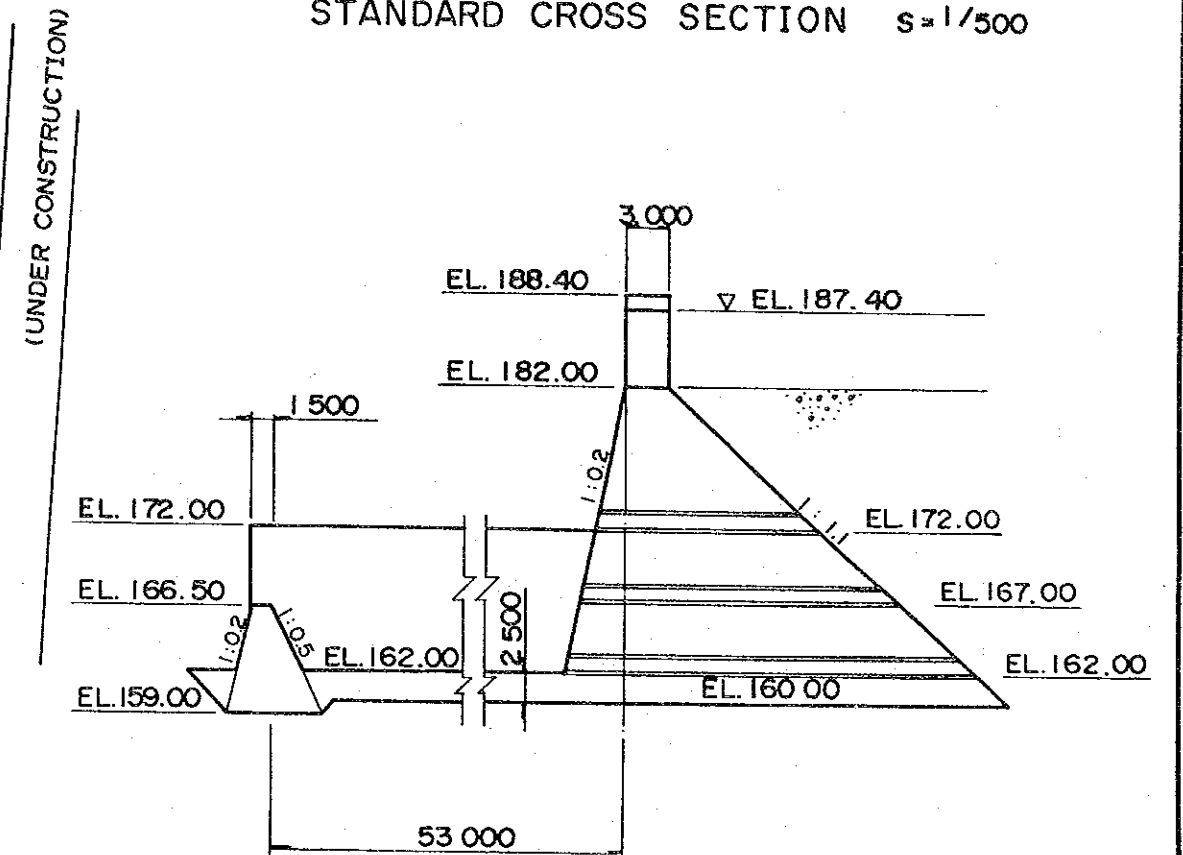
PLAN  $s = 1/1000$



FRONT VIEW  $s = 1/1000$



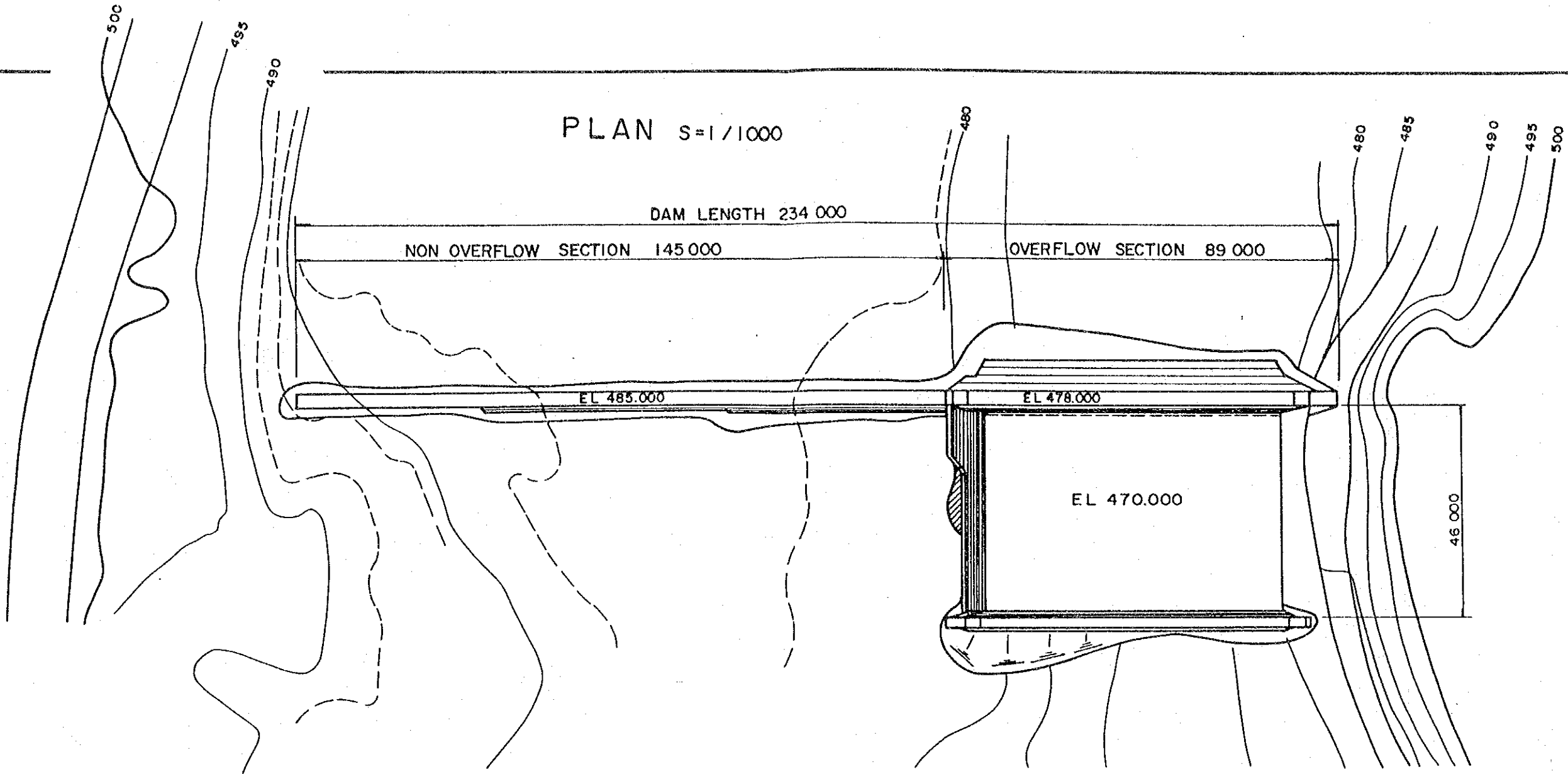
STANDARD CROSS SECTION  $s = 1/500$



STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT  
JAPAN INTERNATIONAL COOPERATION AGENCY

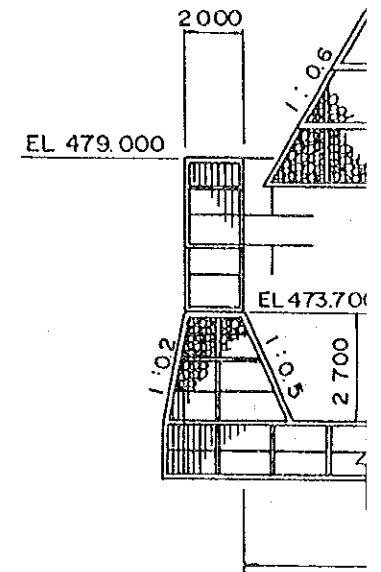
図6.1-2 砂防ダムC-1基本設計図

PLAN S=1/1000

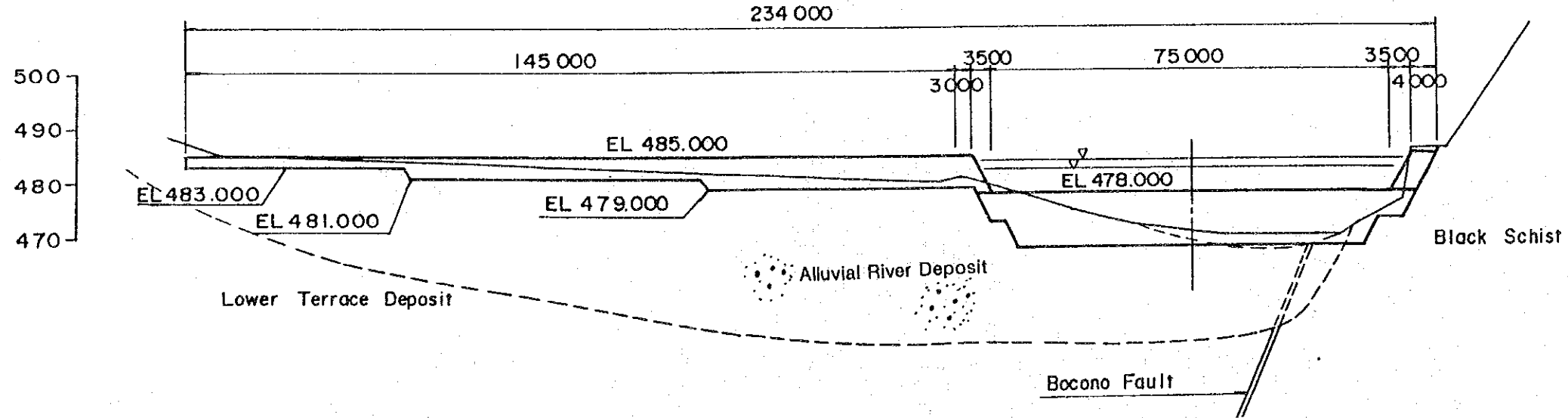


STANDARD

NON-OVERFLOW

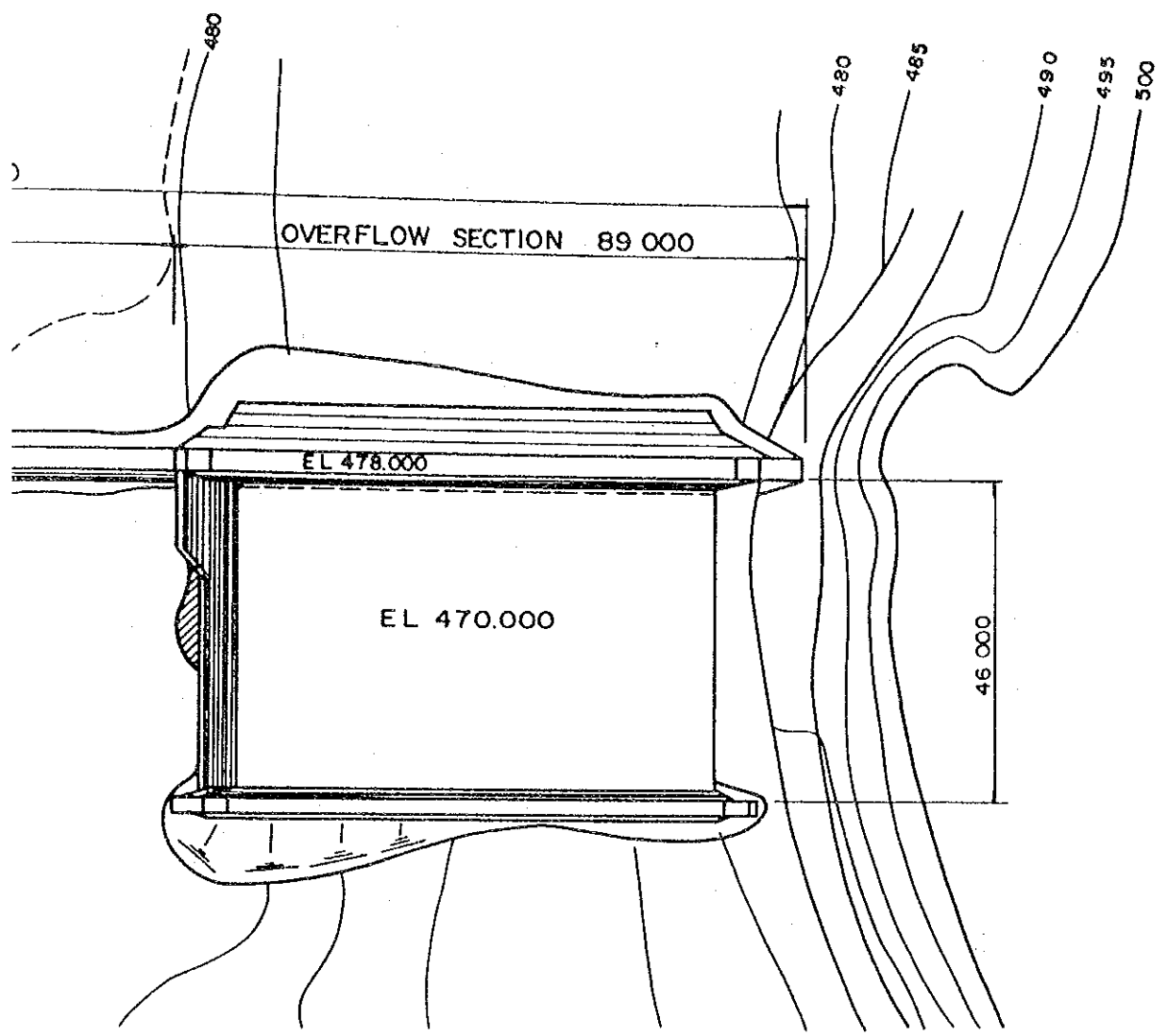


FRONT VIEW S=1/1000

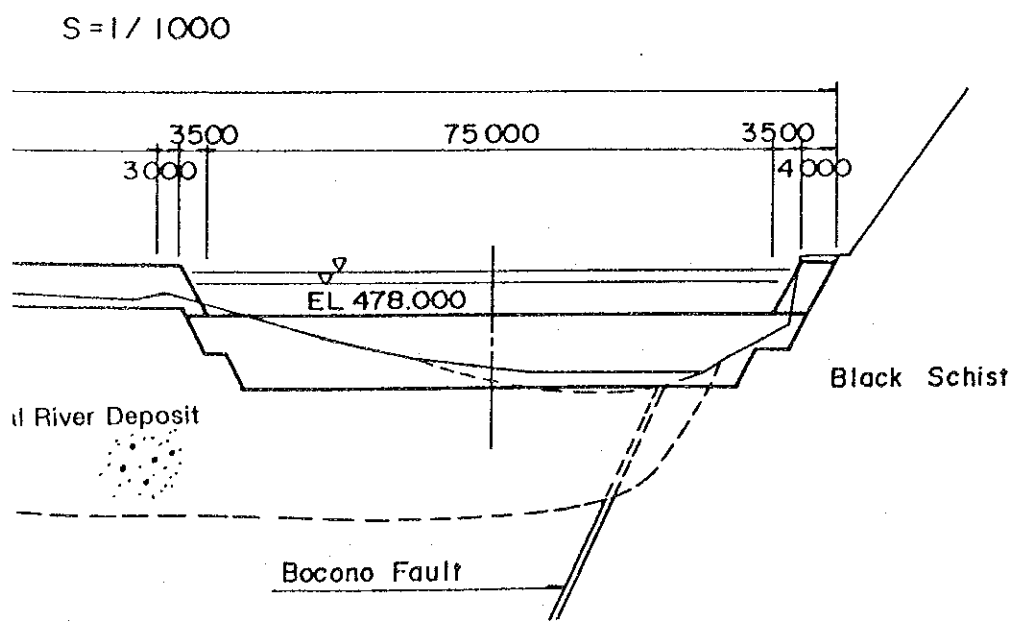
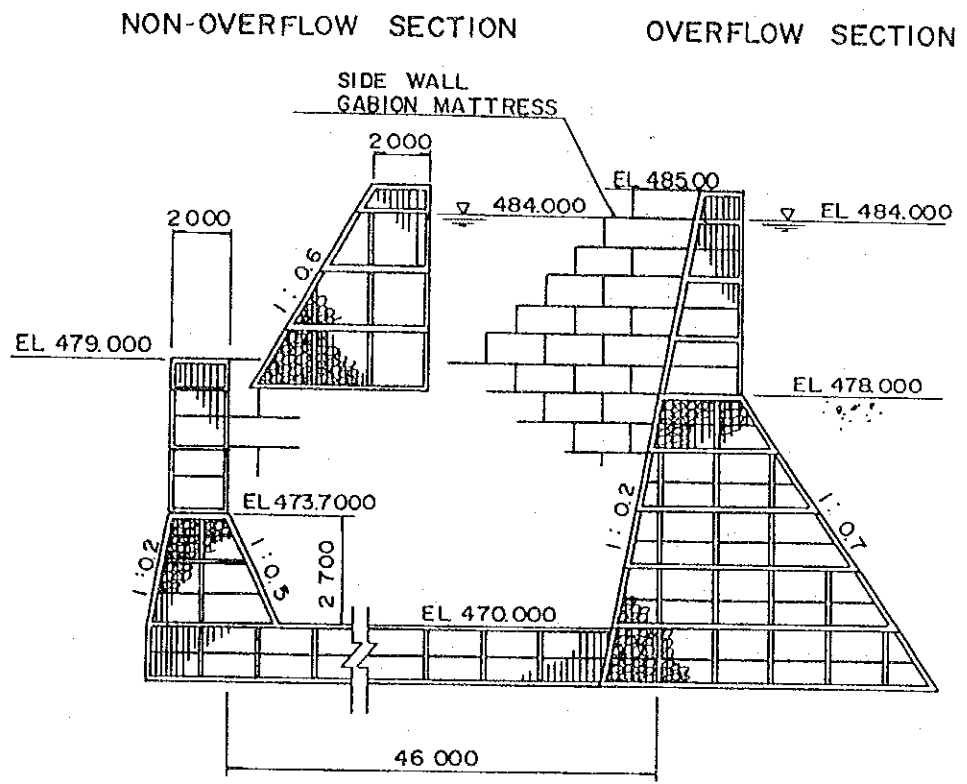


STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

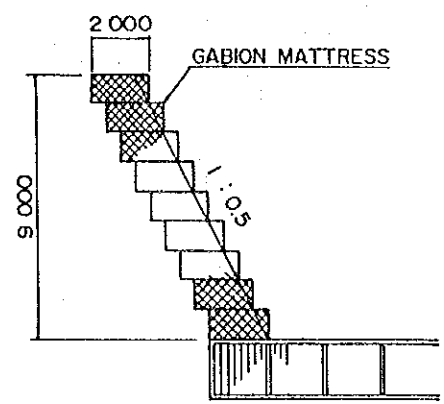
JAPAN INTERNATIONAL COOPERATION AGENCY



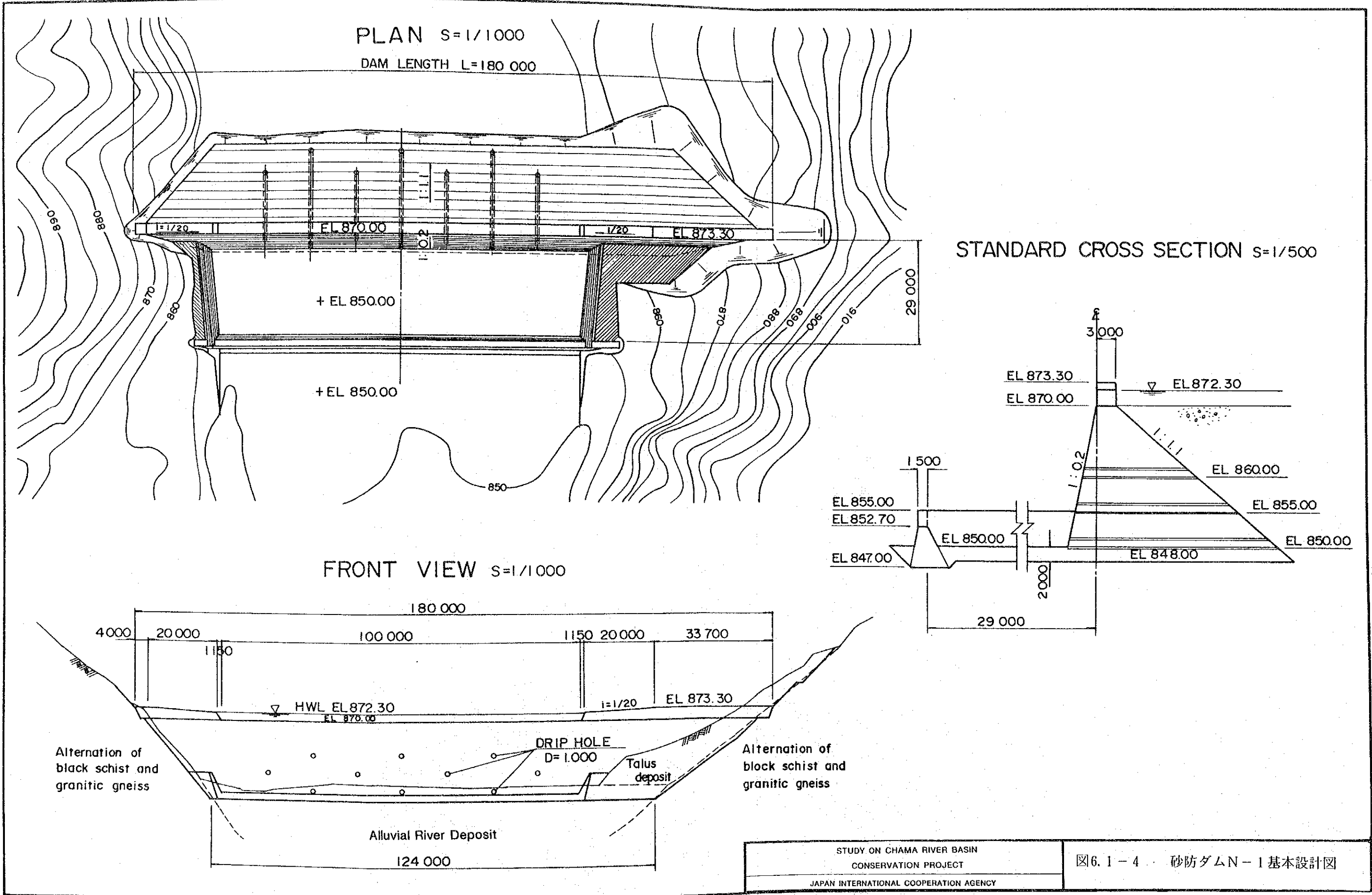
STANDARD CROSS SECTION  $S=1/250$

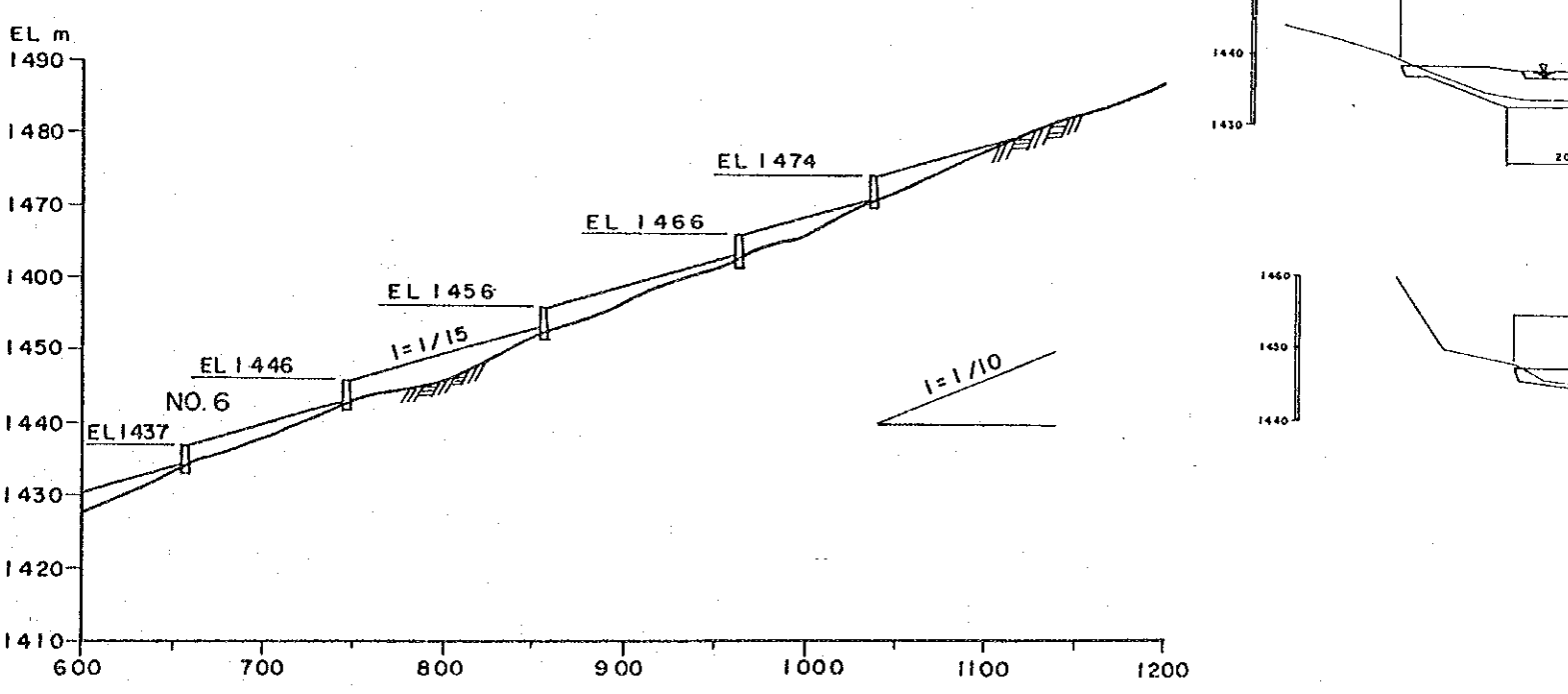
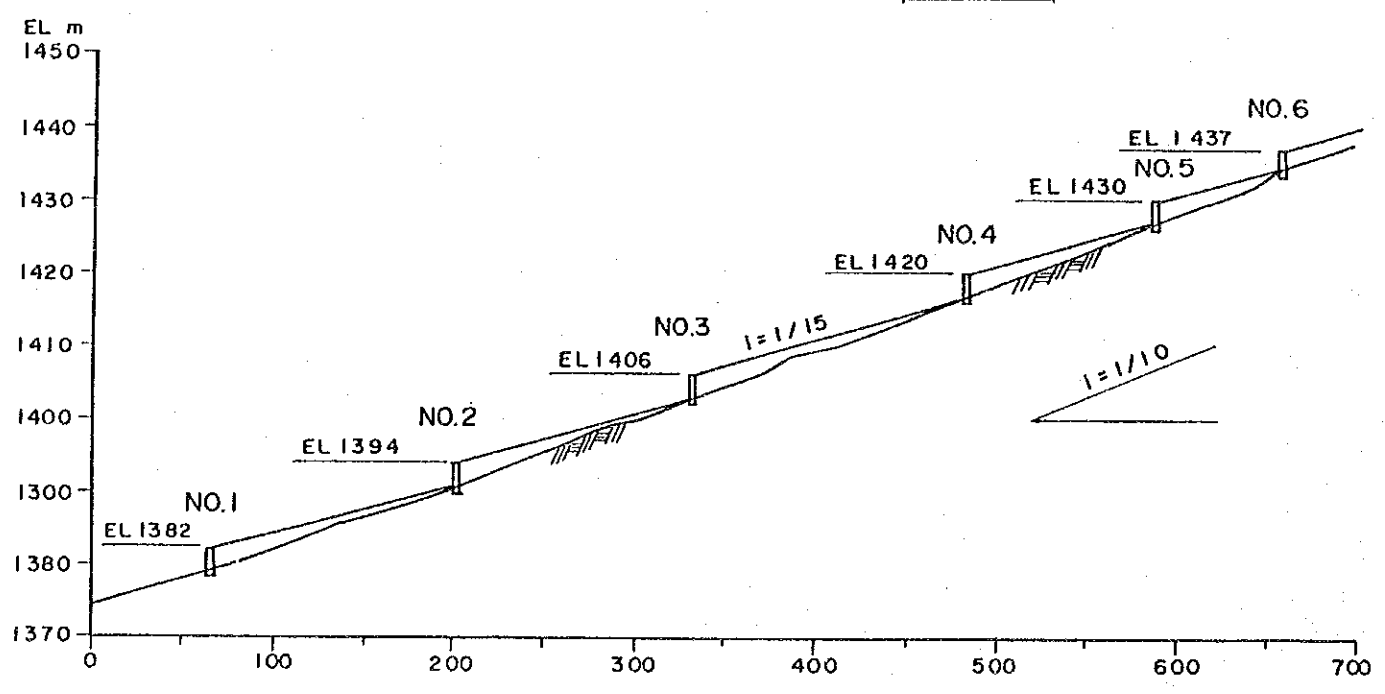
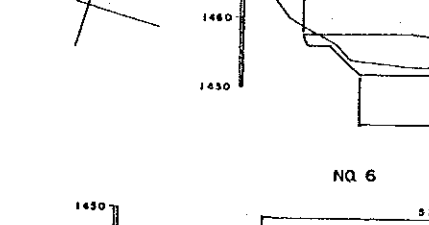
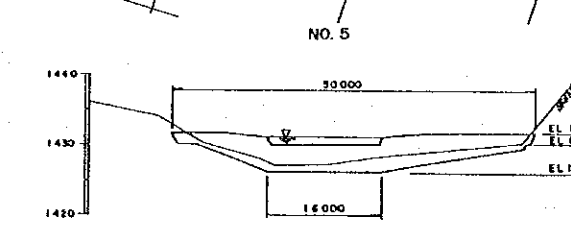
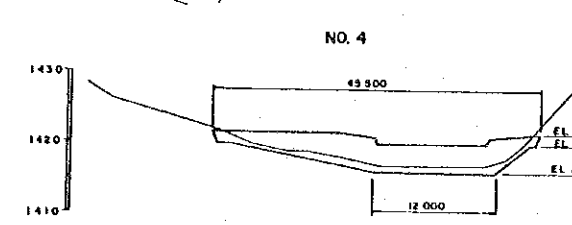
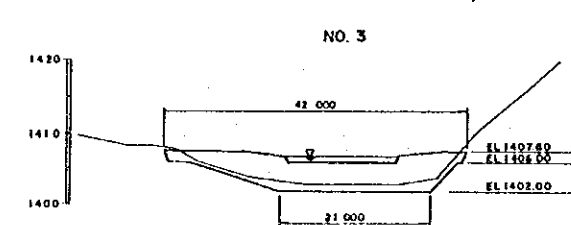
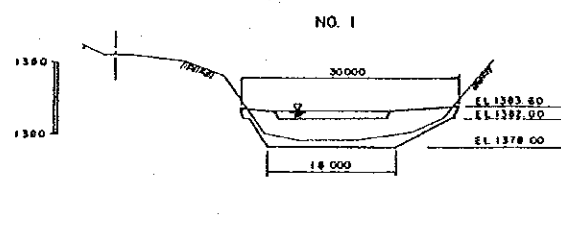
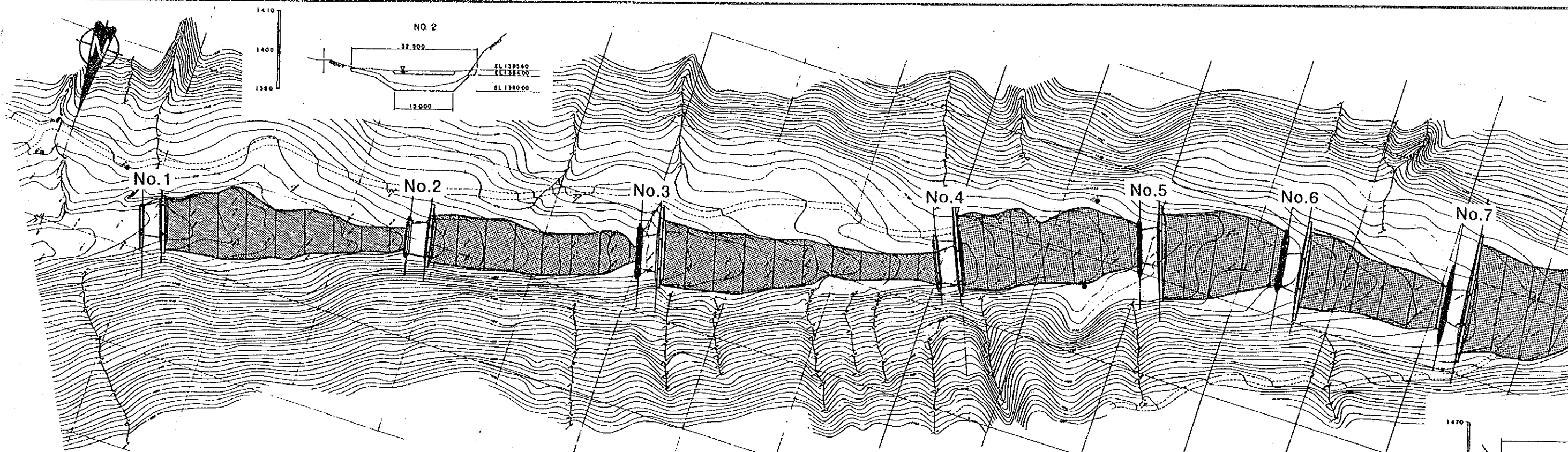


SIDE WALL

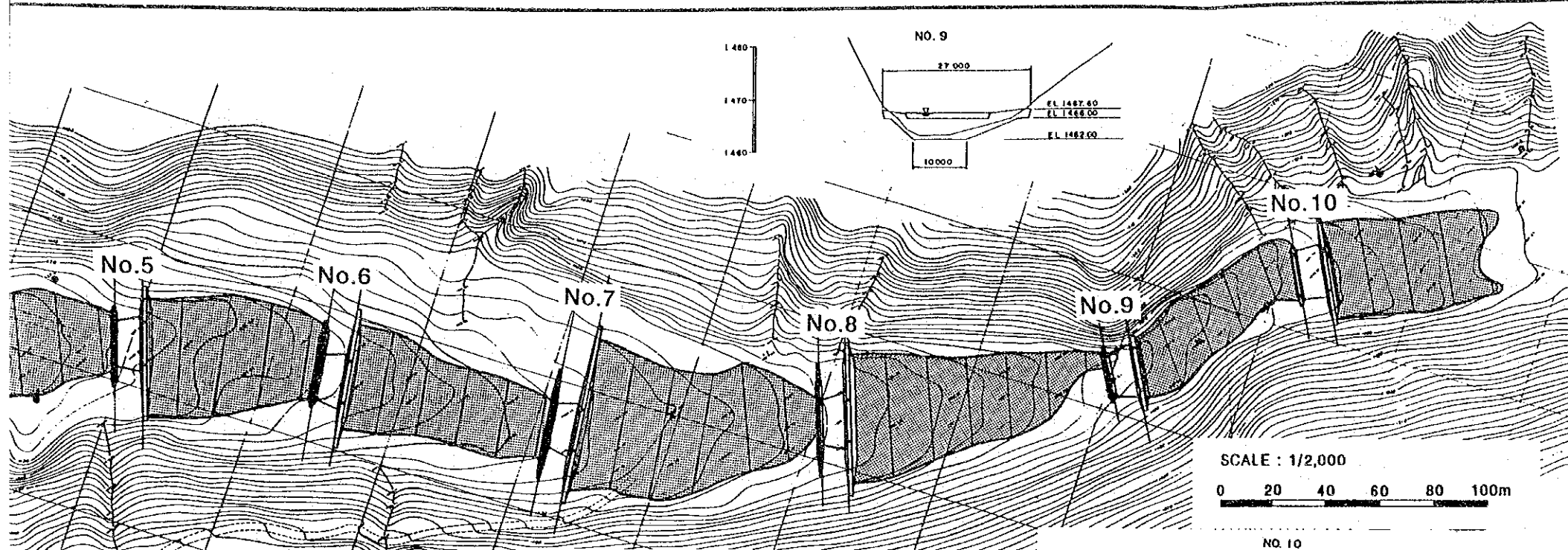


STUDY ON CHAMA RIVER BASIN CONSERVATION PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY	図 6.1-3 砂防ダムC-5 基本設計図
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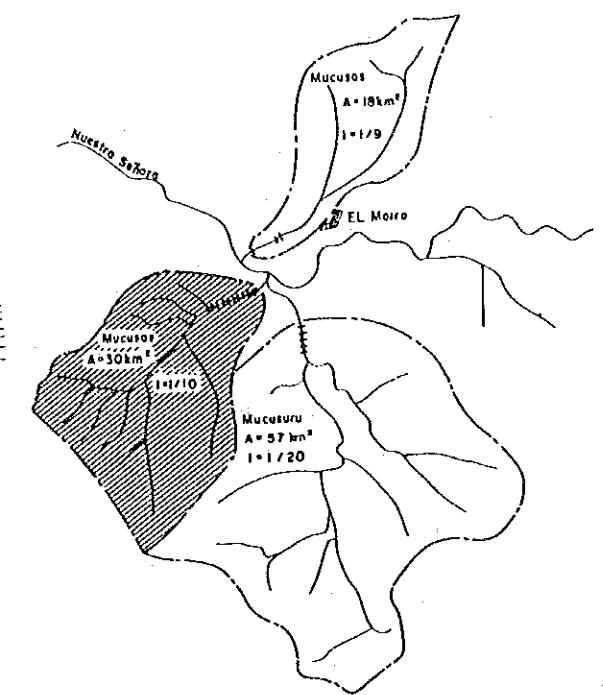




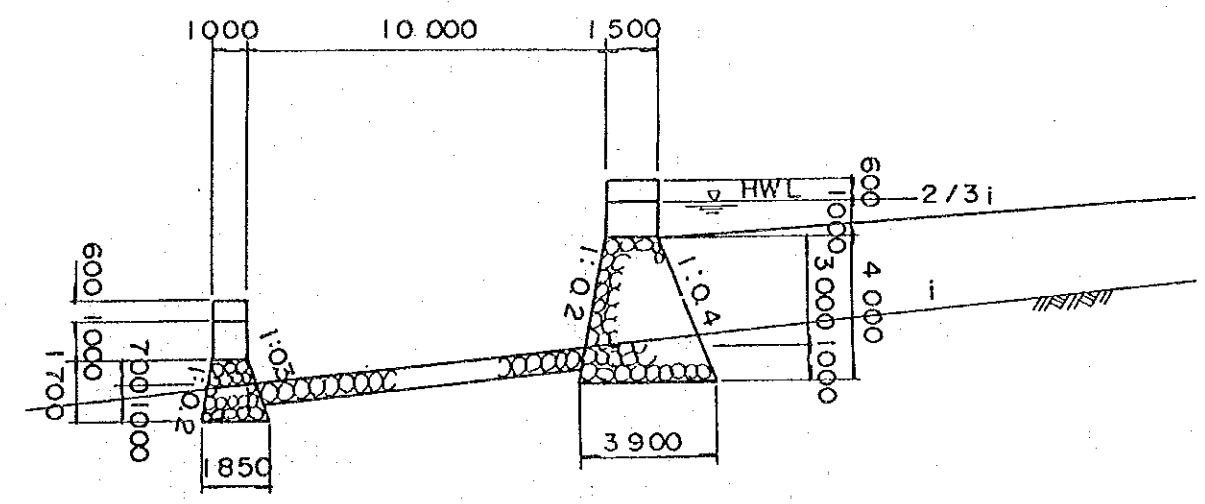
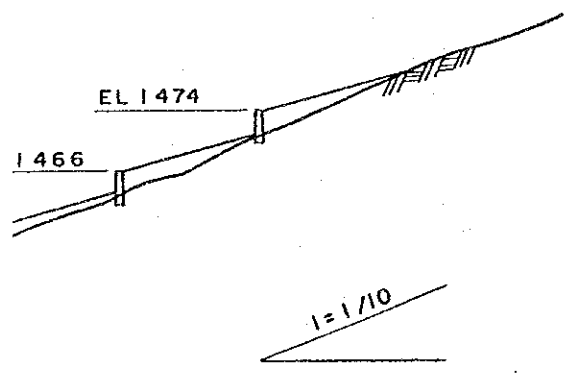
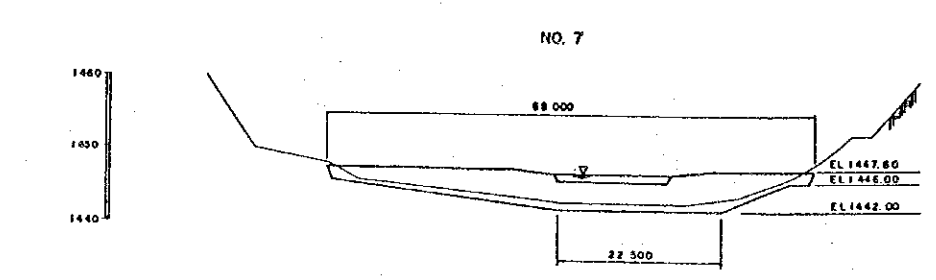
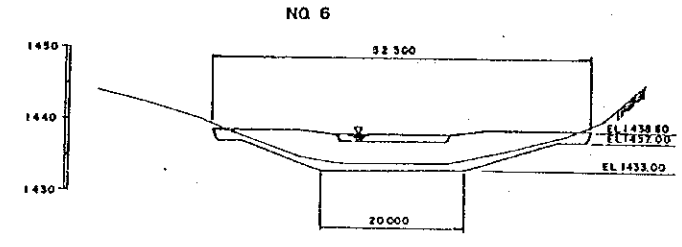
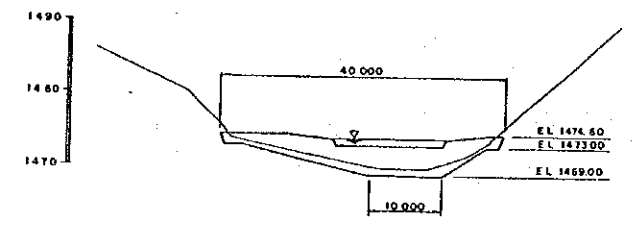
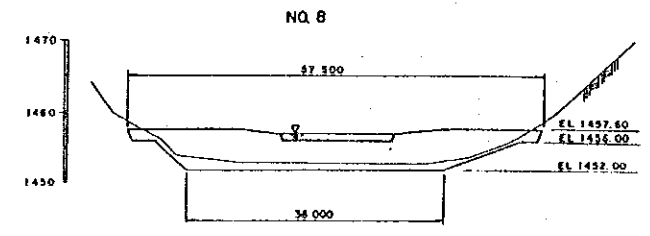
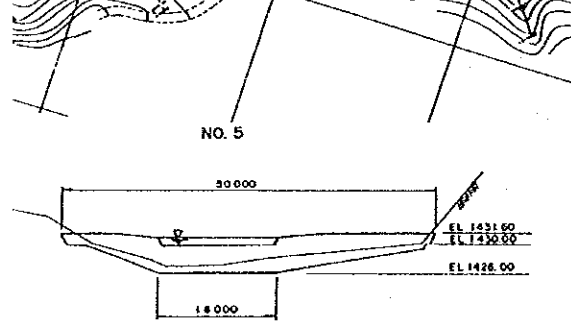




Location Map S=1/200,000



SCALE : 1/2,000  
0 20 40 60 80 100m

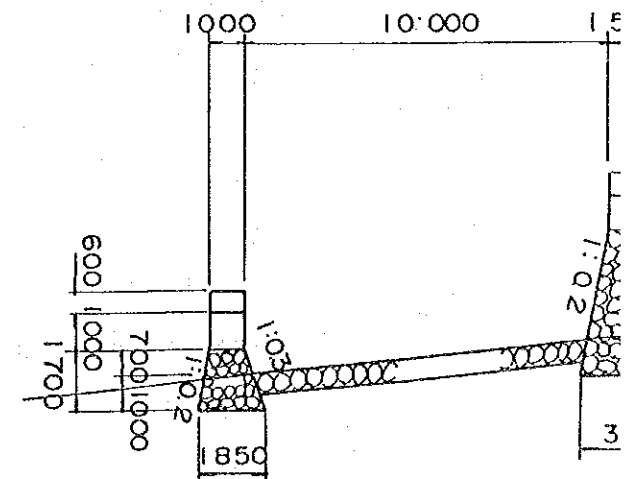
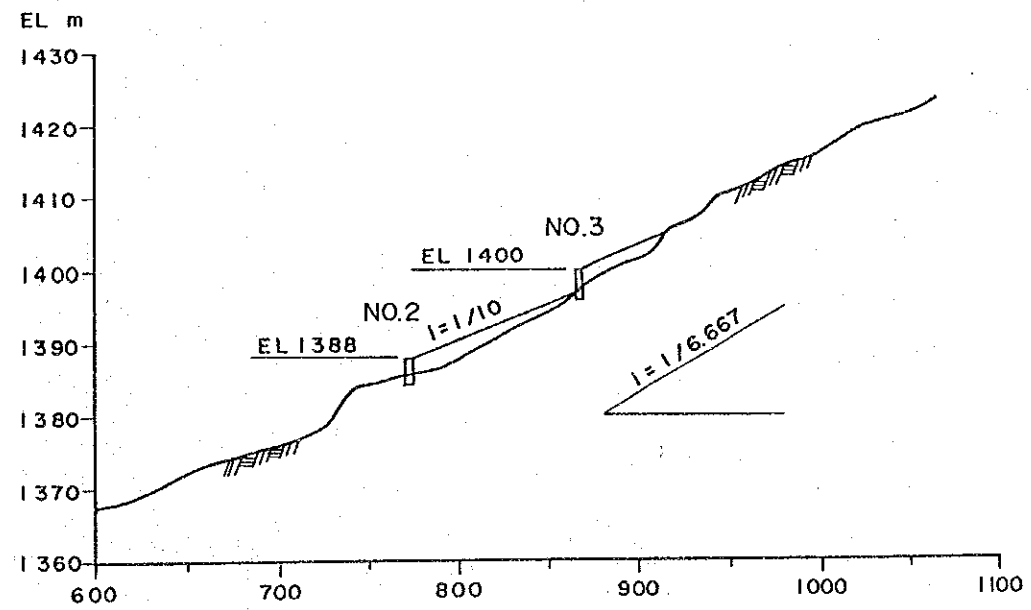
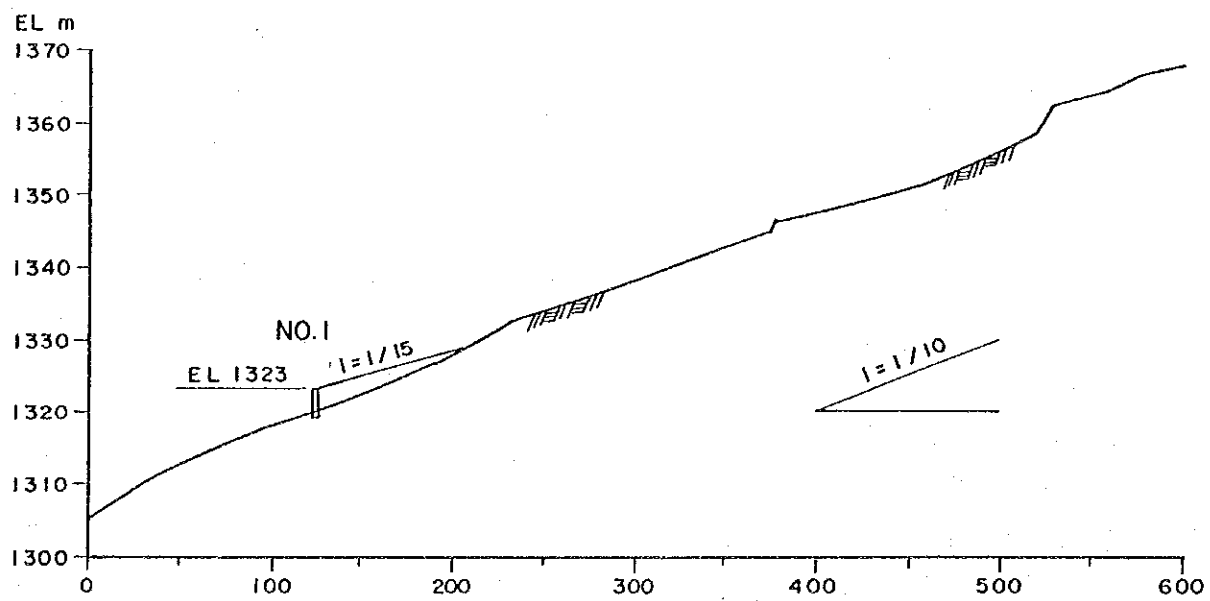
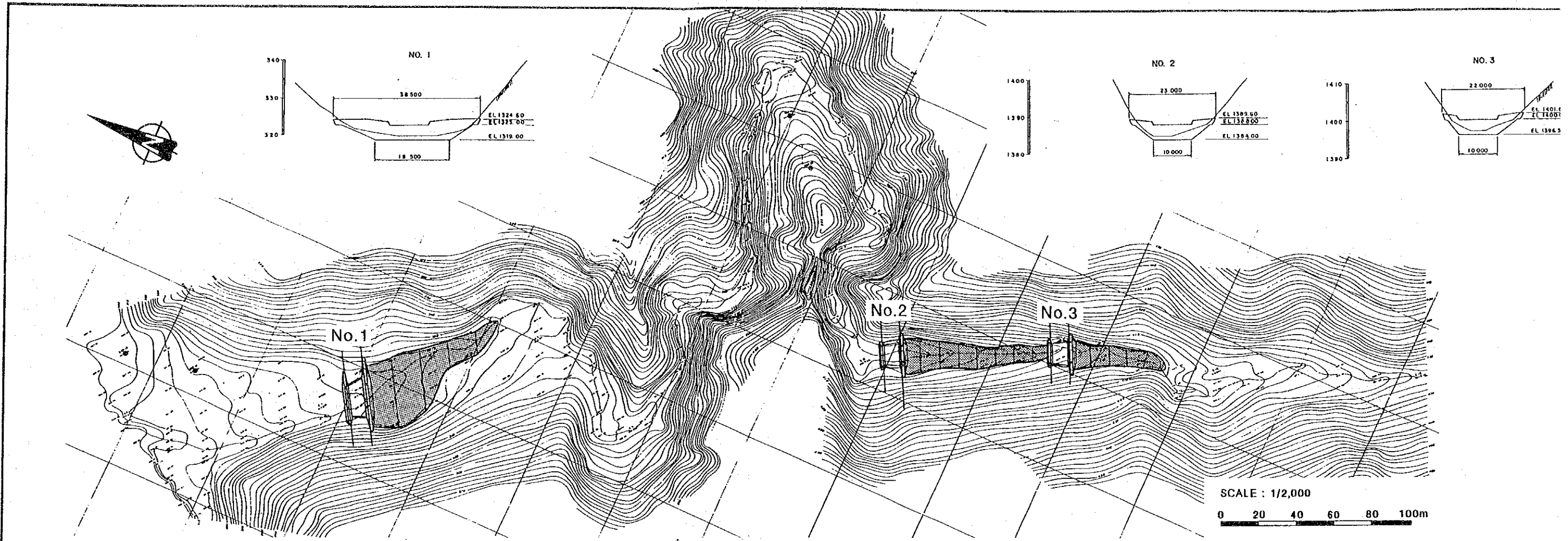


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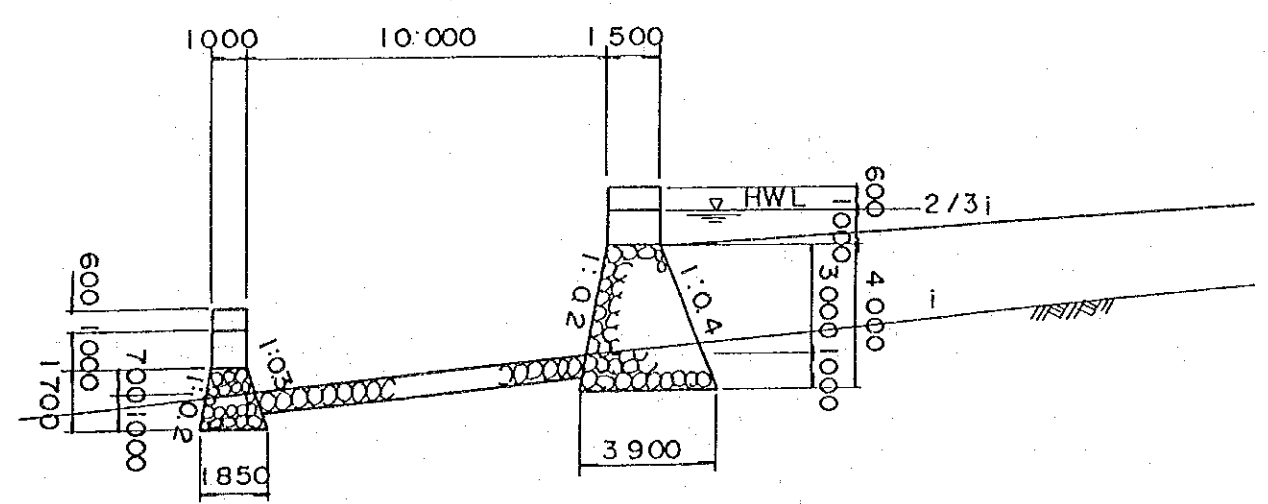
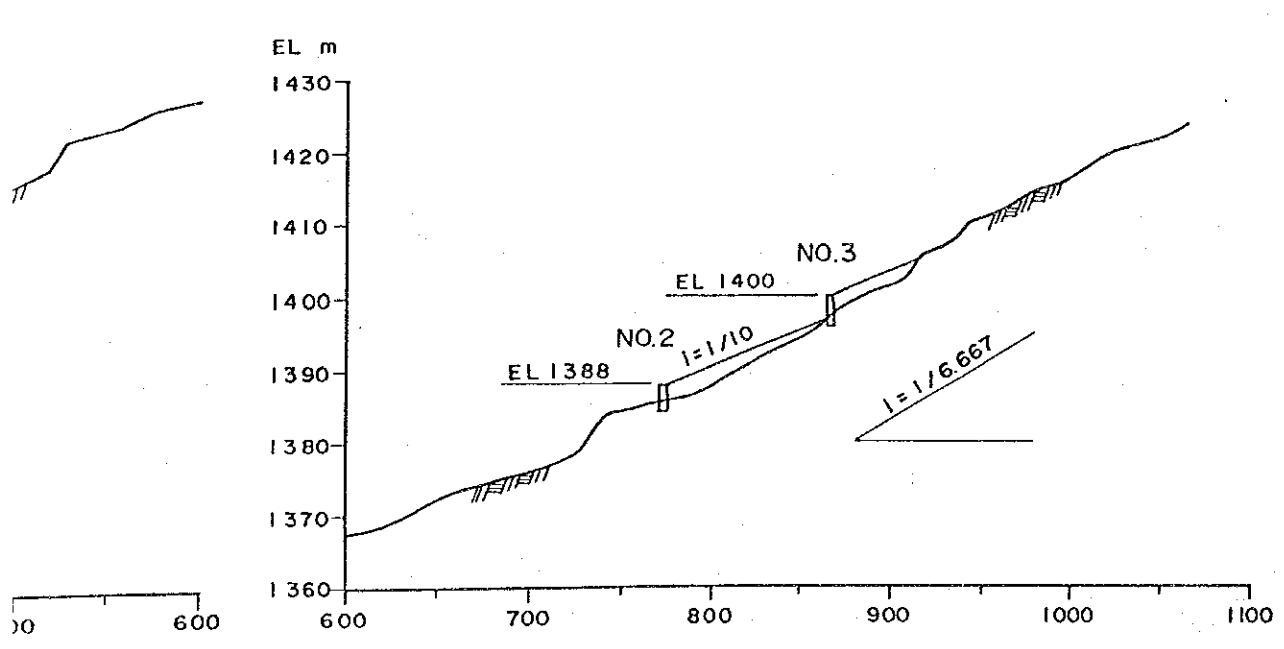
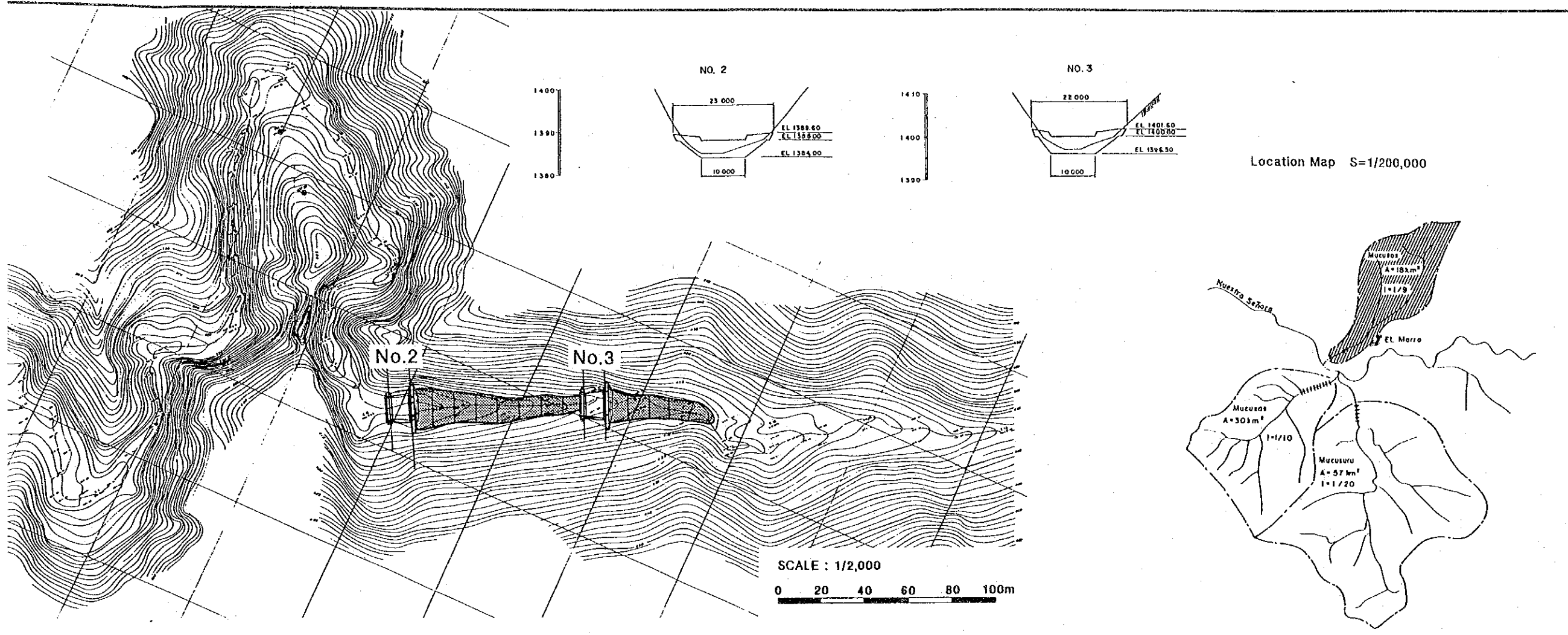
STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT.  
JAPAN INTERNATIONAL COOPERATION AGENCY

図 6.1-5 ムクサス川低ダム群配置図





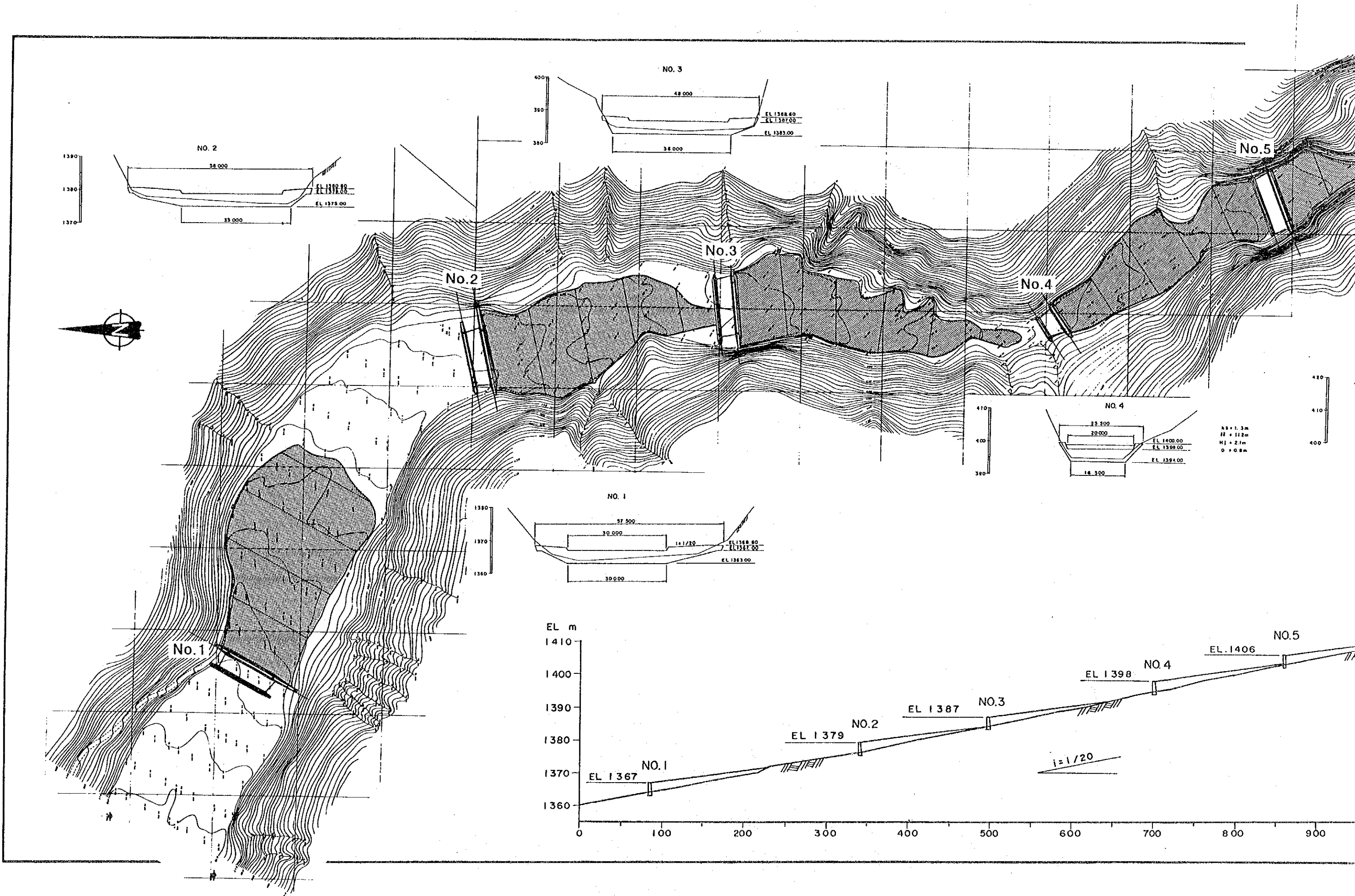
STUDY ON CHAMA RIVER BASIN  
 CONSERVATION PROJECT  
 JAPAN INTERNATIONAL COOPERATION AGENCY

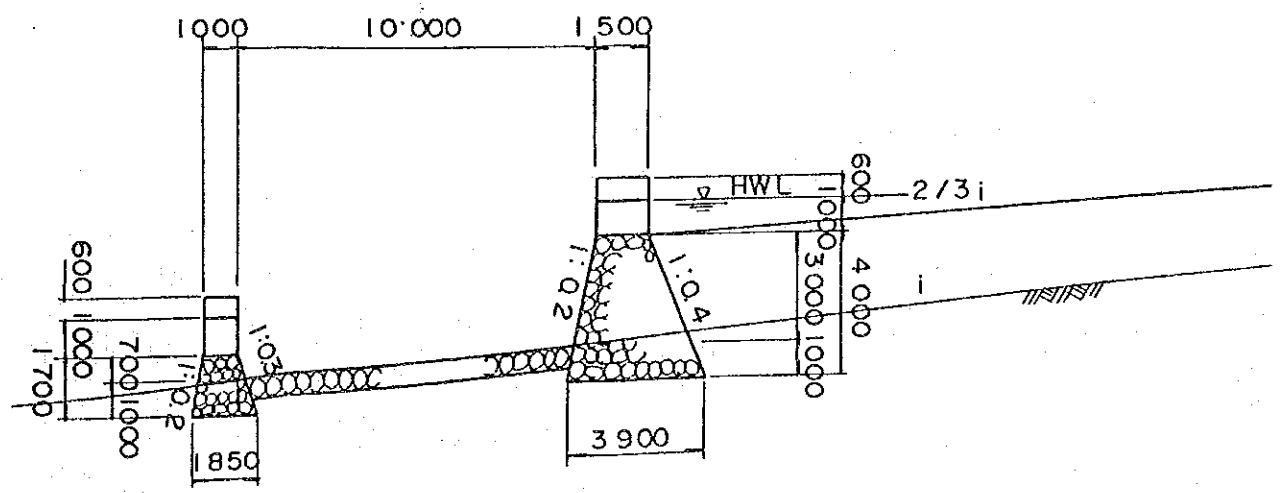
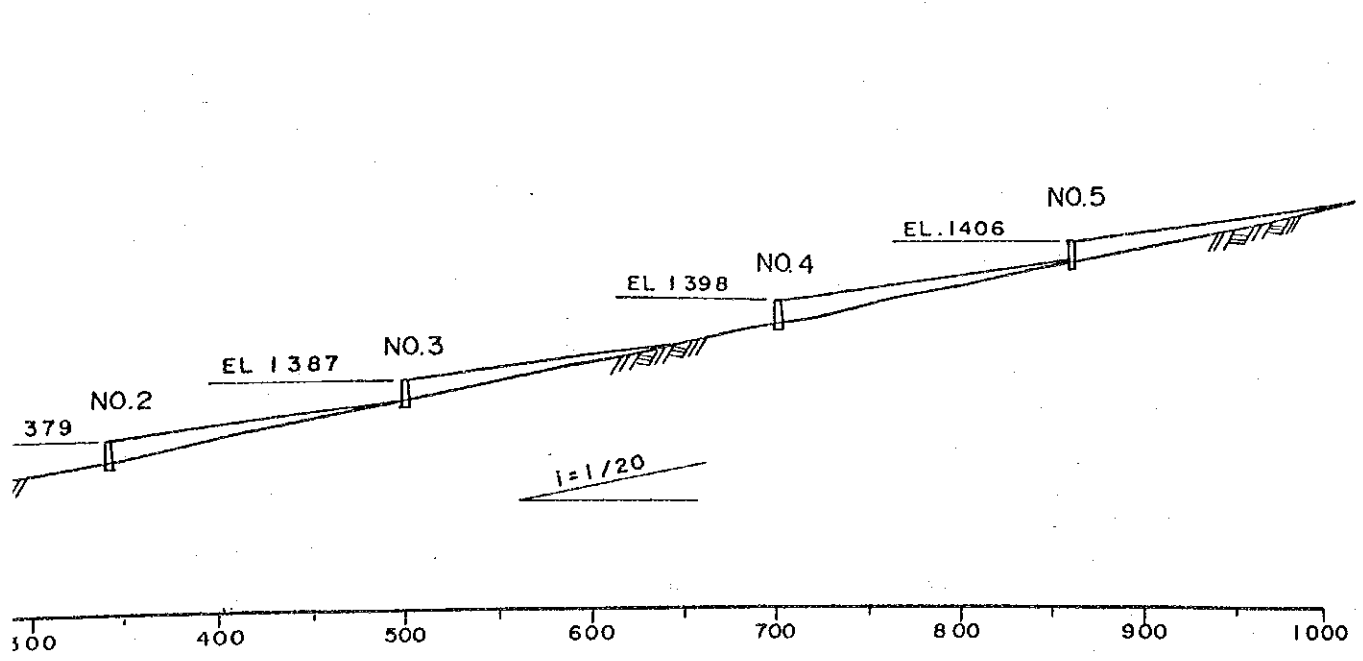
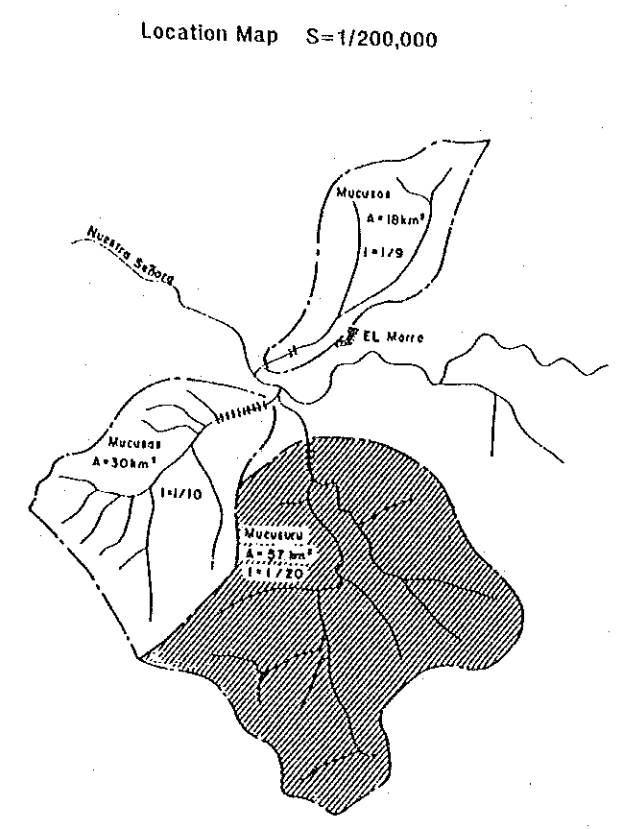
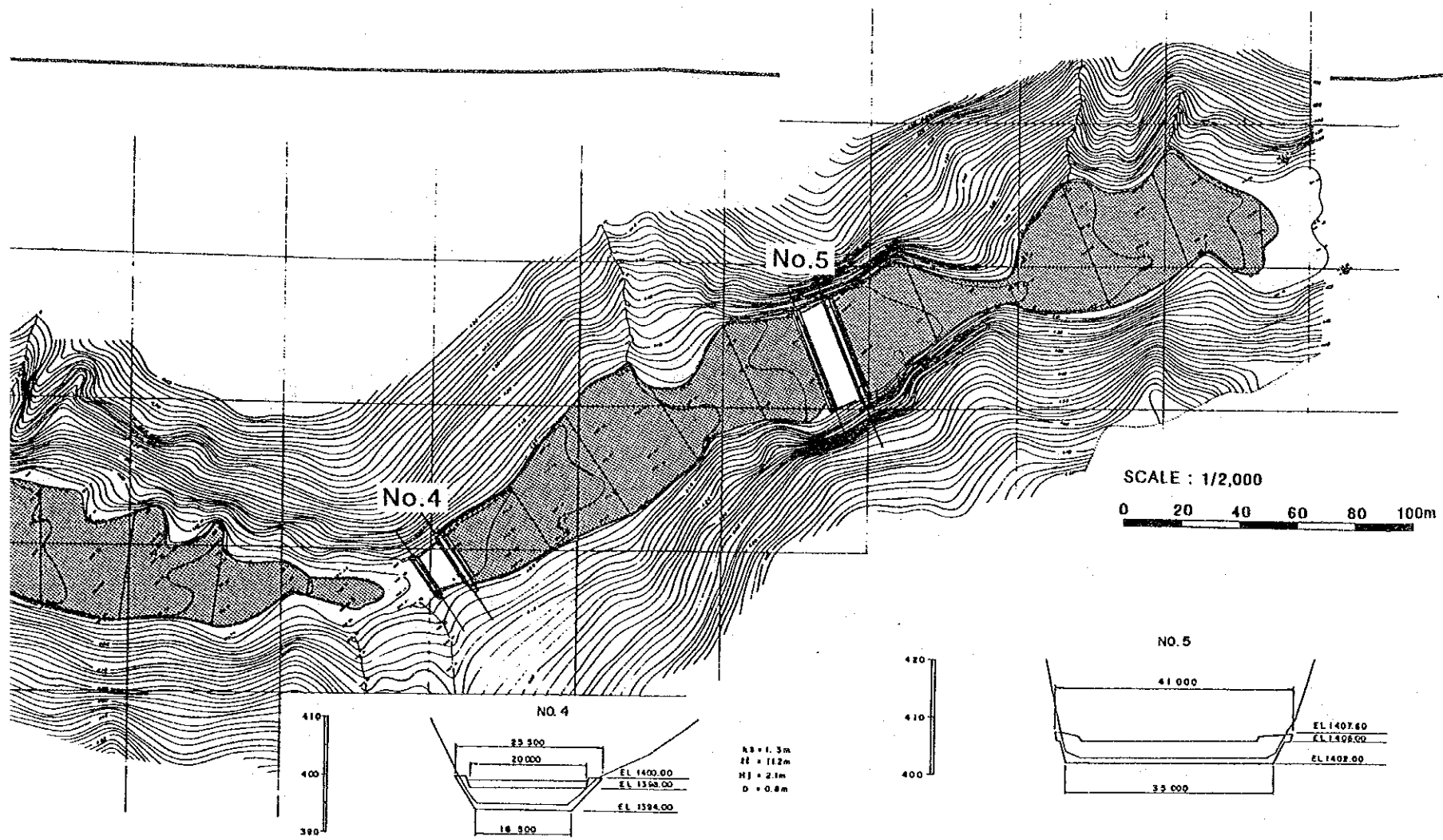


STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

図 6.1-6 ムクスos川低ダム群配置図

JAPAN INTERNATIONAL COOPERATION AGENCY





STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT  
JAPAN INTERNATIONAL COOPERATION AGENCY

図 6.1-7 ムクスル川低ダム群配置図



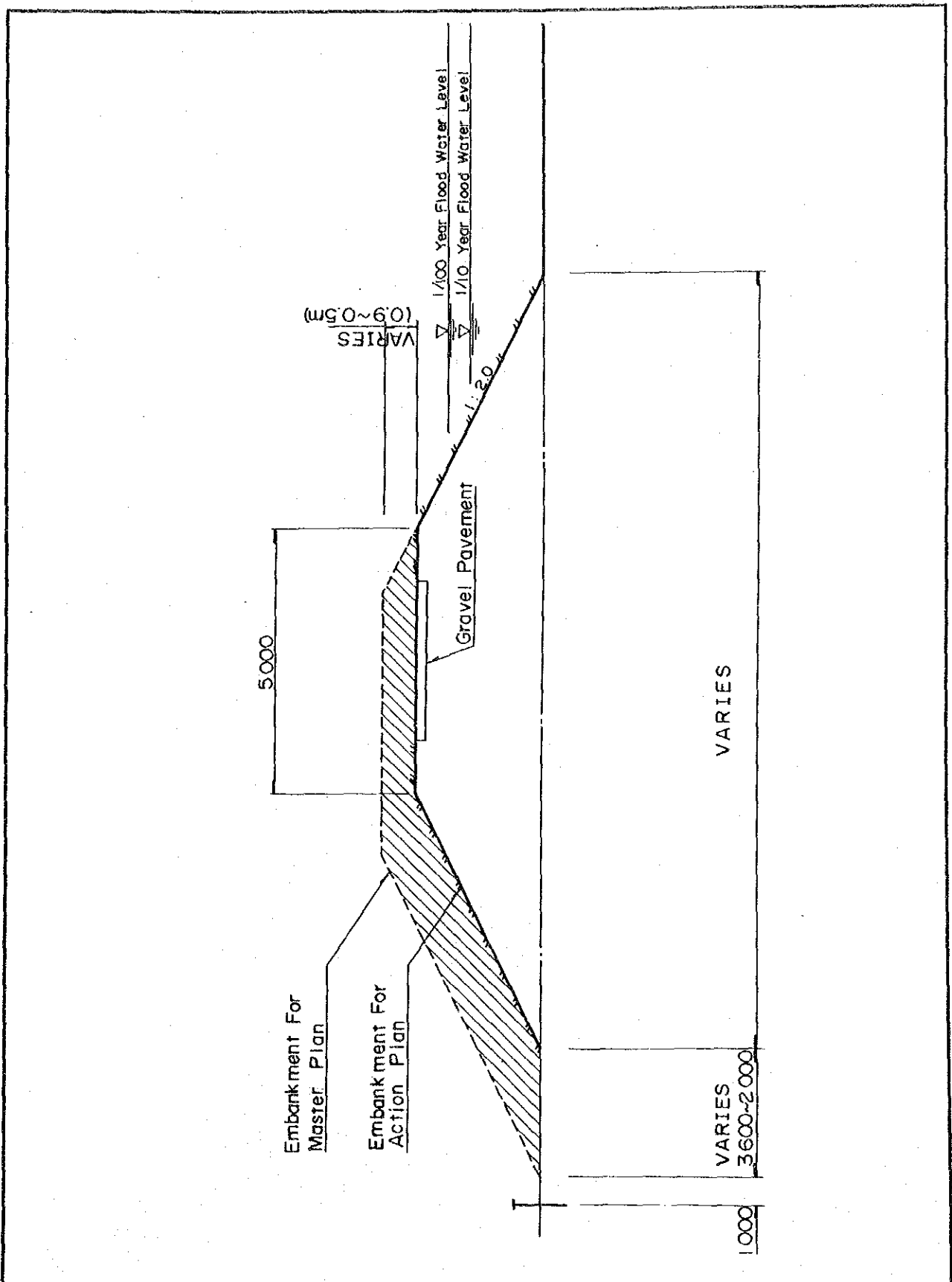


図6.1-8 アクションプラン堤防標準断面図

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



Description	Unit	Quantity	1st Year 1991	2nd Year 1992	3rd Year 1993	4th Year 1994	5th Year 1995	6th Year 1996	7th Year 1997	8th Year 1998	9th Year 1999	10th Year 2000
<b>PRE-CONSTRUCTION STAGE</b>												
<b>I Detailed Design</b>												
<b>II Tendering</b>												
<b>CONSTRUCTION STAGE</b>												
<b>I BASIN-WIDE PROJECT</b>												
<b>A Sediment Control Works</b>												
1. Preparatory Works	LS	1										
2. Sabo Dam	m <sup>3</sup>	62,500										
2.1 C-1 Sabo Dam	m <sup>3</sup>	14,600										
2.2 C-5 Sabo Dam	m <sup>3</sup>	65,000				(C-1)		(C-5)			(N-1)	
2.3 N-1 Sabo Dam												
3. Continuous Low Dam	No.	10				(Mucusas)		(Mucusuru)				
3.1 Mucusas	No.	5										
3.2 Mucusuru	No.	3								(227 nos.)	(Mucusos)	
3.3 Mucusos	No.	340				(113 nos.)						
4. Retaining Wall	No.											
<b>B Flood Control Works</b>												
1. Preparatory Works	LS	1										
2. Land Clearing	ha	674										
3. Dike Embankment	m <sup>3</sup>	745,000				(Sec 1)	(Sec 5)	(Sec 2)	(Sec 3)			(Sec 4)
4. Sod Facing	ha	28				(Sec 1)	(Sec 5)	(Sec 2)	(Sec 3)			(Sec 4)
5. Revetment	m	10,300				(Sec 1)	(Sec 5)	(Sec 2)	(Sec 3)			(Sec 4)
6. Groin	No.	325					(Groin)					
7. Groundsill	No.	1				(Groundsill)						
<b>II LOCAL PROJECT</b>												
<b>A Sediment Control Works</b>												
1. Preparatory Works	LS	1										
2. Retaining Wall	No.	750										
3. Check Dam	m	88										
4. Revetment	m	720										
<b>B Flood Control Works</b>												
1. Albarregas River	m <sup>3</sup>	660										
2. Milla River	LS	1										
3. Portuguese River	m <sup>3</sup>	4,500										

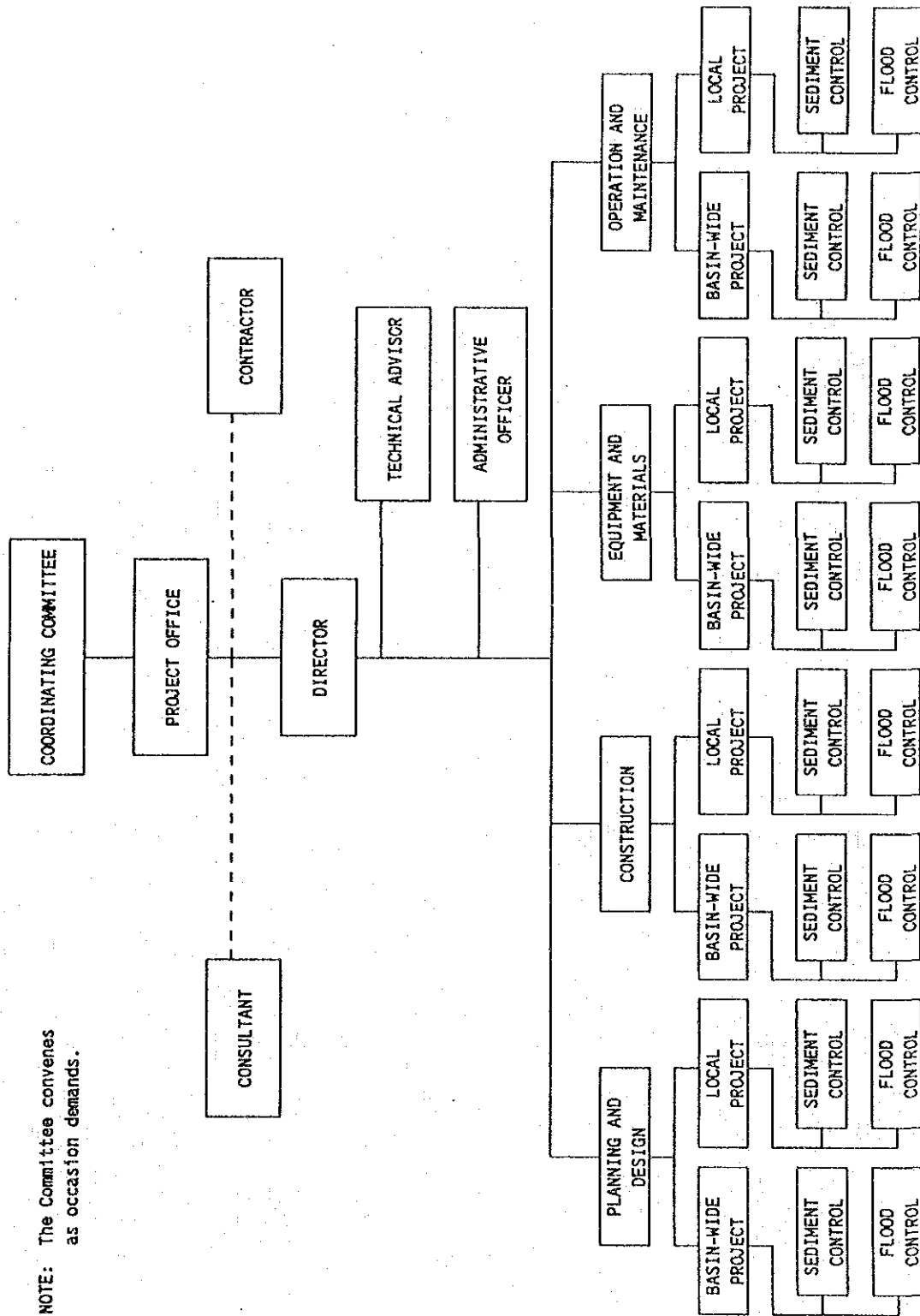
図6.3-1 アクションプラン施工計画図

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY







NOTE: The Committee convenes as occasion demands.

図 6.5-1 プロジェクト事務所組織図 (ケース-1)

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



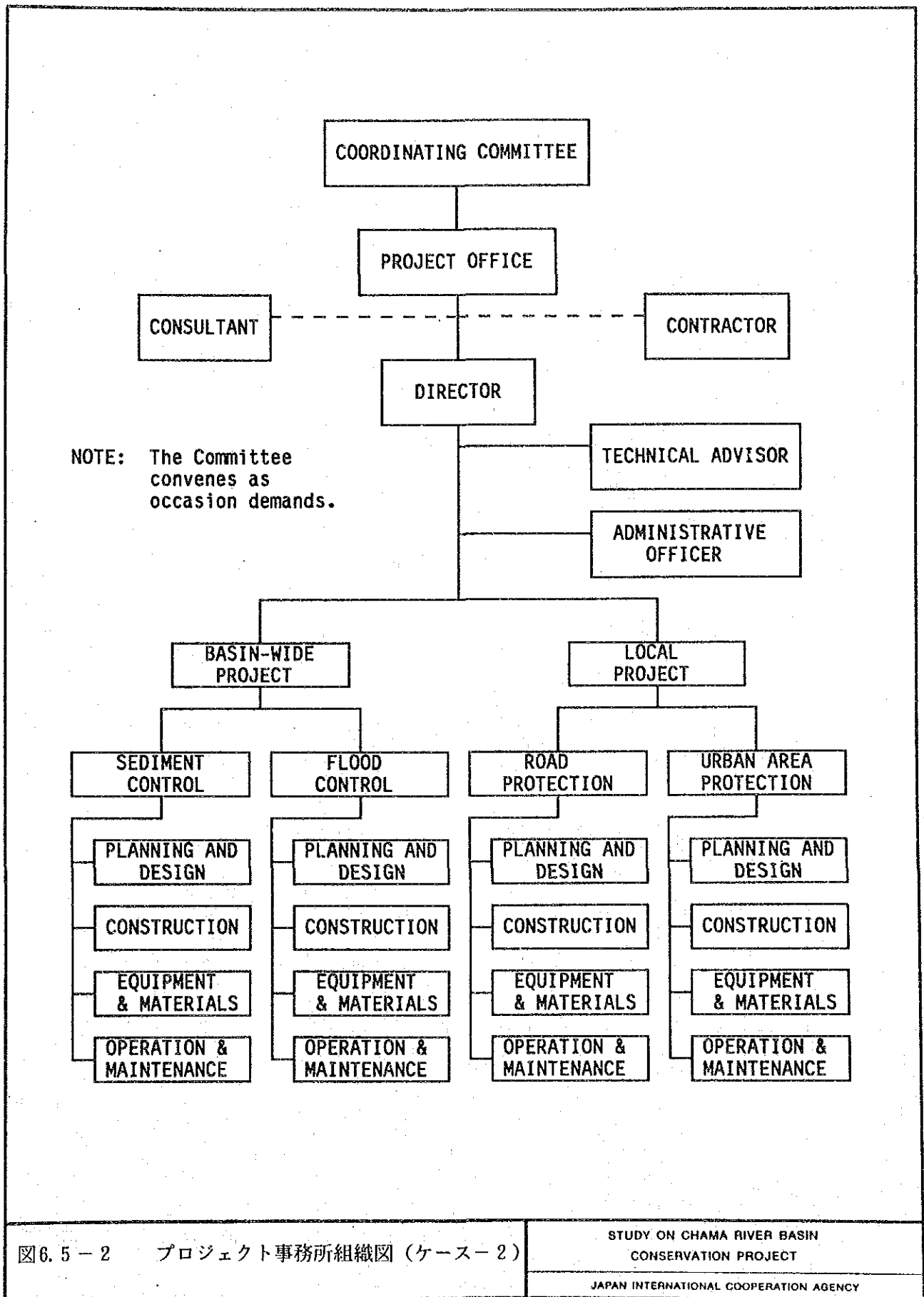


図6.5-2 プロジェクト事務所組織図 (ケース-2)

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



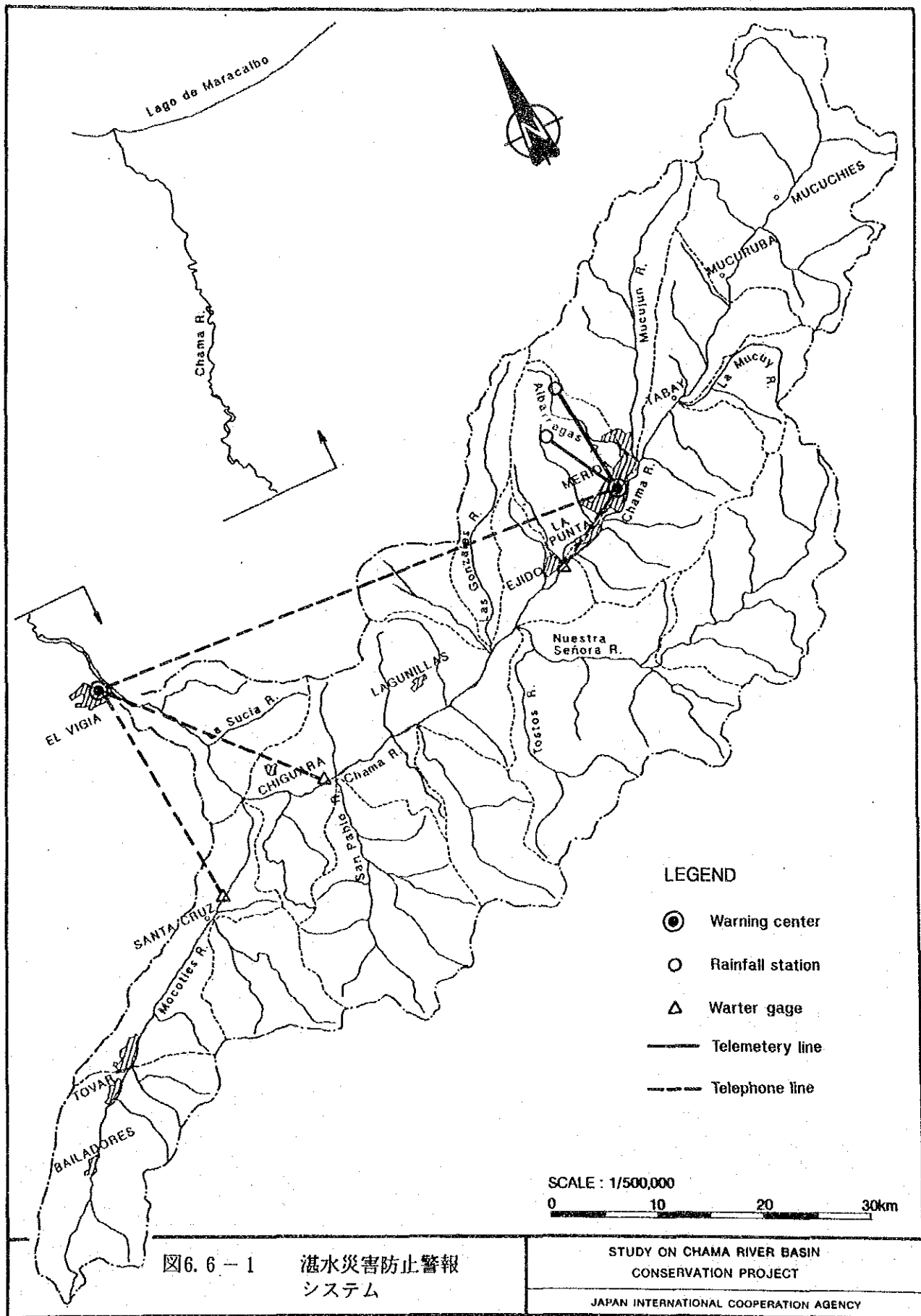


図6.6-1 洪水災害防止警報システム

STUDY ON CHAMA RIVER BASIN  
 CONSERVATION PROJECT  
 JAPAN INTERNATIONAL COOPERATION AGENCY



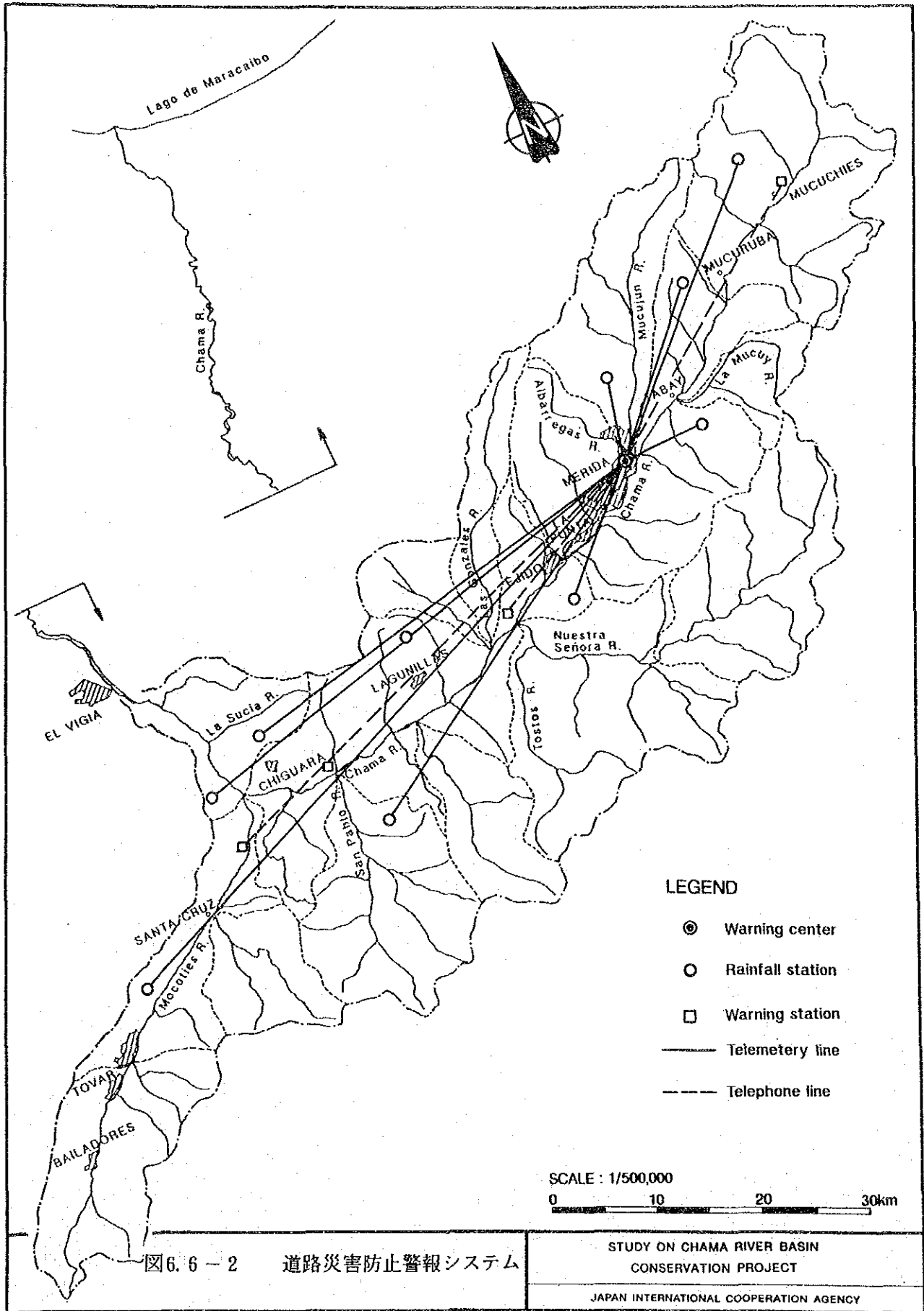


図6.6-2 道路災害防止警報システム

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

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## 添付資料

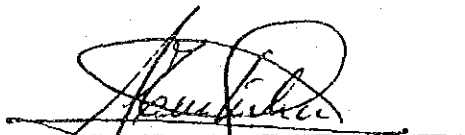


ANNEX 1. COPIES OF MINUTES OF MEETINGS

1. Minutes of Meeting on the Inception Report, December 13, 1988
2. Minutes of Meeting on the Progress Report I, January 30, 1989
3. Minutes of Meeting on the Activity Report, March 9, 1989
4. Minutes of Meeting on the Interim Report, June 20, 1989
5. Minutes of Meeting on the Comments on the Interim Report,  
July 4, 1989
6. Minutes of Meeting on the Progress Report (II), September 6, 1989

MINUTES OF MEETING  
ON  
THE INCEPTION REPORT  
FOR  
STUDY ON CHAMA RIVER BASIN CONSERVATION PROJECT  
IN  
THE REPUBLIC OF VENEZUELA

CARACAS, December 13, 1988



Ing. Salvatore Turtulici  
Director de Manejo de Cuencas  
for Director General de  
Infraestructura,  
Ministerio del Ambiente  
y de los Recursos Naturales



Mr. Mitsuo Nakahiro  
Leader of the Team,  
Study on Chama River Basin  
Conservation Project,  
Japan International  
Cooperation Agency

witnessed by



Mr. Youichi Takeuchi  
Leader of the Advisory  
Committee, Study on Chama  
River Basin Conservation  
Project

The JICA Team headed by Mr. Mitsuo Nakahiro commenced the study on Chama River Basin Conservation Project on November 22, 1988, and the Advisory Committee headed by Mr. Youichi Takeuchi visited Venezuela on December 5, 1988. A meeting between the Ministerio del Ambiente y de los Recursos Naturales Renovables, hereinafter referred to as "MARNR", and the JICA Study Team, hereinafter referred to as "the Team", was held on December 12, 1988, in the presence of the Advisory Committee. Presentation of the contents of the Inception Report was carried out in this meeting, and the following are confirmed by and between MARNR and the Team.

1. The Team submitted twenty (20) copies of the Inception Report to MARNR.

2. All the contents of the Inception Report have been in principle understood and accepted by MARNR with discussion on the following items:

#### 2.1 Aerial Photographing of the Chama River Basin

The existing aerophotos of the Chama River basin, taken in 1987, cover about only 35% of the whole basin, and thus aerophoto taking for the remaining part is required for the study. According to the Minutes of Meeting dated June 28, 1988 between MARNR and the Japanese Side, some parts of these expenses are to be covered by MARNR. However, MARNR is unable to conduct aerial photographing due to no available equipment, and the conceivable alternative is only to enter into a contract with a private company. It is also impossible to earmark a new budget for this work. In this connection, MARNR requested the Japanese Side to cover all the expenses for this photographing.

#### 2.2 Staffing Schedule

The Team will submit the detailed staffing schedule of the Team members, and MARNR will make accordingly due arrangement of the counterpart personnel.


#### 2.3 Technical Training in Japan

The Japanese Side confirmed that one (1) of the counterpart personnel will be accepted for the technical training in Japan in the fiscal year of 1989. MARNR requested the Japanese Side to accept another two (2) trainees.



#### 2.4 Equipment Provided by JICA for the Study

The equipment provided by JICA for this study, listed in Table 3. of the Inception Report, shall be used exclusively for the Study. MARNR requested the Japanese Side to grant those equipment upon completion of the Study to continue a further study.



LIST OF ATTENDANTS

1. Venezuelan (MARNR) Side:

Ing. Salvatore Turtulici	Director de Manejo de Cuencas
Ing. Alfredo Montauti	Director de Estudios y Proyectos
Ing. Miguel H. Cano	Director de Cartografia Nacional
Ing. Ramon Sanchez	Jefe de Division de Conservacion de Cuencas
Ing. Aurelio Trujillo Sarco	Division de Conservacion de Cuencas
Ing. Gilbert Escalante	Coordinador Tecunico, Proyecto Chama, Manejo de Cuencas
Ing. Luis Carbonell	Direccion de Recursos Hidraulicos
Ing. Eduardo Martinec	Direccion de Estudio y Proyectos
Ing. Celina Maros	Direccion de Estudio y Proyectos
Lic. America Cabrera	Asistente Division de Protocol
Ing. Shigeo Horiuchi	Expert on Sabo Works, Direccion de Manejo de Cuencas

2. Study Team:


Ing. Mitsuo Nakahiro	Leader
Ing. Yoshiharu Matsumoto	Planning for Inundation Disaster Prevention
Ing. Kyoon Kim	Planning for Sediment Disaster Prevention
Ing. Keiji Sasabe	Hydrology
Ing. Minoru Ohuchi	Sediment Hydraulics
Ing. Hitoshi Ichihara	Analysis for Disaster
Ing. Atsutoshi Sakata	Geology and Geomorphology
Ing. Kimio Shimomura	Economic and Financial Analysis

3. Advisory Committee:

Ing. Youichi Takeuchi	Leader
Ing. Noriyuki Minami	Sabo Planning
Ing. Takeshi Nakano	Coordinator (Japan International Cooperation Agency)

4. Japanese Embassy:

Sr. Junichi Hatano	First Secretary
Sr. Naomasa Hiraishi	Attache





MINUTES OF MEETING

ON

THE PROGRESS REPORT I

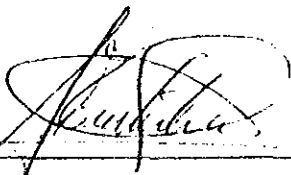
FOR

STUDY ON CHAMA RIVER BASIN CONSERVATION PROJECT

IN


THE REPUBLIC OF VENEZUELA

CARACAS, January 30, 1989



---

Ing. Salvatore Turtulici  
Director de Manejo de Cuencas  
for Director General de  
Infraestructura, Ministerio  
del Ambiente y de los Recursos  
Naturales Renovables



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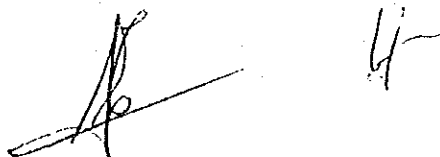
Mr. Yoshiharu Matsumoto  
Asst. Team Leader  
for Leader of the Team,  
Study on Chama River  
Basin Conservation  
Project,  
Japan International  
Cooperation Agency

The JICA Study Team headed by Mr. Mitsuo Nakahiro has completed its works of the former half period in Venezuela, in accordance with the study schedule specified in the Inception Report. The works were composed of field reconnaissance, data collection, preliminary analysis and some other arrangements/coordination for the topographic survey, air photographing and installation of hydrological equipment. As the results of the works, the Progress Report I was compiled and 20 copies of the report were submitted to the Ministerio del Ambiente y de los Recursos Naturales Renovables (hereinafter called "MARNR"). A meeting to discuss and confirm the results was held between MARNR and the JICA Study Team on January 27, 1989. The contents of the Progress Report I were presented in this meeting, and in principle all the contents were understood and accepted by MARNR.

In this meeting, the following were requested by MARNR:

- (1) Pilot areas to accumulate data of sediment movements and runoff conditions in the Chama River Basin will be recommended by the JICA Study Team.
- (2) A micro computer will be introduced to establish the data bank of watershed management.

In response to the request, the JICA Study Team confirmed that the above-said will be conveyed to Japanese Side.



LIST OF ATTENDANTS

1. Venezuelan (MARNR) Side:

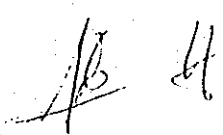
Ing. Salvatore Turtulici	Director de Manejo de Cuencas
Ing. Alfredo Montauti	Director de Estudios y Proyectos
Ing. Ramón Sanchez	Jefe de División de Conservación de Cuencas, Manejo de Cuencas
Ing. Gilbert Escalante	Coordinador Técnico, Proyecto Chama, Manejo de Cuencas
Ing. Miguel Palop	Dirección de Estudio y Proyectos
Ing. Eliana Amengual C.	Proyectos Hidráulicos
Ing. Shigeo Horiuchi	Expert on Sabo Works, Dirección de Manejo de Cuencas

2. Study Team

Ing. Yoshiharu Matsumoto	Planning for Inundation Disaster Prevention
Ing. Kyoon Kim	Planning for Sediment Disaster Prevention
Ing. Minoru Ohuchi	Sediment Hydraulics
Ing. Hitoshi Ichihara	Analysis for Disaster
Ing. Namio Ohyama	Afforestation Planner


3. Japanese Embassy

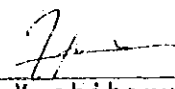
Sr. Naomasa Hiraishi	Attache
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MINUTES OF MEETING  
OF  
THE ACTIVITY REPORT  
FOR  
STUDY ON CHAMA RIVER BASIN CONSERVATION PROJECT  
IN  
THE REPUBLIC OF VENEZUELA

CARACAS; March 9, 1989.

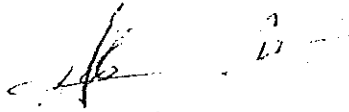
  
Ing. Salvatore Turtulici  
Director de Manejo de Cuencas  
for Director General de  
Infraestructura, Ministerio  
del Ambiente y de los Recursos  
Naturales Renovables

  
Mr. Yoshiharu Matsumoto  
Asst. Team Leader  
for Leader of the Team,  
Study on Chama River  
Basin Conservation  
Project,  
Japan International  
Cooperation Agency

The JICA Study Team has completed its works in Venezuela during a period from November 22, 1988 to March 10, 1989 in accordance with the study schedule specified in the Inception Report. The works were composed of field reconnaissance, data collection, - preliminary analyses and some other arrangement/coordination for the topographic survey, aerophotographing and installation of - hydrological equipment. On the occasion of termination of the works in Venezuela, a meeting to discuss of the activity of the Team was held between the Ministerio del Ambiente y de los Recursos Naturales Renovables (hereinafter called "MARNR") on - March 8, 1989 with submission of Activity Report which includes the activity of the Team and basic principles for formulation of Master Plan.

The contents of the Activity Report were in principle understood and accepted by MARNR.

In this meeting, the Team explained the progress of aerophotographing which has not been completed in this study period due to unexpected weather condition and political situation.

Handwritten signature and initials, possibly "A. G." and "D.", in dark ink.

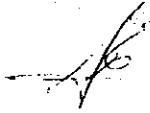
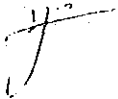
LIST OF ATTENDANTS

1. VENEZUELAN ( MARNR ) SIDE

Ing. Salvatore Turtulici	Director de Manejo de Cuencas
Lic. Miguel H. Cano	Director de Cartografia Nacional
Ing. Cesar Flores	Coordinador de la Secretaria Técnica de la Comisión Nacional de Ordenación del Territorio
Ing. Gilbert Escalante	Coordinador Técnico, Proyecto Chama, Dirección de Manejo de Cuencas
Ing. Aurelio Trusillo Sarco	Dirección de Manejo de Cuencas
Lic. Soler Rodriguez	Jefe de División de Sensores Remotos
Ing. Shigeo Horiuchi	Expert en Sabo Works, Dirección de Manejo de Cuencas

2. STUDY TEAM

Ing. Yoshiharu Matsumoto	Planning for Inundation Disaster Prevention
Ing. Akio Shichijugari	Structure Design
Ing. Hidekazu Konishi	Construction Plan/Cost Estimate

MINUTES OF MEETING

ON

THE INTERIM REPORT

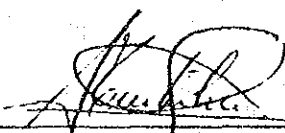
FOR

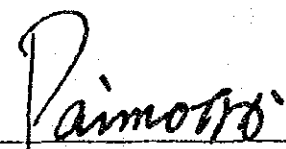
STUDY ON CHAMA RIVER BASIN CONSERVATION PROJECT

IN

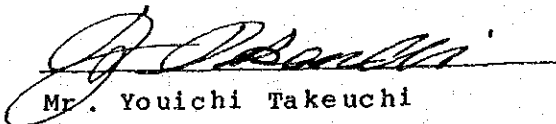
THE REPUBLIC OF VENEZUELA

CARACAS, JUNE 20, 1989

  
\_\_\_\_\_  
Ing. Salvatore Turtulici  
Director de Manejo de Cuencas  
Por Director General de  
Infraestructura,  
Ministerio del Ambiente  
y de los Recursos Naturales  
Renovables

  
\_\_\_\_\_  
Mr. Mitsuo Nakahiro  
Leader of the Team,  
Study on Chama River Basin  
Conservation Project,  
Japan International  
Cooperation Agency

witnessed by

  
\_\_\_\_\_  
Mr. Youichi Takeuchi  
Chairman of the Advisory  
Committee, Study on Chama  
River Basin Conservation

The JICA Survey Team headed by Mr. Mitsuo Nakahiro (hereinafter called "the Team") has formulated the master plan of the Chama River Basin Conservation Project and compiled it into the Interim Report. The Team will thereafter conduct the feasibility study on the action plan for the urgent project which was selected to be firstly implemented among the several components of the master plan.

A meeting between the Ministerio del Ambiente y de los Recursos Naturales Renovables, (hereinafter called MARNR) and the Team was held on June 20, 1989 in the presence of the Advisory Committee headed by Mr. Youchi Takeuchi who visited in Venezuela on June 18, 1989.

In the meeting the contents of the said master plan were explained and the urgent project areas were recommended for the feasibility study by the Team. The feature of master plan and the selected urgent project were preliminarily accepted by MARNR. Although additional comments if any on the Interim Report will be given by MARNR by July 3rd, 1989, the followings were confirmed by and between MARNR and the Team.

- 1.- The internal rate of return of the master plan which was estimated on the basis of the existing assets will be re-estimated on account of the most possible expansion/increase of assets.
- 2.- In consideration of the budgetary constraint of the Venezuelan Government in the recent years, the available fund for the implementation of the project, which was estimated in the study, shall be refined by updating the actual expenditure.

In addition, to find out the possibility of application to some international funding institutions for the project financing, the past performance of the said institutions in Venezuela will be studied.



3.- As for the measures to control the disastrous sediment in the upper and middle areas of the basin, some non-structural measures which may not be included in the economic evaluation of the master plan will be further studied in consideration of their impacts on social condition of the area.

It is noted that the Team submitted twenty (20) copies of Interim Report to MARNR.



## LIST OF ATTENDANTS

### 1. - MARNR

Ing. Salvatore Turtulici	Director de Manejo de Cuencas
Ing. Claudio Caponi	Director de Hidrología y Metereología
Ing. Isaias Espejo	Jefe de División de Conservación de Cuencas
Ing. Rafael Rodriguez	División de Conservación de Cuencas
Ing. Dinoa Paiva	División de Conservación de Cuencas
Ing. Douglas Figueroa	División de Manejo de Cuencas
Ing. Aurelio Trujillo Sareo	División de Conservación de Cuencas
Ing. Alba Herrero	División de Conservación de Cuencas
Ing. Carola Pereira	División de Operación de Embalses
Ing. Luis E. Franceschi	División de Hidrología y Metereología
Ing. Rodolfo Roa	Dirección de Hidrología y Metereología
Ing. Shigeo Horiuchi	Expert on Sabo Works, Dirección de Manejo de Cuencas

### 2. - STUDY TEAM

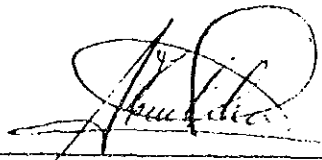
Ing. Mitsuo Nakahiro	Leader
Ing. Yoshiharu Matsumoto	Planning for Inundation Disaster Prevention
Ing. Kyoon Kim	Planning for Sediment Disaster Prevention
Ing. Keiji Sasabe	Hidrology
Ing. Minoru Ohuchi	Sediment Hydraulics
Ing. Atsutoshi Sakata	Geology and Geomorphology
Ing. Sin-ichi Kohno	Topography

### 3. - ADVISORY COMMITTEE

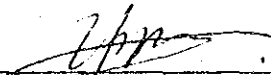
Ing. Youichi Takeuchi	Leader (Ministry of Construction)
Ing. Hiroshi Shimizu	River Planning (Ministry of Construction)

REMARKS ON THE INTERIM REPORT OF THE CHAMA PROJET

1. Unit prices (costs) appear to be very low and should be brought up to date (Check said cost with Direction of Construction and get its advise).
2. In the analysis of maintenance cost estimated seems to be unrealistic and should be reconsidered making new calculations.
3. The technical possibility of building earth dams (structures higher than 15m) should be assessed in view of their lower costs.
4. The <sup>down</sup>upstream effect of the proposed dams, on river water dynamics, should be examined.
5. State order of priorities for building proposed works at upstream and downstream sites. Explain criteria.
6. Taking into consideration local (Venezuelan) construction practice and experience in the use of certain hydraulic works design and materials, consider the possibility for simplifying dyke dams design.
7. Assign special consideration (and importance) in the Master Plan to the Mocoities River influence on the main drainage way (Chama). This will facilitate judging the technical soundness of our approach to the problem (The Ministerio's ideas and plans for the sector).
8. Location sites of all torrent control structures (dykes and other should be shown on the maps.



Ing. Salvatore Turtulici  
Director de Manejo de Cuencas  
Por Director General de  
Infraestructura  
Ministerio del Ambiente y  
de los Recursos Naturales  
Renovables



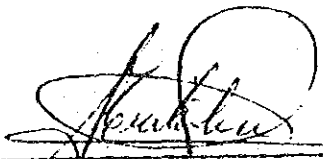
Ing. Yqshikharu Matsumoto  
Sub-Leader of the Team,  
Study on Chama River Basin  
Conservation Project,  
Japan International  
Cooperation Agency

Caracas 3<sup>rd</sup> july 1989

PS. The above are remarks the additional to the ones made earlier

MINUTES OF MEETING  
ON  
THE COMMENTS ON THE INTERIM REPORT  
FOR  
STUDY ON CHAMA RIVER BASIN CONSERVATION PROJECT  
IN  
THE REPUBLIC ON VENEZUELA

Caracas, July 4, 1989



Ing. Salvatore Turtulici  
Director de Manejo de Cuencas  
Por Director General de  
Infraestructura,  
Ministerio del Ambiente  
y de los Recursos Naturales  
Renovables



Mr. Yoshiharu Matsumoto  
Assistant Leader of the Team  
Study on Chama River Basin  
Conservation Project,  
Japan International  
Cooperation Agency

A meeting between the Ministerio del Ambiente y de los Recursos Naturales Renovables (hereinafter referred to as "MARNR") and the JICA Study Team (hereinafter referred to as "The Team") was held on June 20, 1989 to explain and exchange the opinions on the Interim Report of the Study on the Chama River Basin Conservation Project.

Additional comments on the said report was presented to the Team on July 3, 1989. A meeting was held on the same day with attendance listed in the attached sheet to discuss them, and the following were confirmed by and between MARNR and the Team.

Comment 1. Unit prices (costs) appear to be very low and should be brought up to date (check said cost with Direction of Construction and get its advice).

The price level applied to the study is February 1989, the time before tremendous price escalation took place, and this is the reason why the unit prices seem to be very low. It is not appropriate to change the price level or to up-date the prices, because the prices in the recent months are excessively unstable. In this connexion, there is no need to up-date the price level for this study. However, the differences or escalation of prices between the said price level and the present time will be identified in the future study.

Comment 2. In the analysis of maintenance cost estimated seems to be unrealistic and should be reconsidered making new calculations.

The Team estimated the maintenance cost at the possible minimum rate (0.1 %) of the construction investment, considering the nature of project and other examples in the past, but this cost will be re-examined as suggested.

Comment 3. The technical possibility of building earth dams (structures higher than 15 m) should be assessed in view of their lower costs.

Technical feasibility and economic viability of building earth dams will be assessed in the study of Action Plan in comparison with concrete ones.

Comment 4. The downstream effect of the proposed dams, on river water dynamics, should be examined.

The proposed dams in the upper stream are able to stabilize the riverbed in the downstream, so that the flow capacity can be remained constant even if the dikes are not raised up. In other words, dams are proposed in the upper streams in order to stabilize the riverbed in the downstream. Through this explanation, the downstream effect of the proposed dams has been understood.

Comment 5. State order of priorities for building proposed works at upstream and downstream sites. Explain criteria.

The criteria discussed in Sub-section 5.3.2. "Prioritization of Project Components" of the Interim Report were explained and understood well.

Comment 6. Taking into consideration local (Venezuela) construction practice and experience in the use of certain hydraulic works design and materials, consider the possibility for simplifying dyke design.

In designing structure in the Master Plan, it may be appropriate to put emphasis on the technical aspects, though it is a little bit apart from the prevailing practices, because it will be possibly a good example in the future in designing the same kind of structure. In the Action Plan, however, the design may be simplified on the more practical basis, considering the difficulties in procuring materials and skills in recent years.

Comment 7. Assign special consideration (and importance) in the Master Plan to the Mocoties River influence on the main drainage way (Chama). This will facilitate judging the technical soundness of our approach to the problem (The Ministerio's ideas and plans for the sector).

Consideration has been given to the Mocoties River as well in the Master Plan, but to avoid misunderstanding, the location map of structure sites will be presented in the easier understanding manner.

Comment 8. Location sites of all torrent control structures (dykes and other) should be shown on the maps

The location of sites for all the torrent control structures proposed in the Master Plan will be presented on a map in details.

In addition to the above, discussion was made on the available fund for the project implementation, which was one of the main topics in the meeting held on June 20, 1989. The contents of this connection in the Interim Report have been understood through the detailed explanation, and the following were mutually agreed and confirmed.

- (1) MARNR will exert efforts to furnish more detailed budgetary information to the Team.
- (2) As for the ratio of the amount to be possibly invested to this project in relation to the total possible public investment (70% in the Interim Report), its description will be made in the Master Plan and Action Plan in such a manner that 70% of the total amount of public investment will be required, if the project is put into implementation only by the MARNR's budget.

(3) Another financial source such as loans from international financing agencies will be sought as the alternative, and a study will be made in the Master Plan and Action Plan on the assumption that 50% of the total investment is covered by such loans.

Further in addition, the Team were informed that there were some comments on the hydrological aspects and others. It was agreed to discuss these comments between the MARNR'S engineers in charge and the Team.



LIST OF ATTENDANCE

1) MARNR

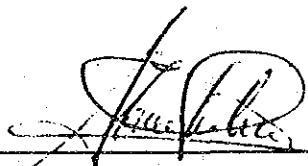
Ing. Salvatore Turtulici	Director de Manejo de Cuencas.
Ing. Eduardo Martines	Asesor, Dirección de Estudios de Proyectos
Ing. Douglas Figueroa	Asesor, Dirección de Manejo de Cuencas
Ing. Luis Mejia	Asesor, Dirección de Estudios de Proyectos

2) The Team

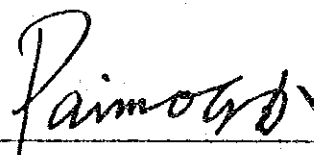
Ing. Yoshiharu Matsumoto	Assistant Team Leader (Flood Disaster Prevention Engr.)
Ing. Kyoon Kim	Sediment Disaster Prevention Engr.
Lic. Kimio Shimomura	Project Economist/Financial Analyst

MINUTES OF MEETING  
ON  
THE PROGRESS REPORT (II)  
FOR  
STUDY ON CHAMA RIVER BASIN CONSERVATION PROJECT  
IN  
THE REPUBLIC OF VENEZUELA

Caracas, September 6, 1989



Ing. Salvatore Turtulici  
Director de Manejo de Cuencas  
Por Director General de  
Infraestructura,  
Ministerio del Ambiente  
y de los Recursos Naturales  
Renovables



Mr. Mitsuo Nakahiro  
Leader of the Team  
Study on Chama River Basin  
Conservation Project,  
Japan International  
Cooperation Agency

The JICA Study Team headed by Mr. Mitsuo Nakahiro (hereinafter called "The Team") has conducted the second site study during a period of three months and compiled the study results into the Progress Report (2). The team will thereafter conduct the further study at home for formulation of the Action Plan of the Urgent Project as well as review of the Master Plan.

A meeting between the Ministerio del Ambiente y de los Recursos Naturales Renovables, (hereinafter called "MARNR") and the Team was held on September 6, 1989.

In the meeting the contents of the said report including the activity of the Team and the further findings for the study were explained and the following discussions were specified.

1) MARNR requested to describe the comments or procedure on the following items in the final report:

-The comments on the difference between the estimated flood discharge of this study and previous ones.

-The procedure to estimate the sediment volume deposited in the estuary.

-The comments on the future transition condition by sedimentation in the alluvial fan area in case that any counter measures to control sediment discharge would not be provided.

-The procedure for calculation of sediment discharge and flood run off discharge.



2) In response to the question on the effect of sabo dam, the team explained its regulation effect for sediment discharge and retaining effect for river bed and bank erosion and MARNR understood.

3) The principle for formulation of Action Plan was basically accepted by MARNR.

It is noted that the Team submitted twenty (20) copies of Progress Report (2) to MARNR.



LIST OF ATTENDANCE

1) MARNR

Ing. Salvatore Turtulici	Director de Manejo de Cuencas
Ing. Douglas Figueroa	División de Manejo de Cuencas
Ing. Luis A. Mejia M.	Asesor, Dirección de Estudios de Proyectos.
Ing. Miguel Palop	Asesor, Dirección de Construcción.
Ing. Manuel Matute P.	Dirección de Manejo de Cuencas
Ing. Eduardo Martinez	Asesor, Dirección de Estudios de Proyectos.
Ing. Jesus Bruzual	Jefe División Control Presas
Ing. Aurelio Trujillo Sarco	División de Conservación de Cuencas.
Ing. Rodolfo Roa	Dirección de Hidrologia y Meteorologia
Ing. Gilbert Escalante A.	Coordinator Proyecto Chama.
Ing. Shigeo Horiuchi	Expert on Sabo Works, Dirección de Manejo de Cuencas

2) STUDY TEAM

Ing. Mitsuo Nakahiro	Team Leader
Ing. Yoshiharu Matsumoto	Assistant Team Leader, Planning for Inundation Disaster Prevention.
Ing. Hidekazu Konishi	Planning for Construction and for Cost.
Ing. Hiroshi Shimizu	Structural Design.





JICA