

APPENDICES

Appendices

- Appendix 1. Member List of the Survey Team**
- Appendix 2. Survey Schedule**
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- Appendix 4. Minutes of Discussion**
- Appendix 5. Drawings**

Appendix 1 . Member List of the Survey Team

(1) Field survey in Ethiopia

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| 1. | Satoshi UMENAGA
(Leader) | Second Project Study Division,
Grant Aid Project Study Department,
Japan International Cooperation Agency |
| 2. | Tatsuya ICHIKAWA
(Project Coordinator) | Associate Expert, Second Project Study
Division,
Grant Aid Project Study Department,
Japan International Cooperation Agency |
| 3. | Kimio CHIBA
(Chief Consultant/Transportation Planning) | Construction Project Consultants, Inc. |
| 4. | Isao INUZUKA
(Road Designer) | Nippon Koei Co., Ltd. |
| 5. | Nobuyuki SUZUKI
(Bridge Designer) | Construction Project Consultants, Inc. |
| 6. | Seiju IKEDA
(Natural Condition Survey) | Nippon Koei Co., Ltd. |
| 7. | Tamio SHINADA
(Construction Planning/Cost Estimator) | Construction Project Consultants, Inc. |

(2) Consultation on draft report

- | | | |
|----|---|---|
| 1. | Kenji KIYOMIZU
(Leader) | Development Specialist on Civil Engineering
Japan International Cooperation Agency |
| 2. | Yohsuke KOBAYASHI
(Project Coordinator) | Third Project Management Division,
Grant Aid Project Management Department
Japan International Cooperation Agency |
| 3. | Kimio CHIBA
(Chief Consultant/Transportation Planning) | Construction Project Consultants, Inc. |
| 4. | Isao INUZUKA
(Road Designer) | Nippon Koei Co., Ltd. |
| 5. | Tamio SHINADA
(Construction Planning/Cost Estimator) | Construction Project Consultants, Inc. |

Appendix 2. Survey Schedule

(I) Field survey in Ethiopia

No.	Date		Transfer	Stay	Schedule
1	Nov.	23 Sun	Tokyo - Frank	Frankfurt	
2		24 Mon	Frank - Addis	Addis	Arrive Addis Ababa 20:50
3		25 Tue		Addis	EOJ, JICA, MEDaC Kickoff Meeting with ERA
4		26 Wed		Addis	Discussion with ERA
5		27 Thu		Addis	Discussion with ERA Preparation of the Minutes (Draft)
6		28 Fri		Addis	Signing of the Minutes Report to EOJ, JICA
7		29 Sat		Addis	Official members leave Ethiopia Consultant team continue the study
8		30 Sun		Addis	Preparation of Site survey
9	Dec.	1 Mon		Addis & site	Site survey
10		2 Tue		Addis & site	Site survey
11		3 Wed		Addis & site	Site survey
12		4 Thu		Addis & site	Site survey
13		5 Fri		Addis & site	Site survey
14		6 Sat		Addis & site	Site survey
15		7 Sun		Addis	Internal meeting
16		8 Mon		Addis & site	Site survey
17		9 Tue		Addis & site	Site survey
18		10 Wed		Addis & site	Site survey
19		11 Thu		Addis & site	Site survey
20		12 Fri		Addis	Discussion with ERA
21		13 Sat		Addis	Site survey
22		14 Sun		Addis	Internal meeting
23		15 Mon		Addis	Discussion with ERA
24		16 Tue		Addis	Signing of the Technical Notes Report to EOJ, JICA, ERA Chief Engineer leaves Ethiopia
25		17 Wed		Addis & site	Site survey
26		18 Thu		Addis & site	Site survey
27		19 Fri		Addis & site	Site survey
28		20 Sat		Addis & site	Site survey
29		21 Sun		Addis	Internal meeting
30		22 Mon		Addis & site	Site survey
31		23 Tue		Addis & site	Site survey
32		24 Wed		Addis	Data compiling
33		25 Thu		Addis	Report to EOJ, JICA, ERA
34		26 Fri	Addis - Frank	Frankfurt	Consultant members leave Ethiopia 12:15
35		27 Sat	Frank - Tokyo		
36		28 Sun	Tokyo		Arrive Tokyo 8:30

(2) Consultation on draft report

Days	Date		Move	Stay	Activities
1	98 Mar. 11	Wed.	Tokyo-Frankfurt	Frankfurt	
2	12	Thu.	Frankfurt-Addis	Addis	Arrive Addis Ababa 20:50
3	13	Fri.		Addis	Courtesy call to: EOJ and MEDaC Discussion with ERA
4	14	Sat.		Addis	Mr. Kobayashi (JICA) arrives in Addis
5	15	Sun.		Addis	
6	16	Mon.		Addis	Discussion with ERA
7	17	Tue.		Addis	Discussion with ERA Mr. Kiyomizu (Leader) arrives in Addis
8	18	Wed.		Addis	Discussion with ERA
9	19	Thu.		Addis	Discussion with ERA on the Minutes of Meeting (Draft)
10	20	Fri.		Addis	Signing of the Minutes of Meeting Report to EOJ and JICA
11	21	Sat.	Addis-Frankfurt	Frankfurt	Leave Ethiopia 0:50
12	22	Sun.	Frankfurt-Tokyo		Arrive Tokyo 8:30

Appendix 3. List of Party Concerned in Ethiopia

Ethiopian Roads Authority (ERA)

Mr.Tesfamichael Nahusenay	General Manager, ERA
Mr.Sema Igziabher Berhane	Deputy General Manager
Mr.Zerfu Tessema	Engineering and Regulatory Dep.
Mr.Kenene Bedada	Contract Administration Div.Manager
Mr.Oumer Ahmed	Finance Div.Manager
Mr.Eriso Garbado	Legal Counsel Legal Service Div.
Mr.Mesfin Wodajo	Project Implementation Branch Head
	Project Formulation Branch Head

Ministry of Works & Urban Development

Mr.Haile Assegidie	Minister
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Ministry of Economic Development and Cooperation(MEDaC)

Mr.Girma Birru	Minister
Mr.Haile Michael Kenfu	Acting Head of Bilateral Cooperation Dep.
Mr.Tassew Bekele	Acting Team Leader, Asian Desk
Ms.Asnakech Teferra	Senior Expert, Asian Desk
Ms.Sebele Getachew	Expert, Japanese Desk
Mr.Kinjiro Wada	JICA Expert

Addis Ababa Roads Authority (ARA)

Mr.Ismael Ibrahim	General Manager
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Other

Mr.Negede Lewi	World Bank Resident Mission
Mr.Ben H.M.van Ampting	Project Manager for the Project of Restructuring of the ERA
Mr.Nigel Penfold	DFID Contract Capacity Building Project (ERA)

Embassy of Japan

Mr.Yasuhiro Hamada	Ambassador
Mr.Shuichiro Kawaguchi	Counsellor
Mr.Yoichi Sakai	First Secretary
Mr. Satoshi Nakasuka	First Secretary

JICA Ethiopia Office

Mr.Hiroshi Matsutani	Resident Representative (up to March 1998)
Mr.Akio Hirasawa	Resident Representative (since March 1998)
Mr.Kyosuke Kawasumi	Assistant Resident Representative
Mr.Eita Narita	Assistant Resident Representative

Appendix 4. Minutes of Discussions

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY
ON
THE PROJECT FOR REHABILITATION OF TRUNK ROAD
IN
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

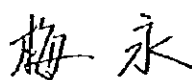
Based on the results of the Preliminary Study, the Japan International Cooperation Agency (hereinafter referred to as "JICA") decided to conduct a Basic Design Study on the Project for Rehabilitation of Trunk Road (hereinafter referred to as "the Project").

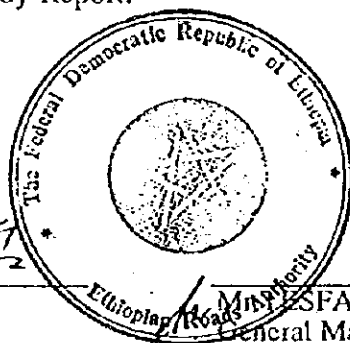
JICA sent to the Federal Democratic Republic of Ethiopia a basic design study team (hereinafter referred to as "the Team"), which is headed by Mr. Satoshi UMENAGA, Second Project Study Division, Grant Aid Project Study Department, JICA, and is scheduled to stay in the country from November 24 to December 26, 1997.


The Team held discussions with the concerned officials of the Government of Ethiopia.

In the course of the discussions, both parties have confirmed the main items of the Project as described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

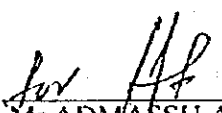
Addis Ababa, November 28, 1997


Mr. SATOSHI UMENAGA
Leader
Basic Design Study Team
JICA




Mr. ESFAMICHAEL NAHUSENAY
General Manager
Ethiopian Road Authority (ERA)
The Federal Democratic Republic of Ethiopia

Witness:


Mr. ADMASSU ABEBE
Head of Bilateral Cooperation Department
Ministry of Economic Development and Cooperation
The Federal Democratic Republic of Ethiopia

Attachment

The Government of Ethiopia has presented a request for the rehabilitation of Addis Ababa - Debre Markos road in priority order of Addis Ababa - Goha Tsyion, Goha Tsyion-Dejen, and Dejen-Debre Markos on the Minutes of Discussion of the Preliminary Study on August 21, 1997.

The Government of Japan after screening the said project has selected for consideration the Addis Ababa - Goha Tsyion section only. Therefore, the Government of Ethiopia has to formally make a request again for Addis Ababa - Goha Tsyion section only.

Based on the above, the following requests has been lodged again.

1. Objective of the Project

The objective of the Project is to rehabilitate the Addis Ababa - Goha Tsyion section of the existing trunk road to cope with socio-economic demands of the country.

2. Project Site

The site of the Project is shown in Annex-1.

3. Responsible and Implementing Agency

The Ethiopian Roads Authority (ERA) is responsible for the administration and the execution of the Project. The organization chart of ERA is shown in Annex-2.

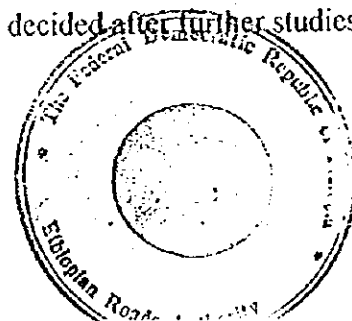
4. Item Requested by the Government of Ethiopia

After a series of discussions, the following item was finally requested by the Government of Ethiopia:

- 1) To rehabilitate the Addis Ababa to Goha Tsyion (the chainage from 3.5 km to 186 km) as phase I of the Addis Ababa - Debre Markos project in line with the Detailed Design Study conducted by ERA in November, 1996, and the recommendation of the Basic Design Team.

However, the final components of the Project will be decided after further studies.

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5. Japan's Grant Aid System

- 1) The Government of Ethiopia has understood the system of Japan's Grant Aid explained by the Team as described in Annex-3.
- 2) The Government of Ethiopia will take the necessary measures described in Annex-4 for smooth implementation of the Project, on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.
- 3) The Government of Ethiopia will take action on extending the period of the Grant Aid, if necessary.

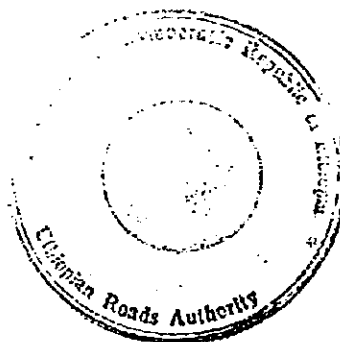
6. Further Schedule of the Study

- 1) The Team will proceed to further studies in Ethiopia until December 26, 1997.
- 2) Based on the results of the Basic Design Study, JICA will prepare the Draft Basic Design and dispatch a team at the beginning of March 1998 in order to consult the Government of Ethiopia on outline of the Draft Basic Design.
- 3) Upon acceptance of the Draft Basic Design by the Government of Ethiopia, JICA will complete the Basic Design Study Report and forward it to the Government of Ethiopia around the end of June, 1998.

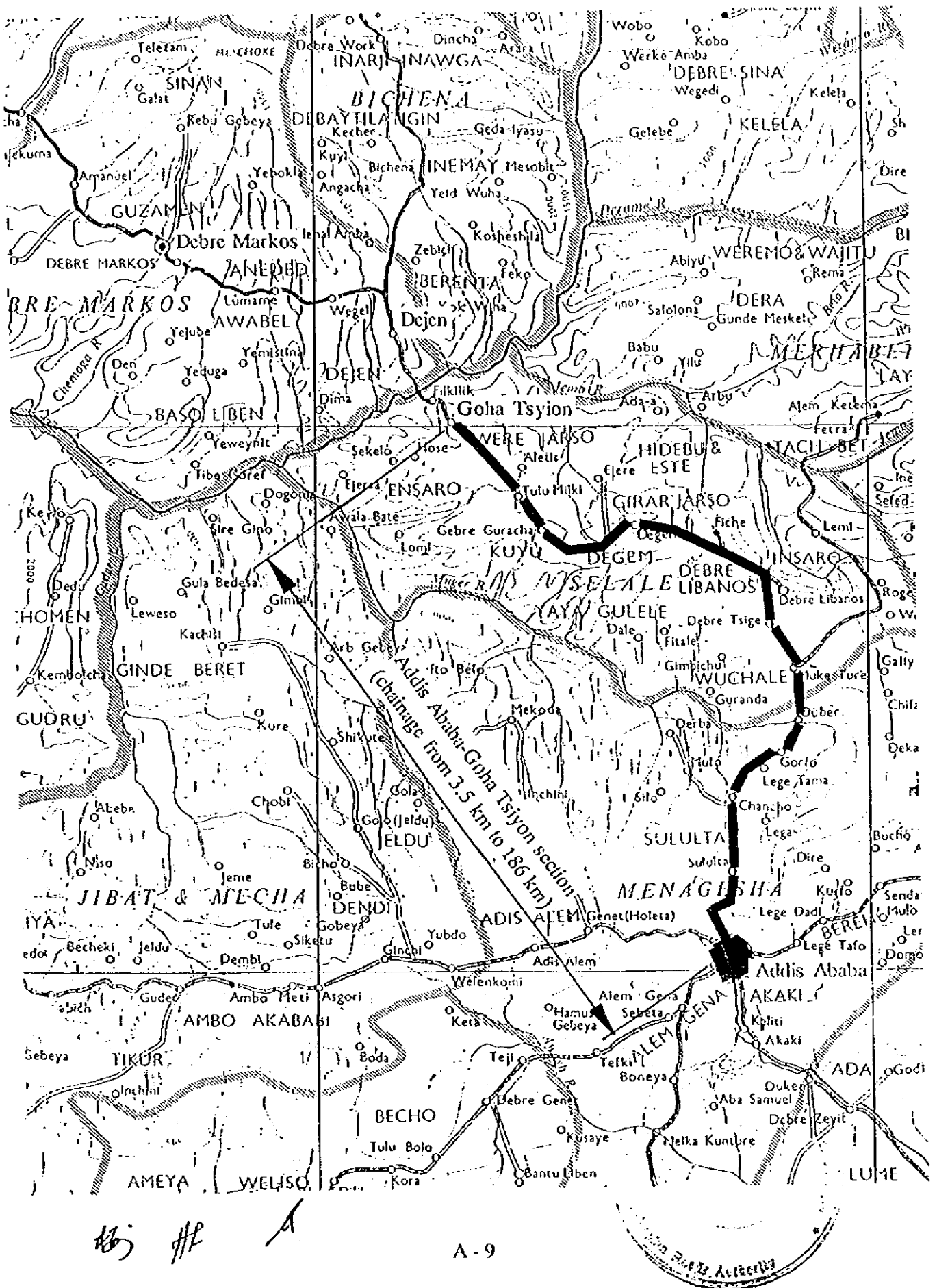
7. Other relevant issue

The Government of Ethiopia has strongly requested the rehabilitation of the Goha Tsyion to Debre Markos (chainage from 186km to 299km) as phase 2 of the Addis Ababa - Debre Markos project.

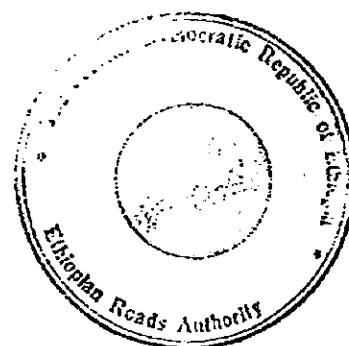
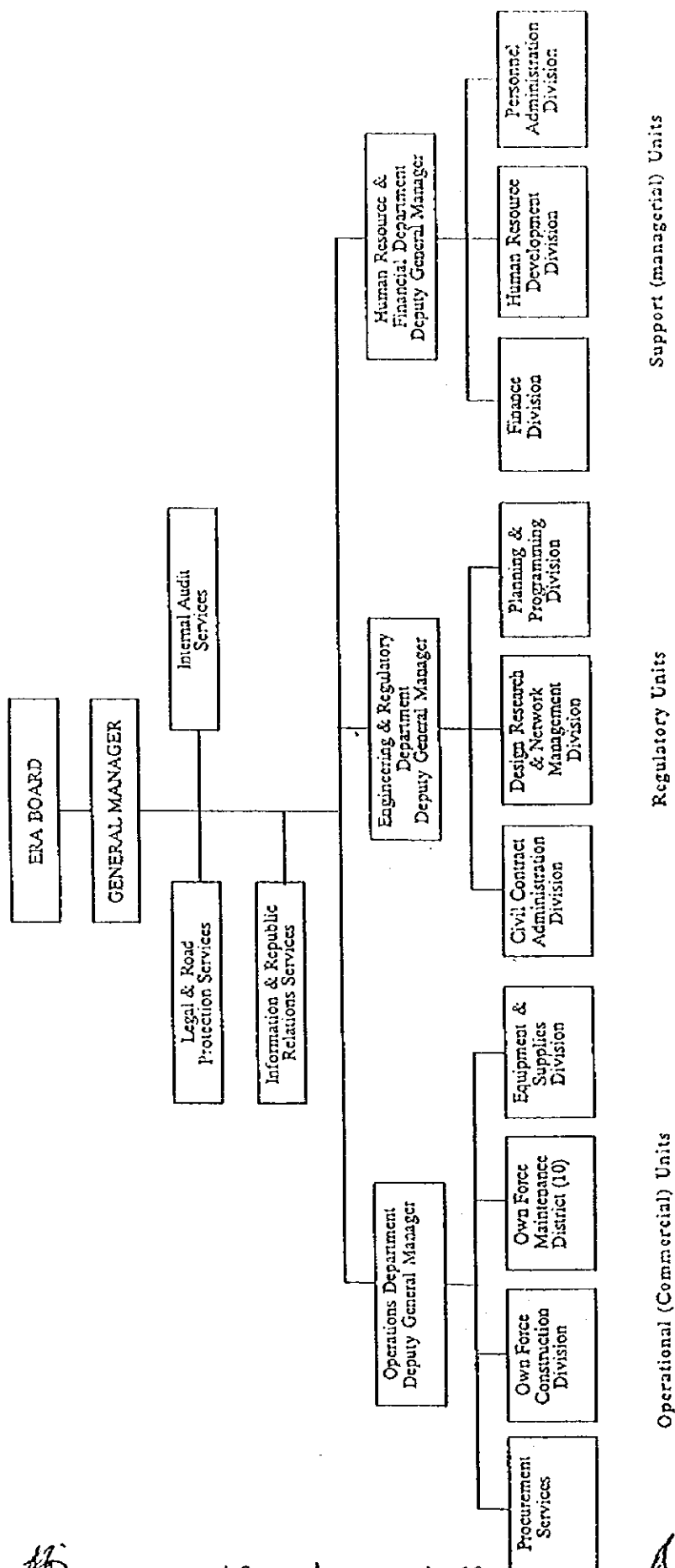
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Annex-1 Project Site



Annex-2 Organization Chart of Ethiopian Roads Authority (ERA)



Annex-3 Japan's Grant Aid Scheme

1. Grant Aid Procedures

- (1) Japan's Grant Aid Program is executed using the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and approval by Cabinet)
Determination of	(The Notes exchanged between the Governments of
Implementation	Japan and the recipient country)

- (2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

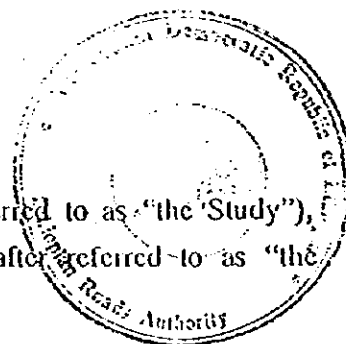
Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

- (1) Contents of the study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the



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Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

- 1) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- 2) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- 3) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- 4) Preparation of a basic design of the Project.
- 5) Estimation of costs of the Project.

The contents of the original requests are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

(2) Selection of Consultants

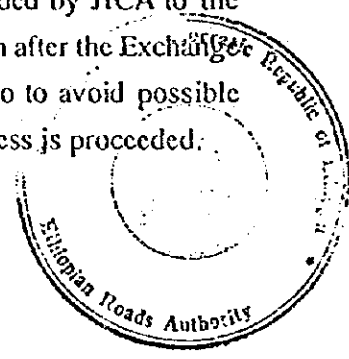
For smooth implementation of the Study, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The selected firm(s) carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consulting firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency and also to avoid possible undue delay in implementation caused if a new selection process is proceeded.

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3. Japan's Grant Aid Scheme

(1) What is Grant Aid?

The Grant Aid program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

(2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of executions, conditions and amount of the Grant Aid, etc., are confirmed.

(3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of Notes, concluding contracts with (a)consulting firm(s) and (a)contractor(s) and final payment to them must be completed.

However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

(4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However the prime contractors, namely, consulting, constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

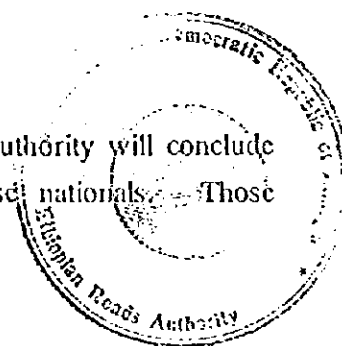
(5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those

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contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

-) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
-) To secure buildings prior to the procurement in case the installation of the equipment.
-) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
-) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts, or pay the same on behalf of the Japanese Nationals.

Proper Use"

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

Re-export"

The products purchased under the Grant Aid should not be re-exported from the recipient country. Exemption to this is made to contractor's equipment.

Banking Arrangement (B/A)

-) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the

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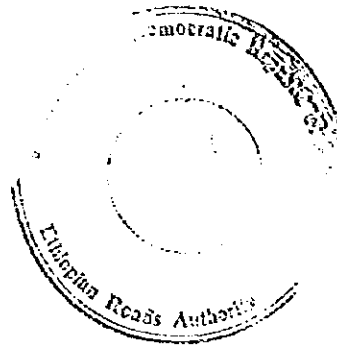
Government of the recipient country or its designated authority under the Verified Contracts.

- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

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Annex-4 Necessary Measures to be Taken by The Government of Ethiopia

The following necessary measures should be taken by the Government of Ethiopia on condition that the Grant Aid by the Government of Japan is extended to the Project:

- (1) To provide data and information necessary for the Project.
- (2) To secure land necessary for the execution of the Project, such as temporary offices, working areas, storage yards and others.
- (3) To clear the sites prior to the commencement of the construction.
- (4) To make passable all roads and bridges leading to the Project sites before the commencement of inland transportation of materials and equipment.
- (5) To ensure prompt unloading customs clearance at the port of disembarkation in Ethiopia and prompt internal transportation of the materials and equipment for the Project purchased under the Grant Aid.
- (6) To accord Japanese Nationals whose services may be required in connection with the supply of products and the services under the verified contract such facilities as may be necessary for their entry into Ethiopia and stay therein for the performance of their work.
- (7) To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary.
- (8) To maintain and use properly and effectively the facilities constructed under the Project.
- (9) To coordinate and solve any issues related to the section which is maintained under the Region 14 with Addis Ababa Roads Authority (ARA).
- (10) To coordinate and solve any issues related to the project which may be raised from third parties or inhabitants in the Project area during implementation of the Project.

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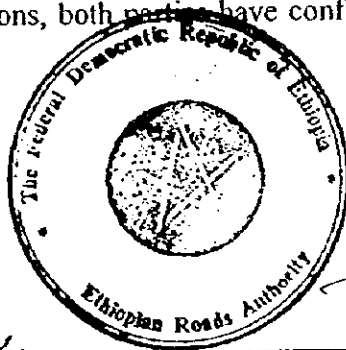


MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY
ON
THE PROJECT FOR REHABILITATION OF TRUNK ROAD
IN
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
(Consultation on Draft Report)

From November to December 1997, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study team on the Project for Rehabilitation of Trunk Road (hereinafter referred to as "the Project") to the Federal Democratic Republic of Ethiopia (hereinafter referred to as "Ethiopia"). Through discussions, field survey, and technical examination of the results in Japan, JICA has prepared the Draft Report of the Study.

In order to explain and to consult the Government of Ethiopia on the components of the Draft Report, JICA sent to Ethiopia a study team (hereinafter referred to as "the Team"), which is headed by Mr. Kenji KIYOMIZU, Development Specialist, Institute for International Cooperation, JICA, and is scheduled to stay in the country from March 12 to 21, 1998.

As the result of discussions, both parties have confirmed the main items described on the attached sheets.



Addis Ababa, March 20, 1998

Kenji Kiyomizu
Mr. KENJI KIYOMIZU
Leader
Basic Design Study Team
Japan International Cooperation Agency

Tesfamihael Nahusenay
Mr. TESFAMICHAEL NAHUSENAY
General Manager
Ethiopian Roads Authority (ERA)
The Federal Democratic Republic of Ethiopia

Witness:

Admassu Abebe
Mr. ADMASSU ABEBE
Head of Bilateral Cooperation Department
Ministry of Economic Development and Cooperation
The Federal Democratic Republic of Ethiopia

Attachment

1. Components of the Draft Report

The Government of Ethiopia has agreed and accepted in principle the component of the Draft Report prepared by the Team.

2. Project Site

The site of the Project is shown in Annex-1.

3. Responsible and Implementing Agency

The Ethiopian Roads Authority (ERA) is responsible for the administration and the execution of the Project. The organization chart of ERA is shown in Annex-2.

4. Japan's Grant Aid System

- (1) The Government of Ethiopia has understood the system of Japan's Grant Aid explained by the Team as described in Annex-3.
- (2) The Government of Ethiopia will take the necessary measures described in Annex-4 for smooth implementation of the Project, on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.
- (3) The Government of Ethiopia will take action on extending the period of the Grant Aid, if necessary.

5. Further Schedule

The Team will complete the Final Report in accordance with the confirmed items and forward it to the Government of Ethiopia around the end of June, 1998.

6. Other relevant issue

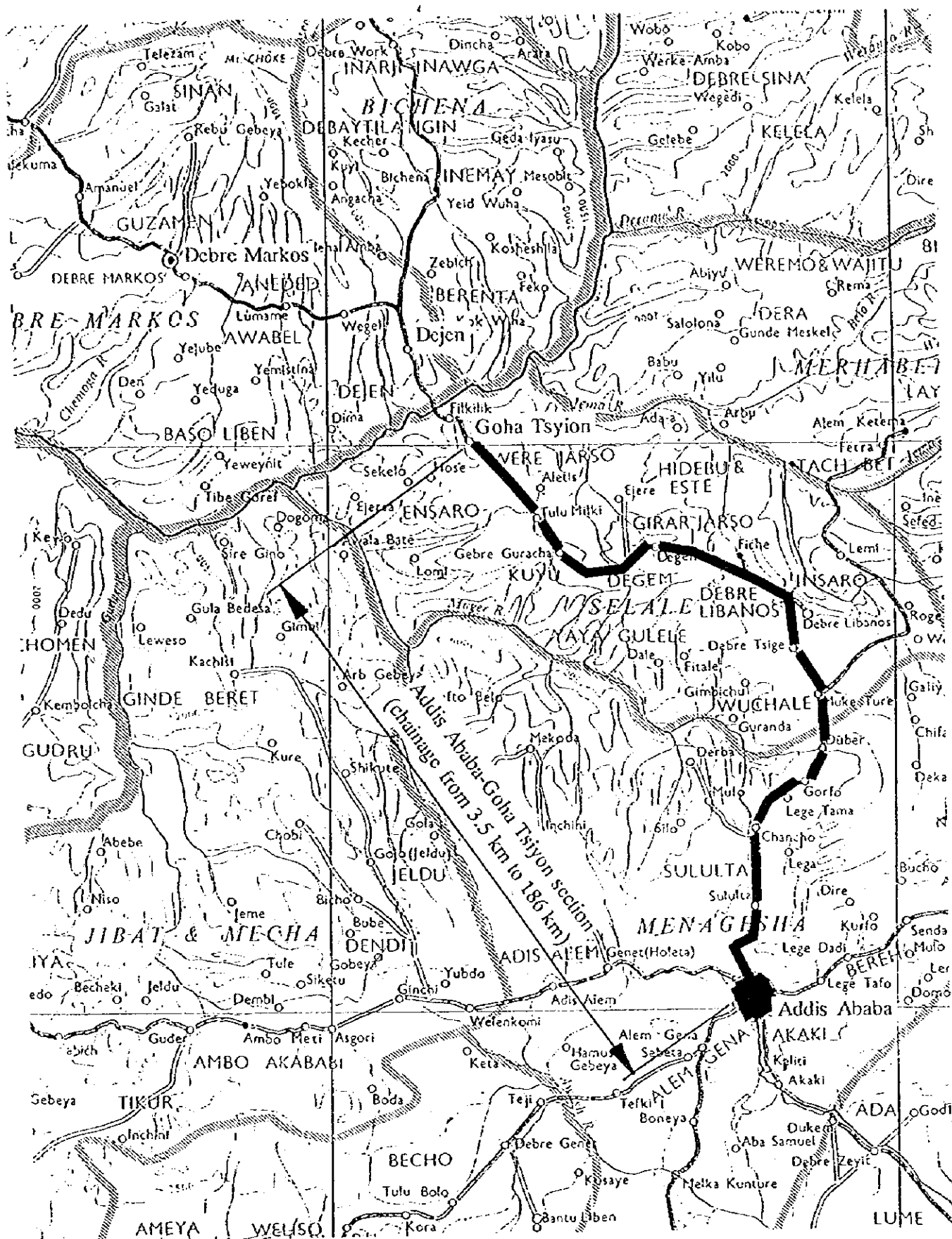
The Government of Ethiopia has strongly requested the rehabilitation of Goha Tsyion to Debre Markos (chainage from 186km to 299km) as the phase 2 of the Addis Ababa - Debre Markos project.

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Annex-1 Project Site

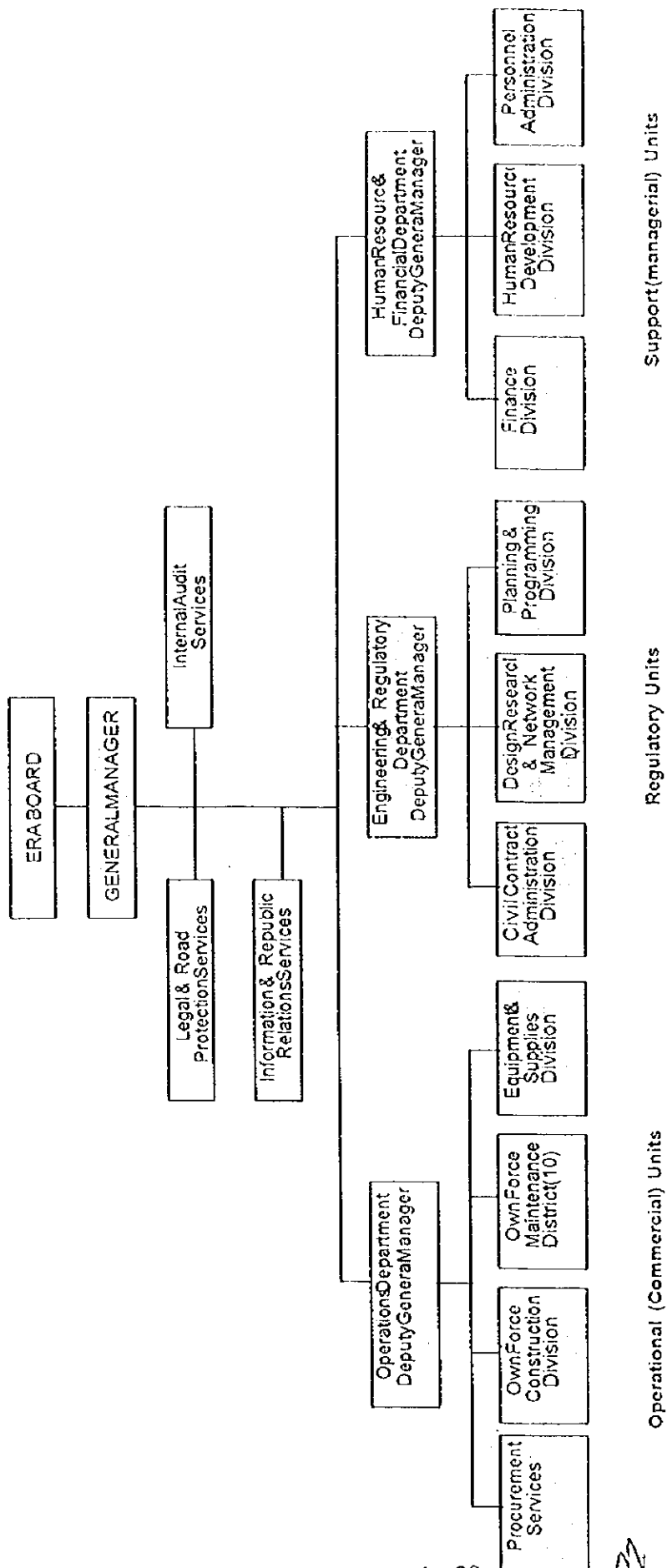


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Annex-2 Organization Chart of Ethiopian Roads Authority (ERA)



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Annex-3 Japan's Grant Aid Scheme

1. Grant Aid Procedures

- (1) Japan's Grant Aid Program is executed using the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and approval by Cabinet)
Determination of	(The Notes exchanged between the Governments of
Implementation	Japan and the recipient country)

- (2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.



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2. Basic Design Study

(1) Contents of the study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

- 1) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- 2) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- 3) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- 4) Preparation of a basic design on the Project.
- 5) Estimation of costs on the Project.

The contents of the original requests are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested

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firms. The selected firm(s) carry(ies) out a Basic Design Study and write(s) a report, based upon the terms of reference set by JICA.

The consulting firm(s) used for the Study is(are) recommended by JICA to the recipient country to work also on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency and also to avoid possible undue delay in implementation caused if a new selection process is proceeded.

3. Japan's Grant Aid Scheme

(1) What is Grant Aid?

The Grant Aid program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

(2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of executions, conditions and amount of the Grant Aid, etc., are confirmed.

(3) "The period of the Grant Aid" means one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of Notes, concluding contracts with (a)consulting firm(s) and (a)contractor(s) and final payment to them must be completed.

However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between two Governments.

(4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

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However the prime contractors, namely, consulting, constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

(6) Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

- 1) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
- 2) To secure buildings prior to the procurement in case of the installation of the equipment.
- 3) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
- 4) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts, or pay the same on behalf of the Japanese Nationals.

(7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.



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(8) "Re-export"

The products purchased under the Grant Aid should not be re-exported from the recipient country. Exemption to this is made to contractor's equipment.

(9) Banking Arrangement (B/A)

- a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

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Annex-4 Necessary Measures to be Taken by The Government of Ethiopia

The following necessary measures should be taken by the Government of Ethiopia on condition that the Grant Aid by the Government of Japan is extended to the Project:

- (1) To provide data and information necessary for the Project.
- (2) To secure land necessary for the execution of the Project, such as temporary offices, working areas, storage yards and others.
- (3) To clear the sites prior to the commencement of the construction.
- (4) To make passable all roads and bridges leading to the Project sites before the commencement of inland transportation of materials and equipment.
- (5) To ensure prompt unloading customs clearance at the port of disembarkation in Ethiopia and prompt internal transportation of the materials and equipment for the Project purchased under the Grant Aid.
- (6) To accord Japanese Nationals whose services may be required in connection with the supply of products and the services under the verified contract such facilities as may be necessary for their entry into Ethiopia and stay therein for the performance of their work.
- (7) To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary.
- (8) To maintain and use properly and effectively the facilities constructed under the Project.
- (9) To coordinate and solve any issues related to the section which is maintained under the Region 14 with Addis Ababa Roads Authority (ARA).
- (10) To coordinate and solve any issues related to the project which may be raised from third parties or inhabitants in the Project area during implementation of the Project.



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Mr. TSEFAMICHAEL NAHUSENAY
General Manager
Ethiopian Roads Authority

Dec. 15, 1997

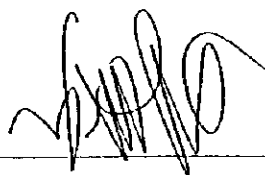
**Subject : The Project for Rehabilitation of Trunk Road
in The Federal Democratic Republic of Ethiopia**

Dear Sir,

We would like to submit herewith our Technical Notes for the Basic Design of the captioned project for your confirmation.

We would be grateful if you would comment this as soon as possible.

Sincerely yours,



Mr. Kimio Chiba

Consultant's Leader of the Basic Design

**The Project for Rehabilitation of Trunk Road
in
The Federal Democratic Republic of Ethiopia**

Technical Notes by the Basic Design Study Team

Dec.12, 1997

(1) Introduction

In accordance with the Minutes of Discussions signed on November 28, 1997 between the Ethiopian Road Authority (ERA) and the Basic Design Study Team, the Consultant has been carrying out close review of the Detailed Design of Addis Ababa-Debre Markos Road Rehabilitation based on his own site investigation for Addis Ababa-Goha Tsyion section of the above road.

Now, at the mid-point of the study, the Consultant prepared this technical notes for ERA's confirmation on the design concept of the Basic Design, and to enable the Consultant to start his design activities.

(2) Design Concept

The Consultant understands this Project to be categorized into the "rehabilitation" which definition is accepted internationally, accordingly, the existing facilities shall be maximized where both technical and economic conditions permit it.

Based on the above mentioned policy the concept of the Basic Design is summarized as follows:

1. Design Standards to be applied:

Geometrical design: AASHTO and TRL Road Note No.6

Pavement design: TRL Road Note No.31

Bridge design: AASHTO HS-20

2. Road Alignment (horizontal and vertical)

To follow the existing alignment as much as possible where the design standards permit it

3. Traffic Safety

To ensure traffic safety and smooth flow of traffic

4. Construction Costs

To minimize construction costs by avoiding large cutting and filling

5. Maintenance after the Project

To facilitate the maintenance



(3) Cross Section Design

The design road cross section is categorized into 4 types as shown in Fig. 1.

The corresponding road section to each type is shown in Fig. 2, also a brief description of each type is attached to.

(4) Bridge Design

1. The existing RC slab and/or girder will be replaced by new structure for the 4 bridges, which are recommended replacement by the Detailed Design.
2. Width of the above mentioned 4 bridges shall have 7m of carriage way and 0.5m of shoulder on both sides
2. Other bridges will be rehabilitated in accordance the Detailed Design except bridge width, where the existing width of carriageway and shoulder is kept at 7.0m and 0.5m, respectively will not be changed.

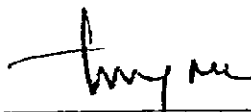
(5) Crossing Drainage structures

1. To be rehabilitated basically in accordance with the Detailed Design
2. Length of the drainage structure to be extended shall be decided by adding the design width of carriageway and shoulder at that station.



Mr. Kimio Chiba

Consultant's Leader of the Basic Design



Mr. Tesfamichael Nahusenay

General Manager

Ethiopia Road Authority(ERA)

*Principally agreed but
reference shall be made to
the letter ref. No MM/3/44/15-400*

dated Dec 16, 1997

Description of the Cross Section Type

Type A Station from 3km500 to 5km500 (section lengths 2.0km)

Environment: Located near market place in the northern area of Addis Ababa. Traffic is seriously congested with pedestrian, carts and various types of vehicles.

Design concept:

1. Carriage way width to be 7.0m
2. Shoulder with 1.5m of width to be surface-treated by DBST
3. To construct pedestrian with 3.0m of width on both sides
4. To construct bus-bay at 2 stations near the market
5. To construct rip-rap side ditch with 1.5m of width on both sides

Type B Station from 5km500 to 10km000 (section lengths 4.5km)

Environment: Steep climbing section. Traffic is seriously congested with pedestrian, carts and heavy cargo trucks

Design concept:

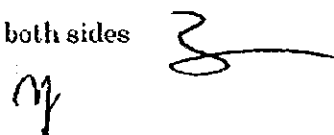
1. As the existing alignment is in accordance with AASHTO standards further re-alignment not considered
2. Carriageway width to be 6.0m (AASHTO standards).
3. Width of right-side shoulder, i.e. hill side of the road within the existing curve section to be widened to 3.0m in accordance with AASHTO standards, and surface-treated with DBST.
4. To construct passing lane within appropriate section
5. To construct rip-rap side ditch on the hill side
6. To avoid large cutting to prevent possible land-slide

Type C Station from 10km000 to 95km000(section length 85.0km), and from 101km000 to 186km000(section length 85.0km)

Environment: Flat, rolling and hilly sections. Low traffic

Design concept:

1. As the existing alignment is in accordance with AASHTO standards further re-alignment not considered
2. Carriage way width to be 7.0m, and shoulder 1.5m on both sides



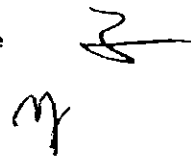
3. Road width to be widened within the existing curve section in accordance with AASHTO standards
4. To construct bus-bay or the shoulder to be surface-treated by DBST at several villages
5. To construct side ditch where necessary
6. To install safety facilities where necessary

Type D Station from 95km 000 to 101km 000 (section length 6.0km)

Environment: Rocky mountainous sections. Low traffic

Design concept:

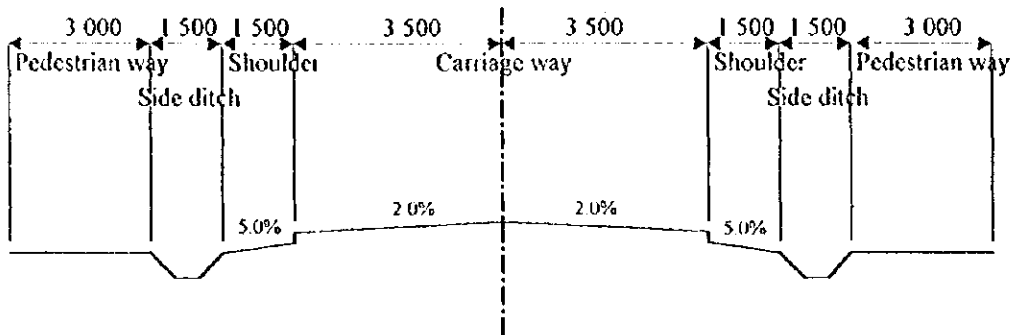
1. As the existing alignment is in accordance with AASHTO standards further re-alignment not considered
2. Carriageway width to be 6.0m (AASHTO standards).
3. Width of the road within the existing curve section to be widened in accordance with AASHTO standards, and surface-treated with DBST.
4. To construct rip-rap side ditch on the hill side
5. To avoid large cutting to prevent possible land-slide



Cross section type

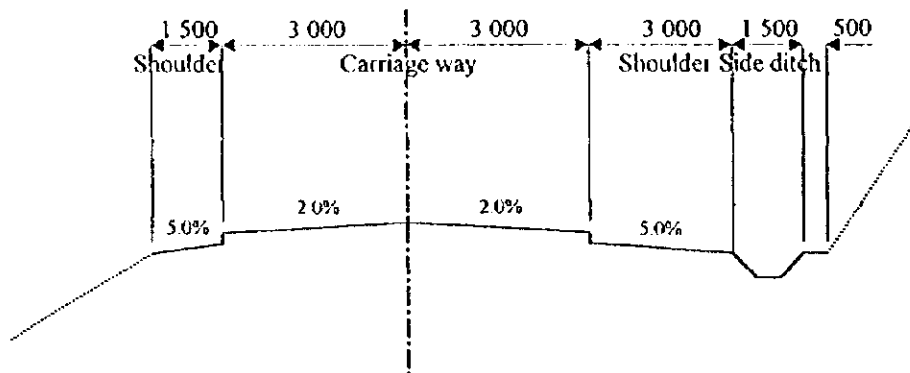
Type (A)

Section lengths 2.0km



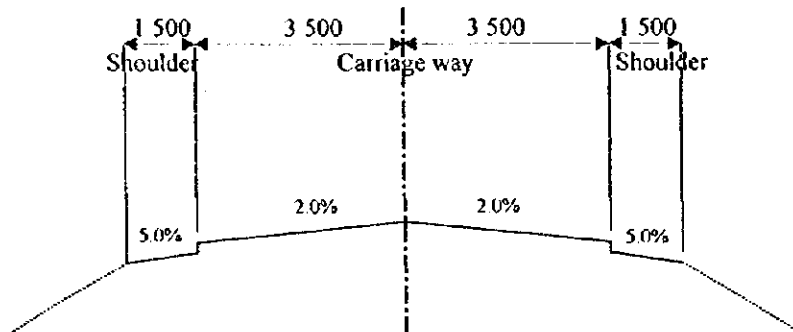
Type (B)

Section lengths 4.5km



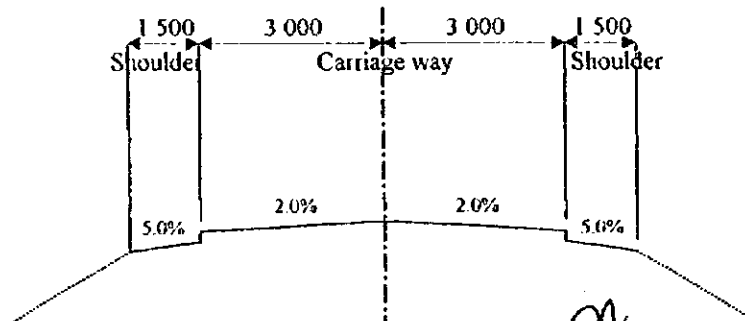
Type (C)

Section lengths 170.0km

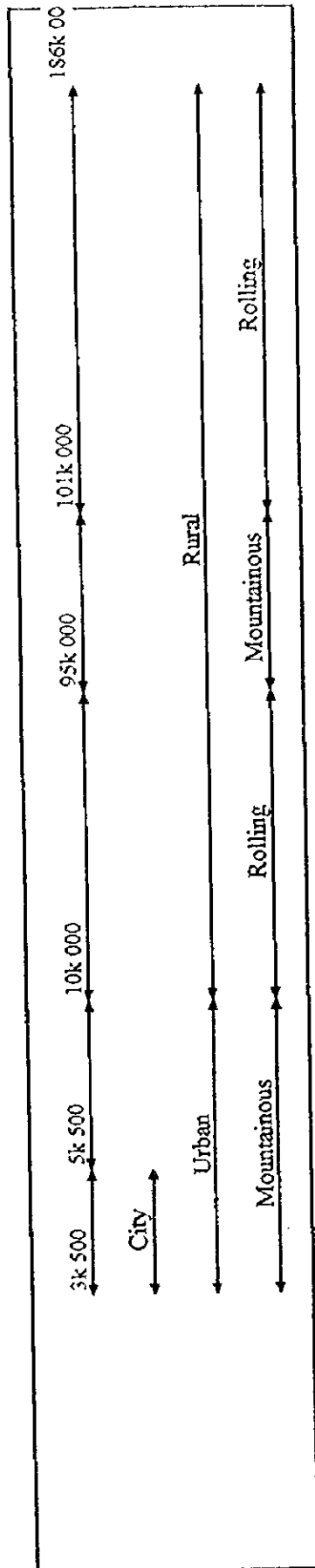


Type (D)

Section lengths 6.0km



SELECTION OF DESIGN SECTION



Design Standard

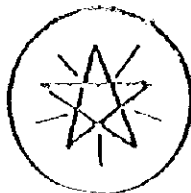
Design speed	40km/h (30mph)	60km/h (40mph)	40km/h (30mph)	60km/h (40mph)
Maximum grade	11.0%	6.0%	8.0%	6.0%
Minimum curvature	R=30m	R=85m	R=30m	R=85m
Minimum sight distance	350m (1,100ft)	460m (1,500ft)	350m (1,100ft)	460m (1,500ft)
Lane width	7.0m (22ft)	6.0m (20ft)	7.0m (22ft)	6.0m (20ft)
Shoulder width	1.5m (4ft) paved	1.5m (4ft) unpaved	1.5m (4ft) paved	1.5m (4ft) unpaved
Cross section type	(A)	(B)	(C)	(D)

source from AASHTO

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የጉዞ መሳሪያ ሚኒስቴር



THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

ETHIOPIAN ROADS AUTHORITY

Post Office Box 1111 Addis Ababa Ethiopia
Cable Address: M/Minawa Addis Ababa
Telephone: 1-1111-1111-1111
Fax: 1-1111-1111-1111

Ref. No. MM3/42/15-400

Date: DEC 16 19 97

Japan International Cooperation Agency
Construction Project Consultants, Inc.
Nippon Koei Co., LTD,

Subject: Addis Ababa-D/Markos Road Rehabilitation Project

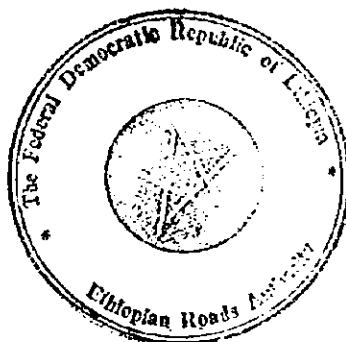
Dear Sirs,

Enclosed herewith please find our comments on the Technical Notes by the Basis Design Study Team.

You are requested to consider and incorporate our notes of comments in your subsequent actions.

Sincerely yours,

TESFAMICHAEL NAHUSENAY
GENERAL MANAGER
ETHIOPIAN ROADS AUTHORITY



Addis Ababa-Debre Markos Road Rehabilitation Project

The consultant selected and recommended to adopt the AASHTO Design manual. The AASHTO Design manual is acceptable, with some departures, where it required to improve the manual, or if it is difficult to attain the standard. However, the basic requirements of the design standard should be maintained.

Accordingly, we make the following comments and/or improvement on the "Technical Notes by the Basic Design Study Team"

i) Design speed (kmh)

Flat (level) terrain	⇒	100
Rolling terrain	⇒	80
Hilly terrain	⇒	65
Mountainous terrain	⇒	50

ii) Description of the cross-section type

* **Type A** km 3+500 to km 5+500 (section length 2.00 km)

- It is an Urban Section, should be provided with 7.00 carriageway and 2.50 m. shoulder width on both sides of the road used as parking lane. Shoulders are paved and constructed of the same material as that of the road carriageway

* **Type B** km 5+500 to km 10+000 (Section length 4.50 km)

- Maintain 6.50 m road carriageway and 3.00 m shoulder width for pedestrian and non motorable traffic *and 1.00m on valley side*

* **Type D** km 95+000 km 101+000 (Section length 6.00 km)

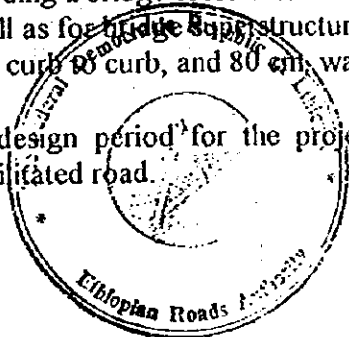
This section of the road is considered mountainous provide 6.50 m. carriageway width and 1.00 m shoulder width on both sides of the road.

Shoulders on the inner side of curves in mountainous section would be flash with the paved ditch, and constructed of the same material and to the same pavement standard of the road carriage way.

iii) Bridge Cross-section design

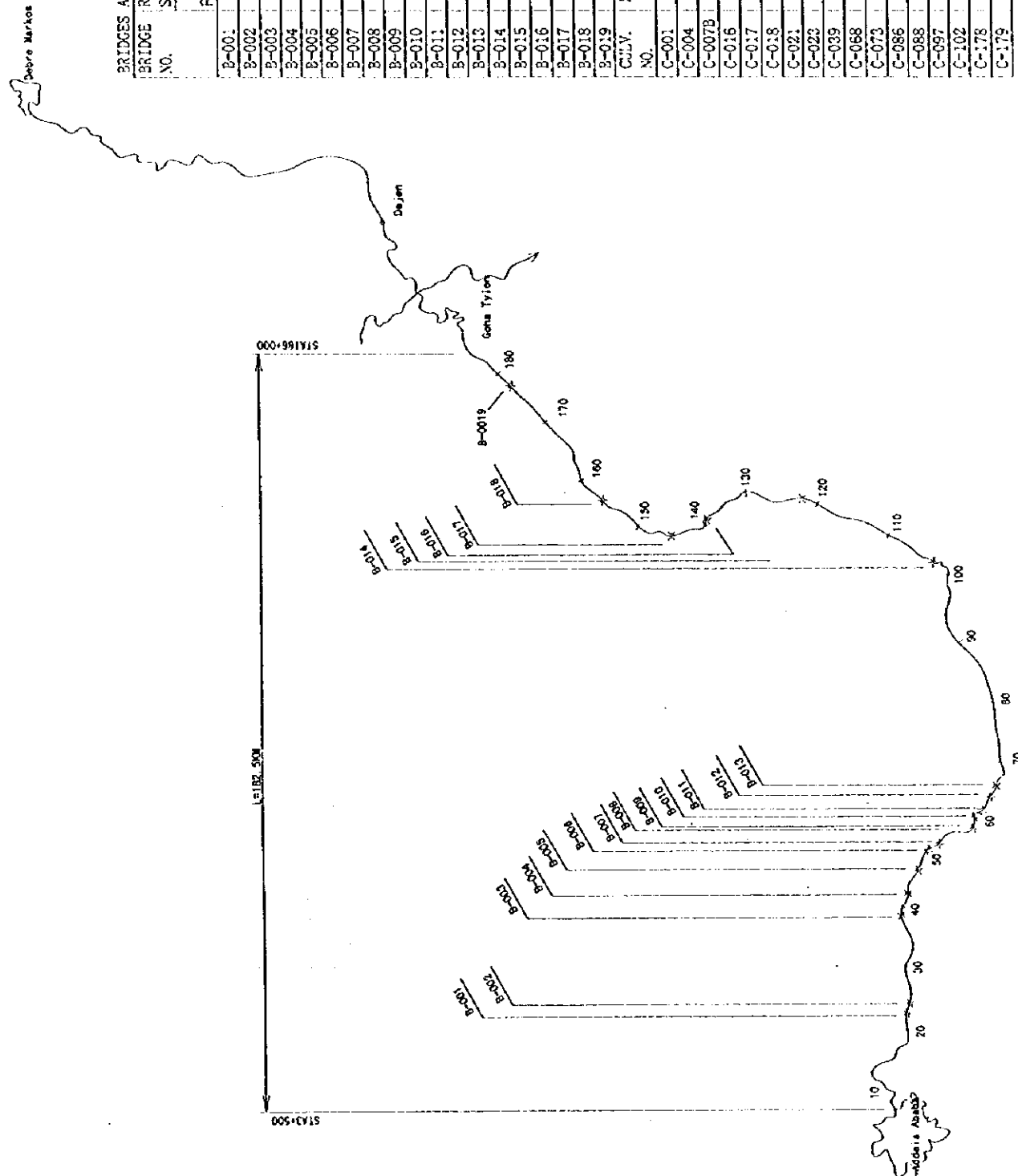
Regarding a bridge cross-section dimensions, which are recommended for replacement, as well as for bridge structure to be replaced, it is advisable to adopt 7.32 m clear width curb to curb, and 80 cm walkway with guard rails on both sides.

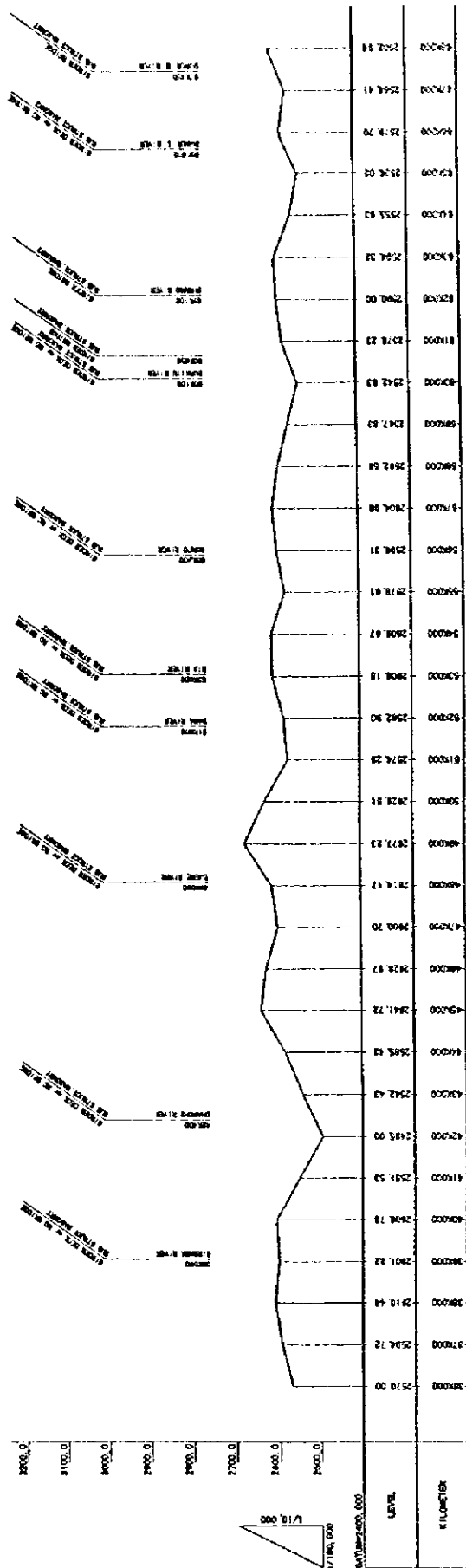
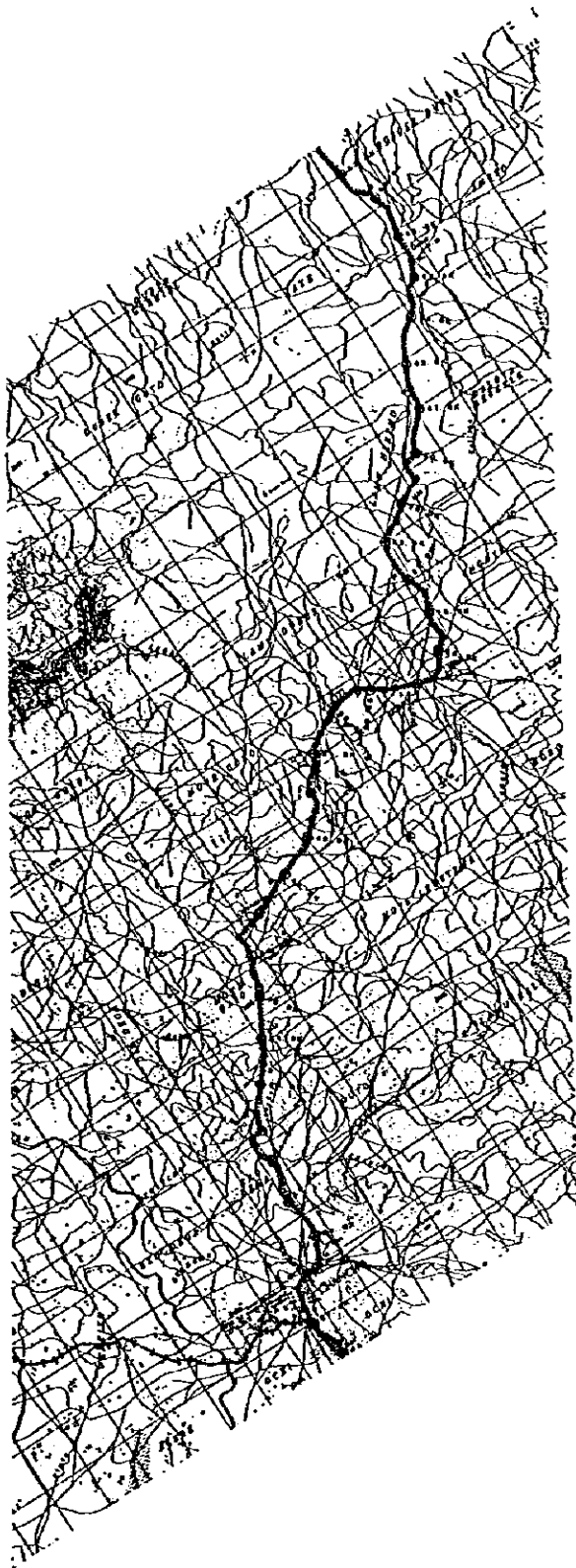
iv) The design period for the project is 20 years starting from the opening date of rehabilitated road.



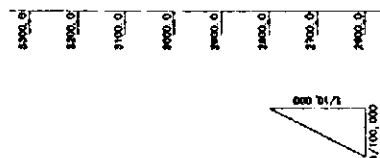
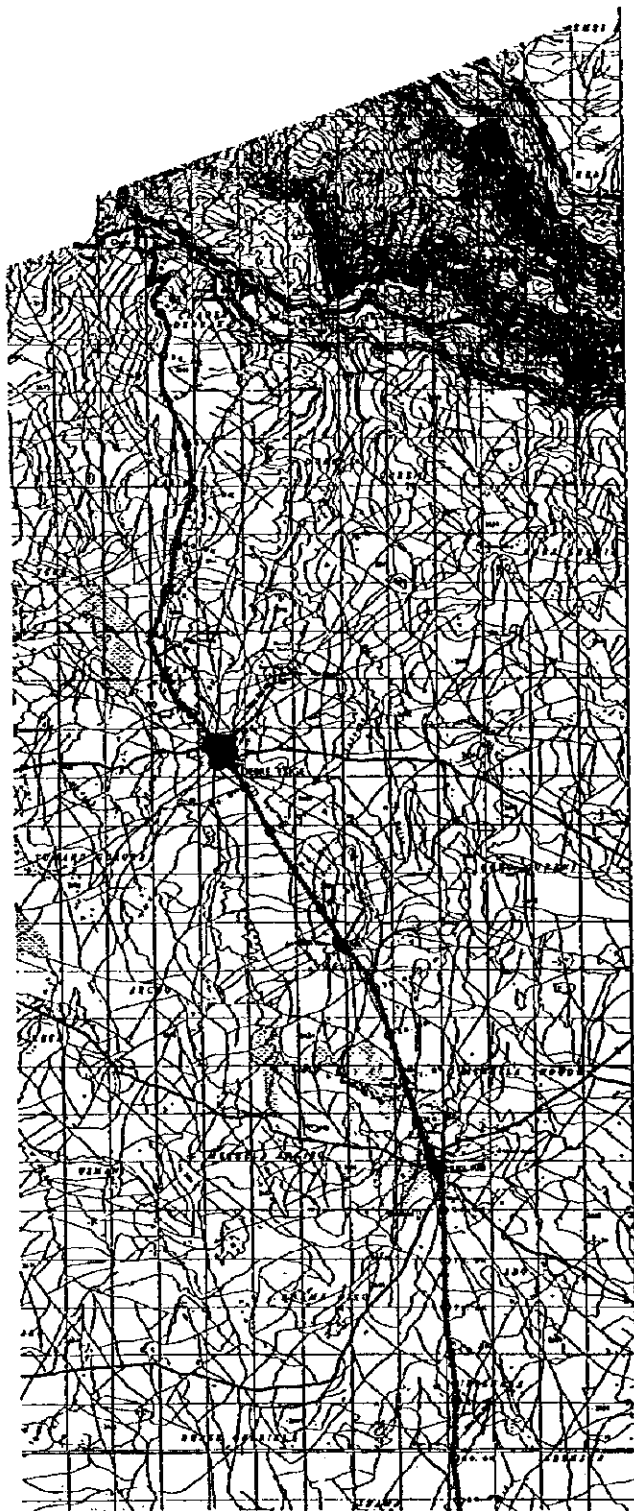
Appendix 5. Drawings

LOCATION MAP



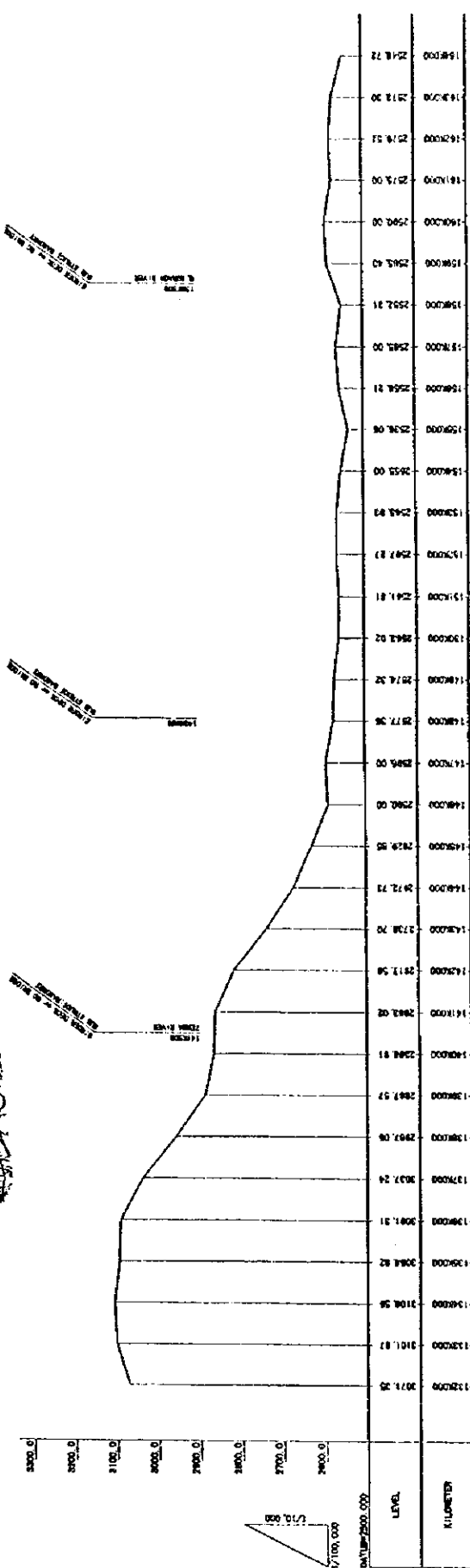


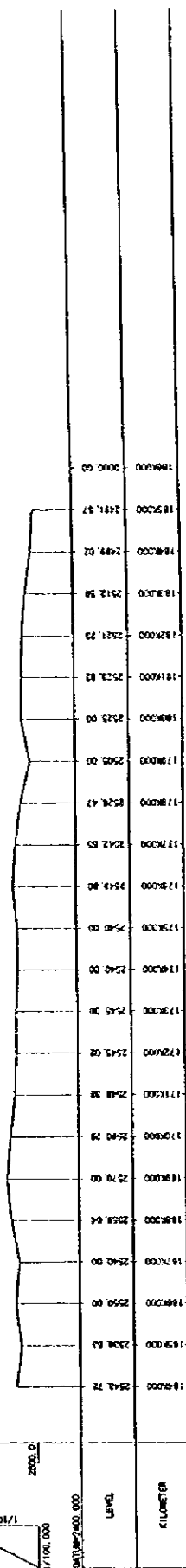
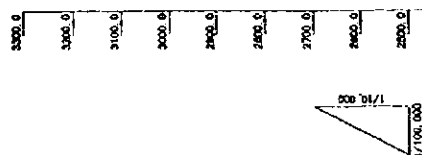
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA		RADIO DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD		JAPAN INTERNATIONAL COOPERATION AGENCY		DATE		SHEET NO.	
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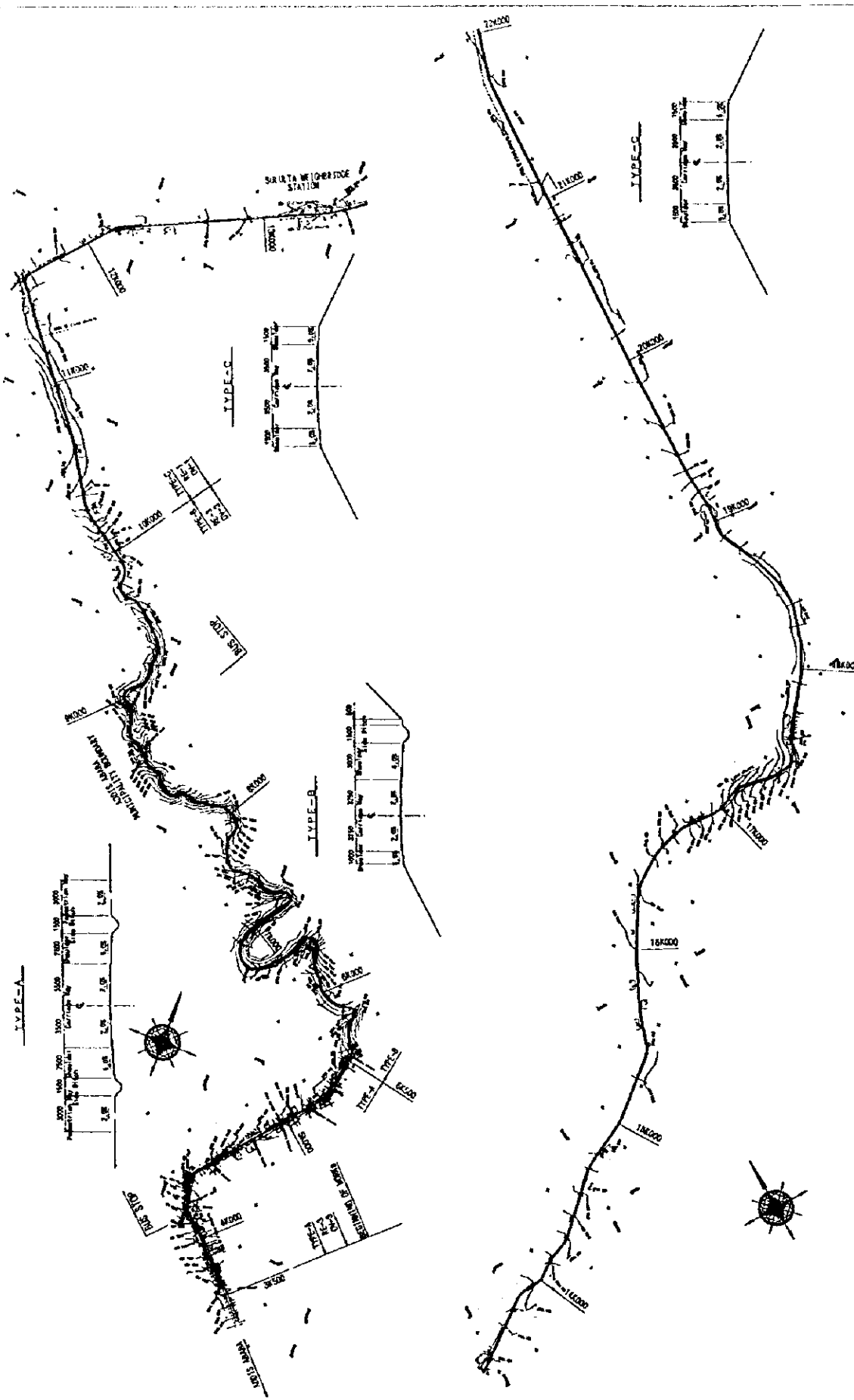


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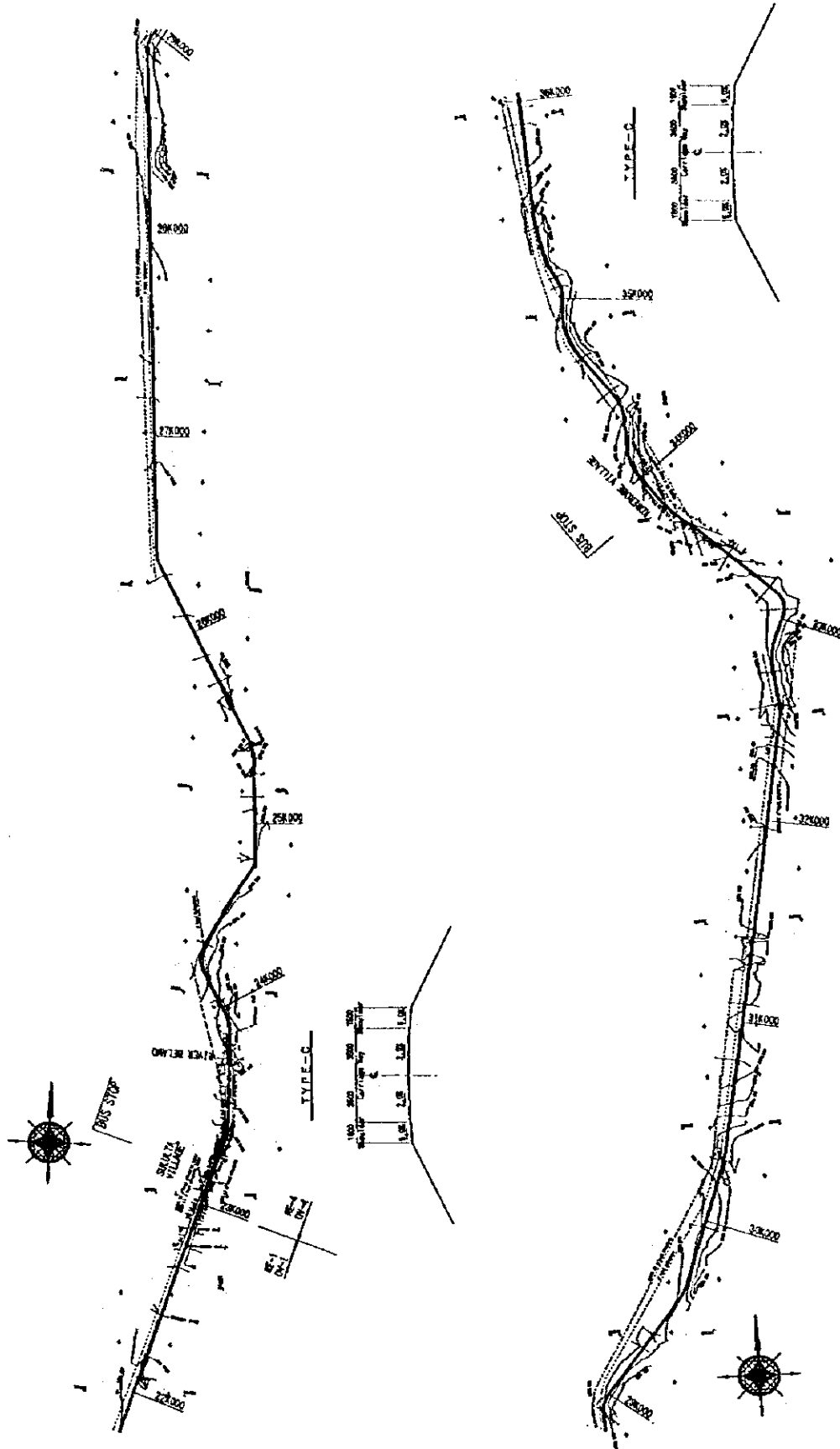
SHEET NO.	DATE	JAPAN INTERNATIONAL COOPERATION AGENCY	SHEET NO.
	1999		
Project and Location		Section (8/8)	
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA			
THE PROJECT FOR REHABILITATION OF TRUNK ROAD			

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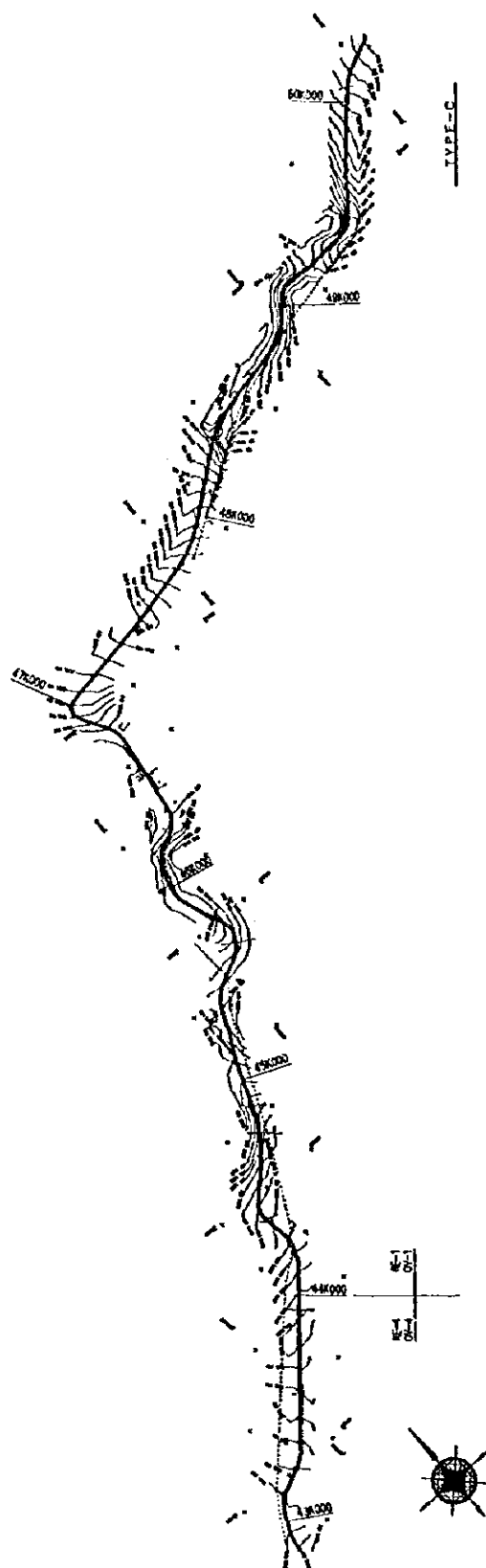
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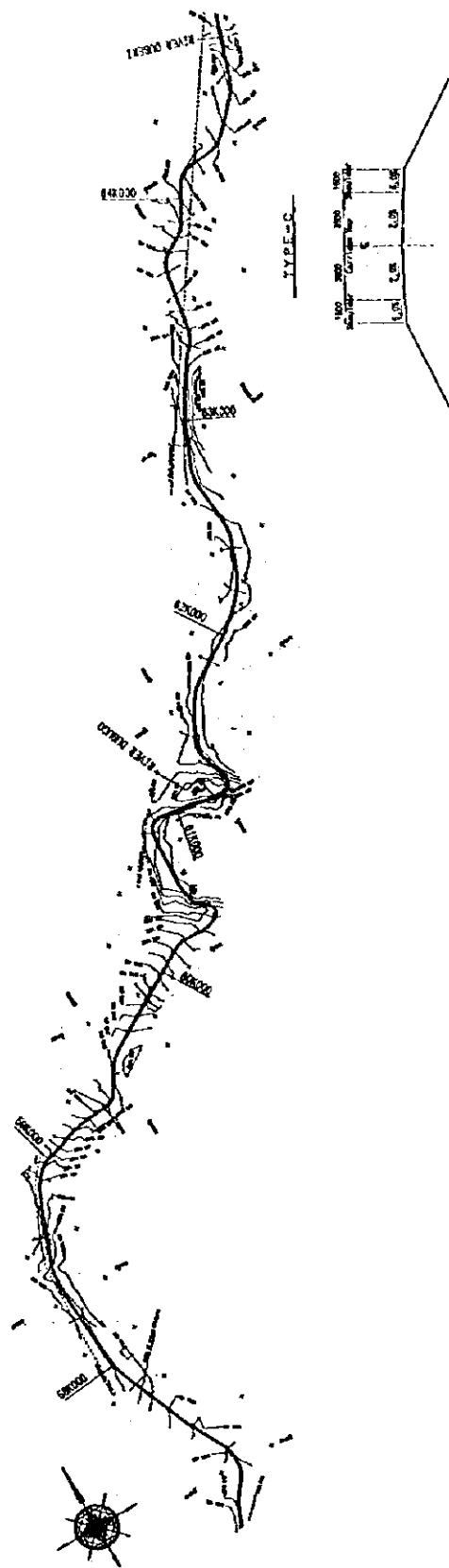
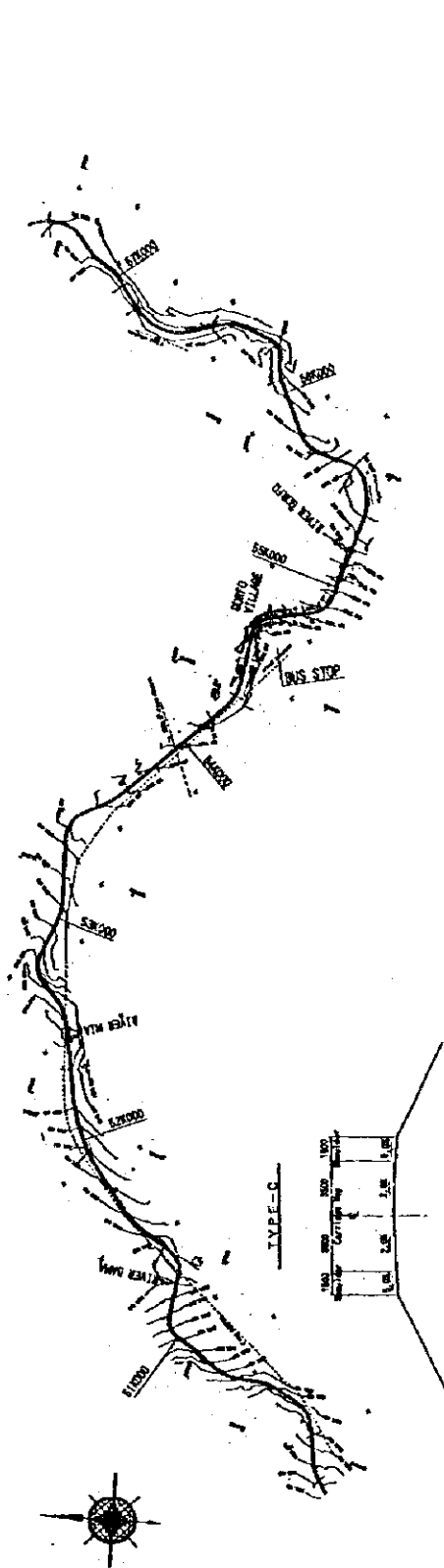
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	DATE	SHEET NO.
			Mar. 1988	Plan (1/3)



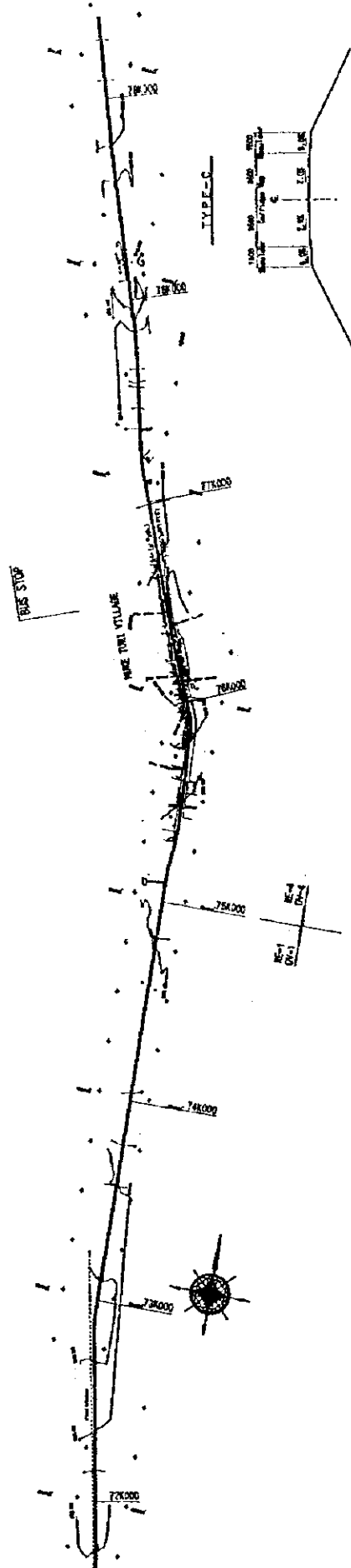
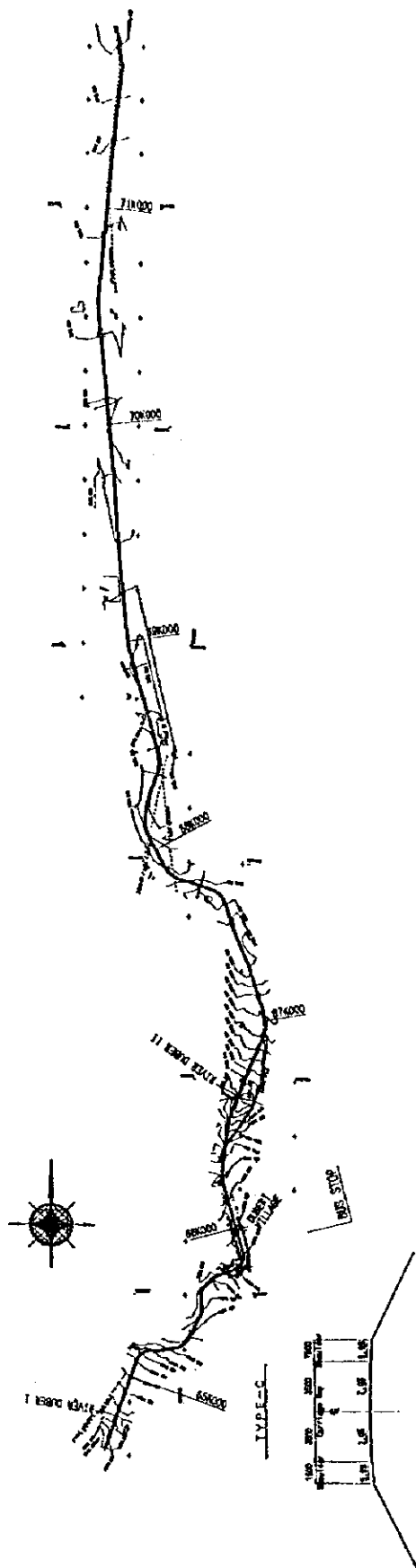
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	DATE	SHEET NO.
			Plan (2/13)	Mar. 1988



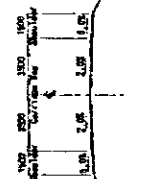
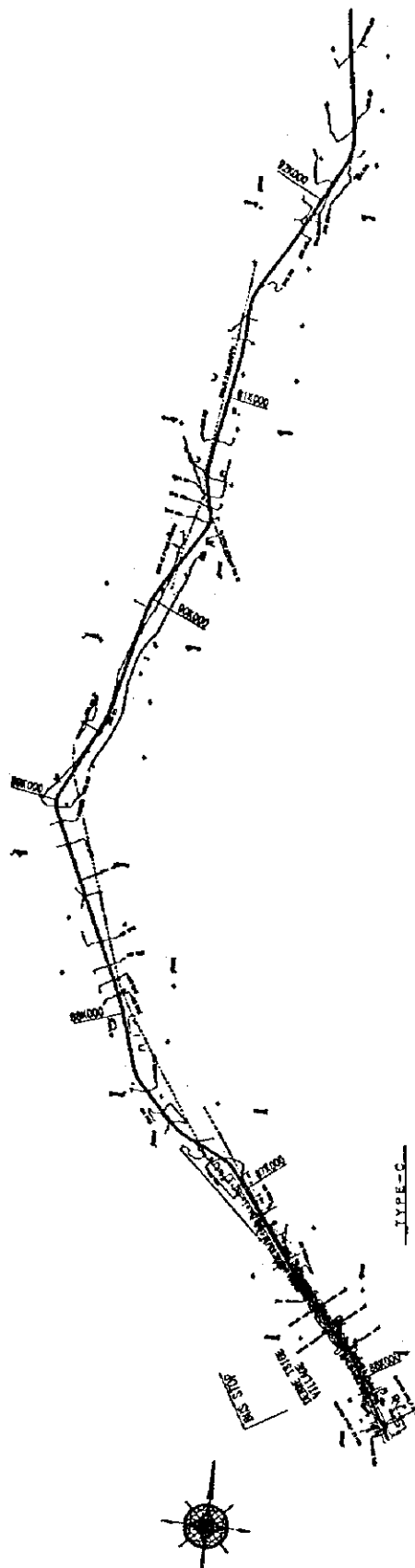
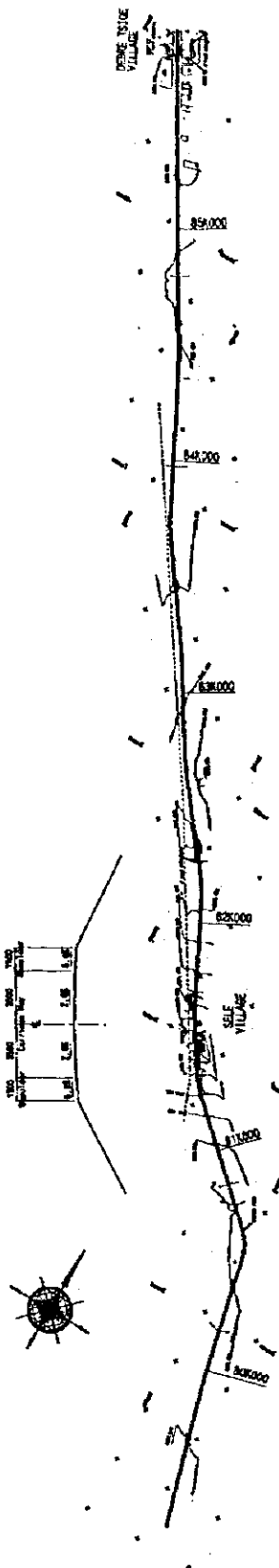
A - 46



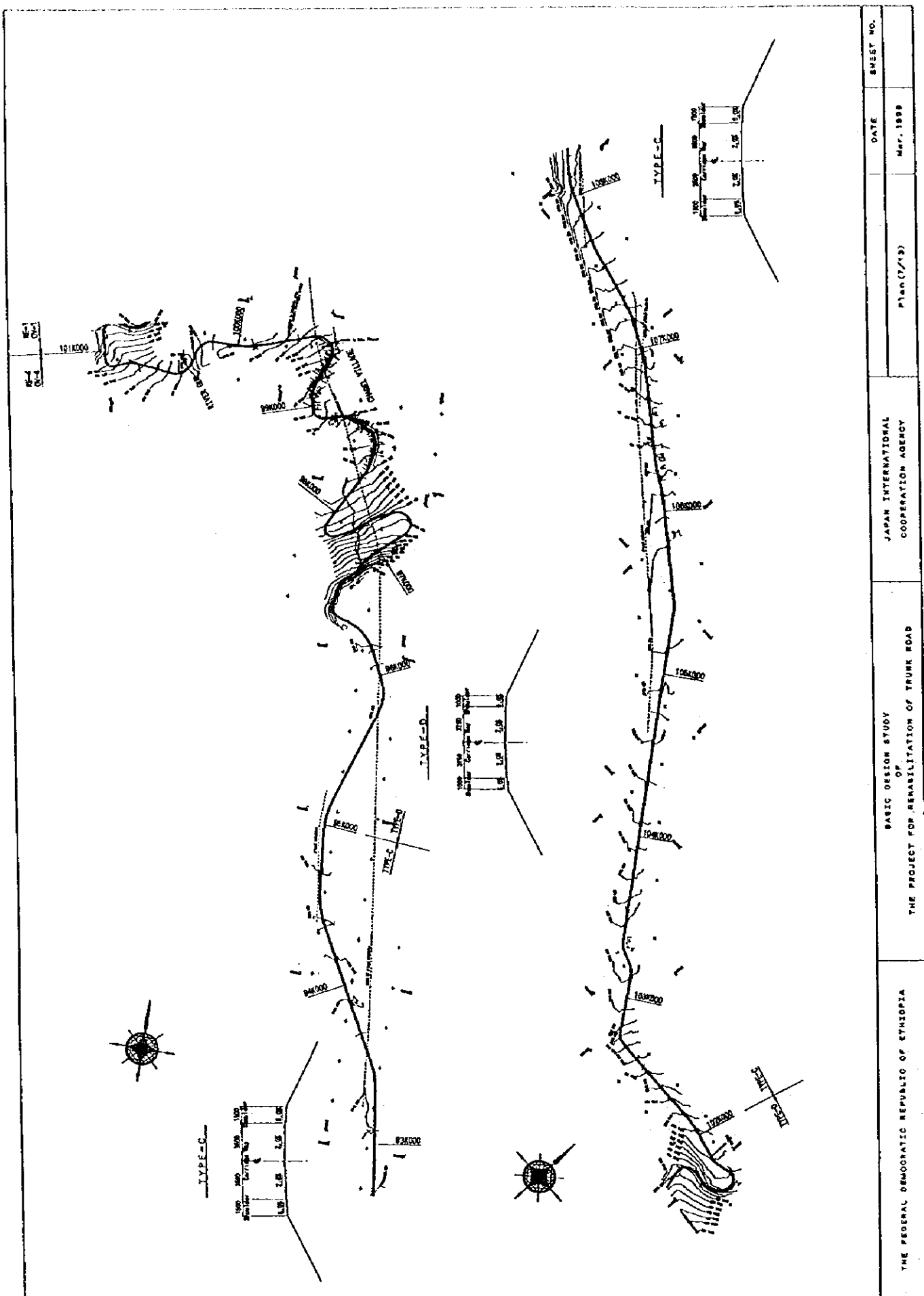
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	BRIEF NO.
		DATE	MAR. 1988
		PLAN (A/13)	

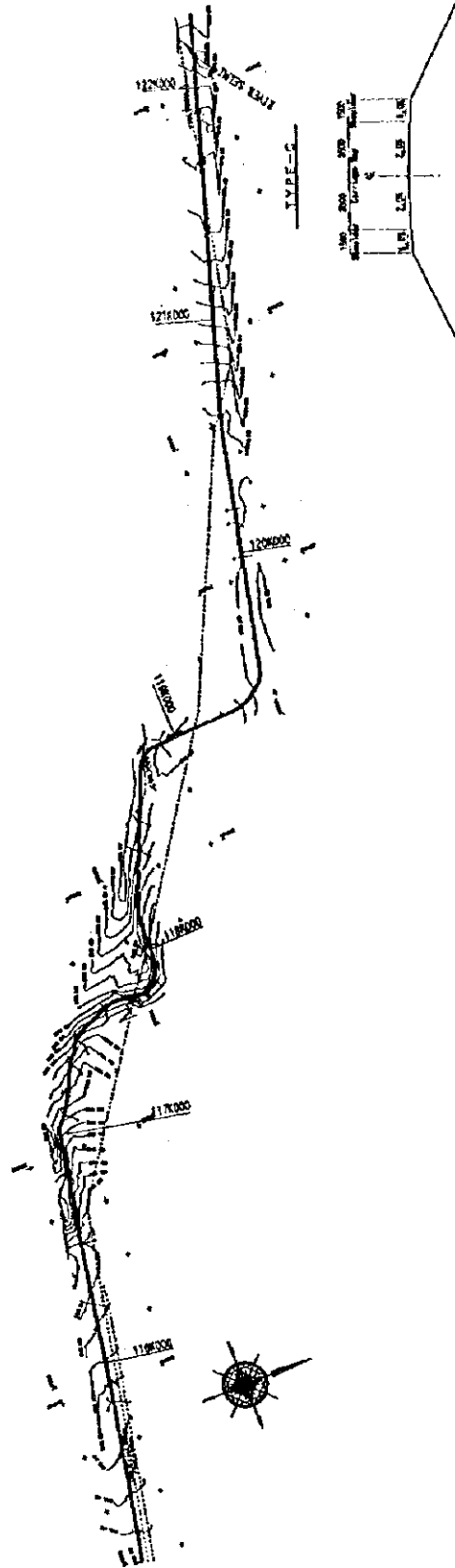
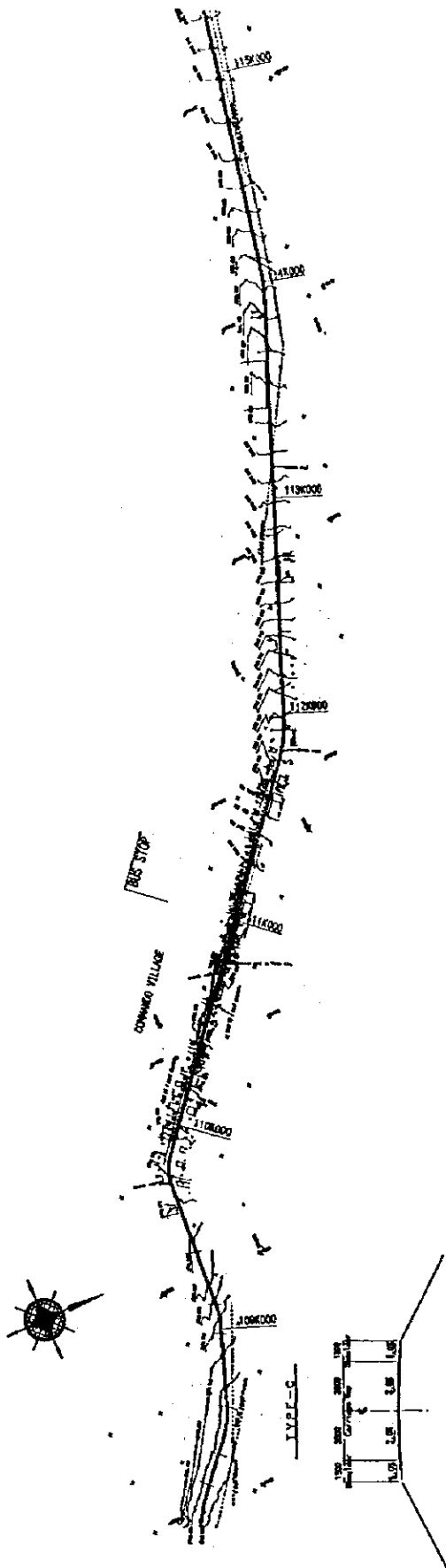


THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD		JAPAN INTERNATIONAL COOPERATION AGENCY	DATE	SHEET NO.
			PLAN (5/12)	MAR. 1998	

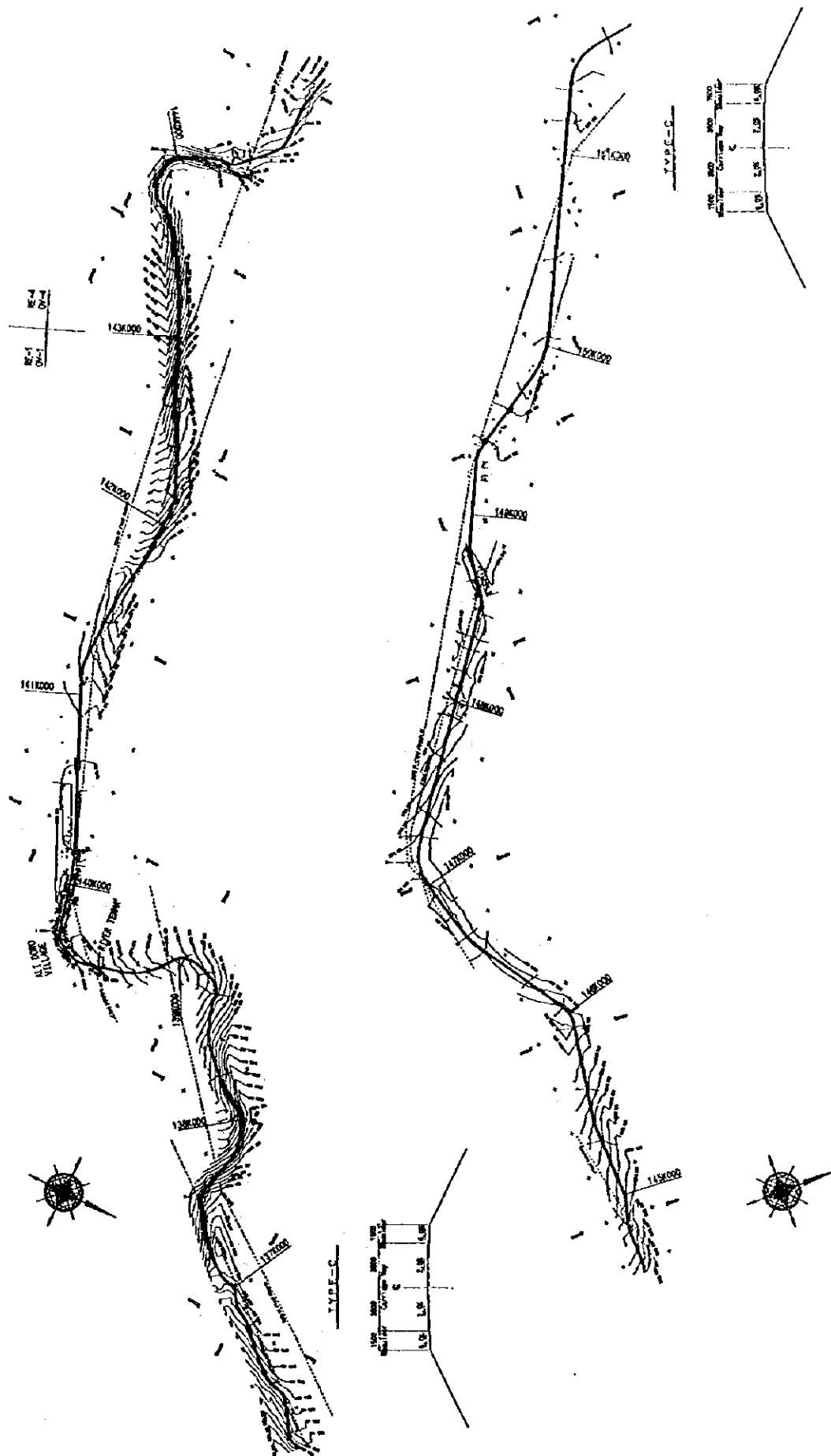


THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	PAISO DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	DATE Mar. 1988	SHEET NO.
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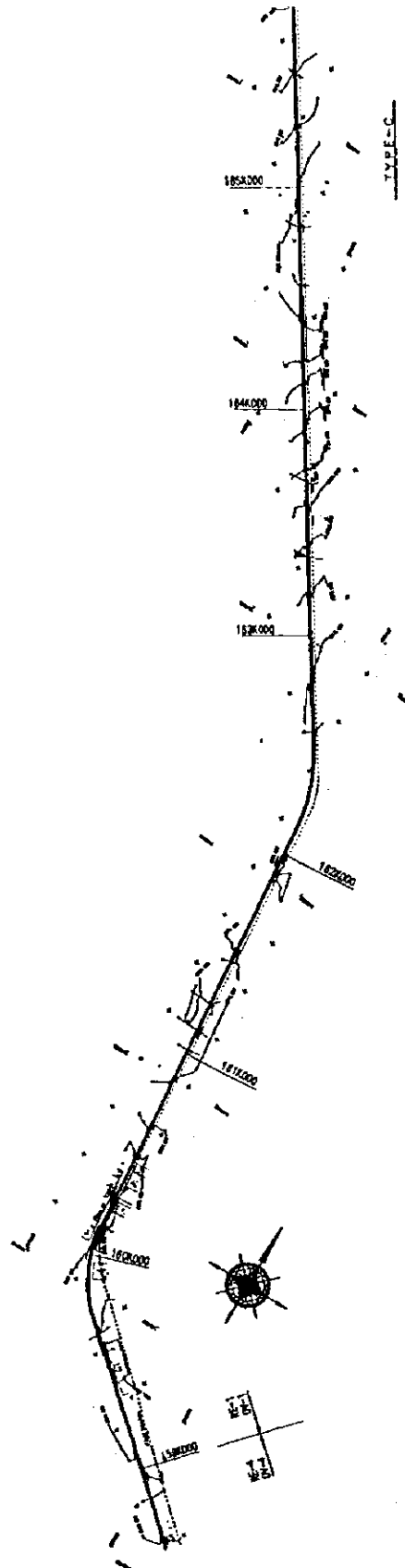
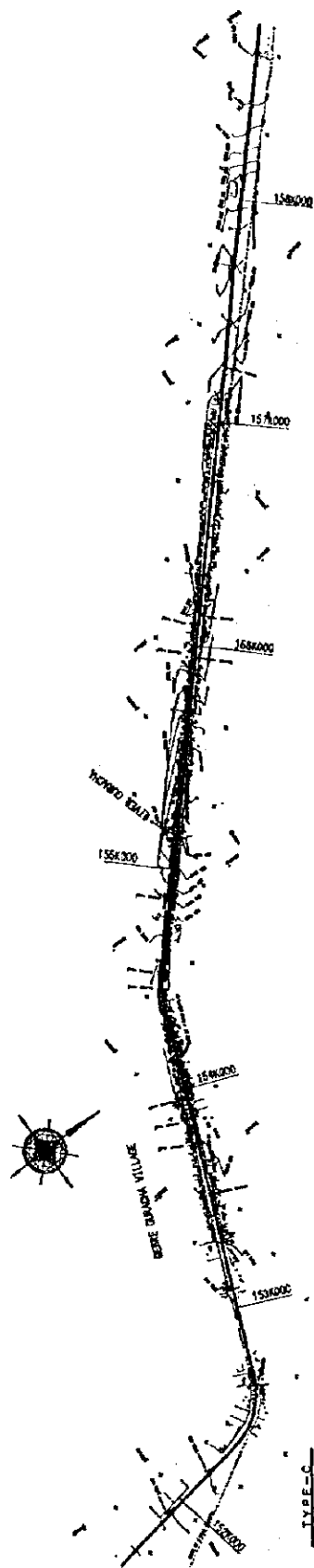




THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	DATE	SHEET NO.
			Mar. 1988	Plan (B/13)



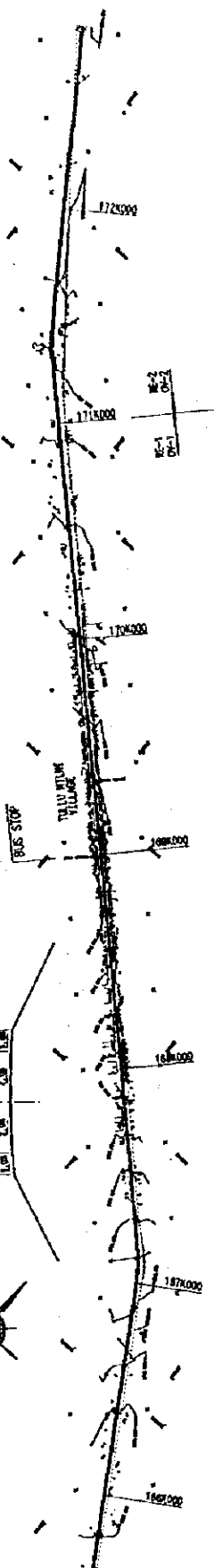
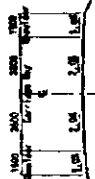
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR RENOVATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	DATE	SHEET NO.
			Plan (10/13)	Mar. 1988



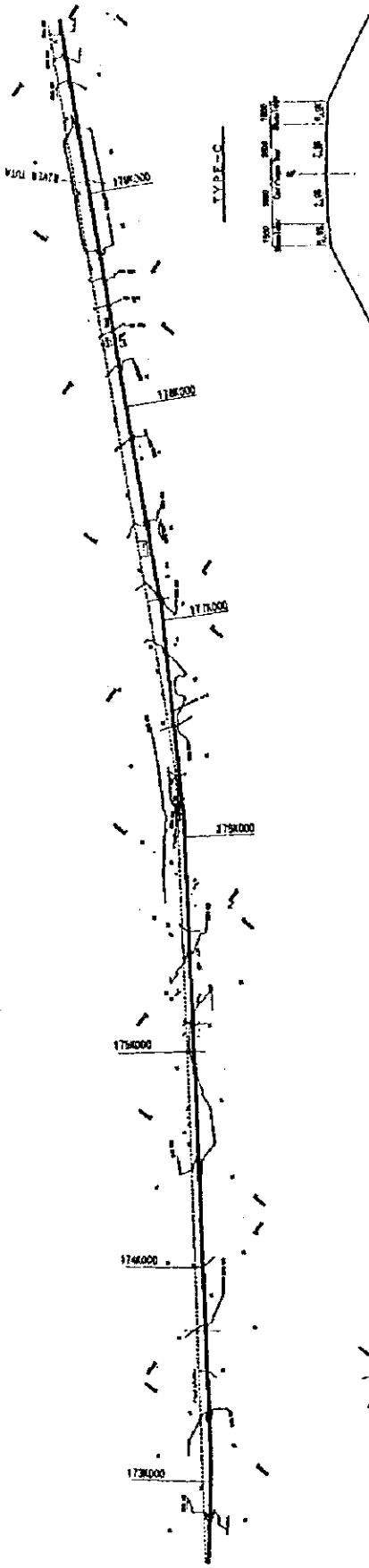
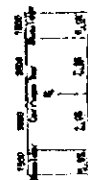
152000	154000	156000	158000
1.00	2.00	1.00	1.00

THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	Plan (1/12)	DATE	SHEET NO.
				Mar. 1989	

TYPE-C



TYPE-C



THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	DATE	SHEET NO.
			Mar. 1988	Plan (18/13)

TYPE-C



185 STOP

180000

180000

180000

180000

180000

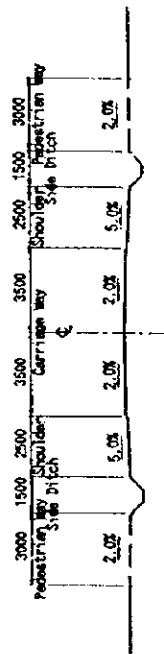
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TYPE-C
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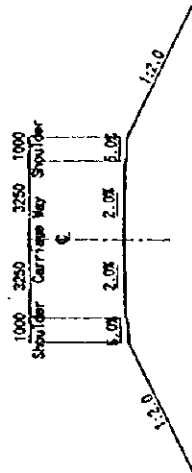


THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR RENOVATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	Plan (13/13)	DATE Mar. 1988	SHEET NO.
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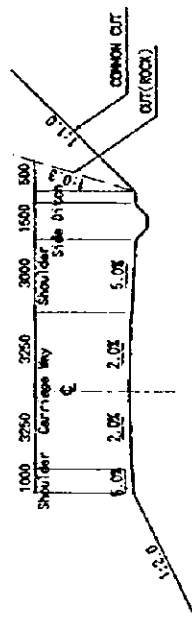
TYPE-A



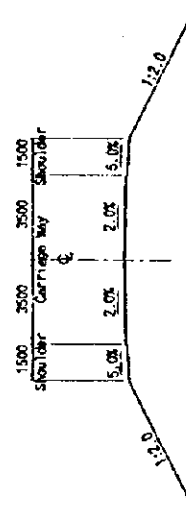
TYPE-D



TYPE-B



TYPE-C



LIST OF CROSS-SECTION TYPE

TYPE OF CROSS-SECTION	KILOMETER		LENGTH (m)	REMARKS
	FROM	TO		
TYPE A	38500	56500	2,000	MOUNTAINOUS (CITY)
			TOTAL 2,000	
TYPE B	58500	106000	4,500	MOUNTAINOUS
			TOTAL 4,500	
TYPE C	106000	950000	85,000	ROLLING
	1026000	1060000	34,000	
			TOTAL 109,000	
TYPE D	950000	1020000	7,000	MOUNTAINOUS
			TOTAL 7,000	
			TOTAL 182,500	

THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

BASIC DESIGN STUDY
OF
THE PROJECT FOR RENOVATION OF TRUNK ROAD

JAPAN INTERNATIONAL
COOPERATION AGENCY

Typical Cross Section

DATE

Mar. 1998

SHEET NO.

OVERLAY TYPE

OV-1



Surface (Flexible Bituminous)
Base (Granular)
Sub Base (Granular Material)

OV-2



Surface (Flexible Bituminous)
Base (Granular)

OV-3



Surface (Flexible Bituminous)
Leveling (30mm)

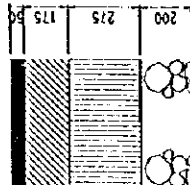
OV-4



Surface (Flexible Bituminous)
Leveling (30mm)

RECONSTRUCTION TYPE

RE-1



Surface (Flexible Bituminous)
Base (Granular)
Sub Base (Granular Material)
Sub Grade (Selected Subgrade F111)

RE-2



Surface (Flexible Bituminous)
Base (Granular)
Sub Base (Granular Material)

RE-3



Surface (Flexible Bituminous)
Base (Granular)
Sub Base (Granular Material)

RE-4

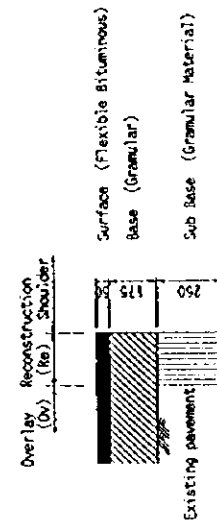


Surface (Flexible Bituminous)
Base (Granular)

LIST OF PAVEMENT TYPE

LIST OF PAVEMENT TYPE				
TYPE OF PAVEMENT	KILOMETER		LENGTH (m)	REMARKS
	FROM	TO		
OVERLAY TYPE				
OV-1	100000	230000	13,000	CBR 42
	440000	750000	31,000	
	1010000	1430000	42,000	
	1590000	1710000	12,000	
	TOTAL		98,000	
OV-2	1710000	1860000	15,000	CBR 102
	TOTAL		15,000	
OV-3	385000	700000	31,500	CBR 152
	TOTAL		31,500	
OV-4	230000	440000	21,000	CBR 302
	750000	1010000	26,000	
	1430000	1590000	16,000	
	TOTAL		63,000	
	TOTAL		182,500	
RECONSTRUCTION TYPE				
RE-1	100000	230000	13,000	CBR 42
	440000	750000	31,000	
	1010000	1430000	42,000	
	1590000	1710000	12,000	
	TOTAL		98,000	
RE-2	1710000	1860000	15,000	CBR 102
	TOTAL		15,000	
RE-3	385000	700000	31,500	CBR 152
	TOTAL		31,500	
RE-4	230000	440000	21,000	CBR 302
	750000	1010000	26,000	
	1430000	1590000	16,000	
	TOTAL		63,000	
	TOTAL		182,500	

Typical section



JAPAN INTERNATIONAL
COOPERATION AGENCY

BASIC DESIGN STUDY
OF
THE PROJECT FOR REHABILITATION OF YRUM ROAD

THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

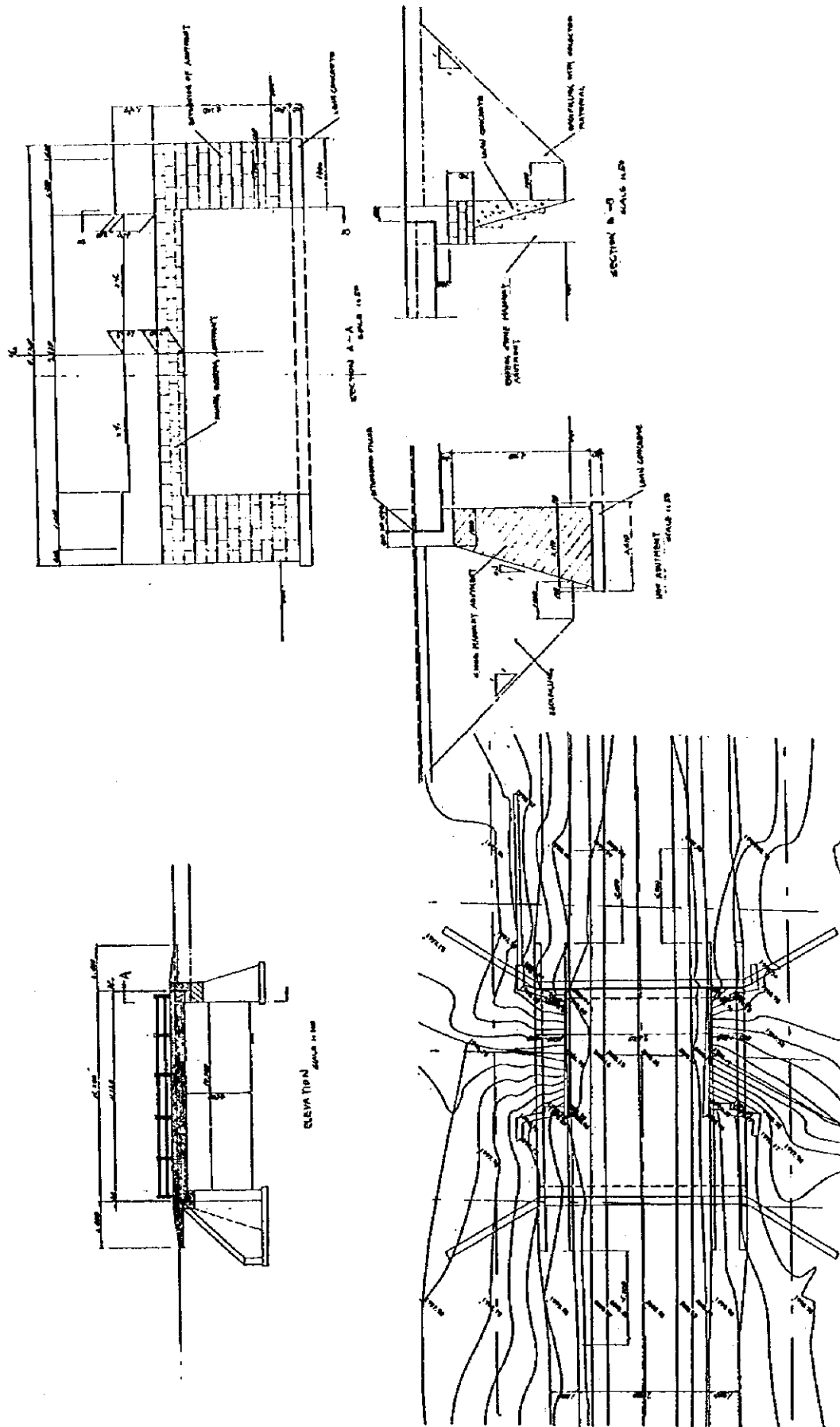
DATE

Mar. 1998

Pavement Structure

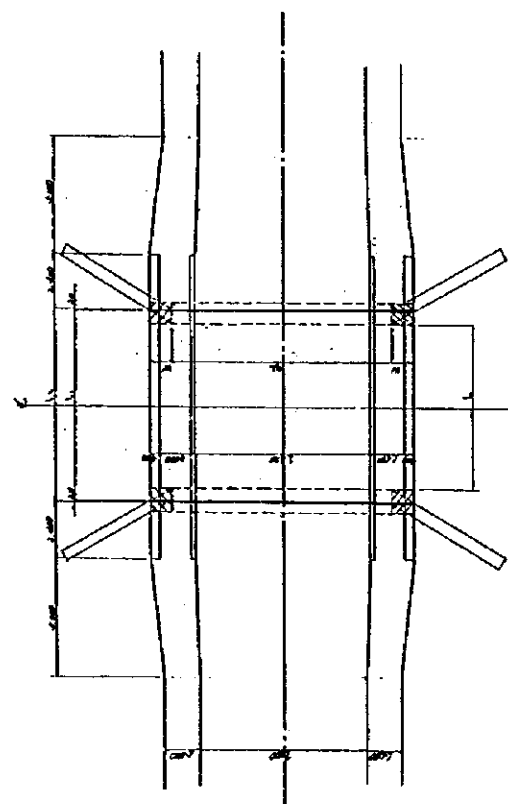
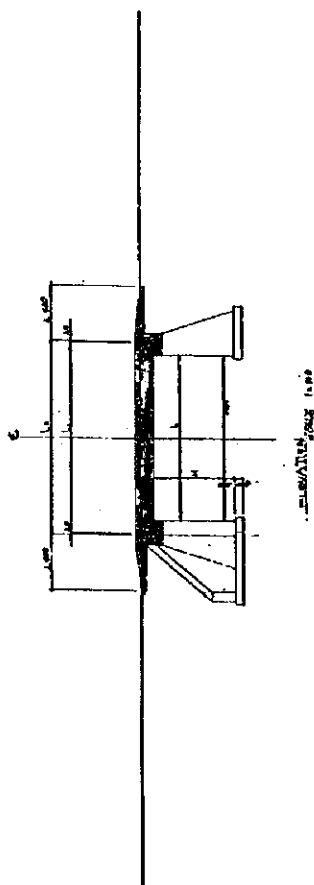
SHEET NO.

403



PLAN
Scale 1:100

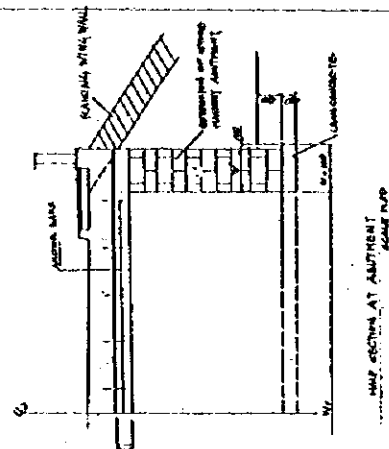
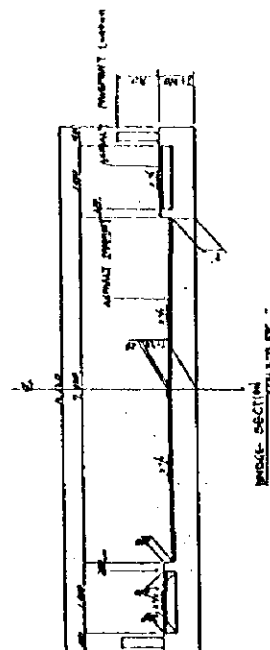
SHEET NO.	DATE	36.12.1996
D-501 (REPAIRMENT OF STRUCTURES) (1/2)	JAPAN INTERNATIONAL COOPERATION AGENCY	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA		



— PLAN
SCALE 1:100

DIMENSIONS

BRIDGE No.	SPAN L (m)	PIER L (m)	PIER WIDTH L (m)	PIER HEIGHT H (m)	PIER AREA A (m ²)	PIER VOLUME V (m ³)	PIER WEIGHT W (t)
B-001	11.40	1.40	0.5	1.70	0.5	0.5	0.5
B-002	1.4	1.4	0.5	1.70	0.5	0.5	0.5
B-003	0.2	1.4	0.5	1.70	0.5	0.5	0.5



THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

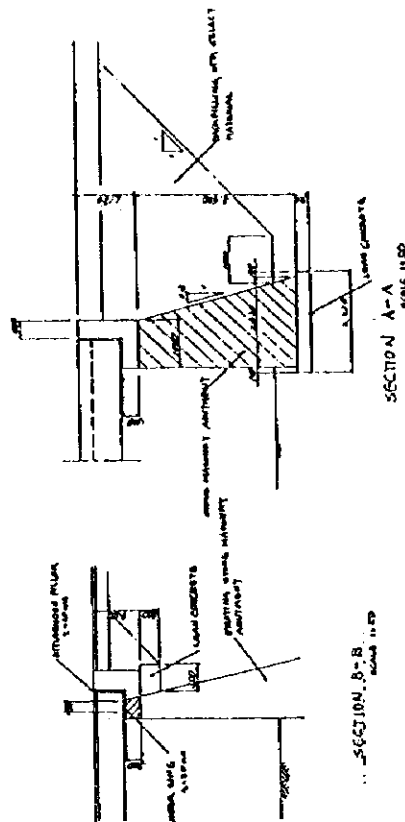
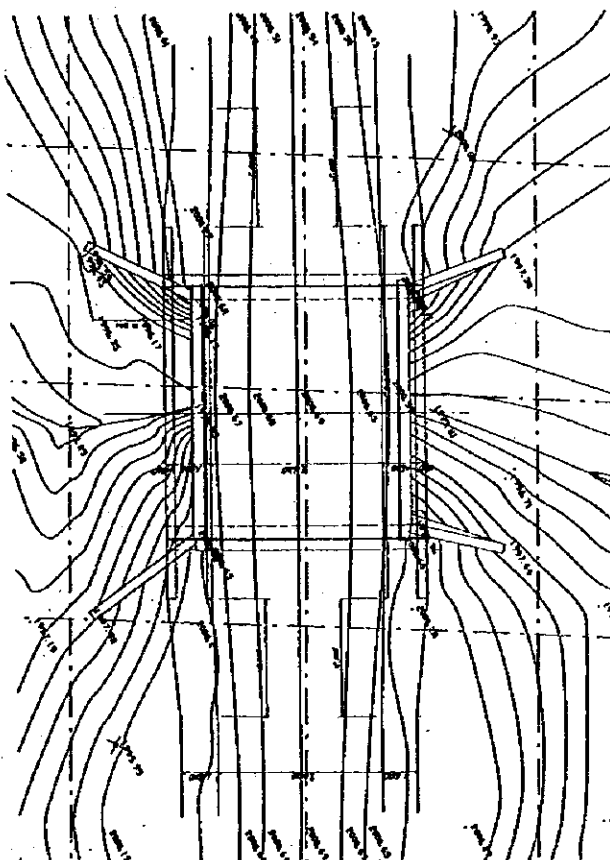
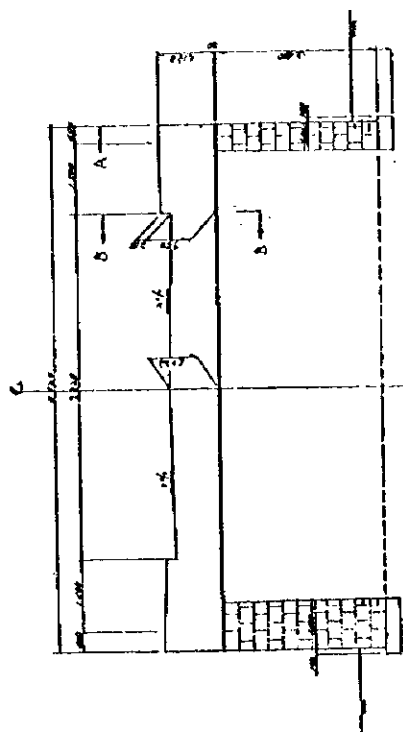
BASIC DESIGN STUDY
OF
THE PROJECT FOR REHABILITATION OF TRUNK ROAD

JAPAN INTERNATIONAL
COOPERATION AGENCY

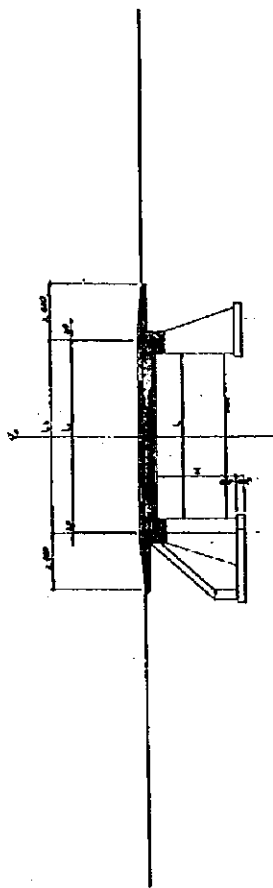
B-001 (REPLACEMENT OF SUPER-
STRUCTURES) (1/2)

DATE
MAR. 1988

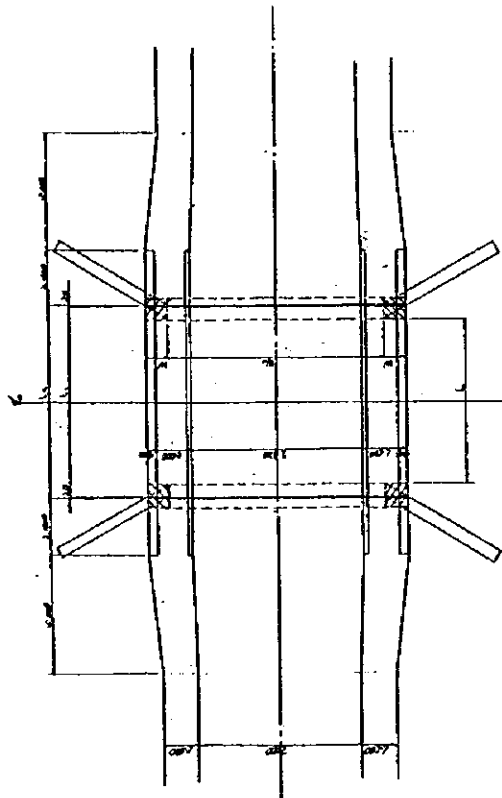
SHEET NO.



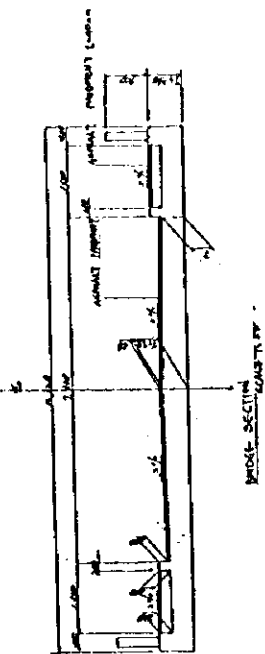
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	D-PO-2 (RENEWAL OF SUPERSTRUCTURE) (1/4)	DATE MAY 1986	PROJECT NO.
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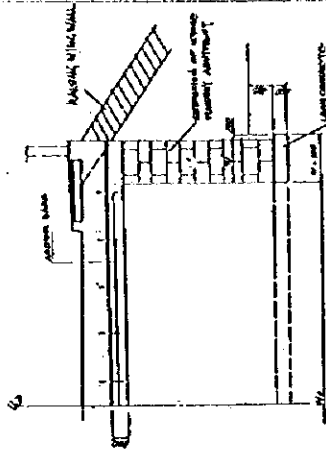
ELEVATION
SCALE 1:100



PLAN
SCALE 1:100



CROSS SECTION
SCALE 1:100



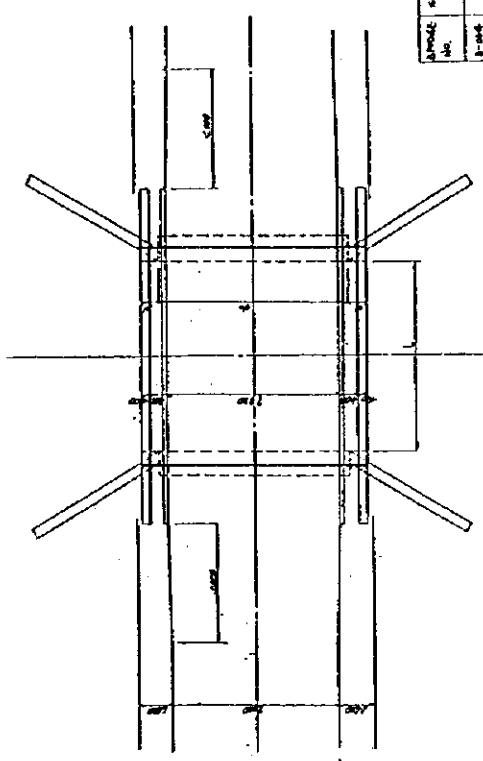
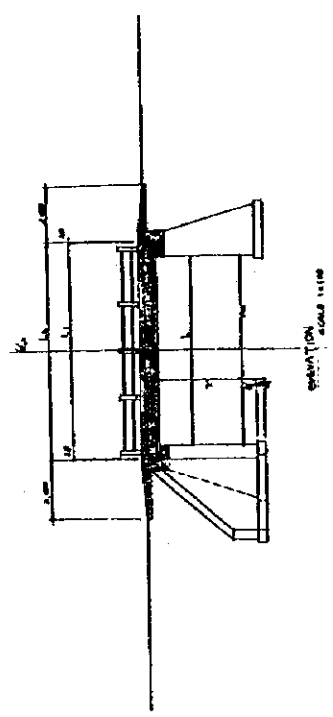
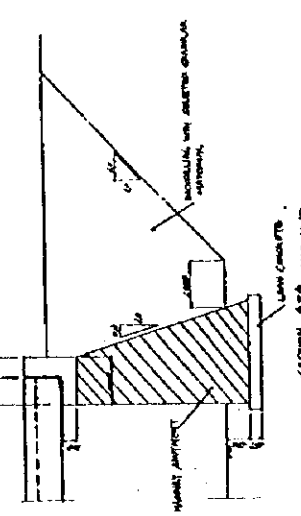
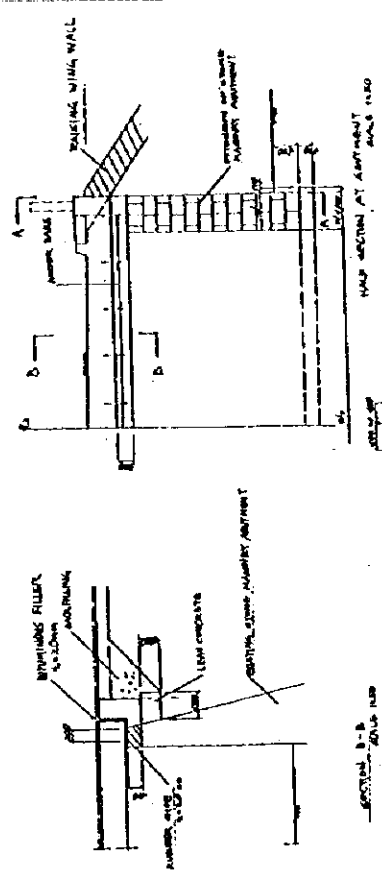
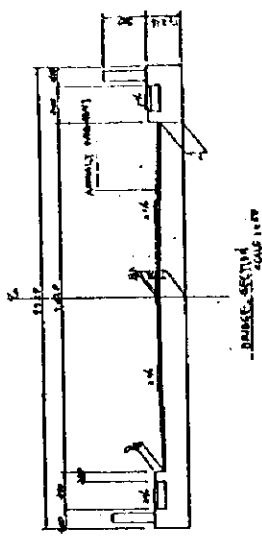
HALF SECTION AT ABUTMENT
SCALE 1:100

CONTINUED

BRIDGE No.	SPAN Length L (m)	SPAN Length L (ft)	SPAN Width W (m)	SPAN Width W (ft)	SPAN Area A (sq m)	SPAN Area A (sq ft)	SPAN Volume V (cu m)	SPAN Volume V (cu ft)
B-001	9.2	30.2	11.6	38.2	106.7	1170	1.07	40.8
B-002	9.2	30.2	11.6	38.2	106.7	1170	1.07	40.8
B-003	9.2	30.2	11.6	38.2	106.7	1170	1.07	40.8

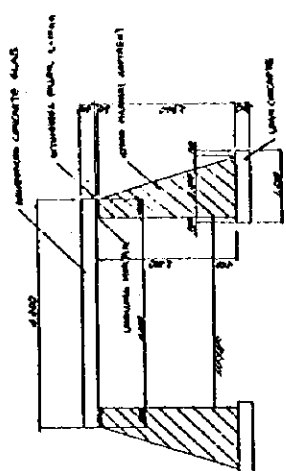
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	RABIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	D-002 (REPLACEMENT OF SUPER- STRUCTURE) (2/2)	DATE	SHEET NO.
				MAR. 1996	

THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF	JAPAN INTERNATIONAL COOPERATION AGENCY	8-003 (REPLACEMENT OF SUPER TECHNICAL)	DATE MAY, 1988	SERIAL NO.
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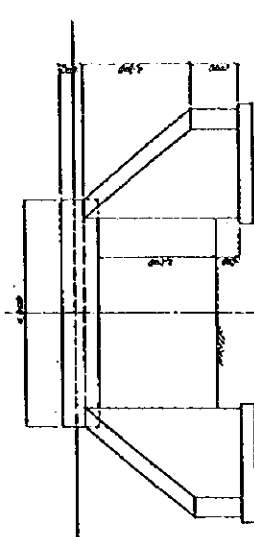


BRIDGE NO.	SPAN LENGTH (M)	PIER SPACING (M)	PIER WIDTH (M)	PIER HEIGHT (M)	PIER AREA (M ²)	PIER VOLUME (M ³)	PIER WEIGHT (T)
B-101	10.0	10.0	10.0	10.0	100.0	1000.0	100.0
B-102	10.0	10.0	10.0	10.0	100.0	1000.0	100.0
B-103	10.0	10.0	10.0	10.0	100.0	1000.0	100.0
B-104	10.0	10.0	10.0	10.0	100.0	1000.0	100.0

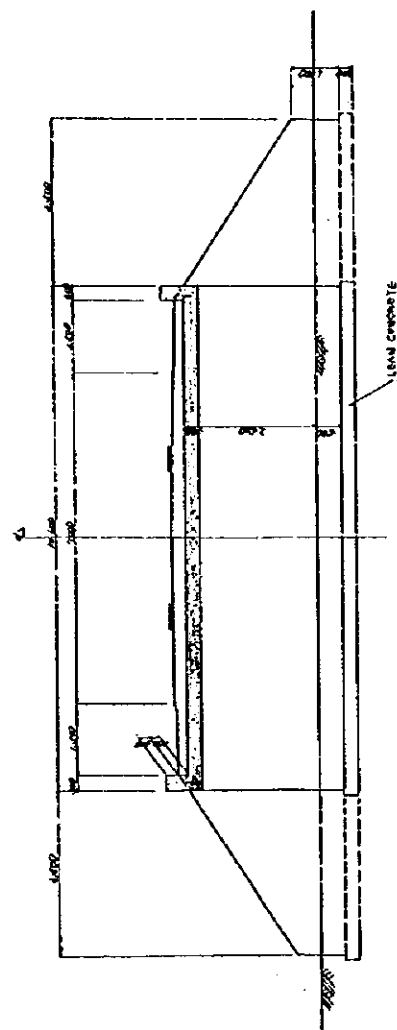
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	DATE	SKETCH NO.
			B-103 (REPLACEMENT OF SUPER-STRUCTURE)	



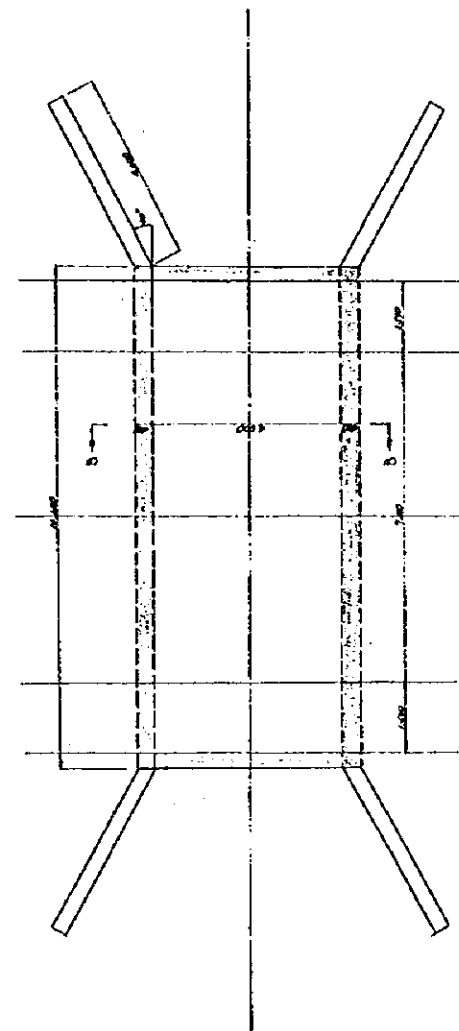
SECTION B-B
SCALE 1:20



FRONT VIEW OF CURB
SCALE 1:20

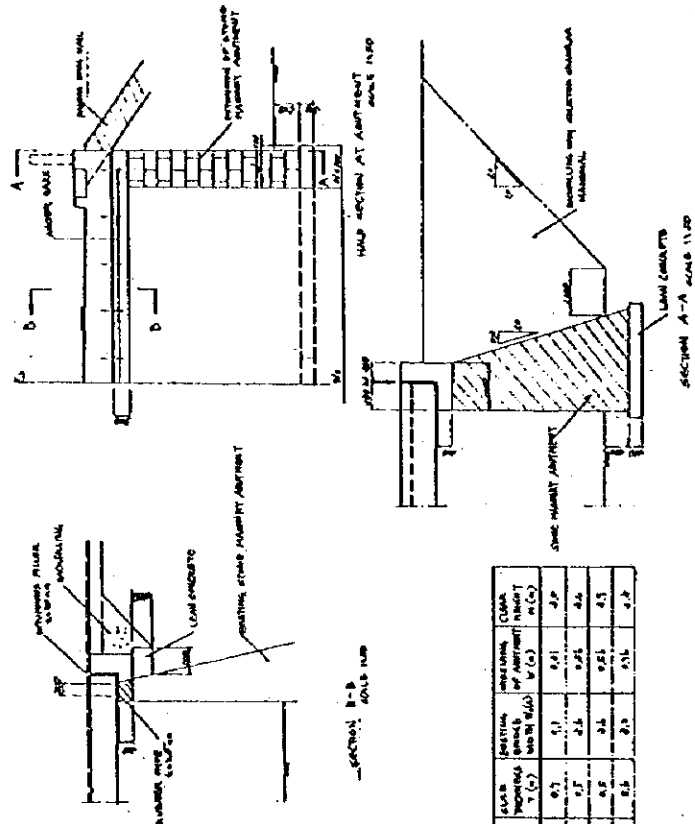
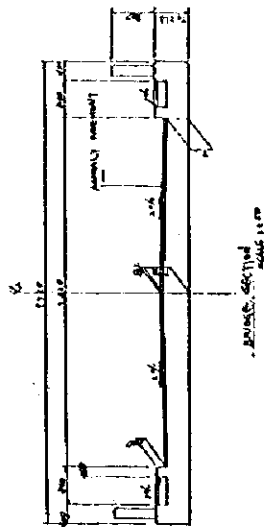


ELEVATION
SCALE 1:20

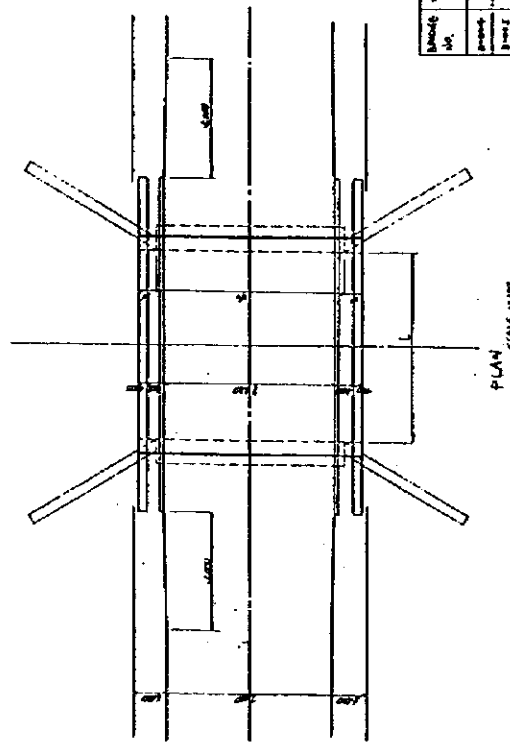
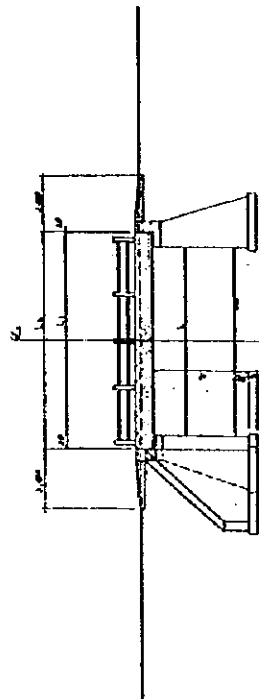


PLAN
SCALE 1:20

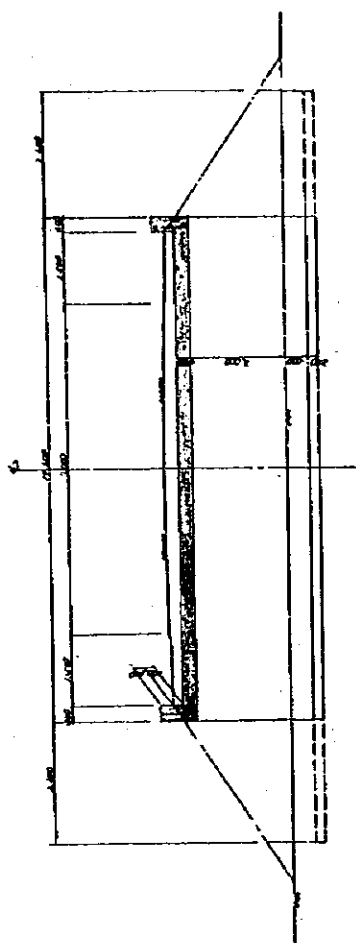
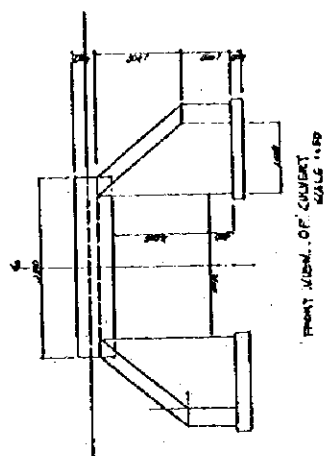
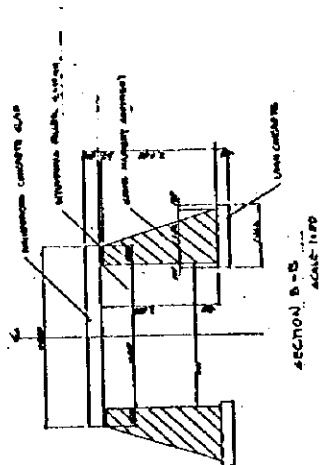
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	B-007 (REPLACEMENT WITH SLAB CULVERT)	DATE MAR. 1988	SHEET NO.
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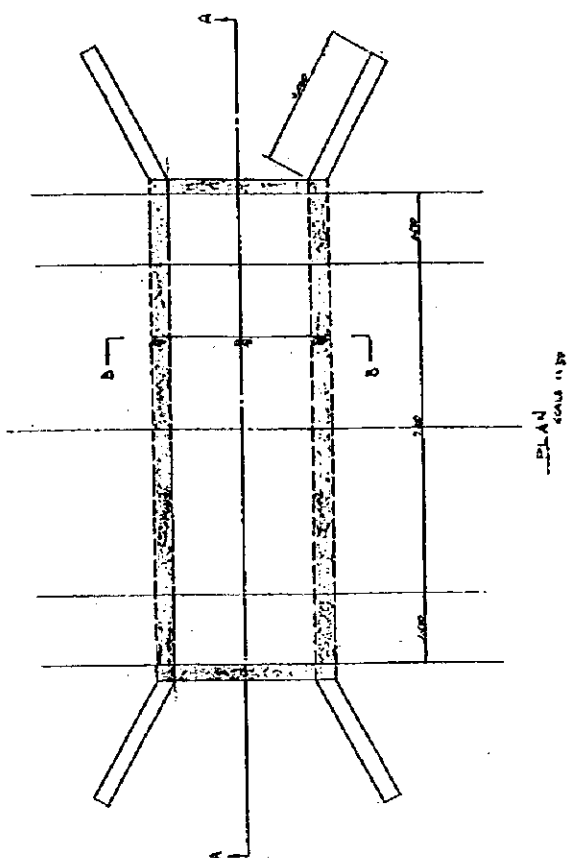
BRIDGE NO.	SPAN L (m)	SPAN LENGTH L (m)	SPAN WIDTH B (m)	SPAN DEPTH H (m)	SPAN AREA A (m²)	SPAN WEIGHT W (kN)	SPAN MOMENT M (kNm)	SPAN CLEARANCE C (m)
1-1	12.12	12.12	3.45	1.5	12.12	12.12	12.12	12.12
2-2	12.12	12.12	3.45	1.5	12.12	12.12	12.12	12.12
3-3	12.12	12.12	3.45	1.5	12.12	12.12	12.12	12.12
4-4	12.12	12.12	3.45	1.5	12.12	12.12	12.12	12.12
5-5	12.12	12.12	3.45	1.5	12.12	12.12	12.12	12.12
6-6	12.12	12.12	3.45	1.5	12.12	12.12	12.12	12.12
7-7	12.12	12.12	3.45	1.5	12.12	12.12	12.12	12.12
8-8	12.12	12.12	3.45	1.5	12.12	12.12	12.12	12.12
9-9	12.12	12.12	3.45	1.5	12.12	12.12	12.12	12.12
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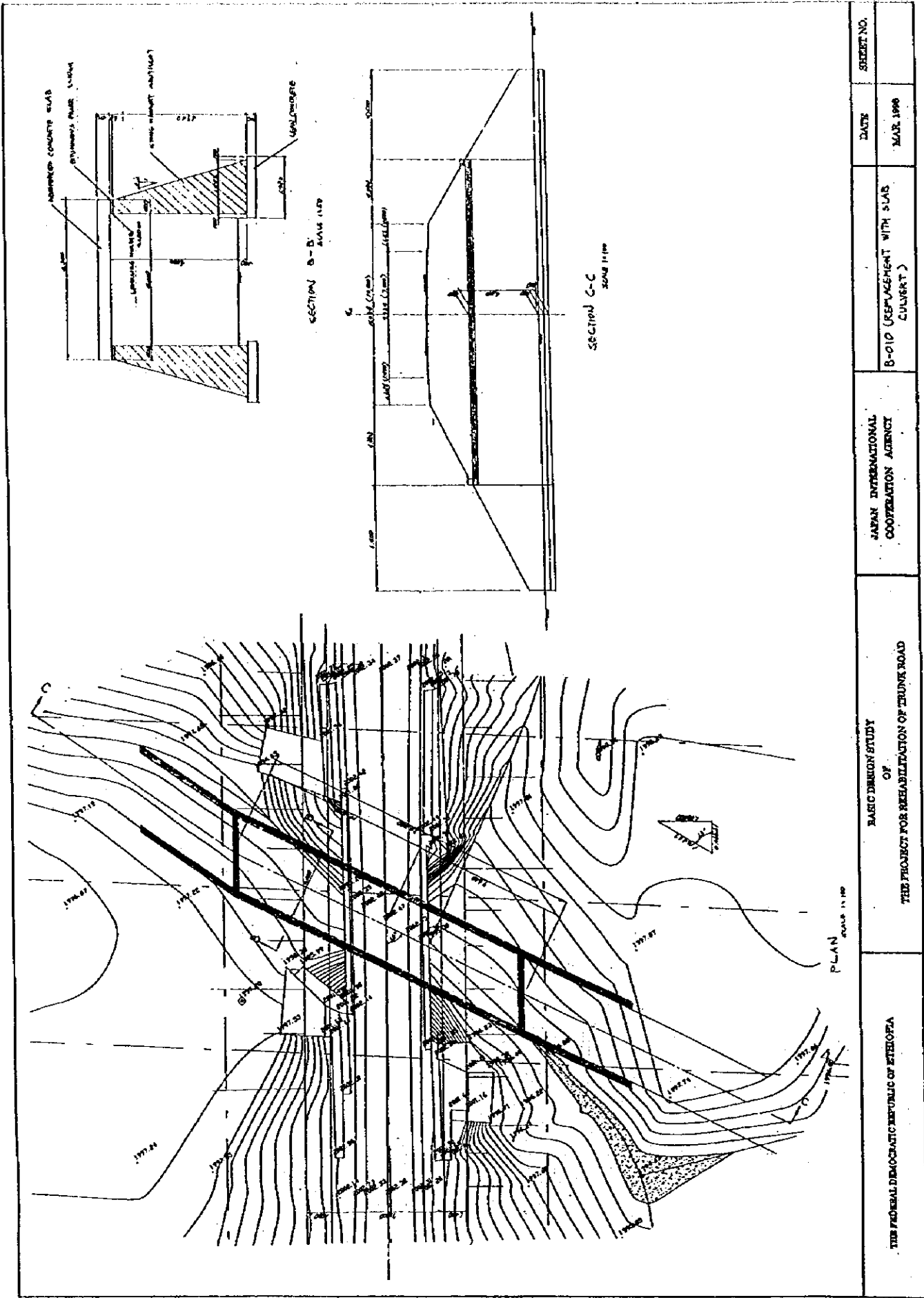
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN - INTERNATIONAL COOPERATION AGENCY	D-007 (REPLACEMENT OF SUPER- STRUCTURE)	DATE	SHEET NO.
				MAR 1988	

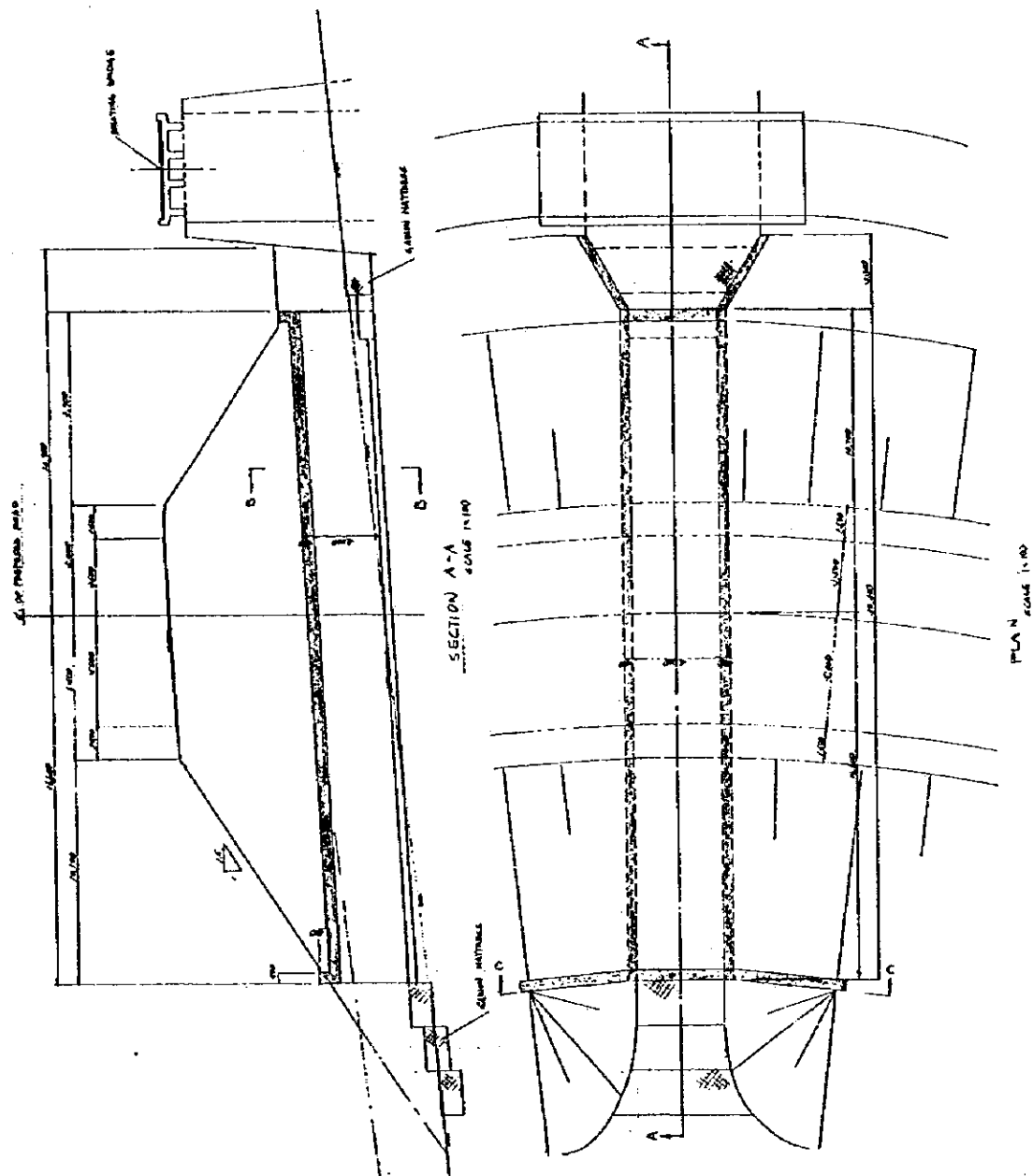


SECTION A-A
SCALE 1:20

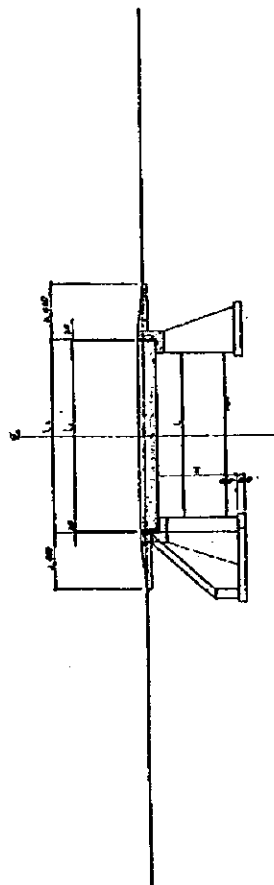


SHEET NO.	DATE	B-001 (REPLACEMENT WITH SLAB CURBET)	JAPAN INTERNATIONAL COOPERATION AGENCY	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
	MAR. 1996				

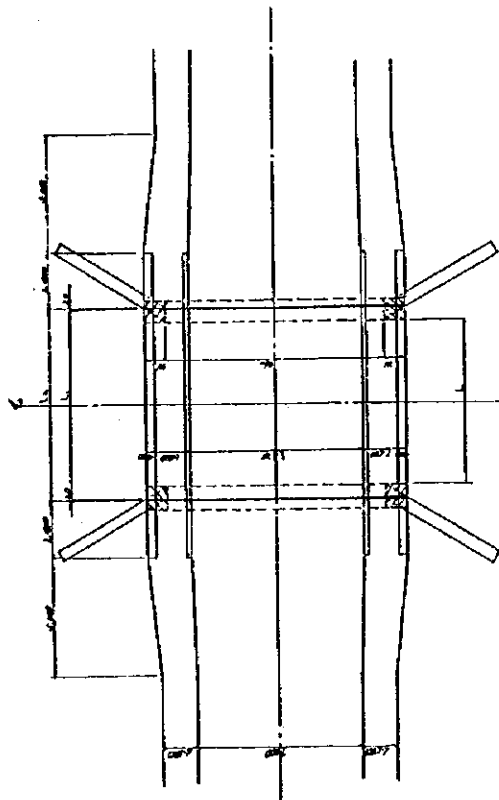




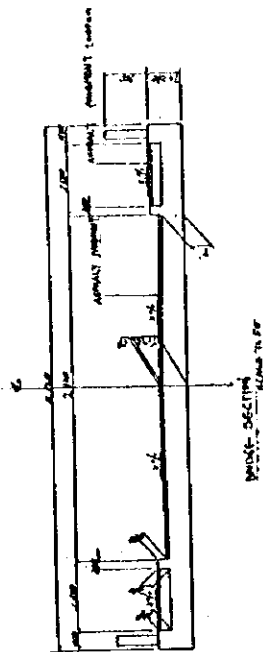
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	B-011 (REPLACEMENT WITH SLAB CULVERT)	DATE MAY 1988	SHEET NO.
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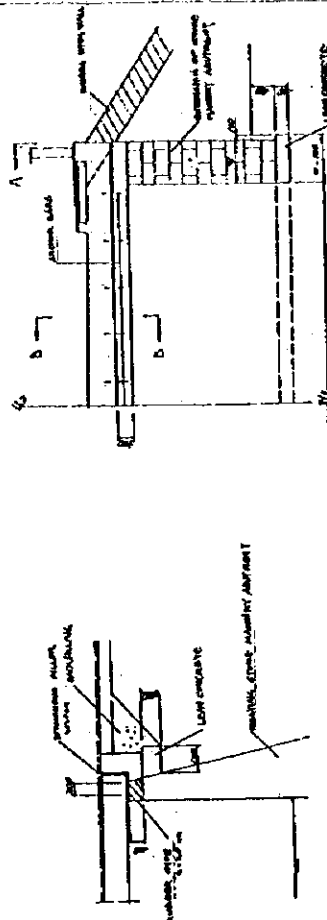
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SCALE 1:100



PLAN
SCALE 1:100

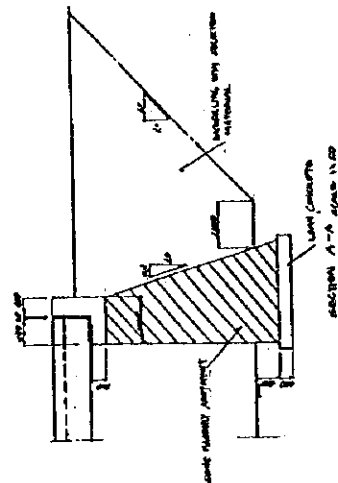


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CROSS SECTION AT ABUTMENT
SCALE 1:100

CROSS SECTION B-B
SCALE 1:100

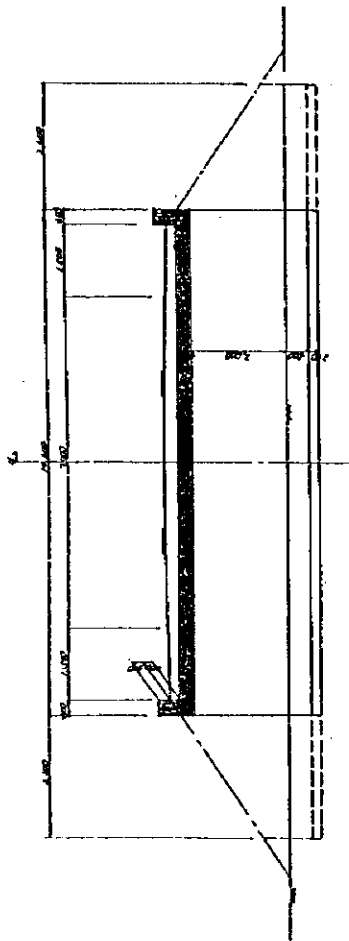
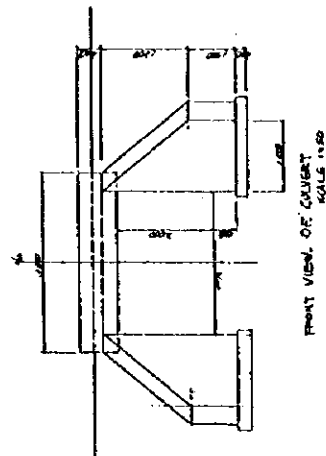
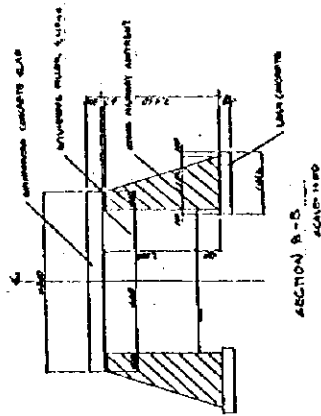


SECTION A-A
SCALE 1:100

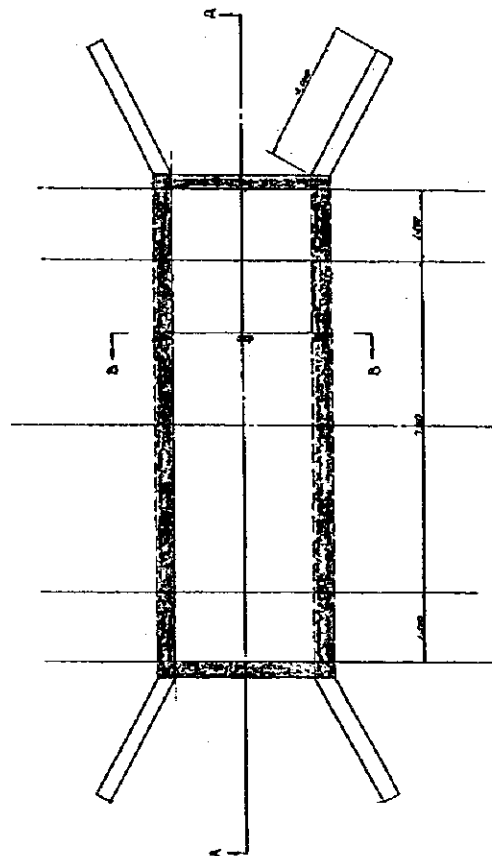
PROPERTIES

BRIDGE No.	SPAN L (m)	SPAN L (ft)	SPAN L (m)	SPAN L (ft)	SPAN L (m)	SPAN L (ft)	SPAN L (m)	SPAN L (ft)	SPAN L (m)	SPAN L (ft)	SPAN L (m)	SPAN L (ft)
1-101	11.0	36.1	11.0	36.1	11.0	36.1	11.0	36.1	11.0	36.1	11.0	36.1
1-102	11.0	36.1	11.0	36.1	11.0	36.1	11.0	36.1	11.0	36.1	11.0	36.1
1-103	11.0	36.1	11.0	36.1	11.0	36.1	11.0	36.1	11.0	36.1	11.0	36.1

THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	DATE	RECEIPT NO.
			0-016 (REPLACEMENT OF SUPER- STRUCTURES)	MAR. 1988



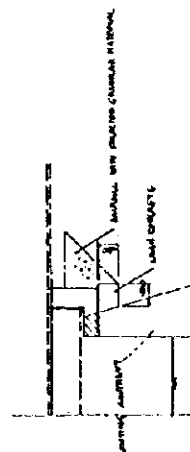
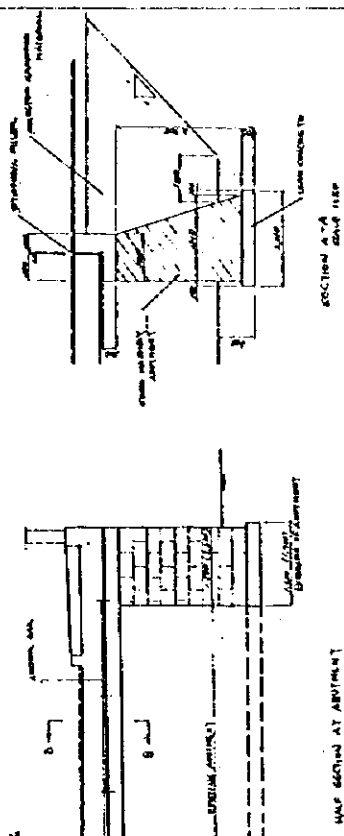
SECTION A-A
SCALE 1:20



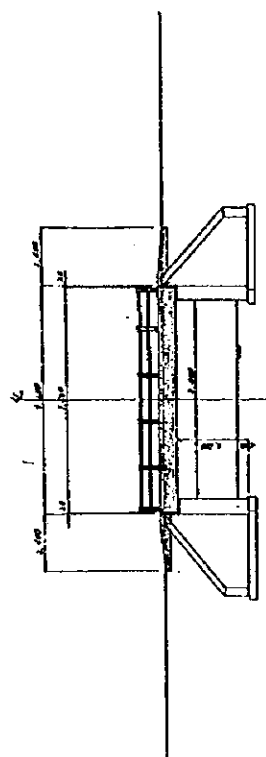
PLAN
SCALE 1:20

THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION - AGENCY	B-017 (REPLACEMENT WITH SLAB CULVERT)	DATE MAR 1998	SHEET NO.
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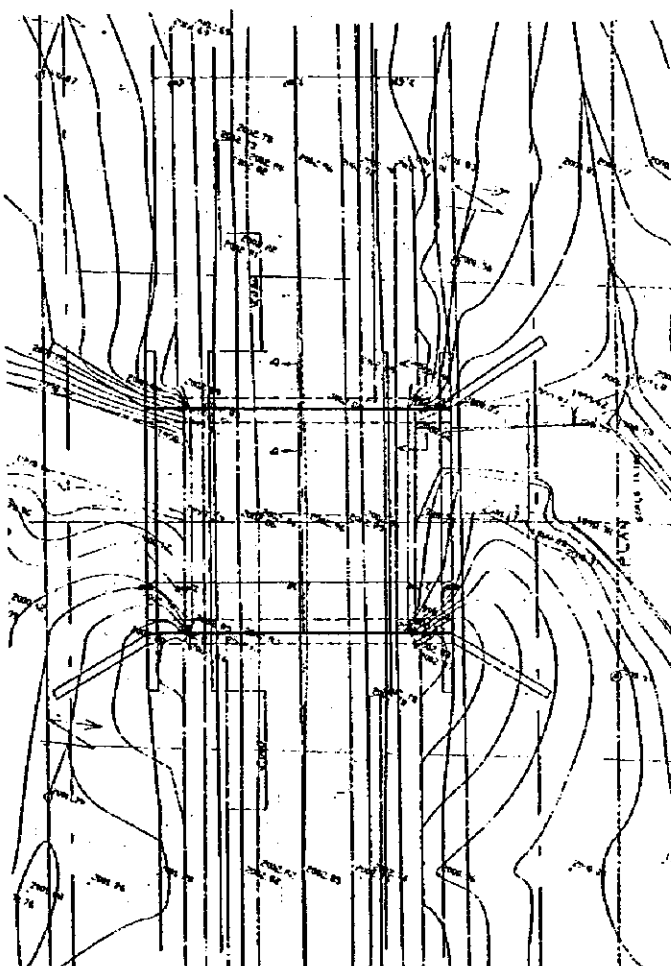
Section 11.1



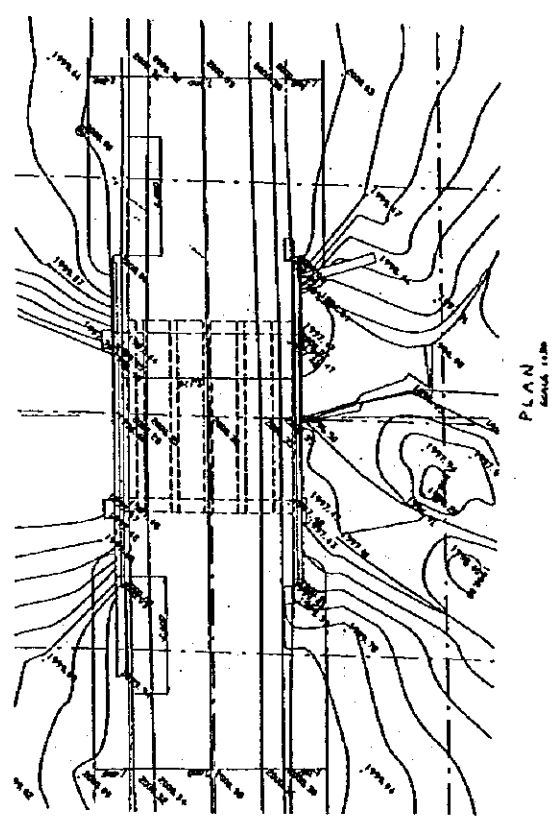
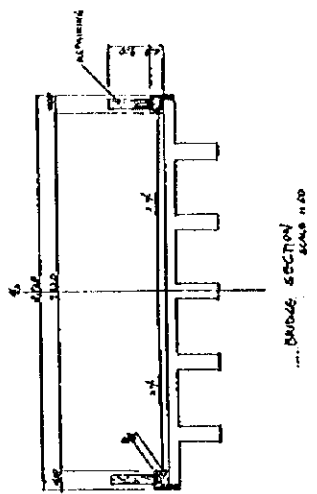
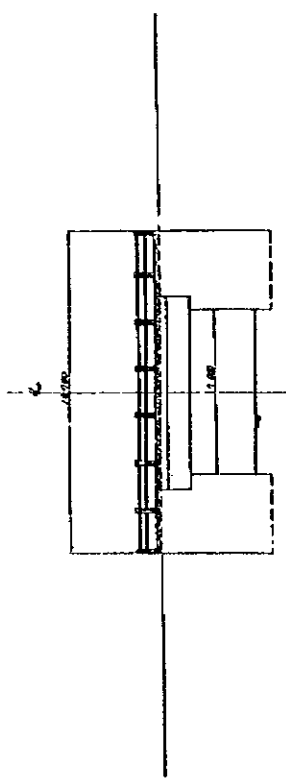
Section 4-B
APR 31 1964



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THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TEJENE ROAD	JAPAN - INTERNATIONAL COOPERATION AGENCY	B-018 (REPLACEMENT OF SUBSTRUCTURE)	DATE	SHEET NO.
				MAR. 1988	



THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	BASIC DESIGN STUDY OF THE PROJECT FOR REHABILITATION OF TRUNK ROAD	JAPAN INTERNATIONAL COOPERATION AGENCY	DATE	SHEET NO.
			MAR. 1983	5-019 (REPAIR)

JICA