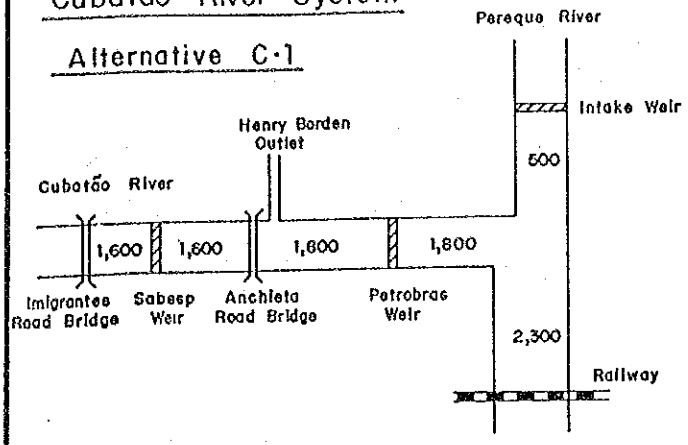
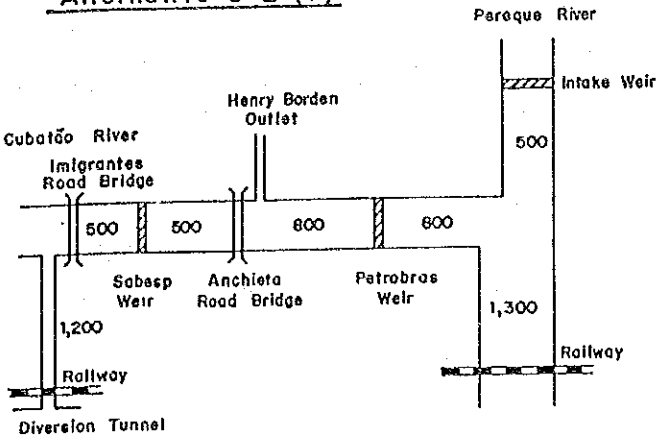
## Cubatão River System

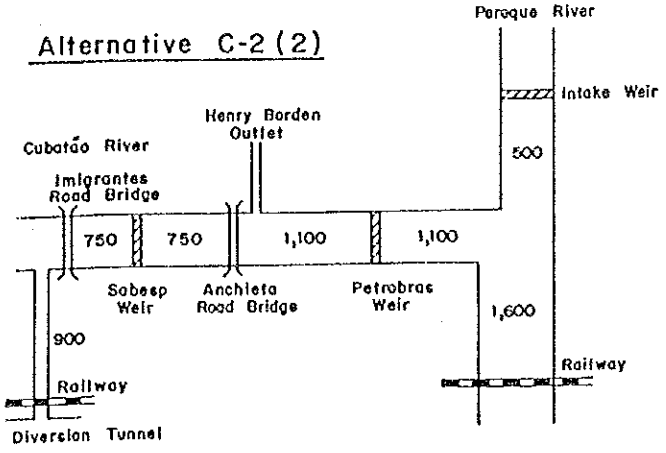
### Alternative C-1




### Alternative C-2 (1)



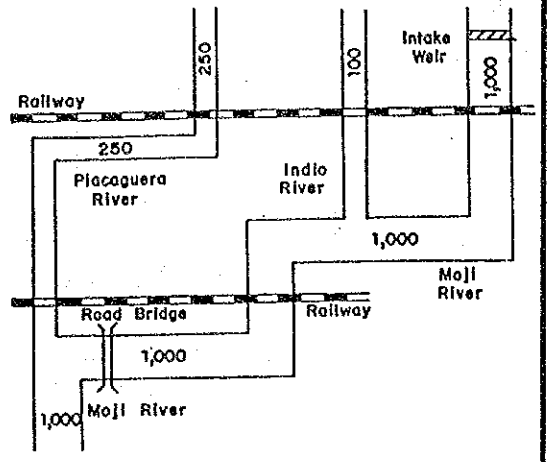

### Alternative C-2 (2)



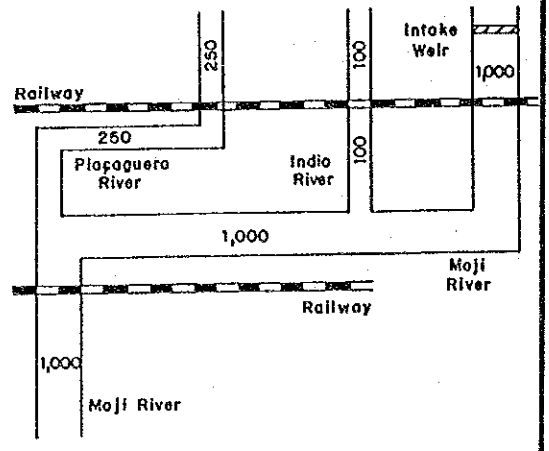

Note: Return Period of Design Flood
Cubatão River W = 1/50
Pereque River W = 1/25
Unit: $m^3/s$

## Moji River System

### Alternative M-1




### Alternative M-2




Note: Return Period of Design Flood
Moji River: W = 1/50
Piaçaguera River: W = 1/25
Indio River: W = 1/25
Unit = $m^3/s$

**FIG. 33**
**DESIGN DISCHARGE DISTRIBUTION OF ALTERNATIVE SCHEMES**

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

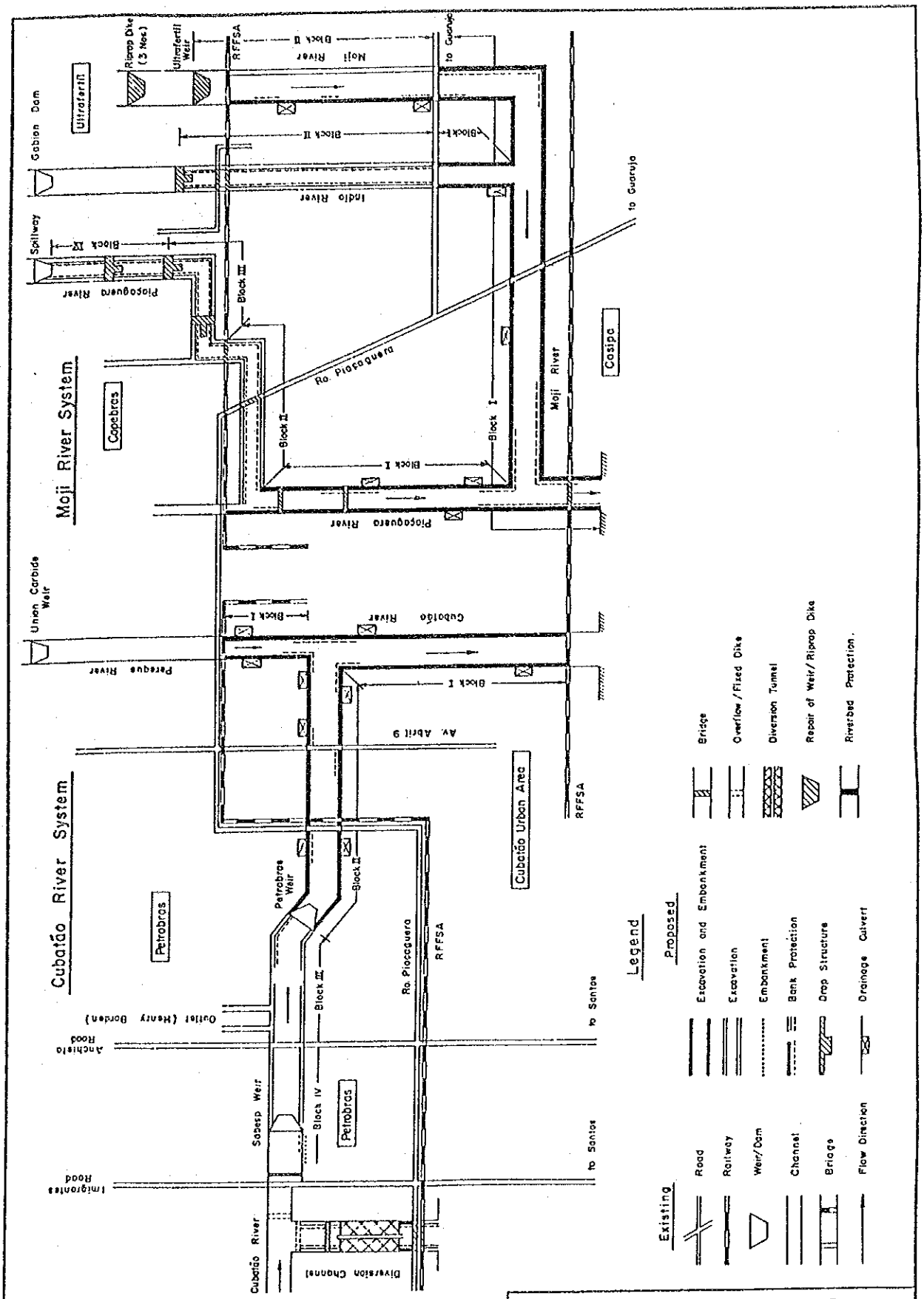
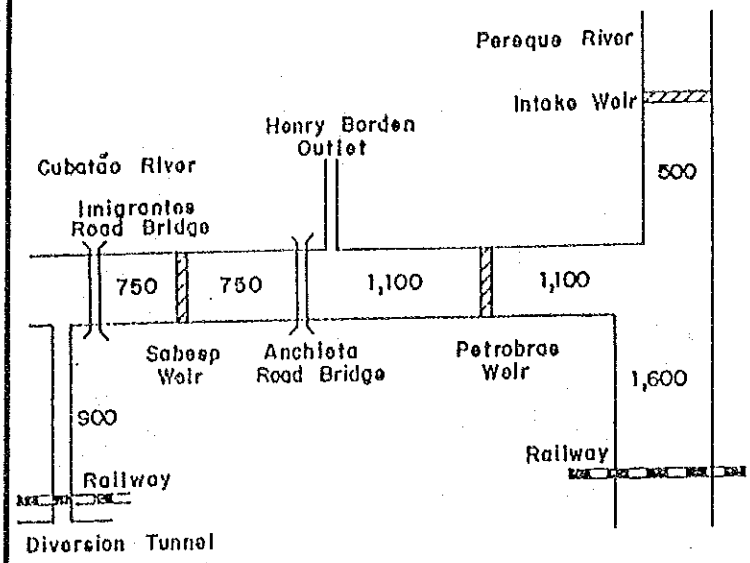



**FIG. 34**
**OUTLINE OF FLOOD DISASTER PREVENTION MASTER PLAN**

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

## Cubatão and Pereque Rivers



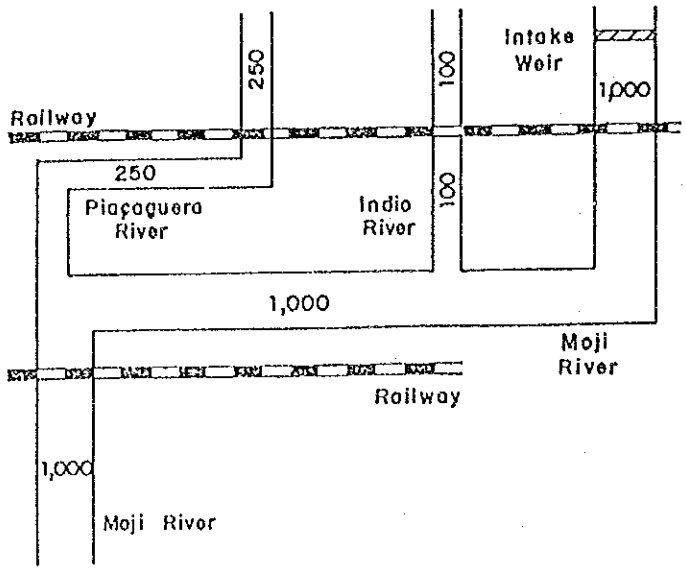

Probable Discharge

unit:m3/s

| Return Period | Cubatao: Before Pereque | Cubatao: River Mouth | Pereque |
|---|---|---|---|
| 1/100 | 1200 (2000) | 1800 (2600) | 700 |
| 1/ 50 | 1100 (1800) | 1600 (2300) | 600 |
| 1/ 25 | 1000 (1650) | 1400 (2000) | 500 |
| 1/ 10 | 900 (1300) | 1200 (1650) | 400 |
| 1/ 5 | 700 (1100) | 1000 (1350) | 350 |
| 1/ 2 | 500 (750) | 700 (950) | 250 |

Note: ( ) indicate discharge without tunnel

## Moji River and Their Tributaries




Probable Discharge

unit:m3/s

| Return Period | Moji: Ultrafertil Weir | Piacaguera | Indio |
|---|---|---|---|
| 1/100 | 1100 | 300 | - |
| 1/ 50 | 1000 | 280 | - |
| 1/ 25 | 800 | 250 | 100 |
| 1/ 10 | 600 | 200 | 60 |
| 1/ 5 | 500 | 150 | 50 |
| 1/ 2 | 300 | 100 | 30 |

Note: Return Period of Design Discharge
Cubatão and Moji Rivers : W = 1/50
Pereque, Piaçaguera and Indio Rivers : W = 1/25
Unit = $m^3/s$

FIG. 35
DESIGN DISCHARGE DISTRIBUTION OF MASTER PLAN

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

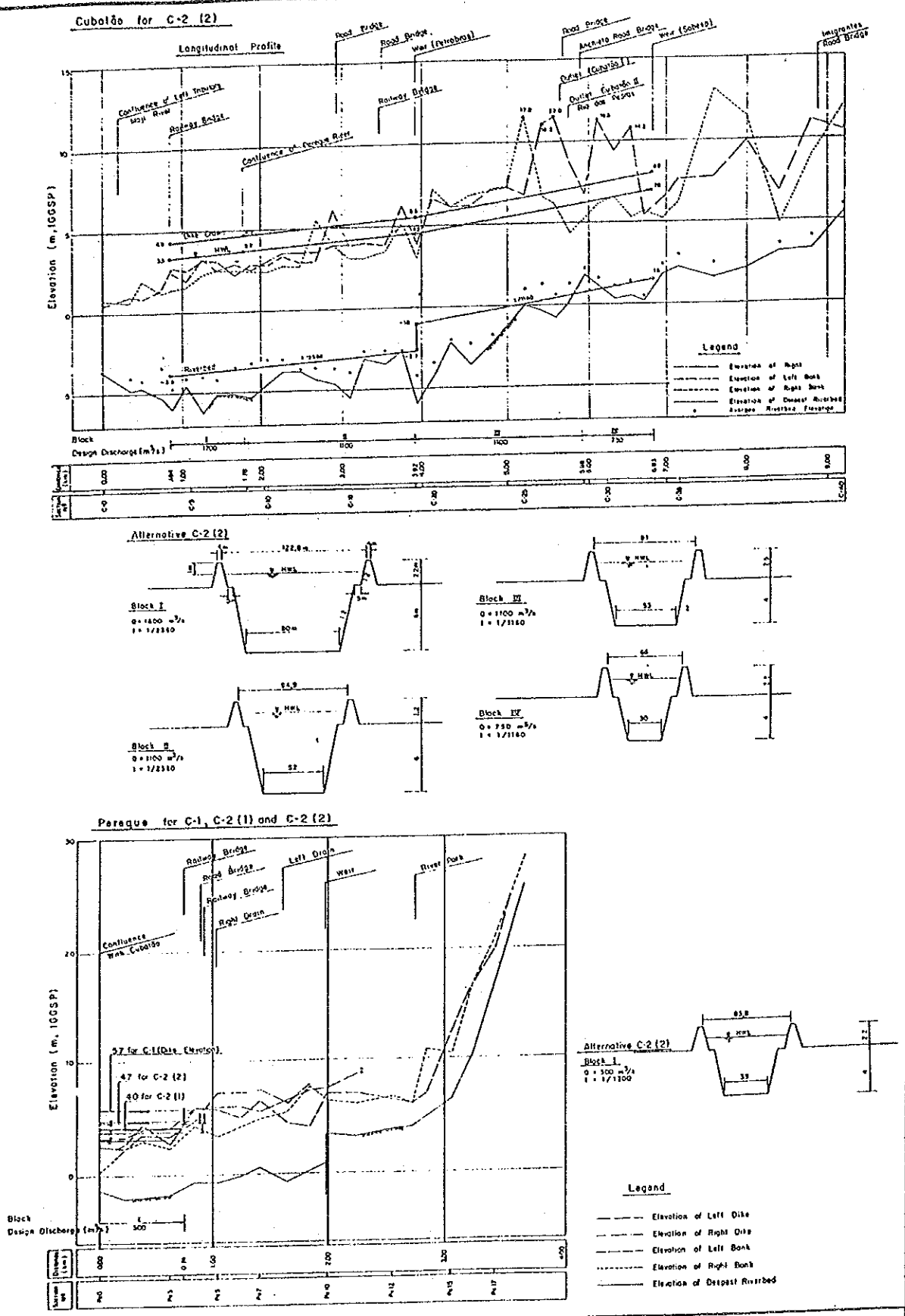



FIG. 36
PROPOSED LONGITUDINAL PROFILE
AND CROSS SECTIONS
OF CUBATÃO RIVER

GOVERNMENT OF FEDERATIVE
REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND
RESTORATION PROJECT IN SERRA DO MAR,
CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

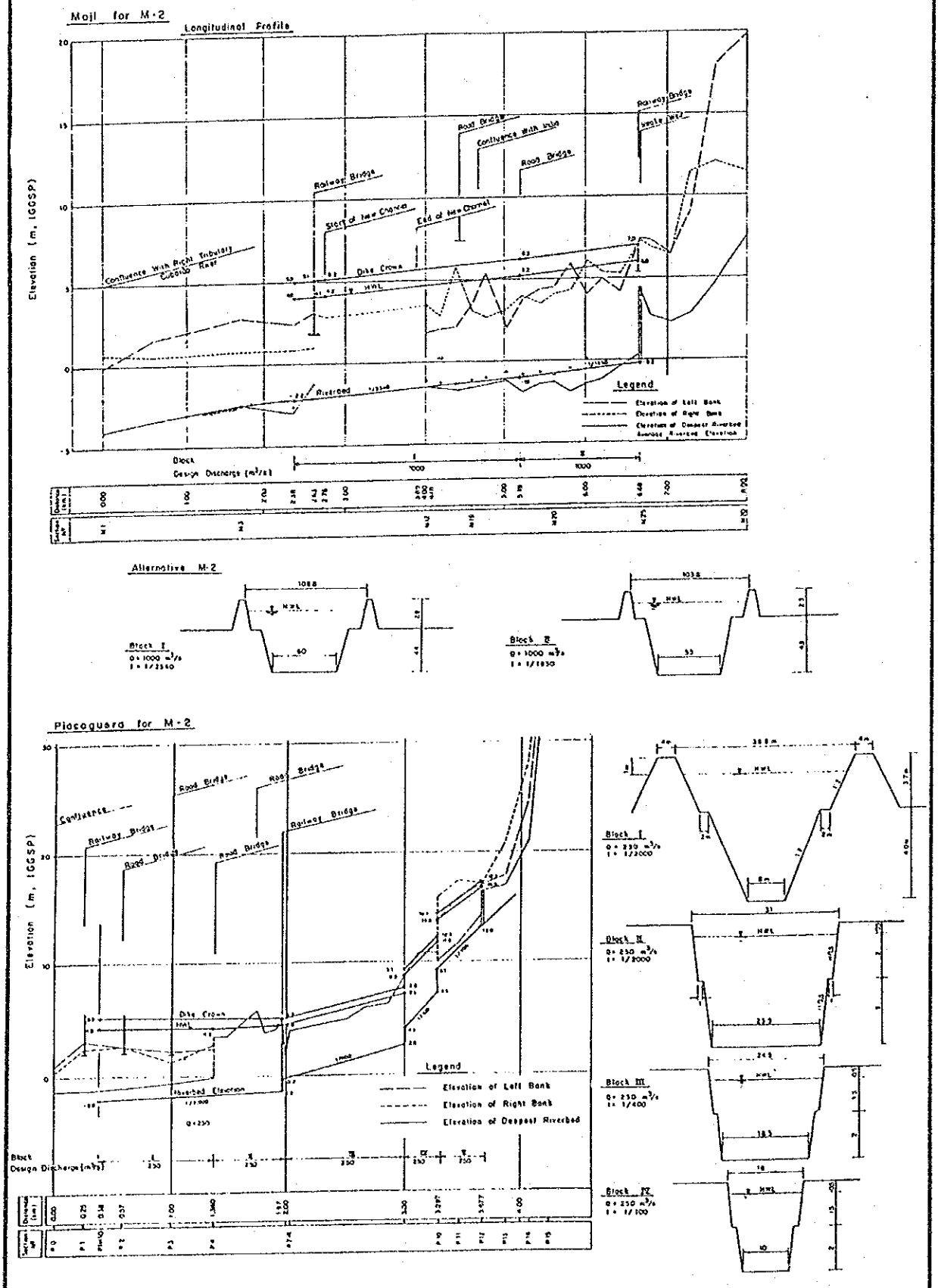
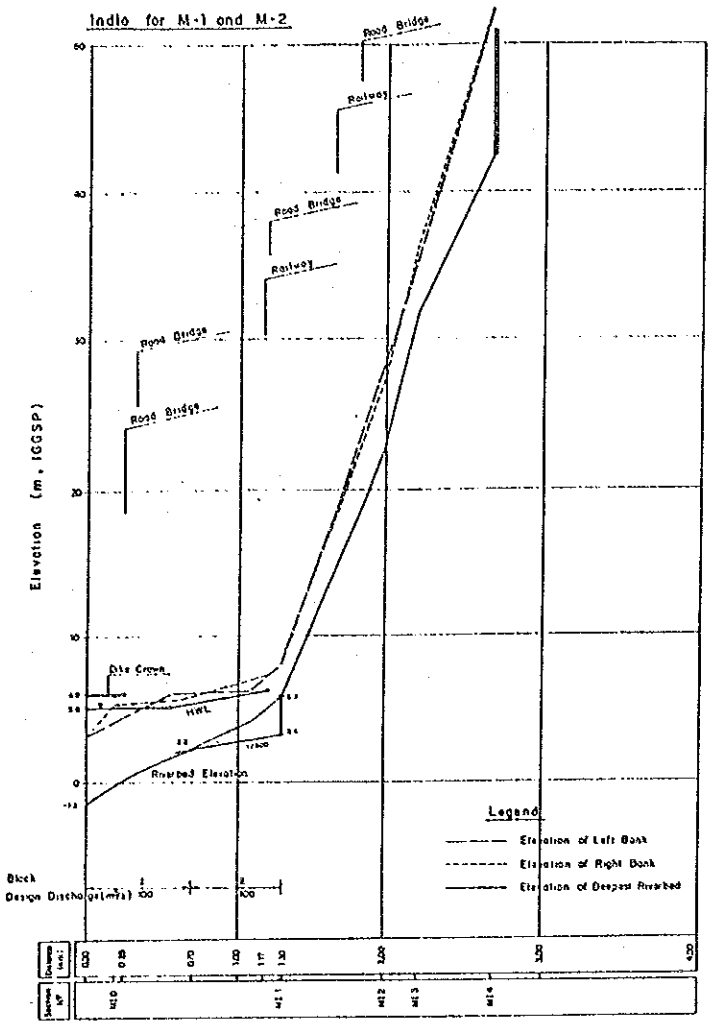



FIG.37
PROPOSED LONGITUDINAL PROFILE AND CROSS SECTIONS OF MOJI RIVER (1/2)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY



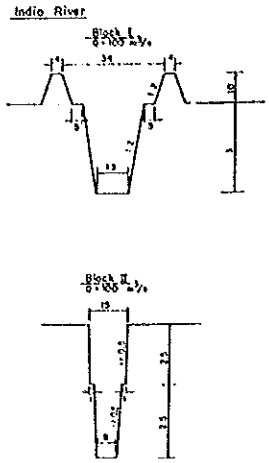
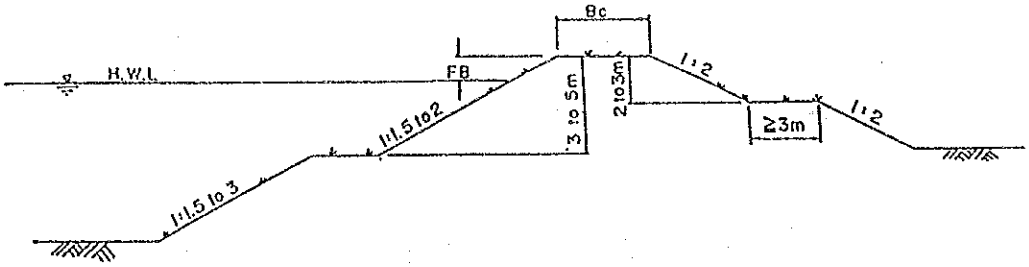




FIG. 37
PROPOSED LONGITUDINAL PROFILE AND CROSS SECTIONS OF MOJI RIVER (2/2)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

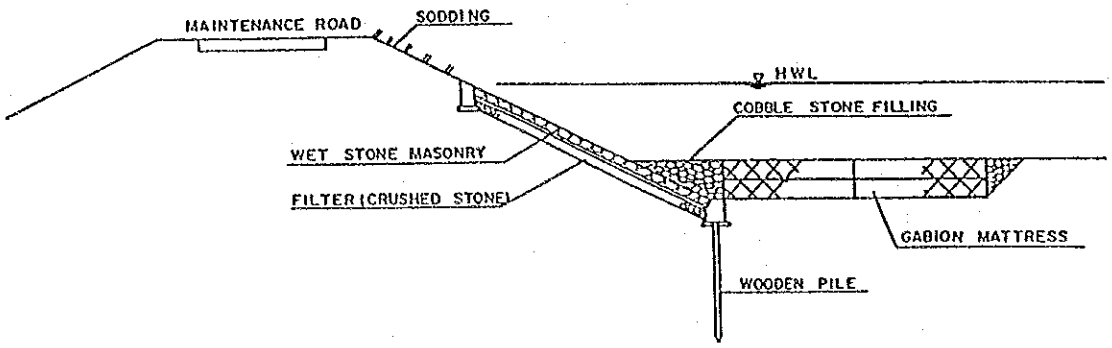
JAPAN INTERNATIONAL COOPERATION AGENCY

## (1) Dike




| Designed Discharge Q ($m^3/s$) | Free-board FB (m) not less than | Crownwidth Bc (m) not less than |
|---|---|---|
| less than 200 | 0.6 | 3 |
| 200 to 500 | 0.8 | 3 |
| 500 to 2,000 | 1.0 | 4 |

## (2) Revetment




## (3) Diversion Tunnel

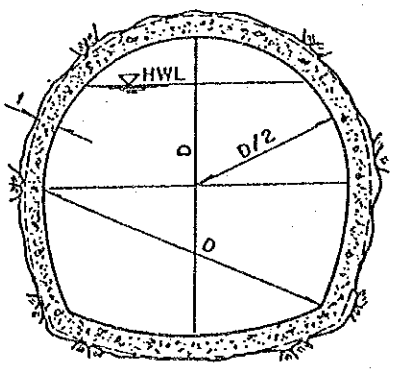



FIG. 38
TYPICAL DESIGN OF STRUCTURES FOR FLOOD DISASTER PREVENTION WORKS

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO
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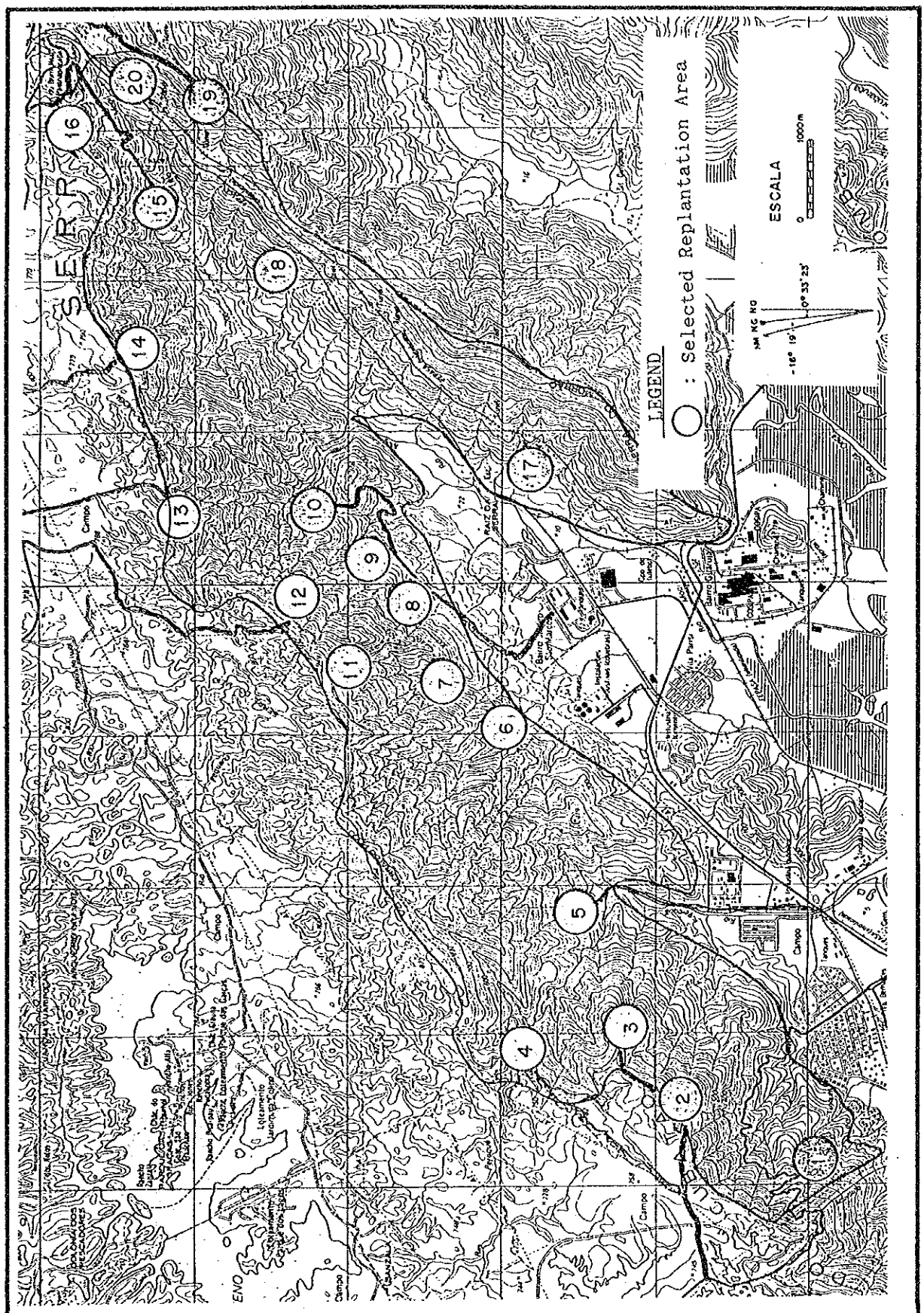



FIG.J.39

SELECTED REPLANTATION AREAS

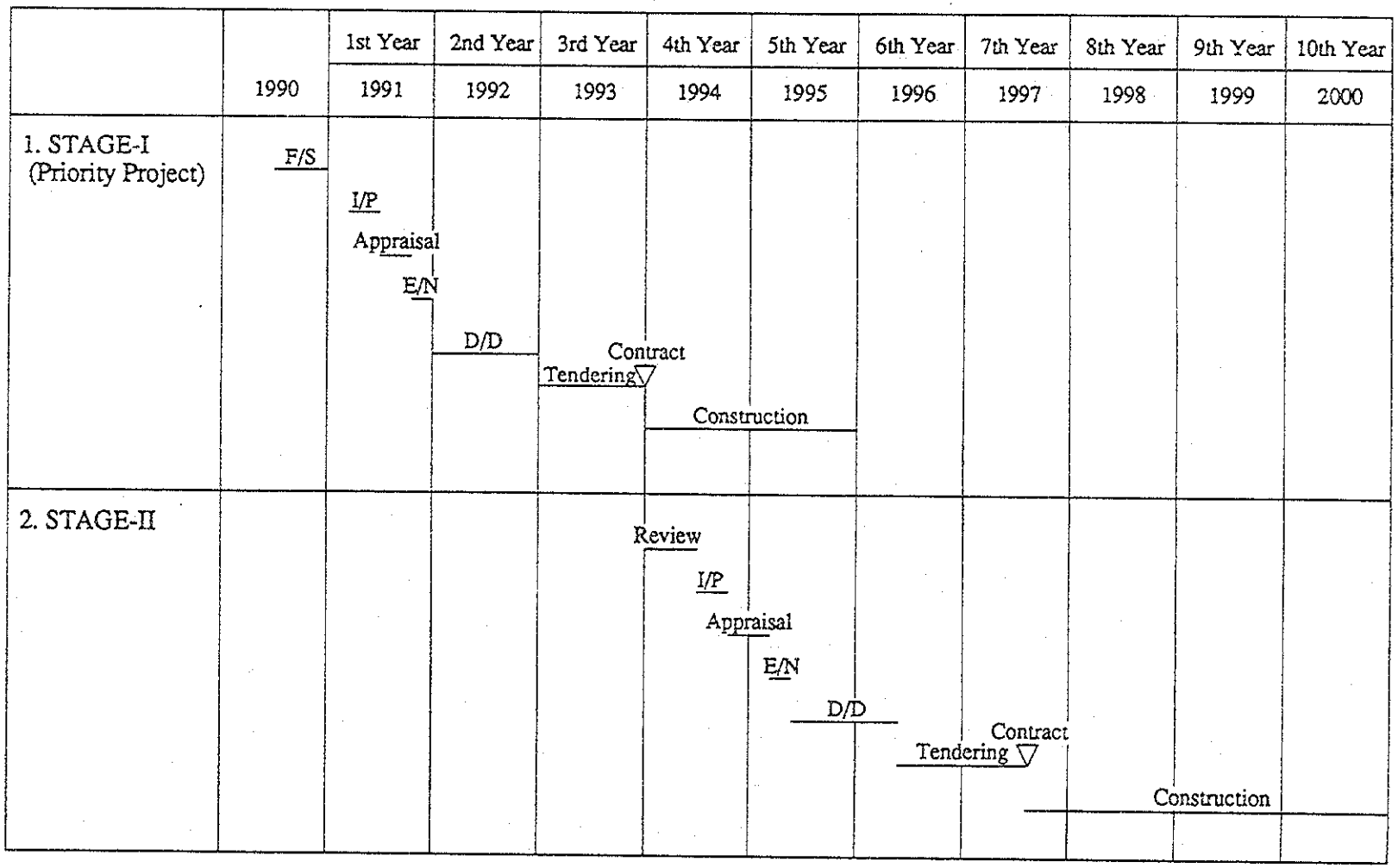
GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL

THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

FIG M.40

IMPLEMENTATION SCHEDULE




F/S : Feasibility Study
I/P : Implementation Program
E/N : Exchange of Note
D/D : Detailed Design

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL

THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

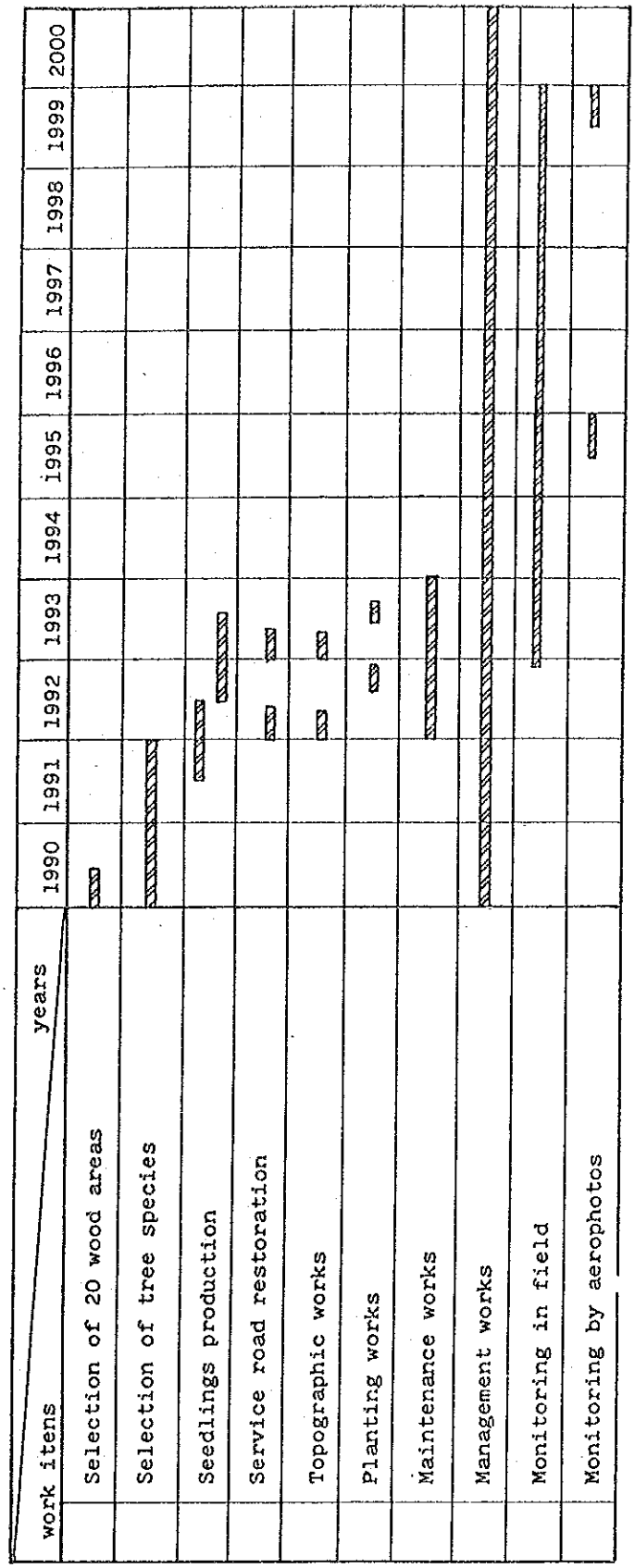



FIG.J.41

IMPLEMETATION PROGRAM

OF THE MASTER PLAN

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL

THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

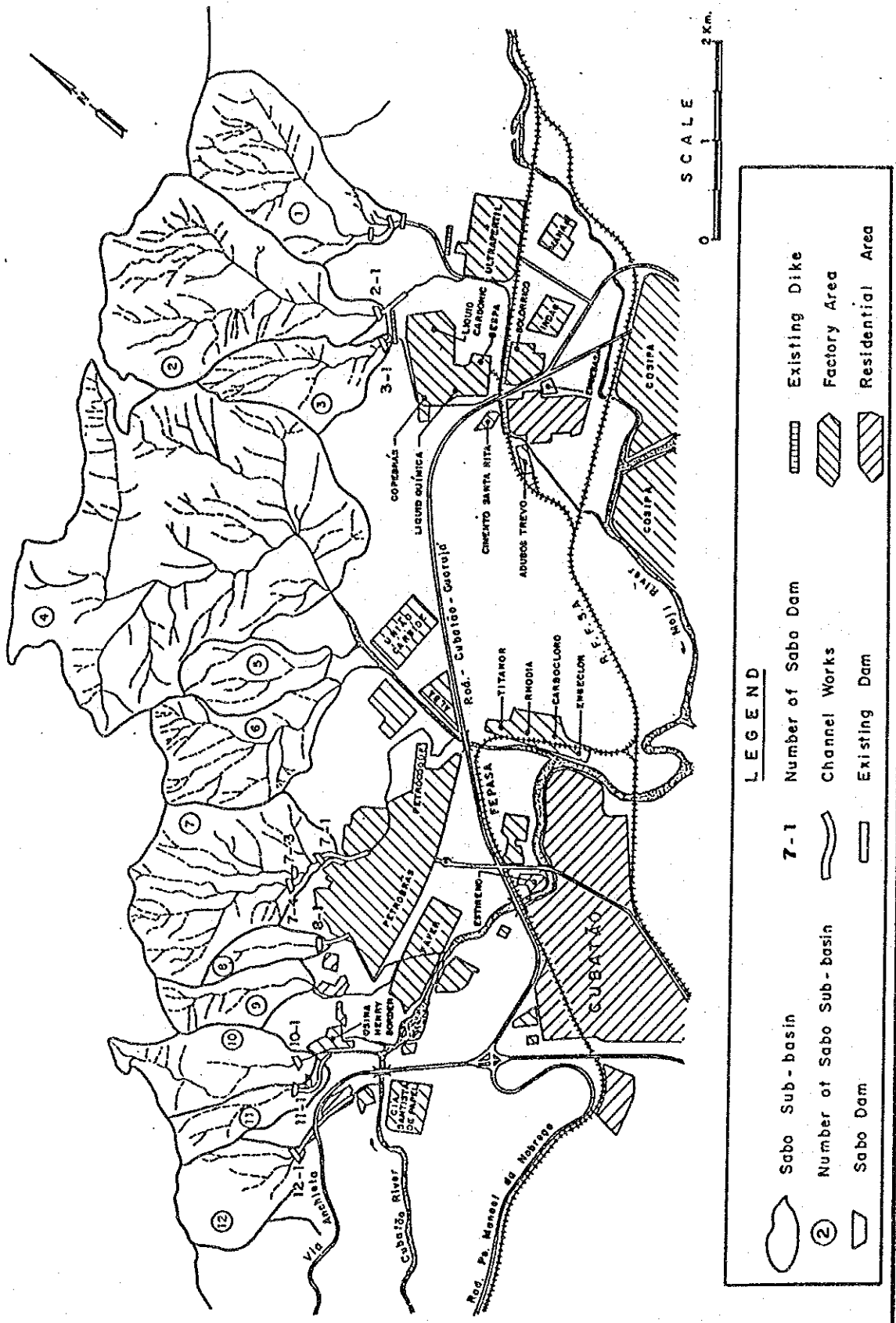



FIG. 42
STRUCTURAL LAYOUT OF
PRIORITY PROJECT

GOVERNMENT OF FEDERATIVE
REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND
RESTORATION PROJECT IN SERRA DO MAR,
CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

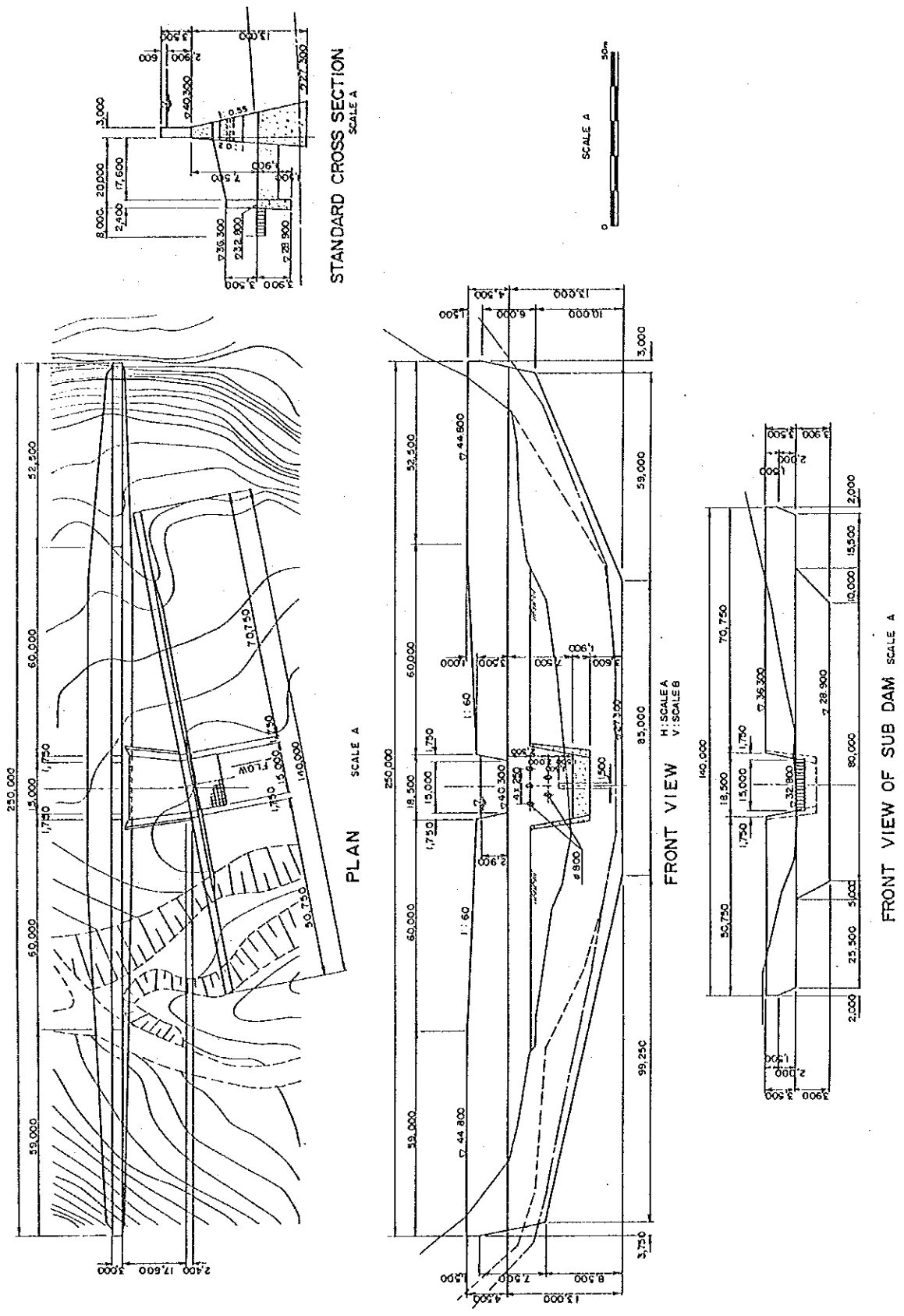



FIG.43
PRELIMINARY DESIGN OF SABO DAM (1/9)
(DAM NO.2-1)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

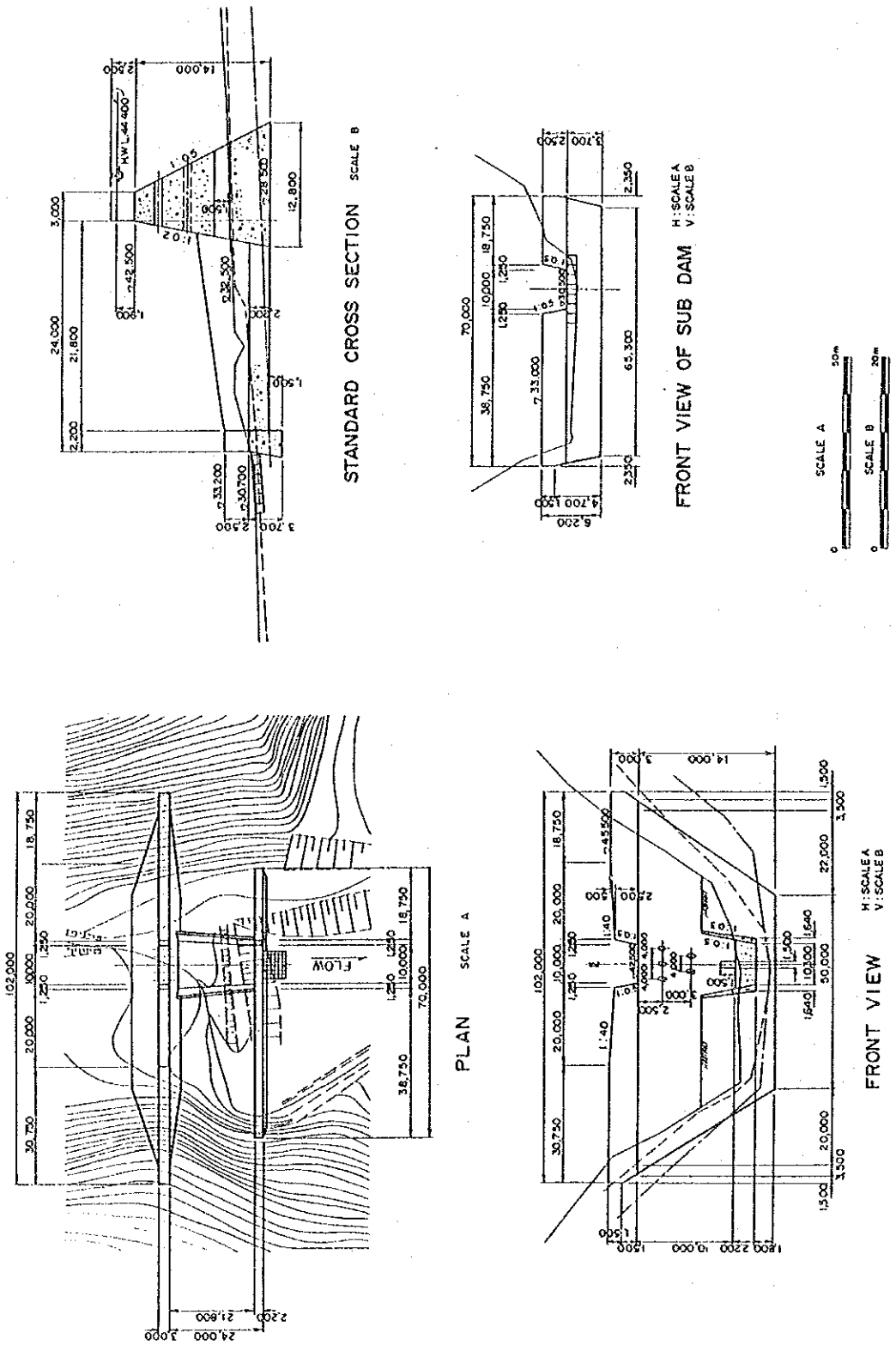
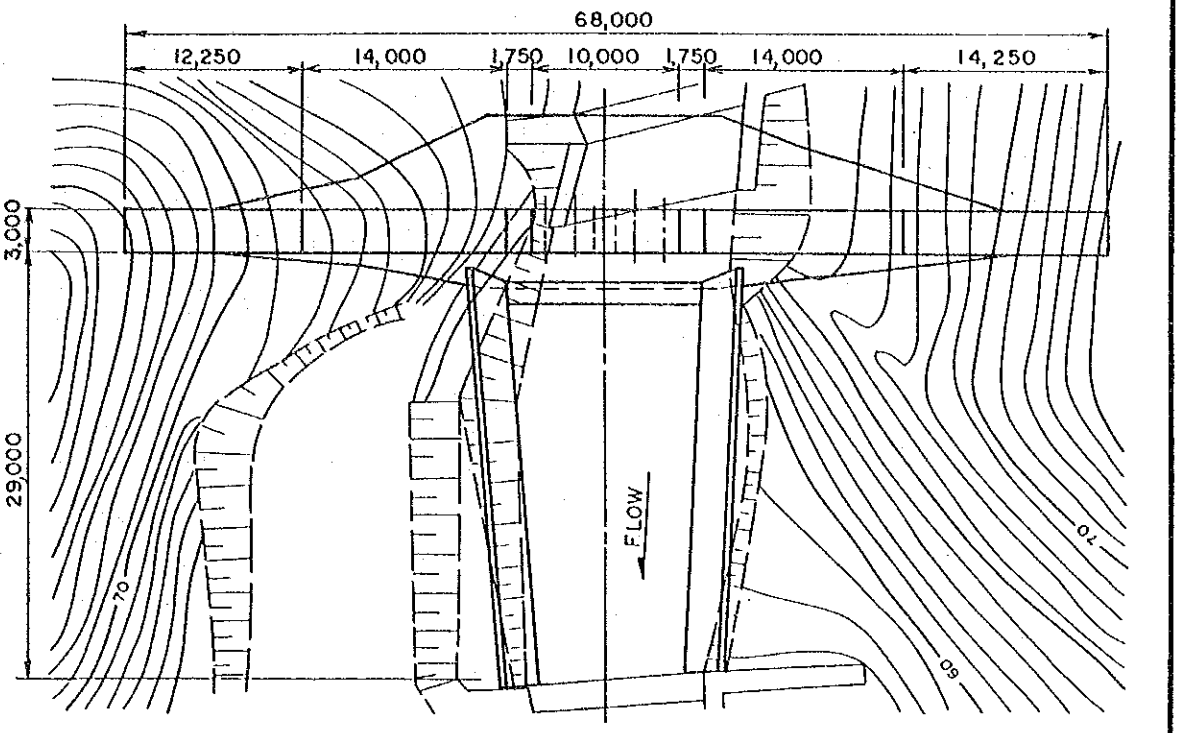


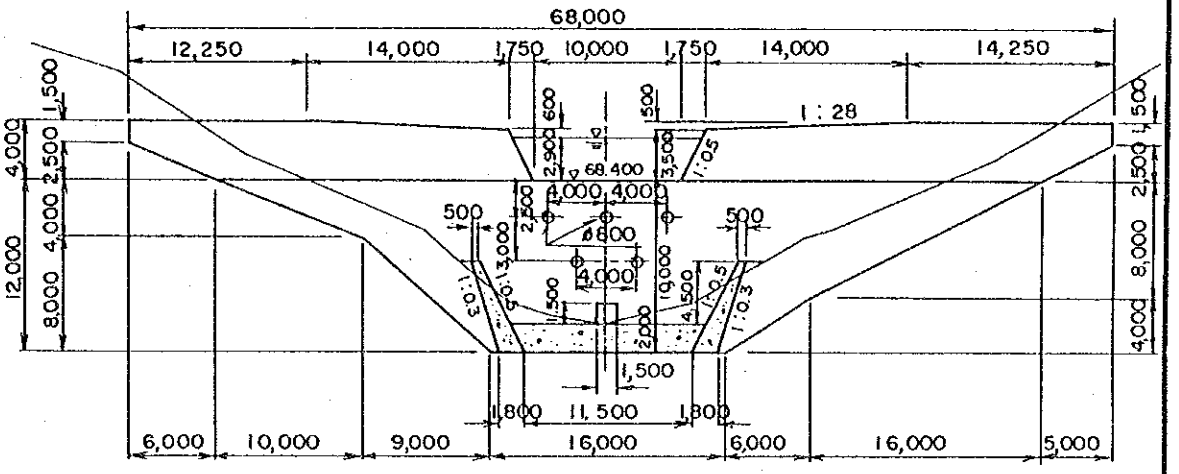

FIG.43
PRELIMINARY DESIGN OF SABO DAM (2/9)
(DAM NO.3-1)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

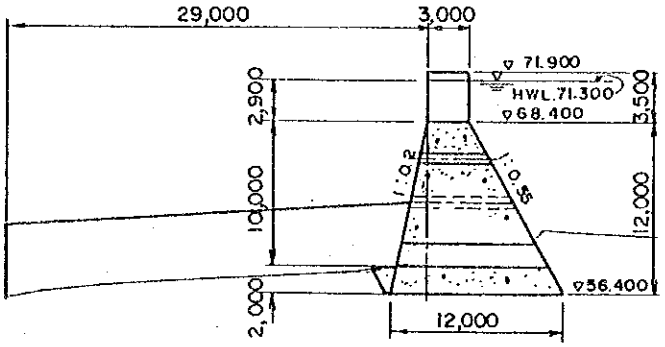
JAPAN INTERNATIONAL COOPERATION AGENCY




PLAN SCALE A




FRONT VIEW SCALE A




STANDARD CROSS SECTION

SCALE A

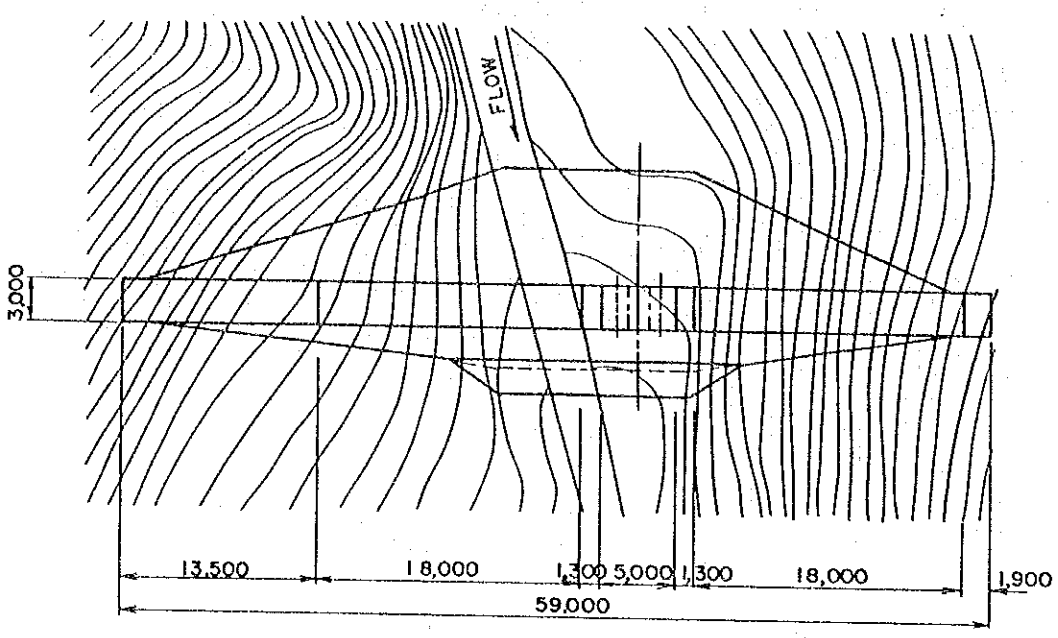
SCALE A

0 25m

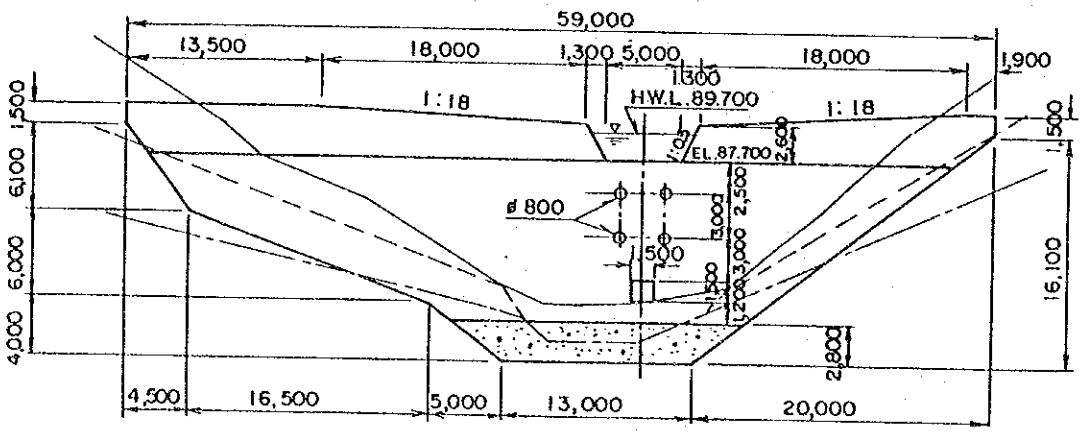
FIG. 43
PRELIMINARY DESIGN OF SABO DAM (3/9)
(DAM NO.7-1)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

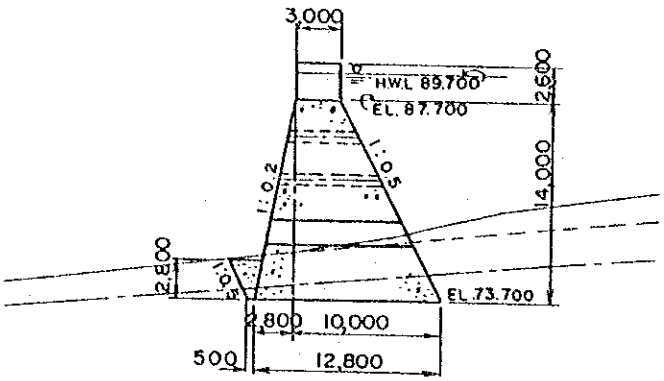
JAPAN INTERNATIONAL COOPERATION AGENCY




PLAN SCALE A




FRONT VIEW SCALE A



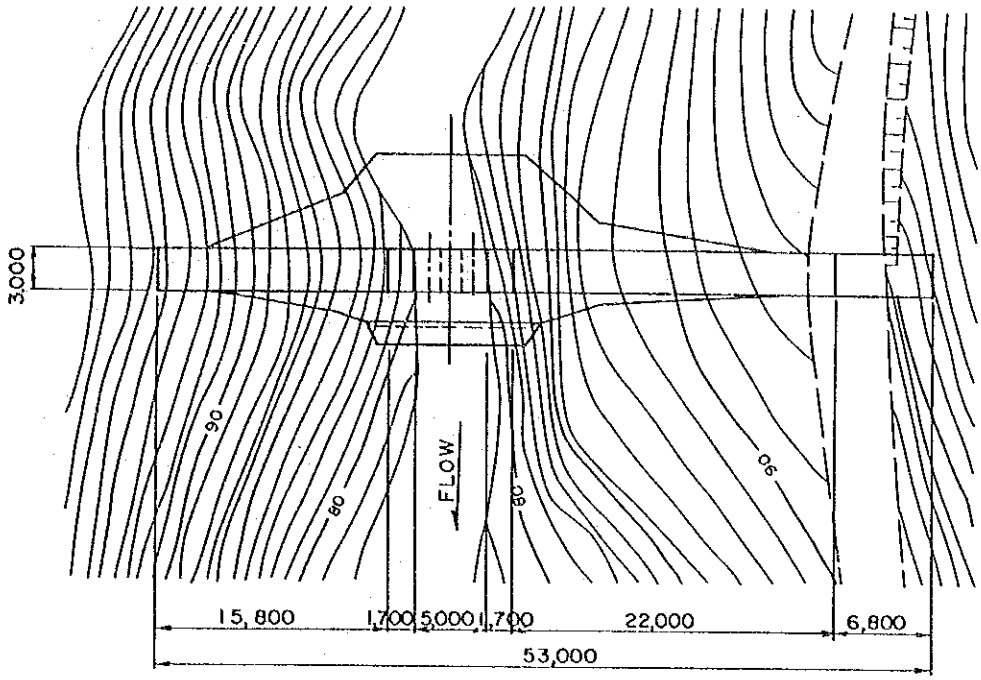

STANDARD CROSS SECTION SCALE A

SCALE A

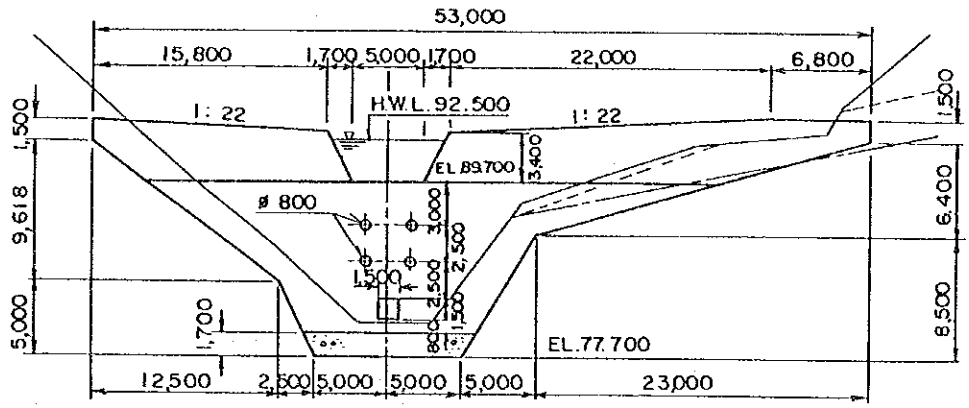

FIG. 43
PRELIMINARY DESIGN OF SABO DAM (4/9)
(DAM NO. 7-3)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

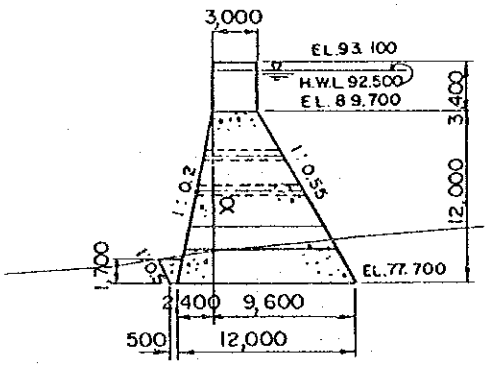
JAPAN INTERNATIONAL COOPERATION AGENCY




PLAN SCALE A




FRONT VIEW SCALE A




STANDARD CROSS SECTION SCALE A

SCALE A

0 25m

FIG.43
PRELIMINARY DESIGN OF SABO DAM (5/9)
(DAM NO.7-4)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

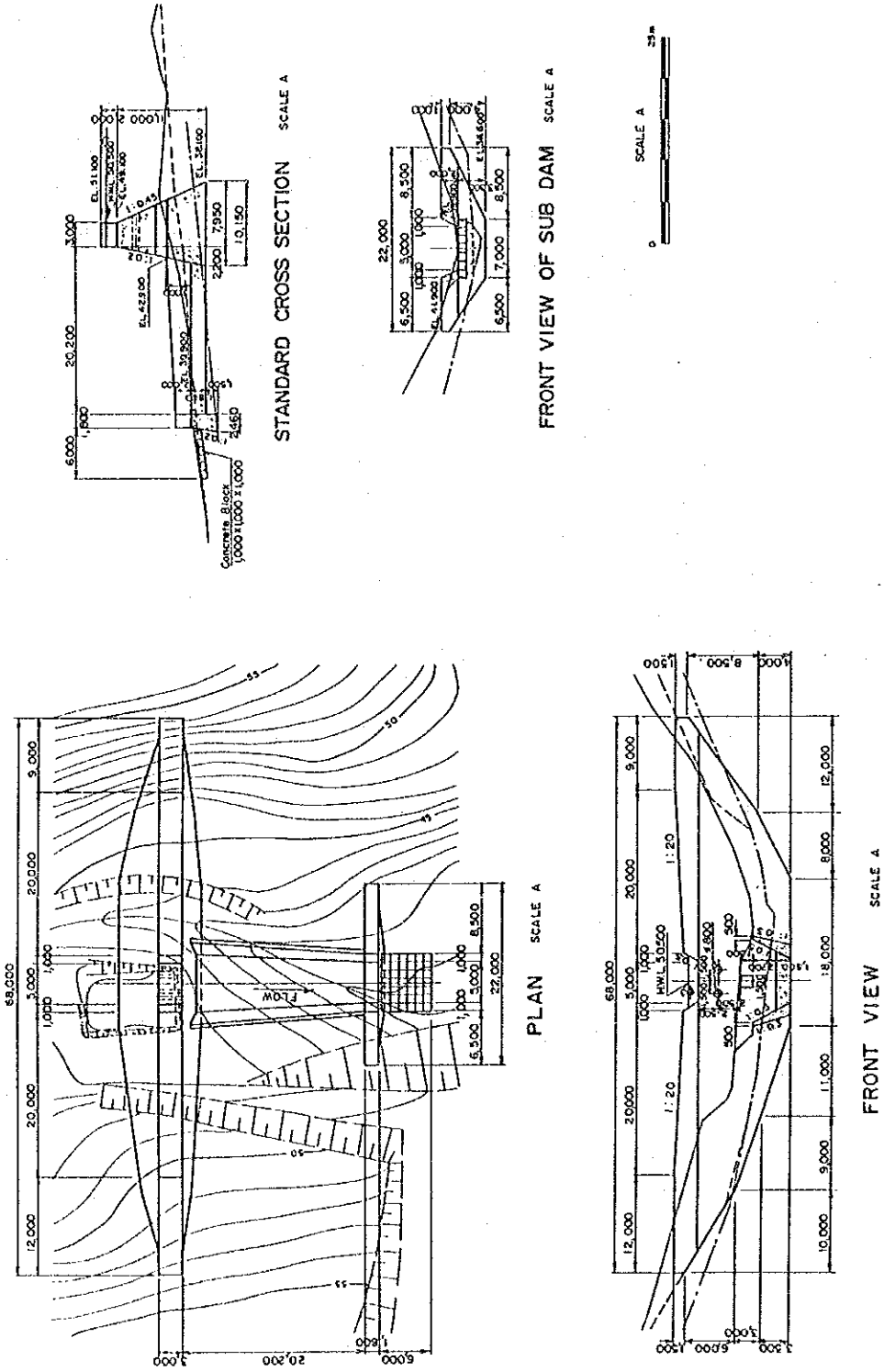
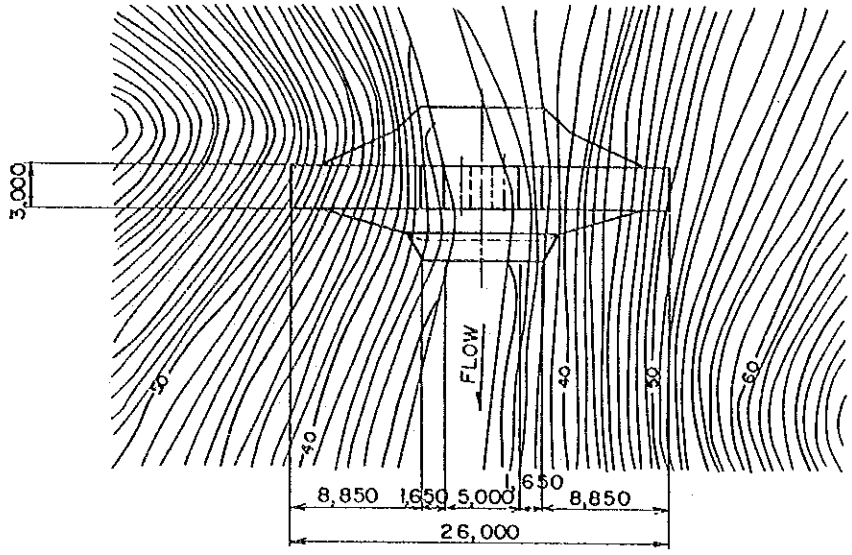


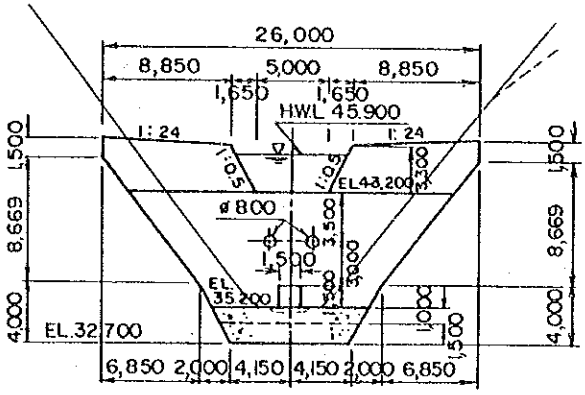

FIG.43
PRELIMINARY DESIGN OF SABO DAM (6/9)
(DAM NO.8-1)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

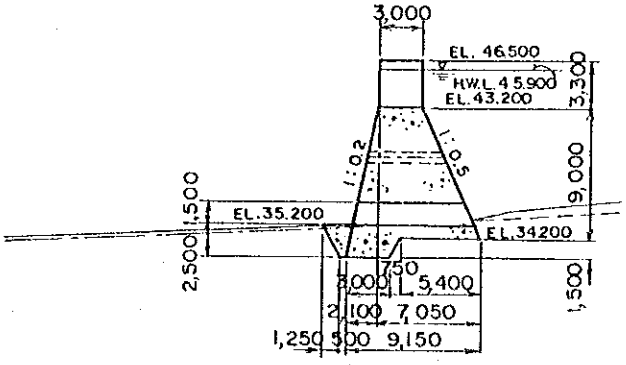
JAPAN INTERNATIONAL COOPERATION AGENCY




PLAN SCALE A




FRONT VIEW SCALE A




STANDARD CROSS SECTION SCALE A

SCALE A

0 25m

FIG. 43
PRELIMINARY DESIGN OF SABO DAM (7/9)
(DAM NO.10-1)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

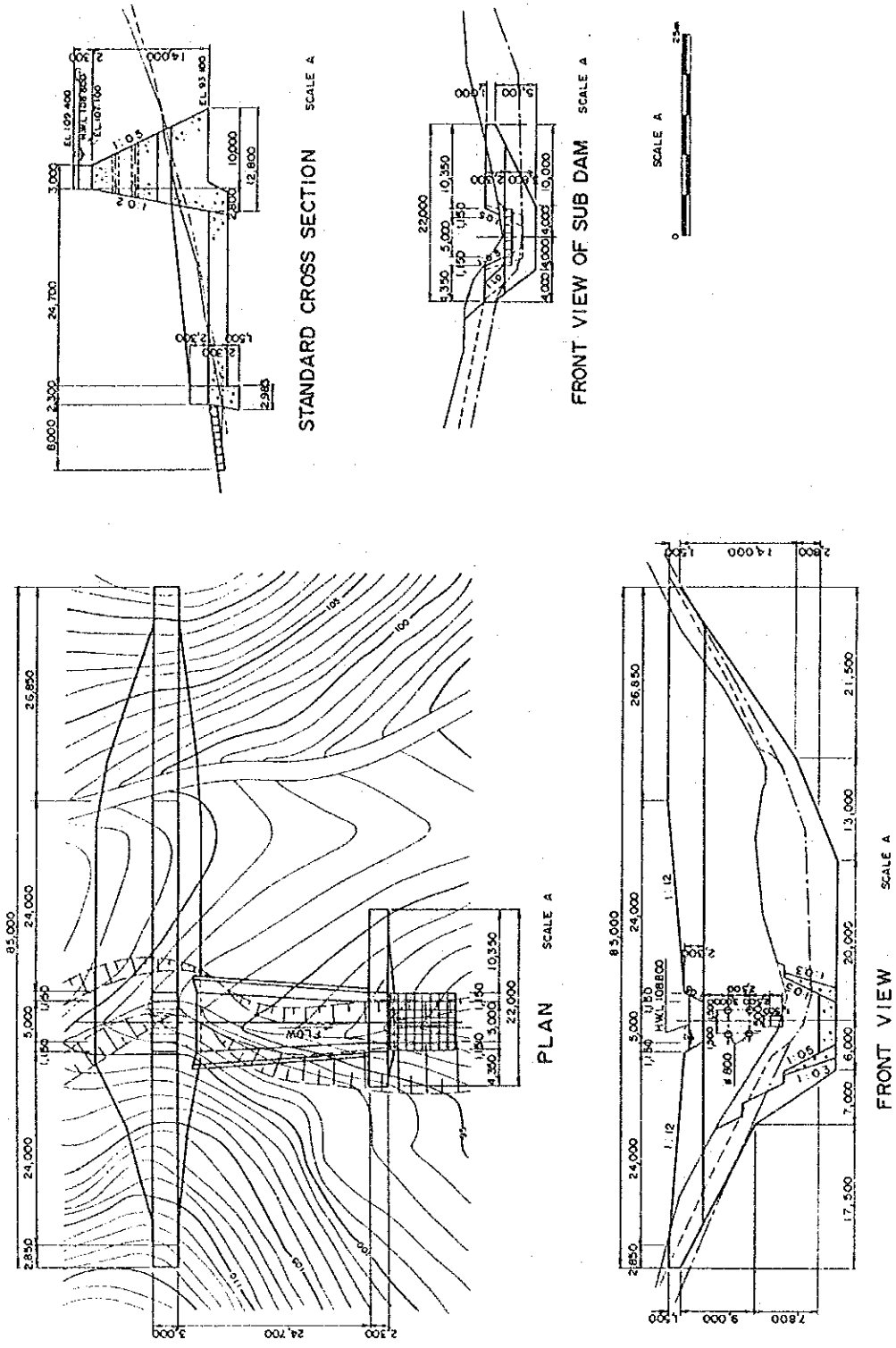



FIG.43
PRELIMINARY DESIGN OF SABO DAM (8/9)
(DAM NO.11-1)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

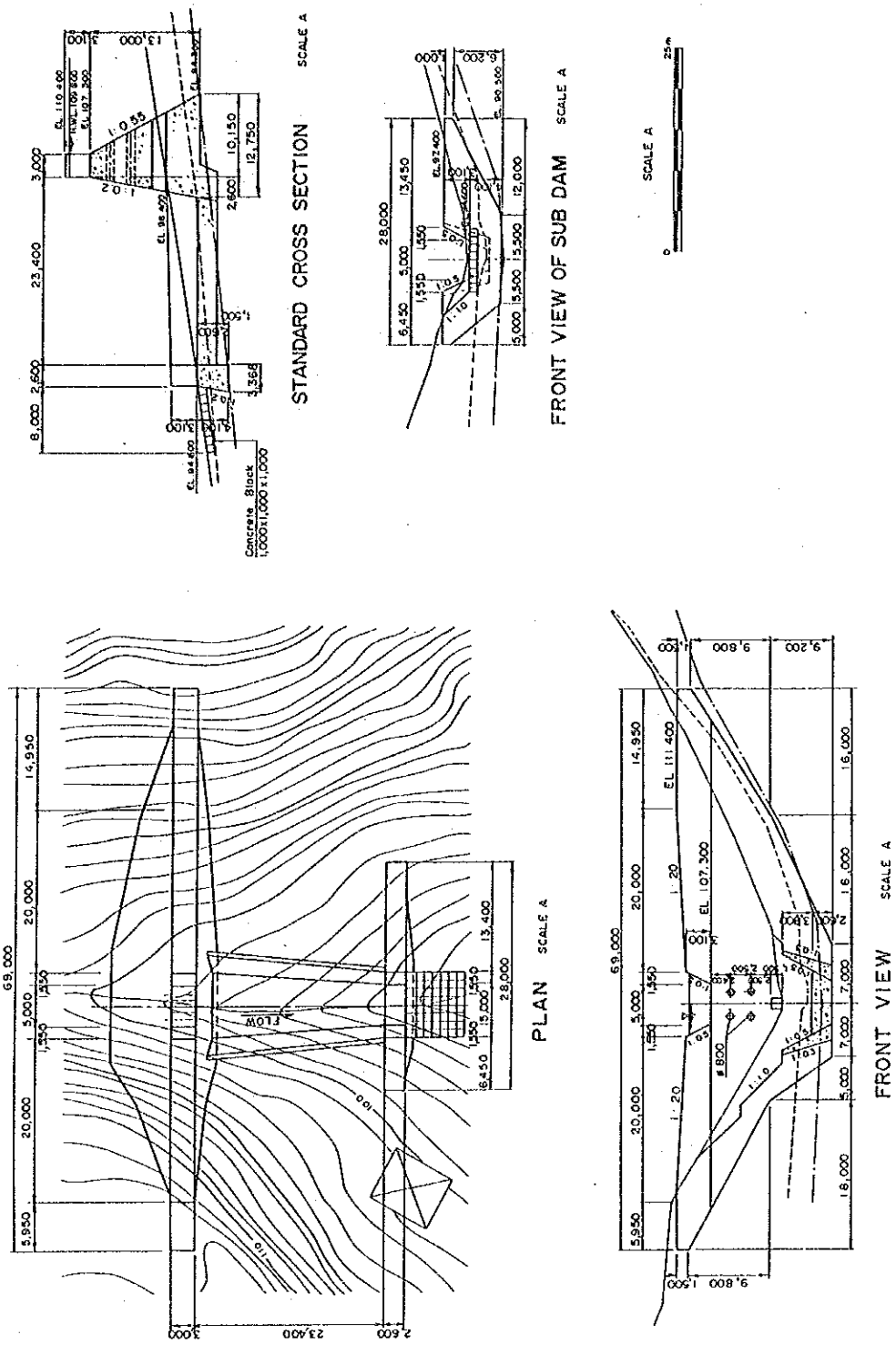



FIG.43
PRELIMINARY DESIGN OF SABO DAM (9/9)
(DAM NO.12-1)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

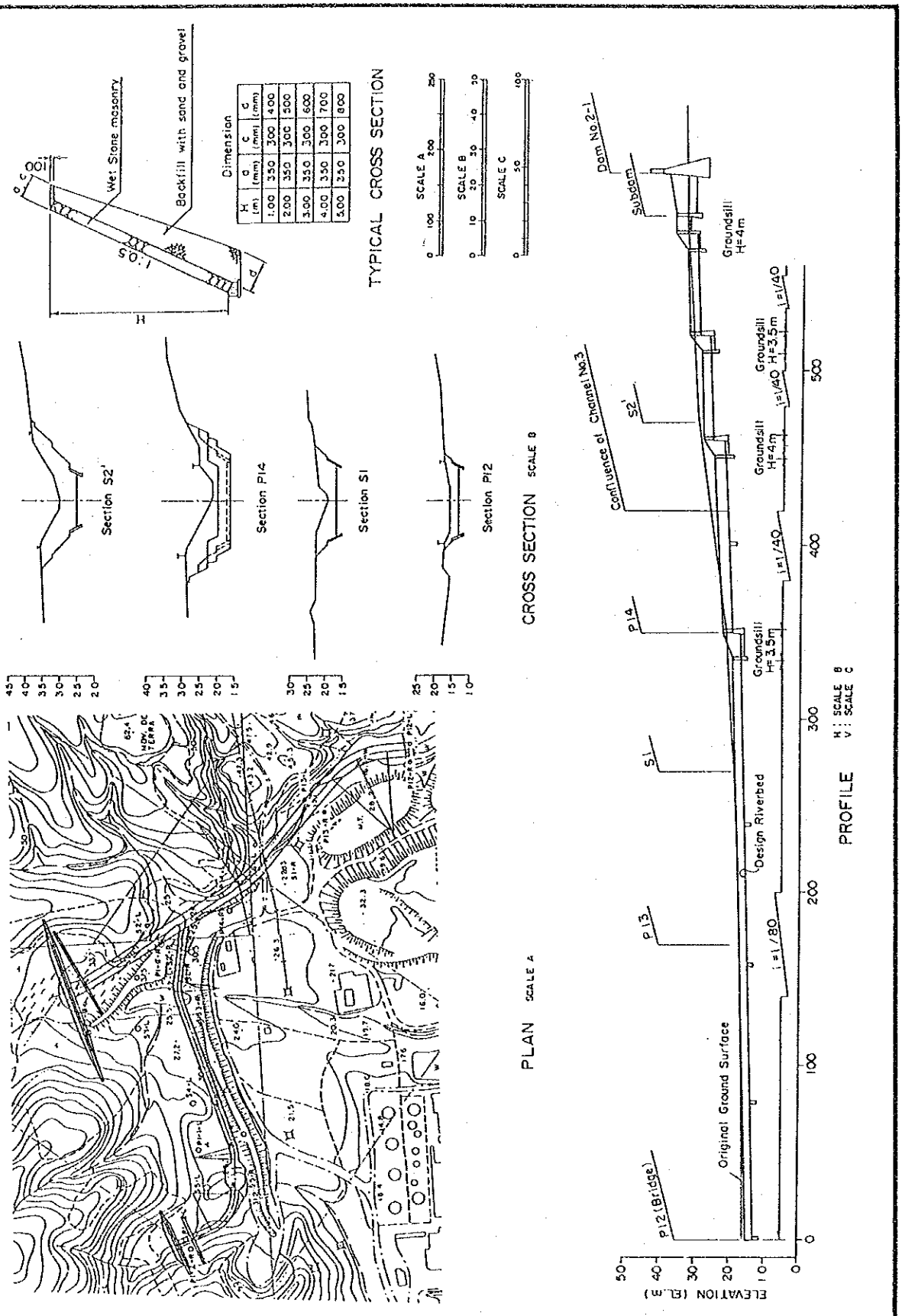



FIG.44
PRELIMINARY DESIGN OF CHANNEL WORKS AND GROUNDSILL (1/6) (BASIN NO.2)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

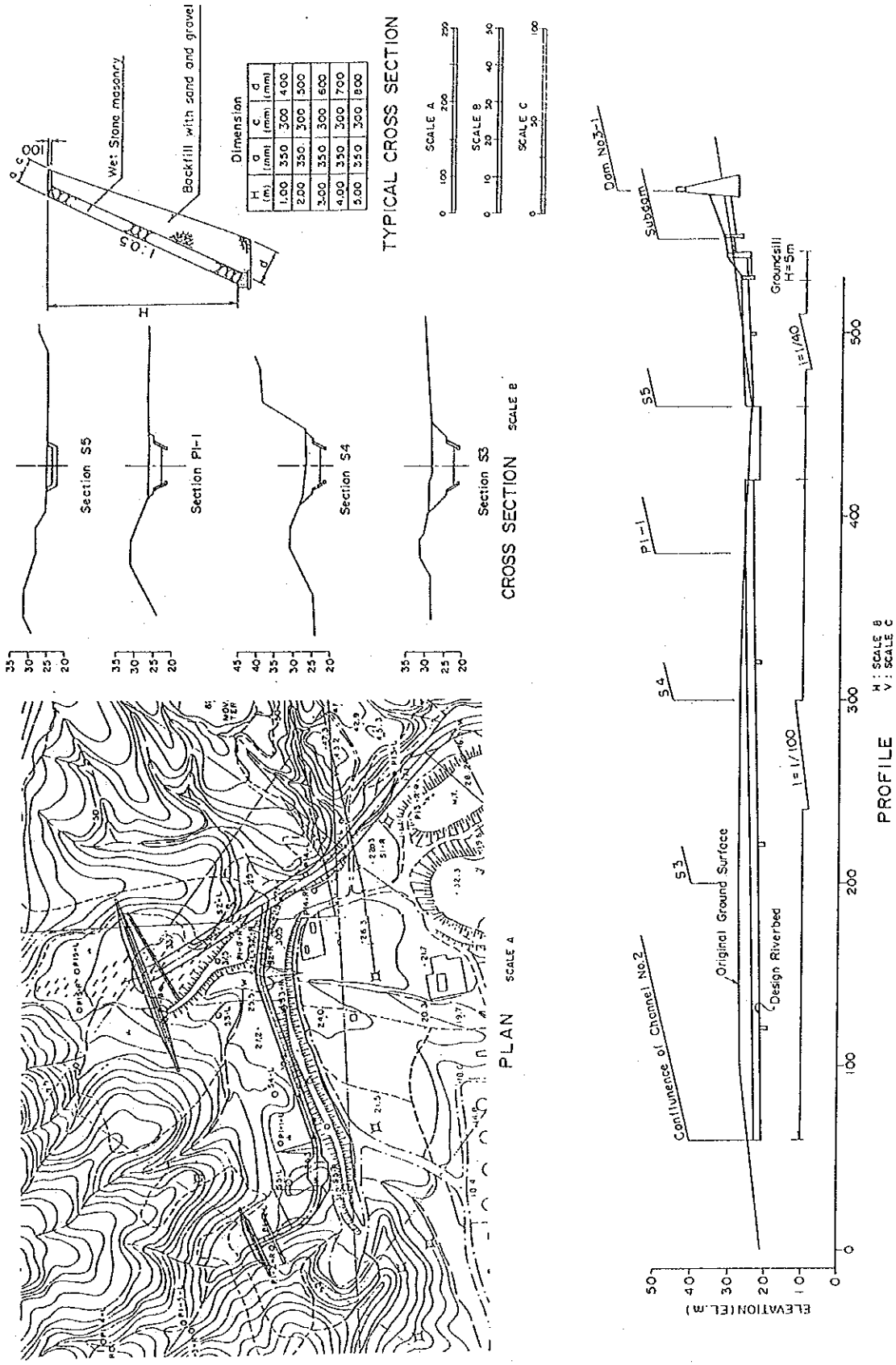



FIG.44
PRELIMINARY DESIGN OF CHANNEL WORKS AND GROUNDSILL (2/6) (BASIN NO.3)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

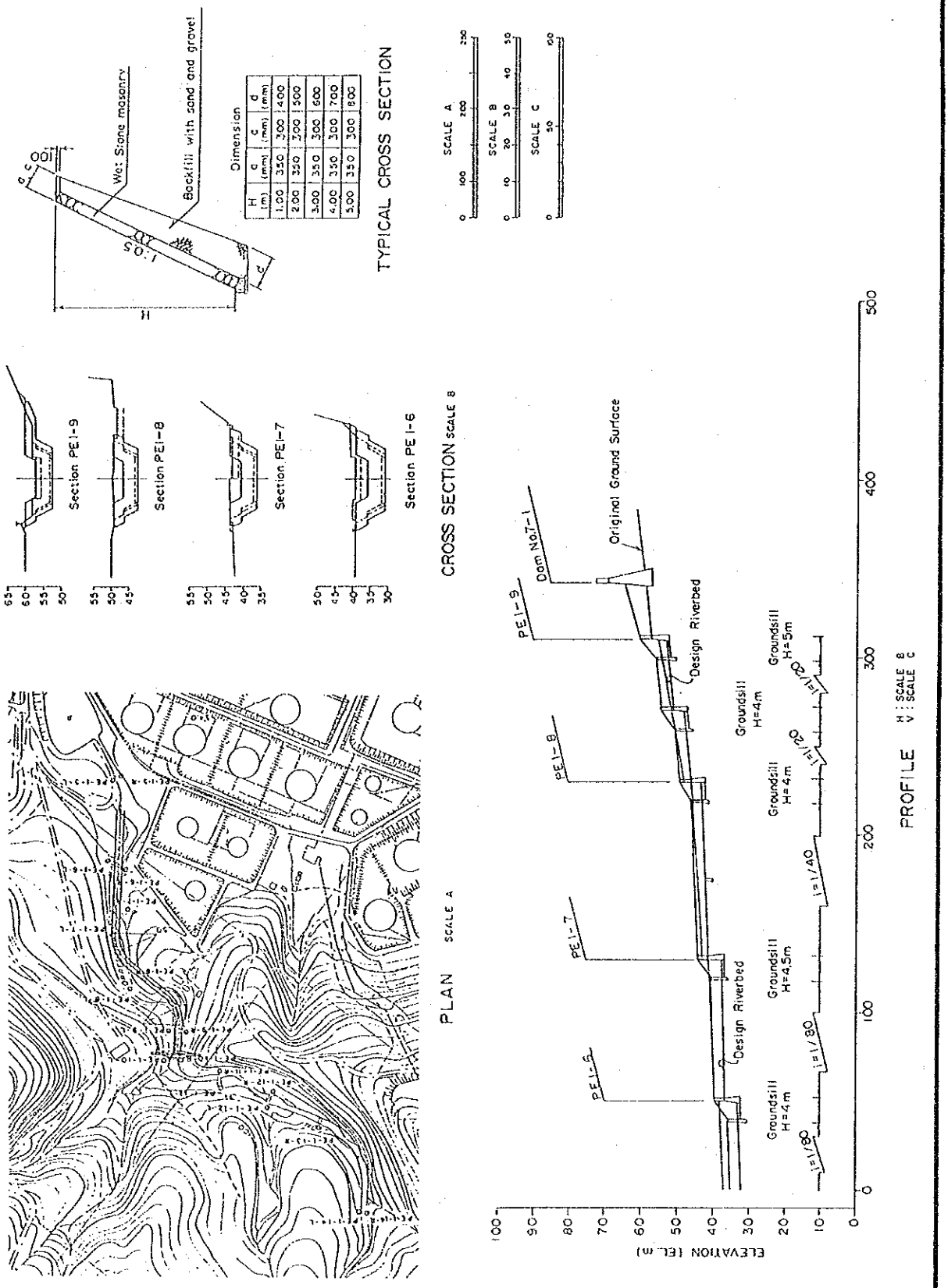



FIG.44
PRELIMINARY DESIGN OF CHANNEL WORKS AND GROUNDSILL (3/6) (BASIN NO.7)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

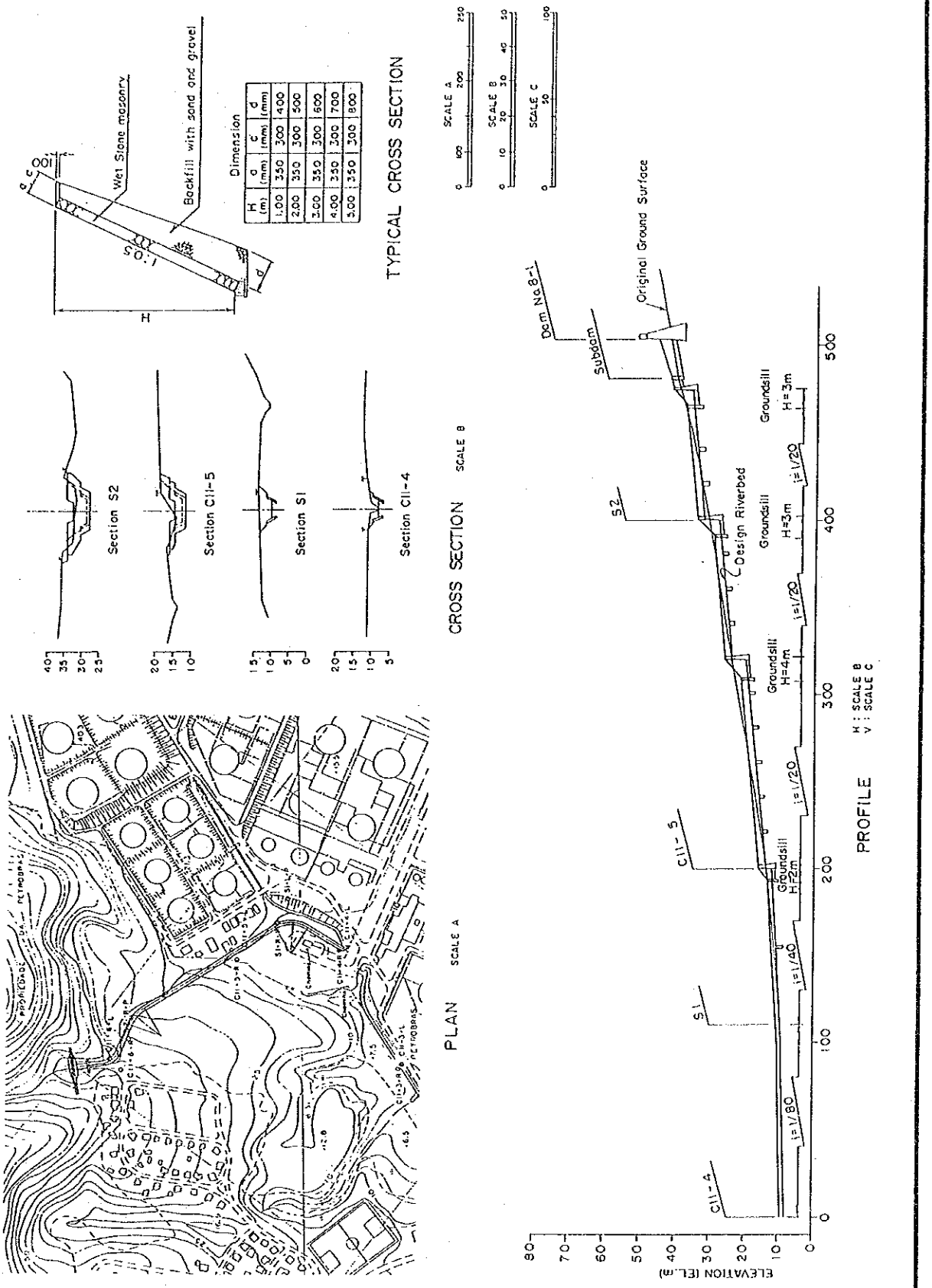



FIG.44
PRELIMINARY DESIGN OF CHANNEL WORKS AND GROUNDSILL (4/6)
(BASIN NO.8)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

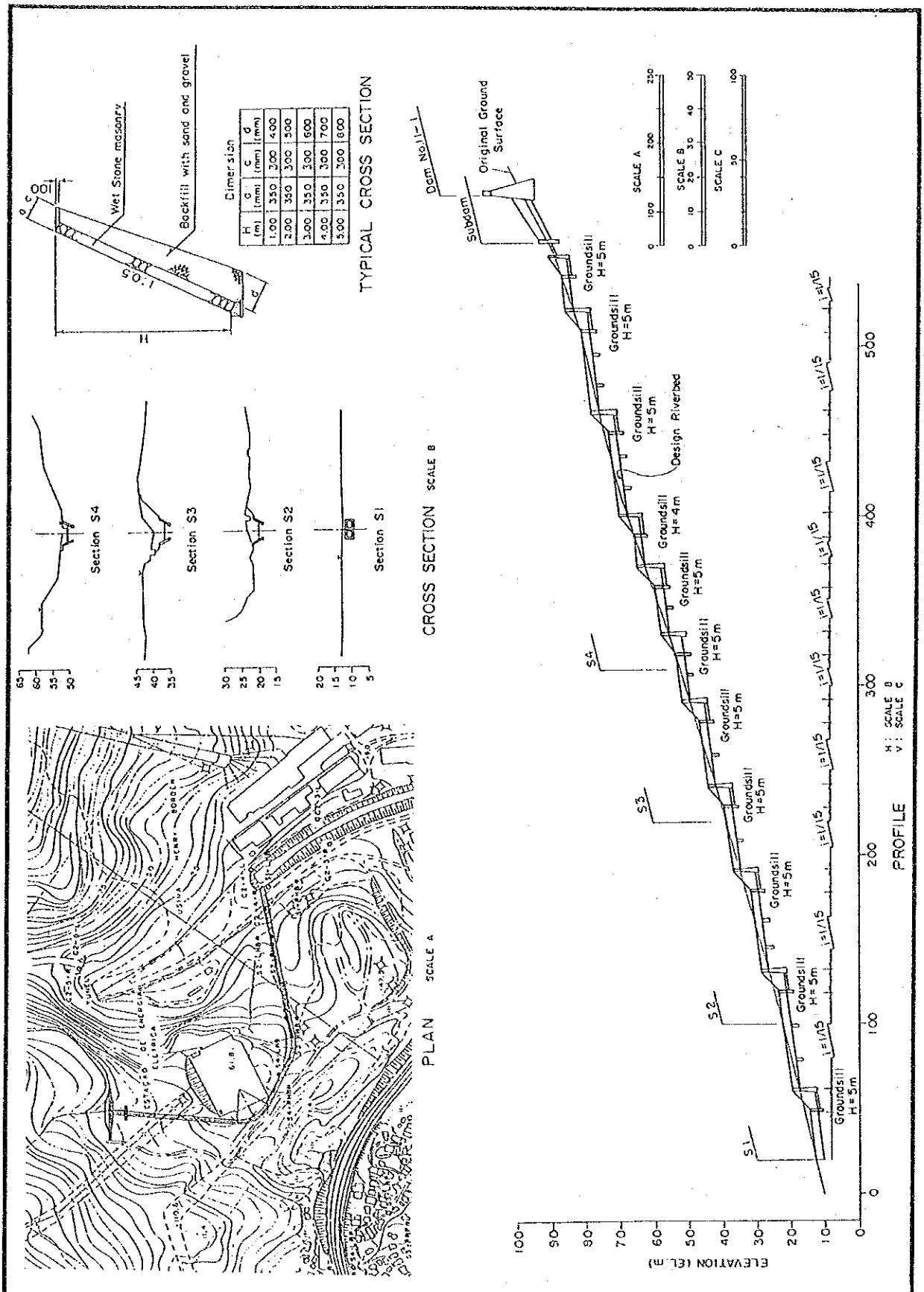



FIG.44
PRELIMINARY DESIGN OF CHANNEL WORKS AND GROUNDSILL (5/6)
(BASIN NO.11)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

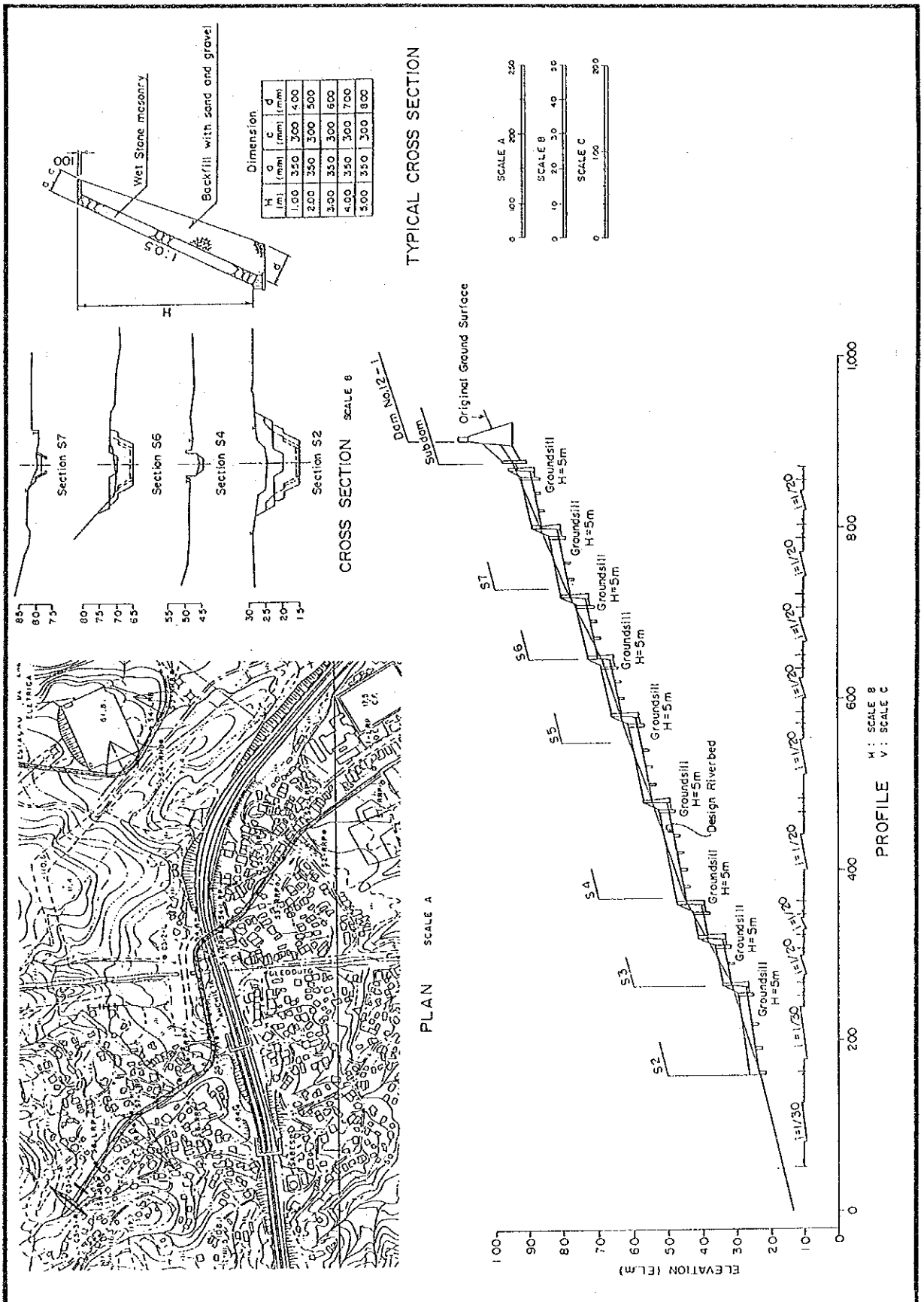



FIG.44
PRELIMINARY DESIGN OF CHANNEL WORKS AND GROUNDSILL (6/6) (BASIN NO.12)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

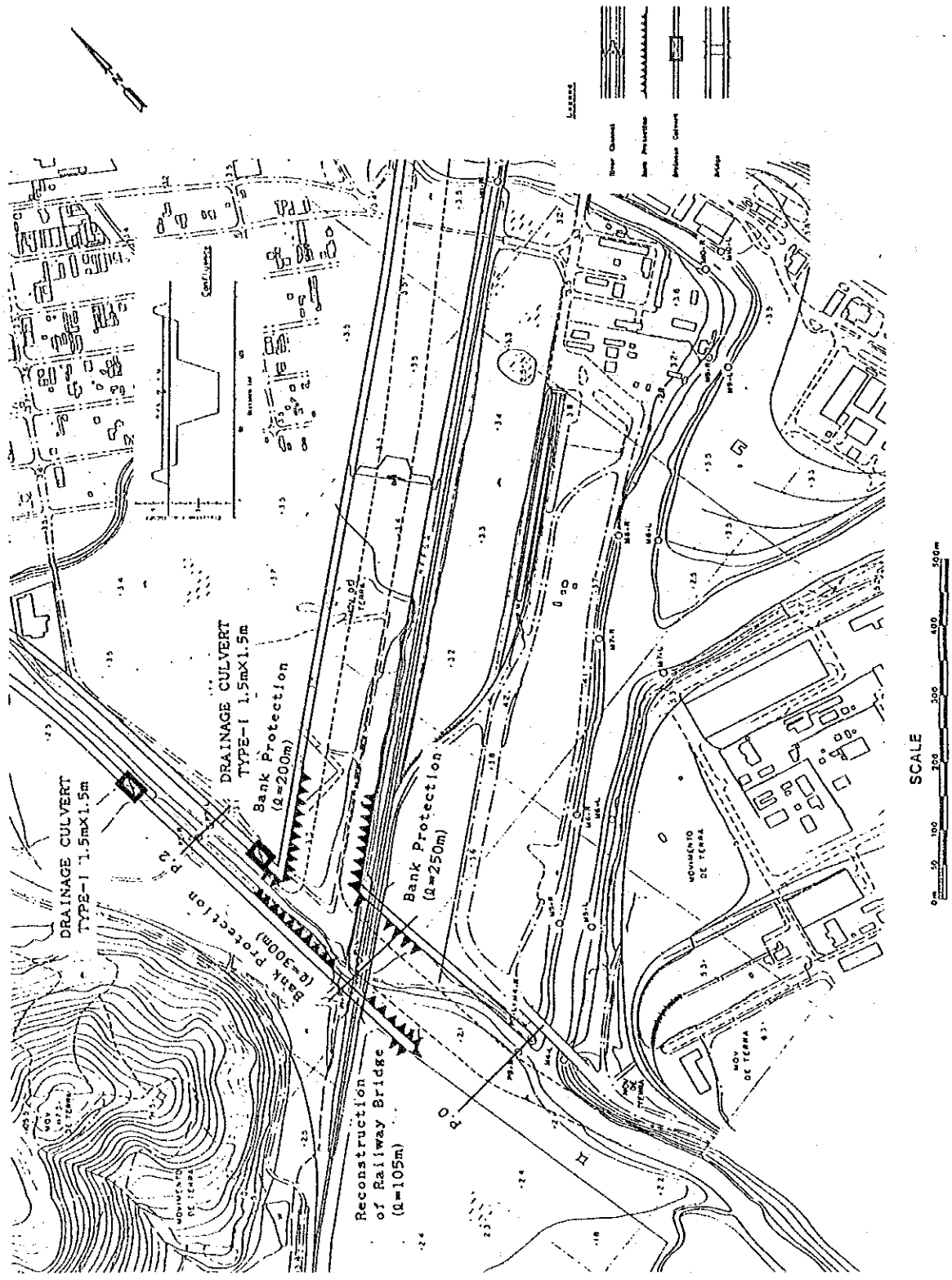



FIG.45
PRELIMINARY DESIGN OF
RIVER ALIGNMENT (1/4)

GOVERNMENT OF FEDERATIVE
REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND
RESTORATION PROJECT IN SERRA DO MAR,
CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

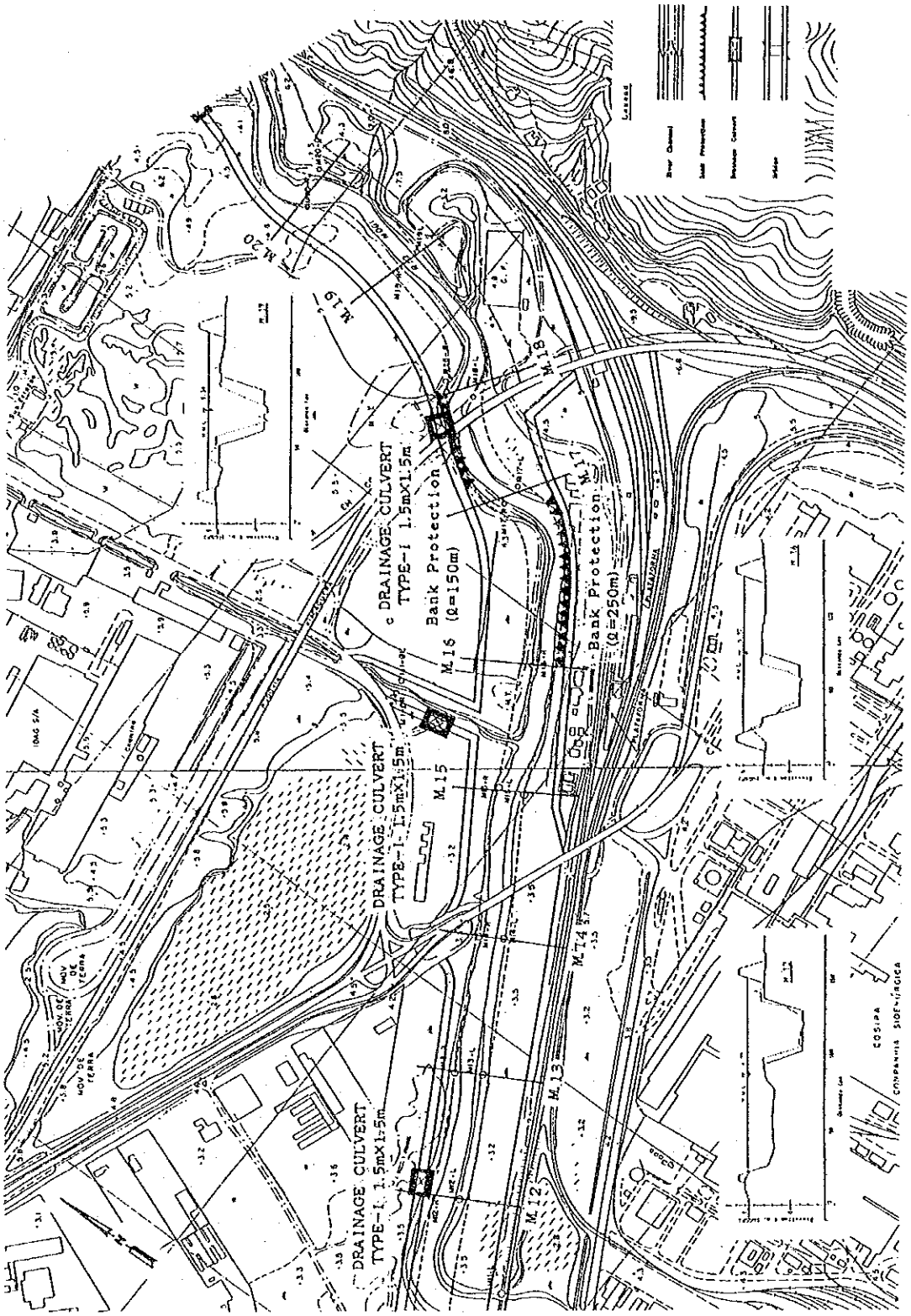



FIG.45
PRELIMINARY DESIGN OF
RIVER ALIGNMENT (2/4)

GOVERNMENT OF FEDERATIVE
REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND
RESTORATION PROJECT IN SERRA DO MAR,
CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

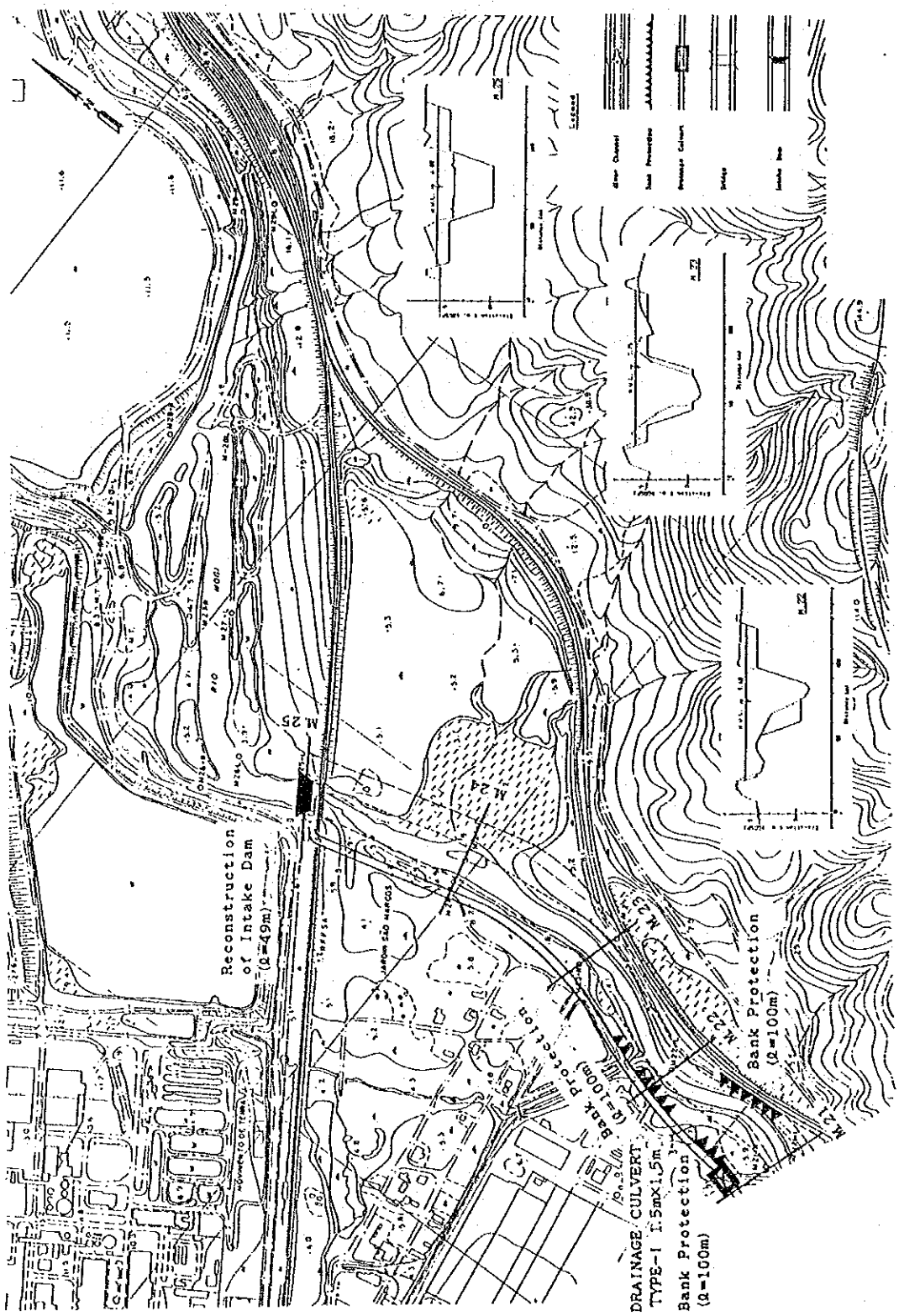



FIG.45
PRELIMINARY DESIGN OF
RIVER ALIGNMENT (3/4)

GOVERNMENT OF FEDERATIVE REPUBLIC OF BRAZIL

THE STUDY ON THE DISASTER PREVENTION AND RESTORATION PROJECT IN SERRA DO MAR, CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

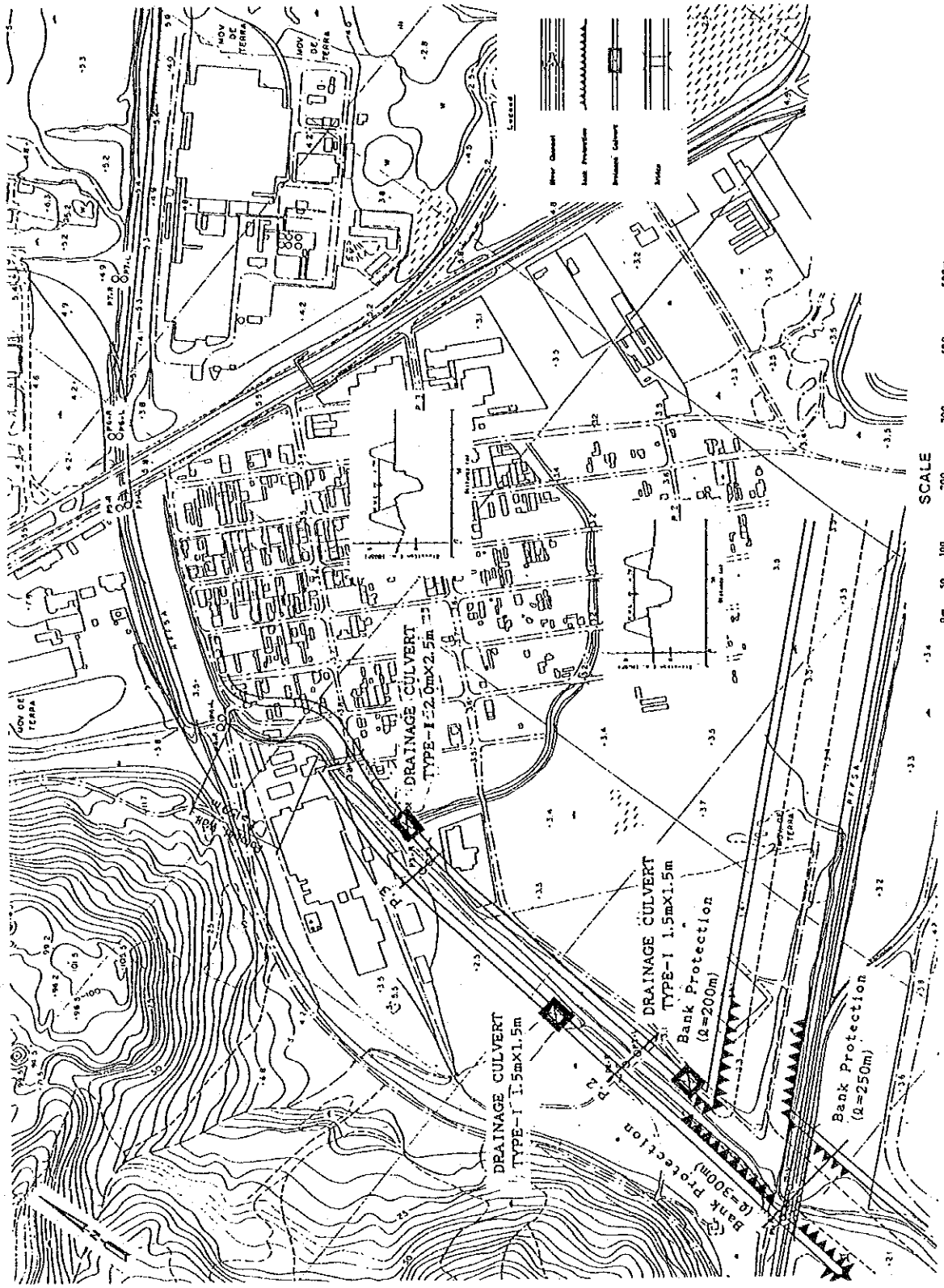



FIG.45
PRELIMINARY DESIGN OF
RIVER ALIGNMENT (4/4)

GOVERNMENT OF FEDERATIVE
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THE STUDY ON THE DISASTER PREVENTION AND
RESTORATION PROJECT IN SERRA DO MAR,
CUBATÃO REGION, STATE OF SÃO PAULO

JAPAN INTERNATIONAL COOPERATION AGENCY

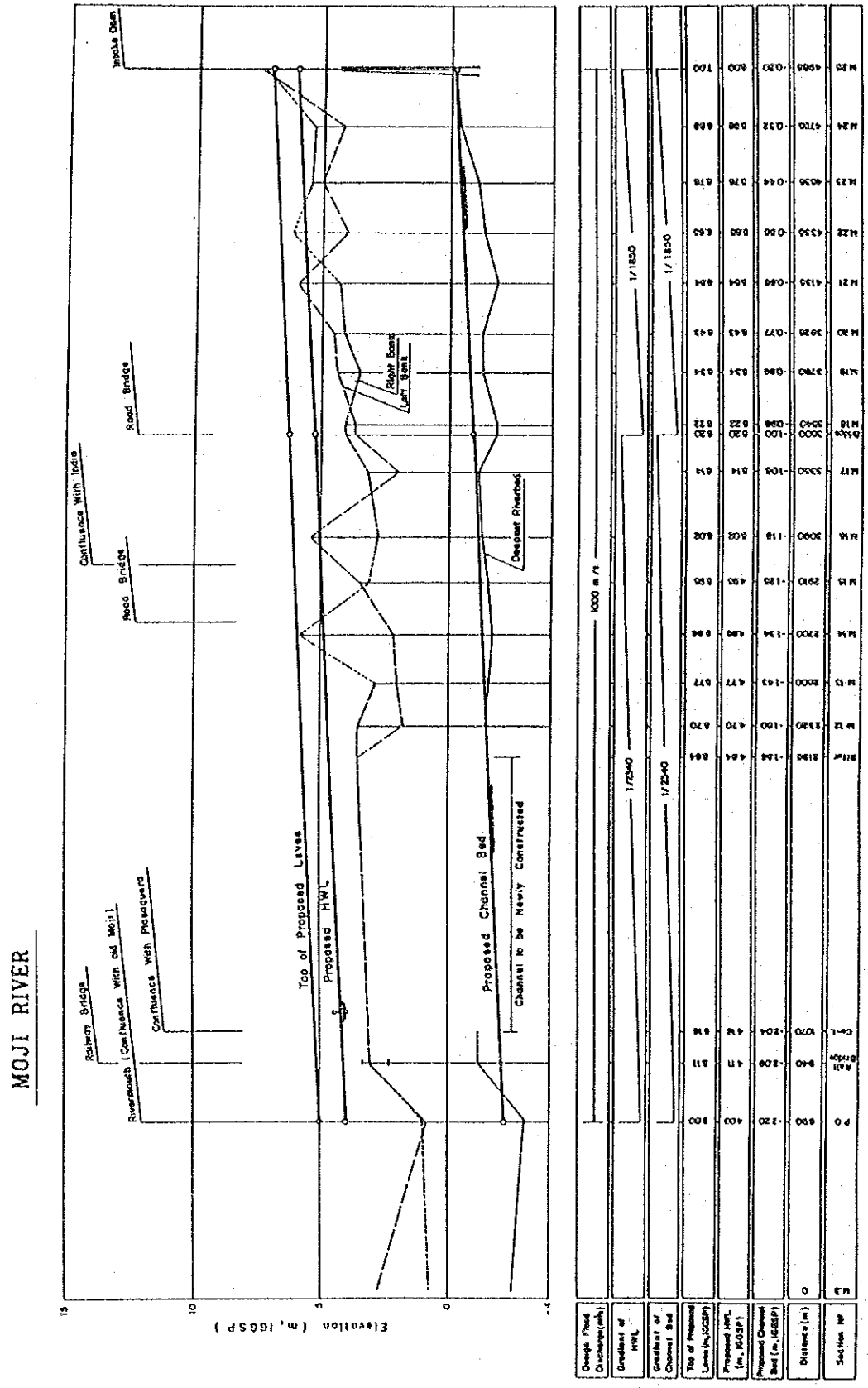


FIG.46
PRELIMINARY DESIGN OF
RIVER PROFILE

GOVERNMENT OF FEDERATIVE
REPUBLIC OF BRAZIL
THE STUDY ON THE DISASTER PREVENTION AND
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