3-3-7 Necessary Amount of Construction

Table 3-4 Necessary Amount of Construction

1) Excavation of rock asphalt	
Excavation	3,879 tons
Transportation of rock asphalt (130 km)	
2) Road construction	
Earthfill	107,670 m^3
Cutaway and removal of excess soil	69,749 m^3
Replacement of subgrade for freezing prevention	5,840 m^3
Forming of subgrade	101,080 m^2
U-drainage installation	2,370 m
Under drainage installation	2,370 m
Crossing drain pipe (D = 1,000 mm)	13 locations
3) Paving of pilot construction	
Road paving (Width 7 m)	13,300 m
Incidental structures (Bus stop etc.)	
4) Repair of existing pavement	
Overall paving	600 m
Spot repair (Potholes, cracks, stripping etc.)	50 locations
Overlay of damaged areas	7,000 m^2

3-3-7 Basic Design Drawings

(1) Fig. 3-4 Rehabilitation Works, Location and Layout

(2) Fig. 3-5 Rehabilitation Works, Typical Repair Section and Drainage Works

(3) Fig. 3-6 Pilot Construction Works, Location and General Layout

(4) Fig. 3-7 Pilot Construction, Typical Cross Section

(5) Fig. 3-8 Pilot Construction, Concrete Pipe Culverts

(6) Fig. 3-9 Pilot Construction, Incidental Works

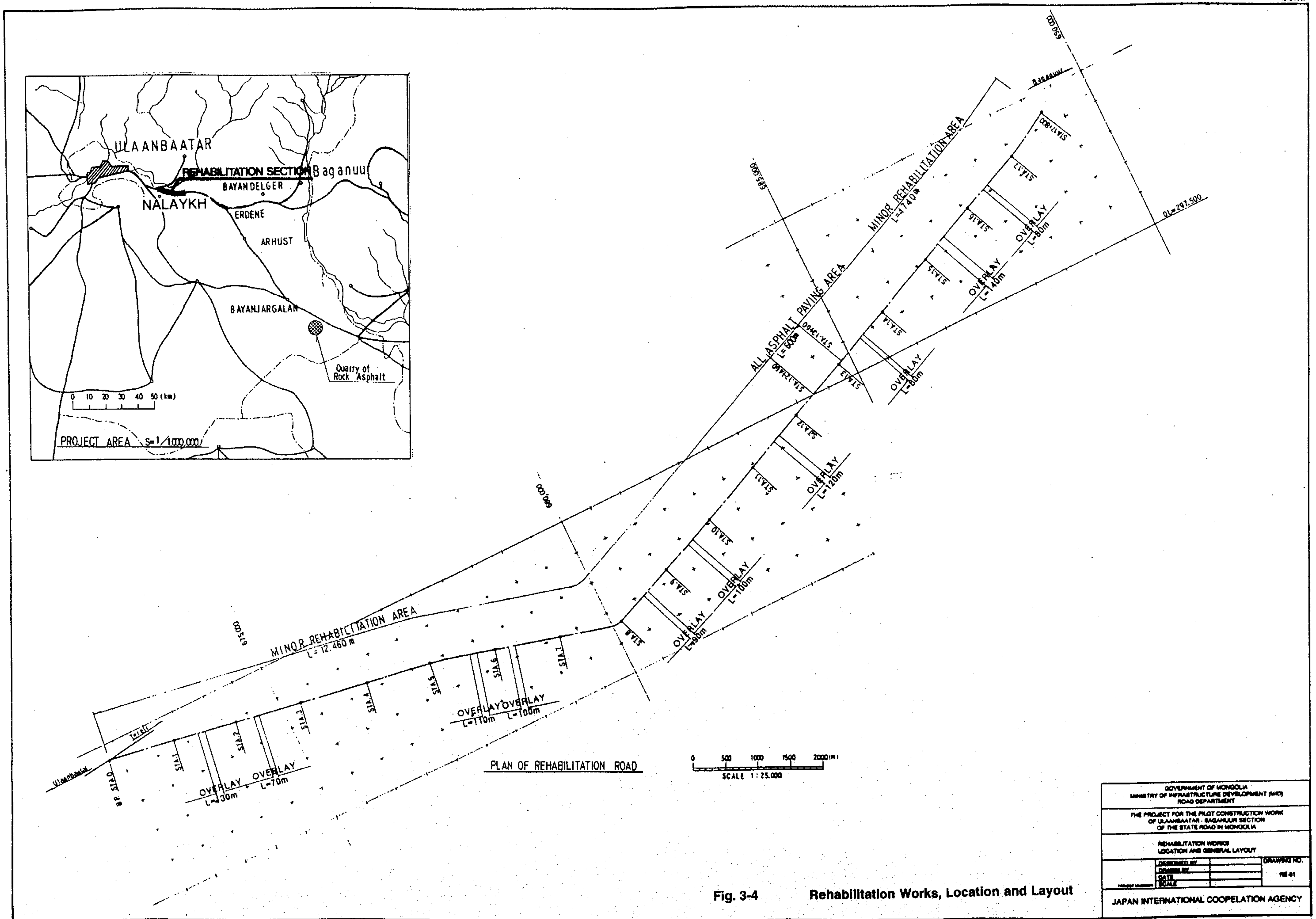
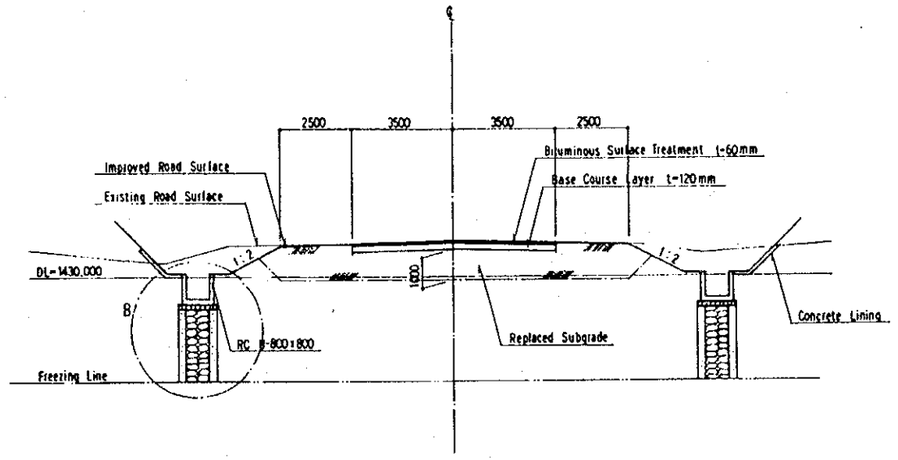
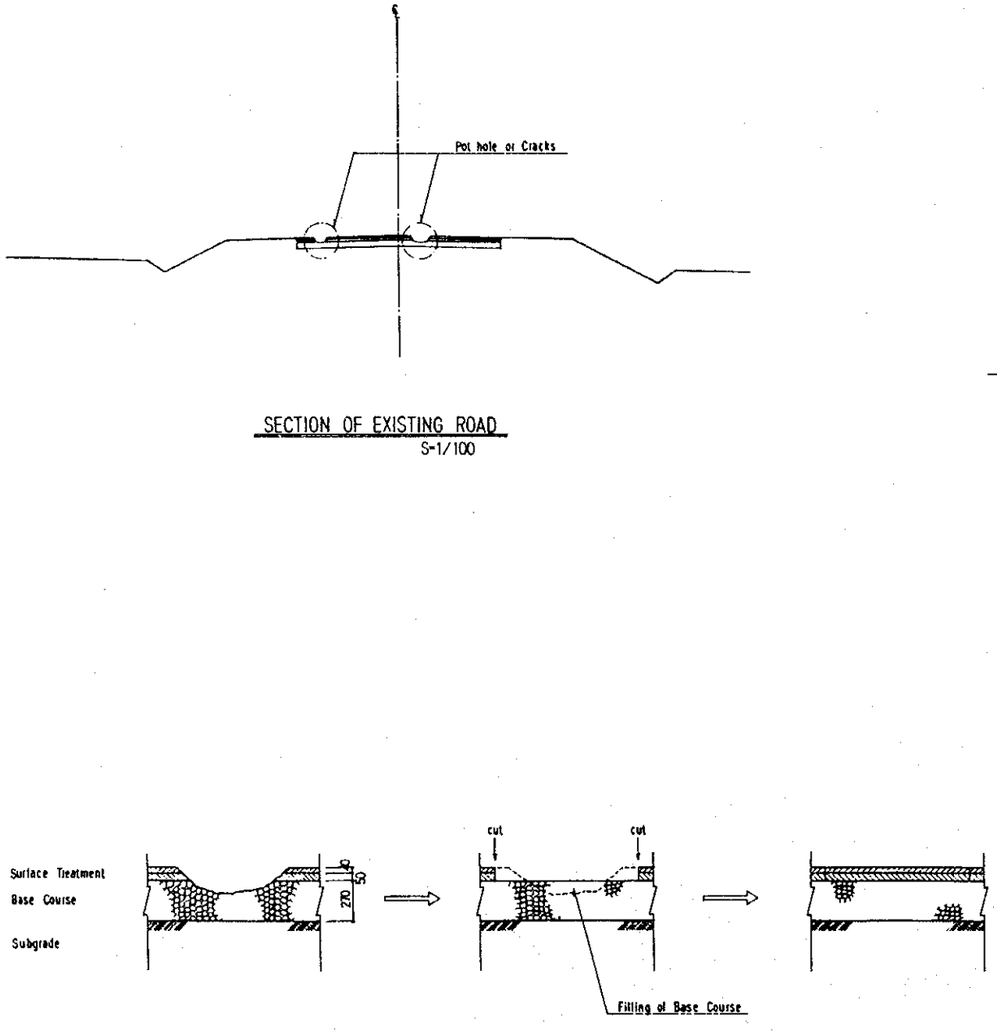


Fig. 3-4 Rehabilitation Works, Location and Layout

SECTION OF EXISTING ROAD
S=1/100

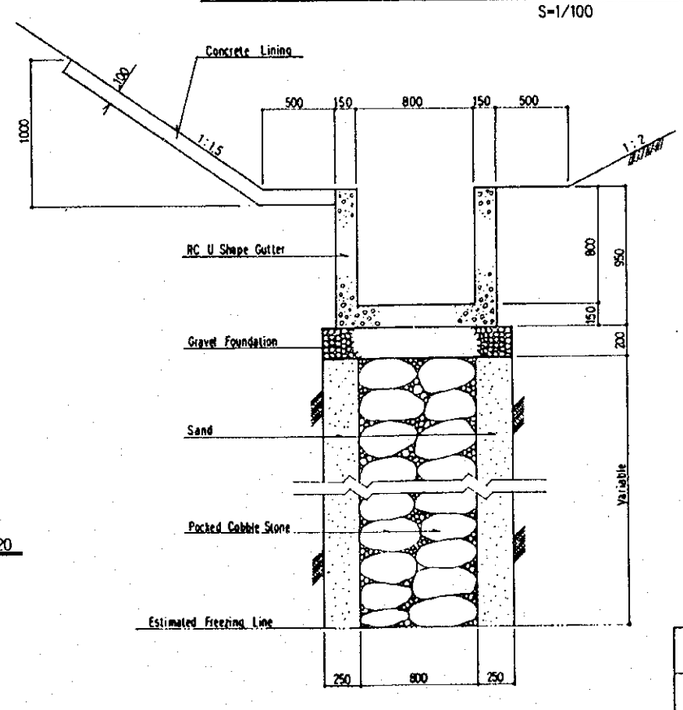


TYPICAL CROSS SECTION (ALL ASPHALT PAVING AREA)
S=1/100



EXISTING POT-HOLE S=1/20

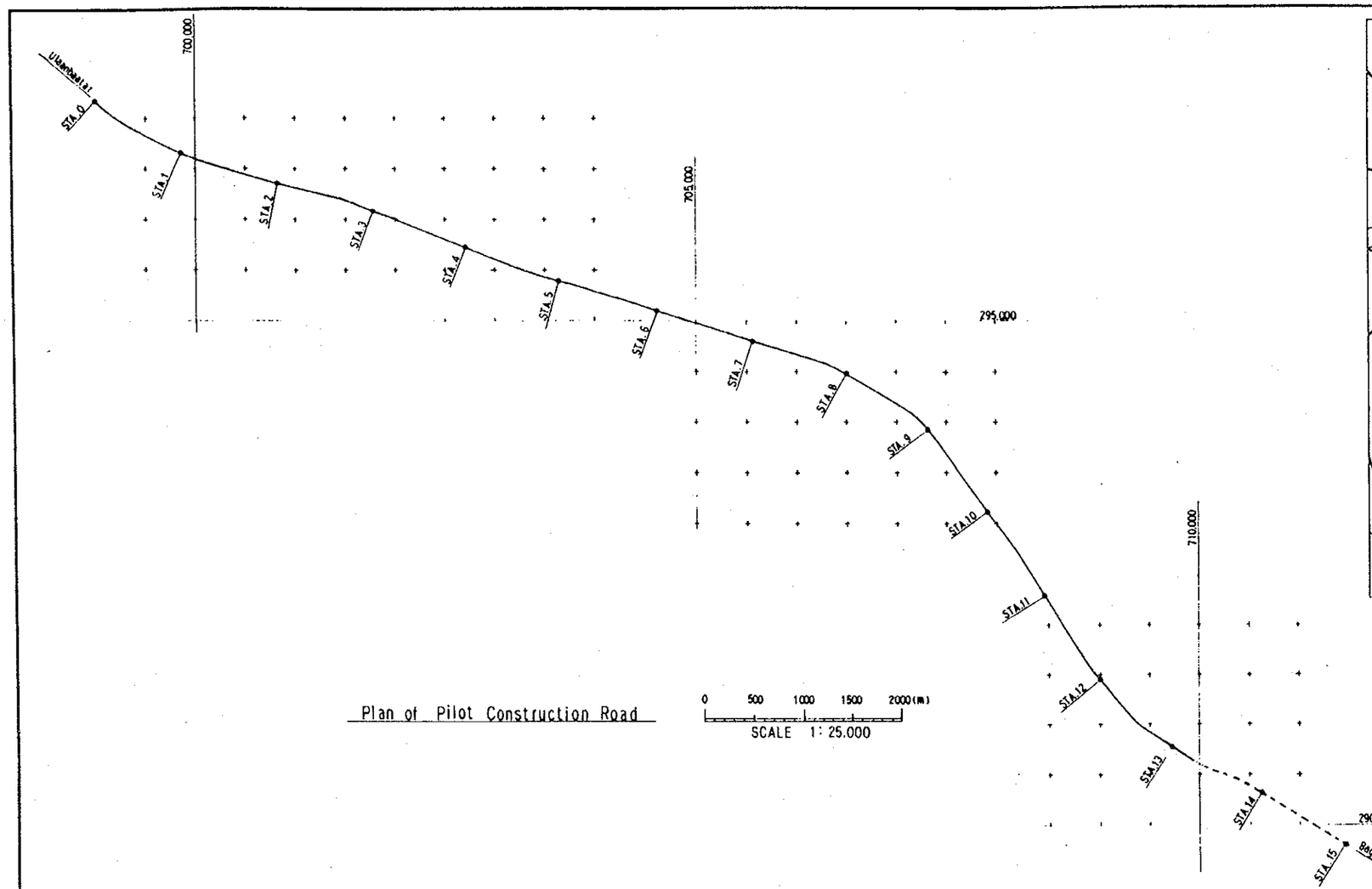
IMPROVED PAVEMENT S=1/20



DETAIL "B" S=1/100

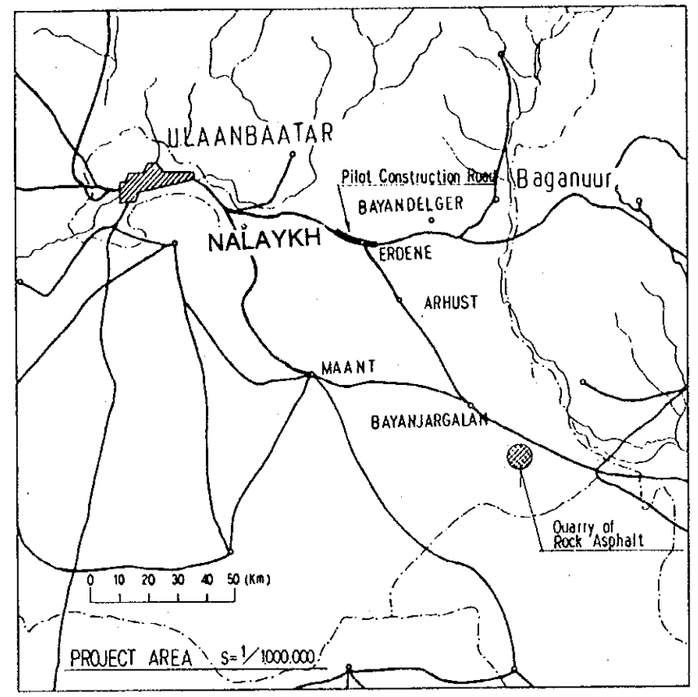
GOVERNMENT OF MONGOLIA MINISTRY OF INFRASTRUCTURE DEVELOPMENT (MID) ROAD DEPARTMENT	
THE PROJECT FOR THE PILOT CONSTRUCTION WORK OF ULAANBAATAR - BAGANUUR SECTION OF THE STATE ROAD IN MONGOLIA	
REHABILITATION WORKS TYPICAL REPAIR SECTION AND DRAINAGE WORKS	
DESIGNED BY	DRAWING NO.
DRAWN BY	RE-03
DATE	
SCALE	
JAPAN INTERNATIONAL COOPERATION AGENCY	

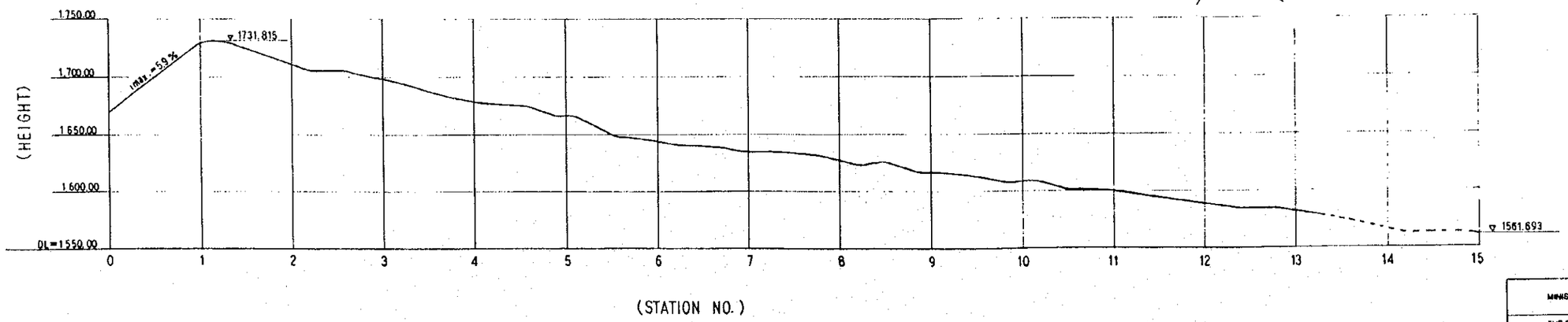
Fig. 3-5 Rehabilitation Works, Typical Repair Section and Drainage Works



Plan of Pilot Construction Road

0 500 1000 1500 2000(m)
SCALE 1: 25,000





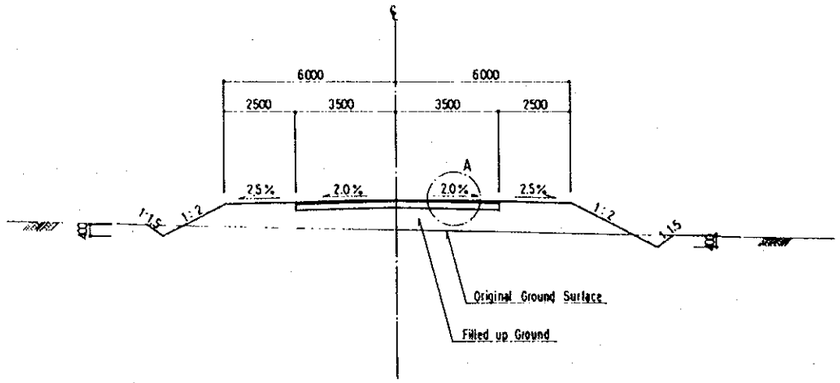
Section of Pilot Construction Road

0 500 1000 1500 2000 (m)
HORIZONTAL SCALE 1:25,000

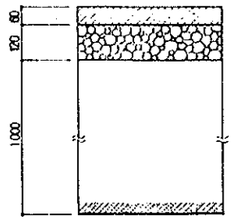
0 50 100 150 200 (m)
VERTICAL SCALE 1:2,000

GOVERNMENT OF MONGOLIA MINISTRY OF INFRASTRUCTURE DEVELOPMENT (MID) ROAD DEPARTMENT	
THE PROJECT FOR THE PILOT CONSTRUCTION WORK OF ULAANBAATAR - BAGANUUR SECTION OF THE STATE ROAD IN MONGOLIA	
PILOT CONSTRUCTION WORKS LOCATION AND GENERAL LAYOUT	
DESIGNED BY	DRAWING NO.
DRAWN BY	PI-01
DATE	
SCALE	
JAPAN INTERNATIONAL COOPELATION AGENCY	

Fig. 3-6 Pilot Construction Works, Location and General Layout

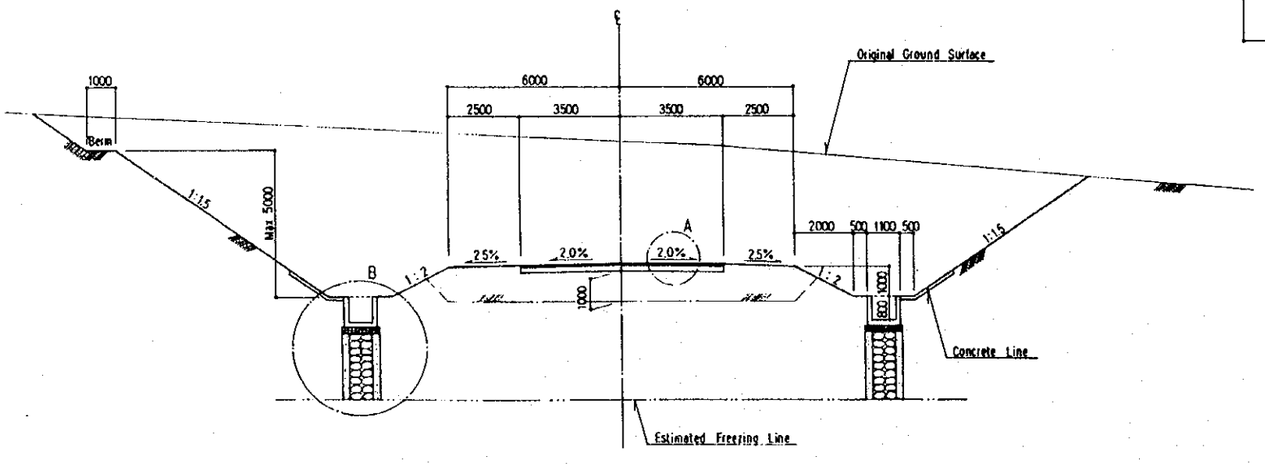


TYPICAL CROSS SECTION (FILLING)
S=1/100

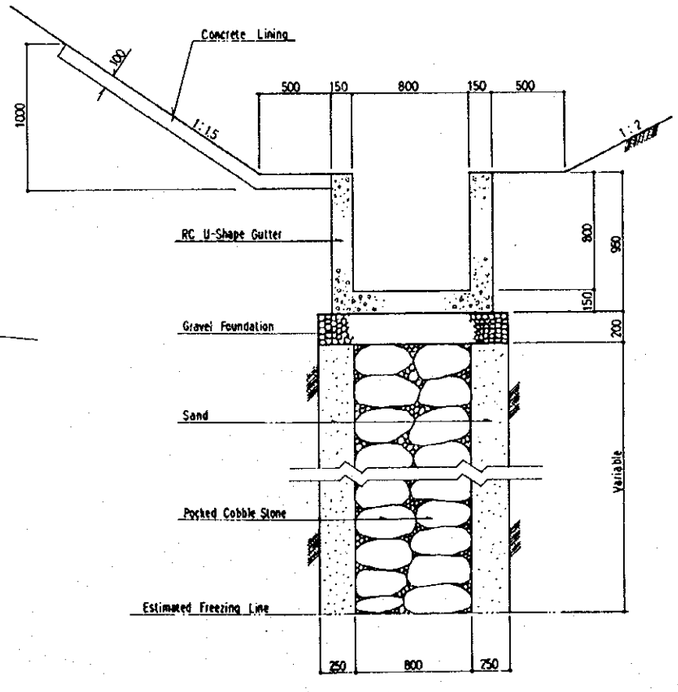


Surface Treatment — Sigle layer of Bituminous Surfacing
Base Course — Crushed Stone for Mechanical Stabilization (M40)
Subgrade — CBR≥12

DETAIL "A" S=1/100



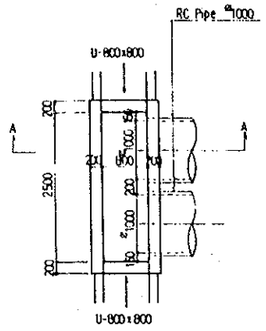
TYPICAL CROSS SECTION (CUTTING)
S=1/100



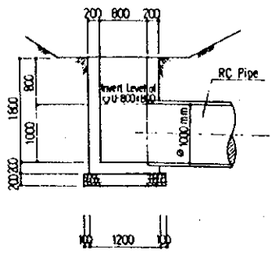
DETAIL "B" S=1/100

GOVERNMENT OF MONGOLIA MINISTRY OF INFRASTRUCTURE DEVELOPMENT (MID) ROAD DEPARTMENT	
THE PROJECT FOR THE PILOT CONSTRUCTION WORK OF ULAANBAATAR - BAGANUUR SECTION OF THE STATE ROAD IN MONGOLIA	
PILOT CONSTRUCTION WORKS TYPICAL CROSS SECTION	
DESIGNED BY / DRAWN BY / DATE / SCALE	DRAWING NO. PI-28
JAPAN INTERNATIONAL COOPERATION AGENCY	

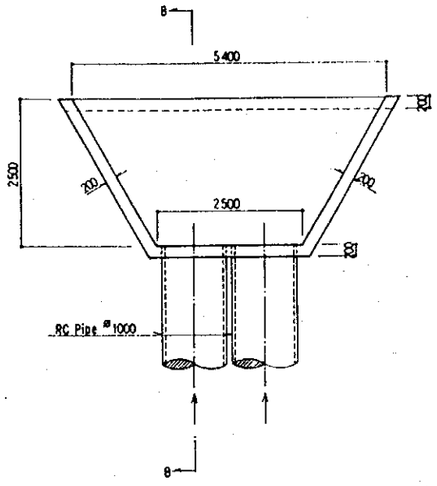
Fig. 3-7 Pilot Construction, Typical Cross Section



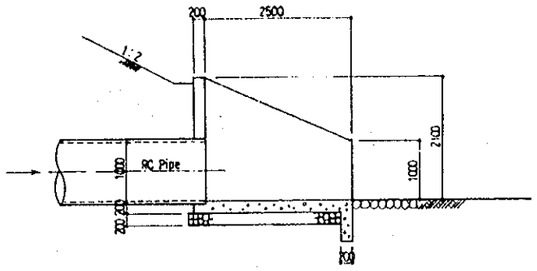
DROP INLET PLAN S=1/50



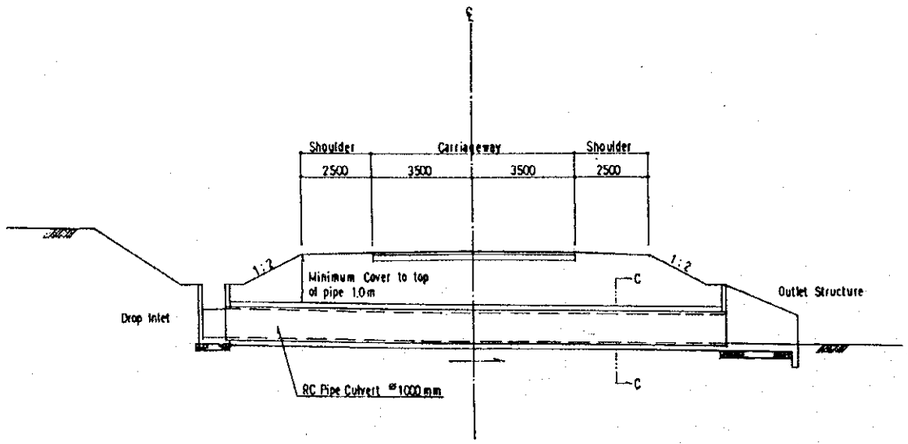
SECTION A-A S=1/50



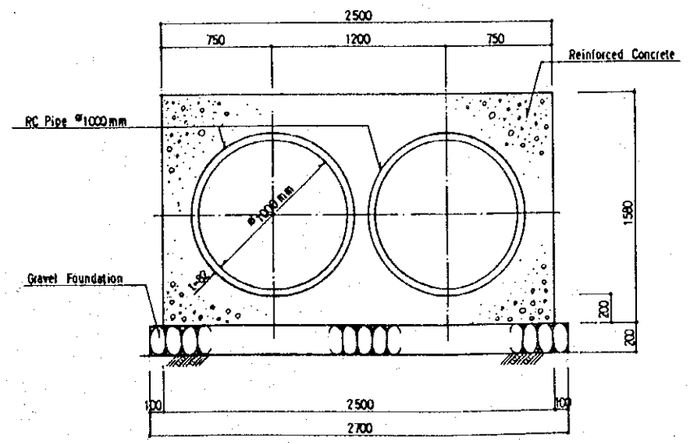
OUTLET PLAN S=1/50



OUTLET SECTION B-B S=1/50



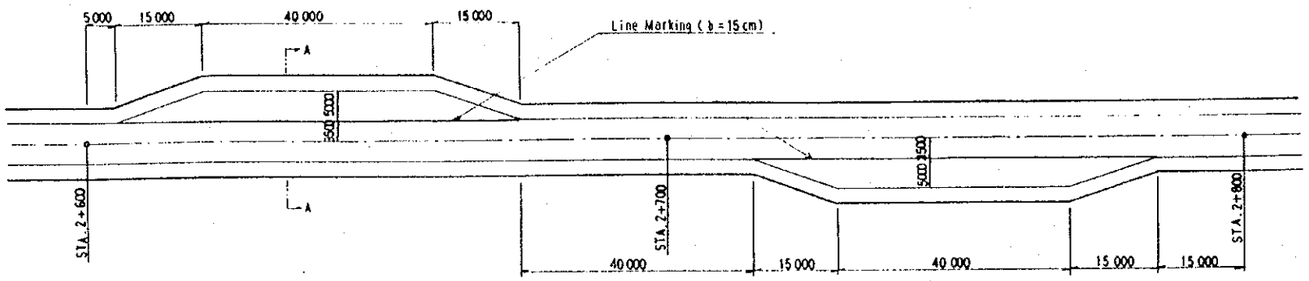
CROSS SECTION S=1/100



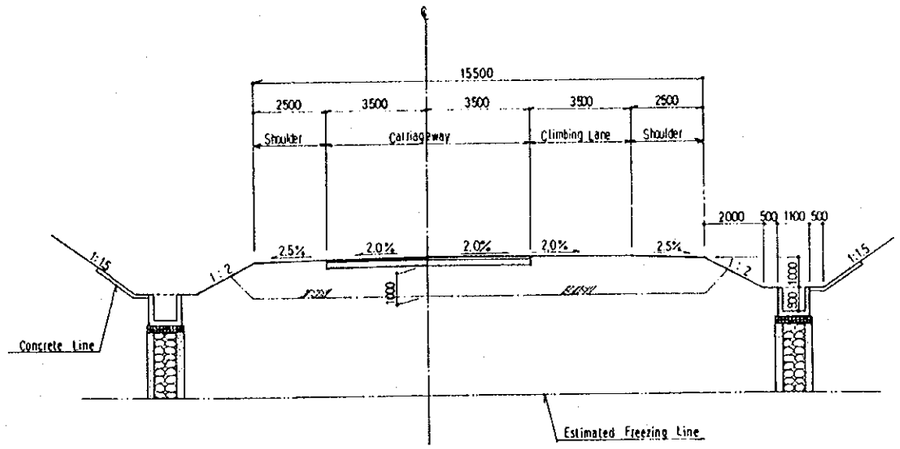
SECTION C-C S=1/20

GOVERNMENT OF MONGOLIA MINISTHY OF INFRASTRUCTURE DEVELOPMENT (MID) ROAD DEPARTMENT	
THE PROJECT FOR THE PILOT CONSTRUCTION WORK OF ULAANBAATAR - BAGANUUR SECTION OF THE STATE ROAD IN MONGOLIA	
PILOT CONSTRUCTION WORKS CONCRETE PIPE CULVERTS	
DESIGNED BY / DRAWN BY / DATE / SCALE	DRAWING NO. PI-30
JAPAN INTERNATIONAL COOPELATION AGENCY	

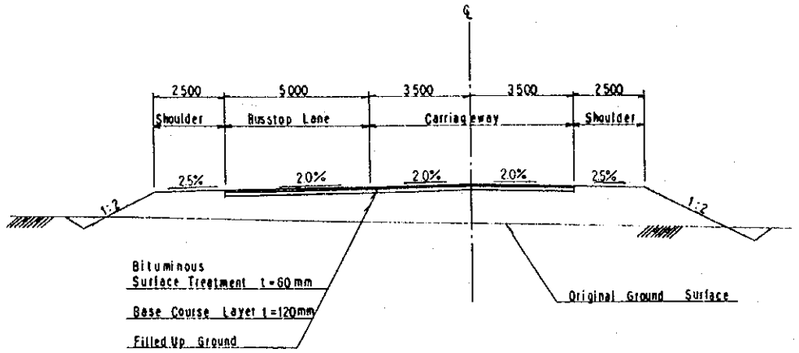
Fig. 3-8 Pilot Construction, Concrete Pipe Culverts



PLAN OF BUSSTOP AREA S=1/500

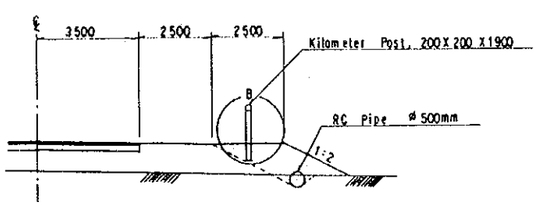


SECTION OF CLIMBING LANE S=1/100

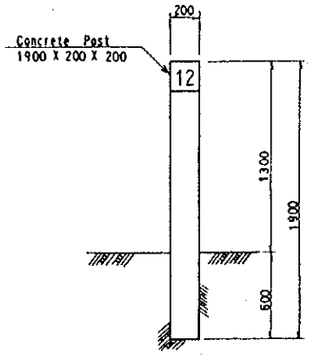


CROSS SECTION "A-A" S=1/100

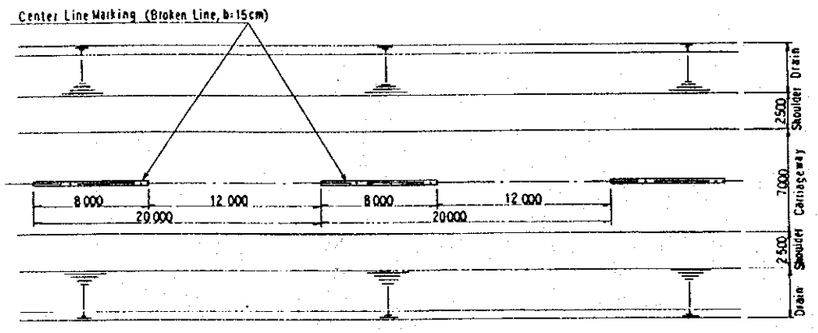
Kilometer Post



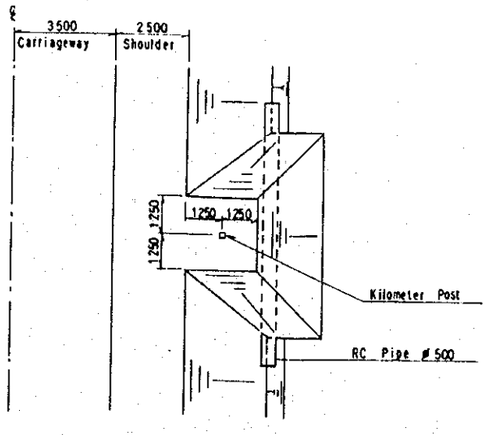
SECTION S=1/100



DETAIL "B" S=1/20



PLAN OF ROAD MARKING S=1/200



PLAN S=1/100

Fig. 3-9 Pilot Construction, Incidental Works

GOVERNMENT OF MONGOLIA MINISTRY OF INFRASTRUCTURE DEVELOPMENT (MID) ROAD DEPARTMENT	
THE PROJECT FOR THE PILOT CONSTRUCTION WORK OF ULAANBAATAR - BAGANUUR SECTION OF THE STATE ROAD IN MONGOLIA	
PILOT CONSTRUCTION WORKS INCIDENTAL WORKS	
DESIGNED BY / DRAWN BY / DATE / SCALE	DRAWING NO. PI-31
JAPAN INTERNATIONAL COOPELATION AGENCY	

3-4 Implementation Plan

3-4-1 Implementation Policy

a. Present Pavement of Rehabilitation Project Section

For part of the damaged area, reparations can be made by a common method used in Japan, which is to cut out a section and replace it. The entire area can be said to be poor in smoothness, but for this project an area of 7,000 m^2 of an especially damaged section will be overlaid. Repair work in pavement construction is a field in which experience is of utmost importance, and it will be necessary to bring a highly experienced foreman accustomed to cold climate pavement.

In order to carry out repair work smoothly and continuously from here out, the provision of a specialized vehicle for repair with repair equipment and materials will be necessary. Regarding the 600-meter-long totally damaged area, a stone-filled trench will be placed to prevent water from seeping out of the cutaway slopes on both sides from causing damage to the roadbed. At the same time, 1.2 m of good quality material will be used to replace the present poor quality material of the roadbed.

b. New Pilot Pavement Section

The section of road up to Erdene is one of urgent priority, but until now a specific completion data has not been set. As part of this project, a completion goal is set at autumn of 1997. Upon discussion with Mongolian authorities, it is believed that, with the two companies presently at work on the 10.6 km section east of Bayan pass working at full capacity and the Japanese team working on the 13.3 km section to the west both sides could be completed in two years.

Furthermore, the Mongolian authorities have especially expressed interest in obtaining technical skills in construction steep roads such as that needed for the Bayan pass area. In compliance, the 2-km area before the pass will be a pilot construction section.

3-4-2 Construction Condition and Methods

The major characteristic of this project is that construction is only possible during the five warmer months of the year; the remaining seven months are for indoor work. Furthermore, excavation of the rock asphalt is only possible during the cold winter months of December to February. When considering the total construction volume involved in the new section, it must span over 2 years and the necessary amount of rock asphalt must be quarried the previous year. Also, considering that it will take from six months to a year from bidding to bringing equipment to the site, and that this is a high-priority project, an alternative plan has been considered. The year of bid completion, quarry development will commence with leasable equipment as it will be acknowledged that one year is necessary before use of the quarry can begin; the first year of construction will proceed with materials thus excavated and equipment provided from Japan.

The following precautions should be made:

(1) Regarding affect of Climate Conditions

Site work will normally take place between May and October. This period is prone to sudden temperature changes, so sufficient temperature control is advised during asphalt paving construction.

(2) Safety Measures

To prevent trouble with workers due to construction accidents, safety instruction and safety measures will be conducted according to Japanese construction standards.

(3) Consideration of Regular Traffic

Construction site should be completely closed off to regular traffic during the entire period of construction, and safety considerations be attended to.

3-4-3 Construction and Supervisory Plan

Qualifications, number of people, and length of time involved of Japanese engineers in construction supervision in consideration of construction content and period are shown below.

a. Basic Policies

Construction supervisors to be sent to Mongolia will conduct the following work:

1) Construction Planning, Approval of Construction Drawings

The supervisor will inspect and approve construction plans, construction schedules, etc., given by the contractor which are in accordance with the contract, drawings and specifications.

2) Schedule Management

Receiving of reports on construction progress from site foreman, he will given instructions to ensure completion within given time frame.

3) Quality Inspection

Inspection and approval of quality of construction and/or construction materials which meet the specifications and the drawings of the contract documents. Furthermore, materials and equipment imported from Japan will be inspected by staff in Japan before shipping.

4) Measurement Inspection

Inspection of whether or not the finished size satisfies the control standards upon inspection of completed sections and horizontal shapes, etc., while confirming amounts.

5) Issuing of Certificates

Issuance of certificates at interim payments, at completion, at the end of warranty period for contractors.

6) Submitting of Reports

Inspection of monthly construction reports, as-built drawings and completion photographs submitted by contractors, and submits them to the Mongolian government and JICA, etc. Also, he will compile an overall report according to compilation policy for grant aid projects after completion of construction for submitting to JICA, etc.

b. Formation of Construction Supervision

The number of Japanese engineers to work as construction supervisors and their number are shown below, according to period and content of construction.

1) Team Leader

The Team Leader will be on hand at commencement and completion of construction.

2) Resident Engineer

The Resident Engineer will be on hand throughout the entire construction and supervise all areas of construction.

3) Equipment Engineer

The equipment engineer will be on hand, if necessary, during the entire construction and supervise in all areas of construction equipment.

4) Road Pavement Engineer

The road pavement engineer will be on hand, if necessary, throughout the period of road construction and supervise earthwork and pavement construction.

3-4-4 Procurement Plan

a. Procurement of Equipment

1) Policy of Equipment Procurement

Equipment needed for this project is not made in Mongolia, so it must be obtained from outside. The number of needed pieces of equipment is about 100. If procurement of equipment is conducted piece by piece, there is the possibility of delays in construction since all pieces are needed at the same time to conduct construction properly. Therefore, it is best that equipment be brought in from a single specified country. At present, most of the construction machinery found in Mongolia is made in the former USSR, and maintenance is unreliable. Upon consideration of future maintenances and repairs, procurement of Japanese-made products would be best.

Procured equipment will be checked in Japan, sent by sea first to the port of Tianjin in China where they will pass through customs, be carried overland by rail transport to Zamyn-Uud and reloaded. They will then be carried to the stock yard in the new plant in Erdene where necessary equipment will be assembled and handed over to Japanese contractors. Handling and maintenance of the equipment will be attended to appropriately. The direct management and operation of equipment during construction will be handled by the Japanese contractors.

2) Plan for Procurement Management

Procurement management begins with the procurement of equipment, and Japanese consultants commissioned by the Mongolian government will conduct such until the hand-over inspection on site. Technical instruction on placement, operation and servicing of this equipment will be conducted by Japanese construction contractors under the supervision of Japanese consultants.

3) Procurement from Third Country

As mentioned previously, it is believed that procurement from a third country is unnecessary.

b. Procurement of Materials

1) Rock Asphalt

According to the plans of the 1.1 million ton exploitation, 6.17 million cubic meters of overburden must be removed. This involves 3.45 cubic meters overburden per ton (0.5 m^3) of rock asphalt. An estimate made in 1988 came to 5.61 million Tg.

This plan's purpose does not directly involve the excavation of rock asphalt, but for the time being it does involve the practical application of rock asphalt as a paving material for major routes in Mongolia. Therefore, for the purpose at hand, the most economically feasible areas of rock asphalt (i.e., the shallow layers) will be used.

The situation of the use of rock asphalt is described below:

Excavation of shallower layers commenced in 1990 (estimated subsurface volume of 6700 tons) and until the present has been conducted at a rate of about 10 thousand tons each winter. Rock asphalt has actually been supplied from the Nalaykh plant to paving sites.

The actual bitumen content is from 7 % to 21 %, depending upon location. In implementing the rock asphalt, it is generally divided into two categories: high bitumen content and low bitumen content.

However, due to lack of budget, no excavation took place over the winter of 1993-94. Rock asphalt supply for 1994 lasted until September 5, 1994; following that straight bitumen mixtures have been used. Budget for winter 1994-95 has not been formulated, so supply of rock asphalt mixtures is not foreseen for 1995.

2) Bitumen

2 % to 3 % raw bitumen must be added to rock asphalt mixtures. Also, since it is difficult to obtain emulsified bitumen to be sprinkled on subgrade, bitumen must be used as a prime coat by cutting back with diesel oil. Autozam is considering researching ways to extract bitumen from rock asphalt, but this is still in the future. At present, most raw bitumen is imported from Russia. At $140 per ton, it is less than half the price of Japanese products, but stock quotas are unknown, obtainability is undependable, and origin unknown; therefore quality is unguaranteeable. Chinese bitumen has a high paraffin content, which causes cracks in cold weather. Russian-produced bitumen for tack coat will also be considered. Transportation of bitumen will be in the usual manner, that is, rail transport in bucket. There is a bitumen pool in the rail station from which lorry transportation is conducted. In regards to this project, it will be transported in drum-cans.

3) Crushed Rock (materials for surface and upper subbase)

At present, there are two major rock crushing plants.

1. Ailak crushing plant

300 km south of the capital, at present manufacturing is practically at a standstill due to lack of equipment.

2. Darhan crushing plant

This is the largest rock crushing plant in Mongolia, about 220 km north of the capital. Approximate daily manufacturing volume is 80,000 m^3. Facilities have a manufacturing potential of 240,000 m^3 per day, but due to decreased demand, are down to 30 %. Crushed rock will be procured from this plant for the pilot construction in this project. Crushed rock will be carried to Ulaanbaatar or Nalaykh by rail cargo (or truck) from where they will be transported to the site by truck.

4) Gravel, Sand (a material for subbase)

This will be procured locally from a plant near Nalaykh. There is no problem in quality or quantity.

5) Lumber (a temporary material for crossing structure)

Available locally and sufficient for scaffolding, etc. in construction, however plywoods for form, etc. will be, unavailable locally, imported from Japan.

6) Steel Material (a temporary material for crossing structure)

Steel material is imported, and availability is uncertain, so for this project will be imported from Japan.

7) Fuel (diesel oil)

Fuel is imported from Russia and rationed out in priority to cooperation projects throughout the country. In this project also, fuel will be procured locally, but we request that necessary fuel be procured ahead of time by Mongolian authorities.

8) Oil/Grease (Lubricants)

Oil/Grease is also imported from Russia, but availability is uncertain, so to avoid problems in construction schedule, they will be imported from Japan.

9) Explosives

Explosives are imported from Russia and there is no problem with quality. However, as with other imported materials, availability can be a problem. However, in this survey, there is some lack of budget, but no apparent problems in availability. For a small-scale rock asphalt quarry as Bayanerhete (4,000 ton/year), purchasing will be no problem, so materials will be purchased locally.

c. Procurement of Labor

There is some concern over the availability of labor for the rock asphalt quarry in winter, but Research and Production Corporation "Autozam" has as many as 60 workers for the plant and quarry, so there should be no problem. Resources of unskilled labor are also rich, so there should be no difficulty obtaining labor from near the site.

d. Related Legislation

As of January 1, 1993, a sales tax was levied which charges a 10 % tax on imported goods, products of registered businesses and service-oriented sales.

e. Technical Capabilities of Local Construction Firms and Consultants

There is believed to be no problem in utilizing Tug Province Road Company (firm conducting construction presently in project area) and/or other Mongolian construction companies as a subcontractor of Japanese contractors.

3-4-5 Implementation Schedule

a. Flow of Implementation Schedule

Following agreement of exchange note, the flow of the project will be generally divided into the following categories:

(1) Detailed Design

Following consultant's contract, detailed design will be conducted and tender documents, etc. will be prepared.

(2) Evaluation of Qualifications

Evaluation categories will be discussed with the International Cooperation Agency ahead of time and qualification evaluation of construction contractors will commence after approval of categories. Evaluation of qualifications will be conducted by a consultant in place of the executing agency of the Mongolian government.

(3) Tender, Contracts

1) Tender, Contracts

Tender evaluation and final decisions for the successful tenderer will be conducted in the presence of the consultant, representative(s) of the Mongolia government, and representing staff of the International Cooperation Agency. Then construction contracts will be made. The contracts will be a direct agreement between the Mongolian government and Japanese contractors (consultants and/or construction contractors). The method of tender will be open competitive tender as is normally conducted in Japan.

2) Banking Arrangement

Upon settlement of contracts, the Mongolian government will open a special account for receiving of funds from the Japanese government and for paying Japanese contractors. This banking arrangement is necessarily simultaneous to the contract signing as it becomes the basis for the Mongolian government to issue an Authorization to Pay which is necessary for Japanese contractors to make applications for obtaining export permission from MTI, and for them to be paid ahead of time, according to contract conditions.

3) Verification of Contract

The verification of contract is a condition of the contract by which the Japanese government confirms that the above contract meets with the

standards of financial assistance concerned. Specifically, the Japanese Ministry of Foreign Affairs obtains the contract via a diplomat in Japan representing the Mongolian government and finalizes it.

4) Carrying-Out of Contract

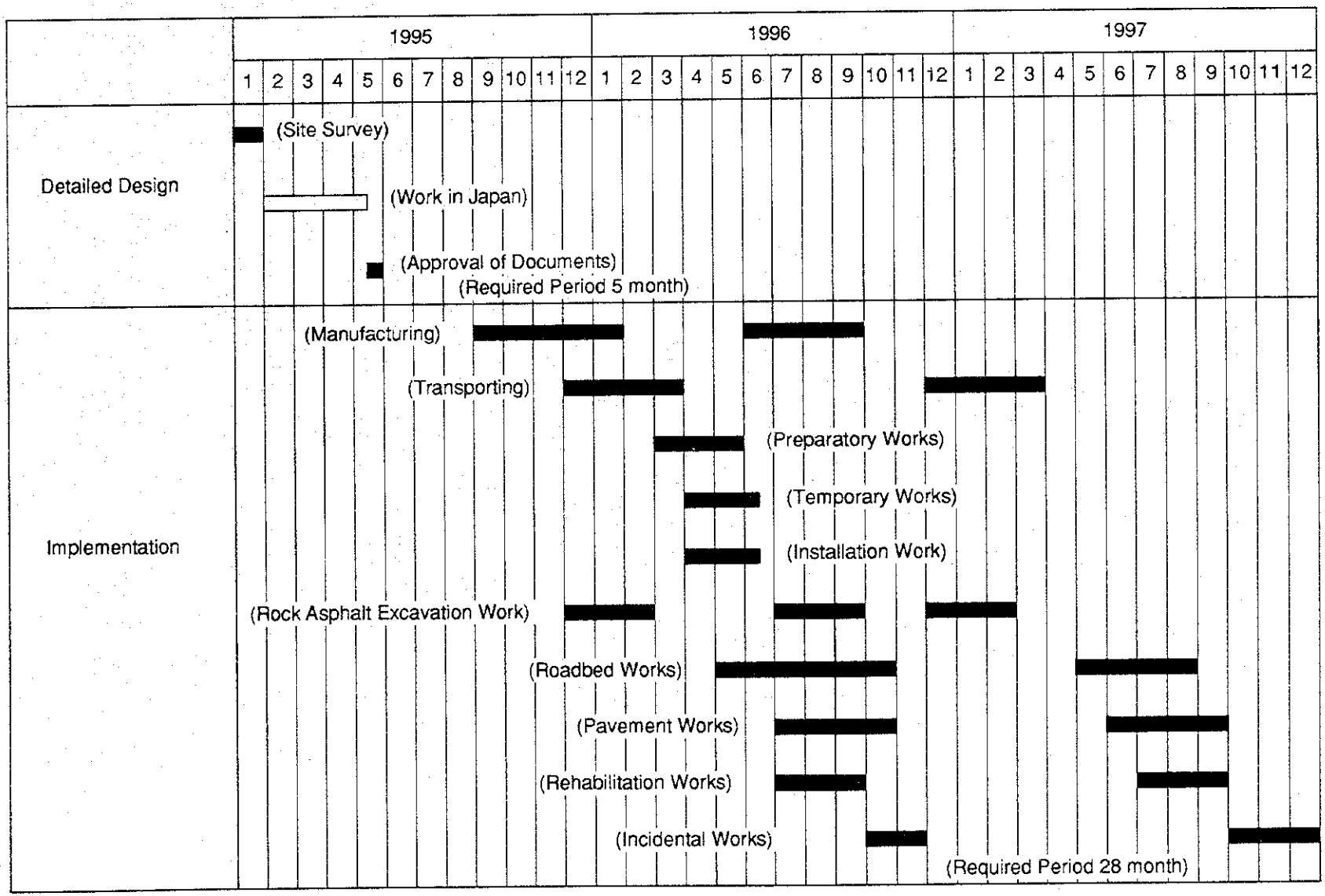
The Japanese contractors carry out the contract upon receipt of the verification of contract and Authorization to Pay.

(2) Construction

Construction consists of preparatory work, repair work of rehabilitation section, earthwork of new construction section, paving, collection of subsurface materials, excavation of rock asphalt, removal of construction-related materials and equipment, and handling over of provided equipment. The planned construction area is in an extremely cold climate, therefore necessitating proper temperature management during pavement construction and proper management of equipment to be used in the rock asphalt quarry during winter.

b. Implementation Schedule

Table 3-5 Implementation Schedule



3-4-6 Scope of Work

The implementation of the project under the Grant Aid of the Japanese Government will require the share of some of the works between the Japanese Government and the Mongolian Government as described hereinafter. The details are described in attached "Minutes of Discussions".

(1) Works to be undertaken by the Japanese site

- Pilot construction of new paved road with rock asphalt;
- Rehabilitation of damaged pavement section with rock asphalt;
- Procurement of road construction equipment for the above referred works;
- Procurement of rock asphalt quarry equipment;
- Technical transfer of construction and field management through the actual construction work

(2) Works to be undertaken by the Mongolian side

(Actual cost is estimated in Appendix 6.)

- Acquisition of sites including for plants and mining sites;
- The exemption of tax on the materials and equipment imported for the project, and the expeditions processing of the custom procedures;
- The exemption of the custom fees for the Japanese and 3rd party nationals entering the Solomon to work on the project, and exemption of other financial obligation;
- To bear all of the expenses other than those related to the Japanese Grant Aid, which are necessary to deliver the materials and the construction of the road; and
- To ensure appropriate maintenance and use of the road constructed and equipment procured under the Japanese Grant Aid.

CHAPTER 4 PROJECT EVALUATION AND CONCLUSION

Chapter 4 Project Evaluation and Conclusion

4-1 Project Evaluation

(1) By using domestically produced rock asphalt, dependence upon imported asphalt as pavement material will decrease. In using rock asphalt, volume of regular asphalt used can be decreased by 60 %.

(2) The use of rock asphalt and the establishment of its paving technology, mechanization of road construction, repair technology, and the transfer of the above technologies will serve as a model case for Mongolia in the future.

(3) By increasing the safety and service level of the Ulaanbaatar - Baganuur road as a transport route, movement of goods will be conducted more effectively. At present, traffic volume is 150 to 200 vehicles a day, but coal transport from Baganuur and consumer goods transport from the capital will benefit from improvements.

The number of people who will benefit is estimated at 320,000, or 15% of Mongolia's population of 2.2 million (290,000 people in Ulaanbaatar, or roughly half the population of 580,000; 20,000 in Baganuur; 10,000 people en route).

(4) As a result of paving improvements, average driving speed will rise from 20 km/hr to 50 km/hr. This will reduce transport time, save fuel and reduce number of breakdowns along the route, therefore bringing ameliorating effects to the economy and society in general.

(5) In the case of unpaved roads, drivers take liberty to drive where they please, thus bringing about destruction of the steppe environment. By paving the road, vehicles will drive on the main road, thereby preserving and improving the steppe.

4-2 Conclusion

In view of the great effect that this project will have, as mentioned above, as well as the contributions it will make to the quality of life for a large number of the populace, it is judged as appropriate as recipient of Japan's Grant Aid. Furthermore, Road Department is judged as sufficiently competent in its present capacity to carry out operation and management of the project.

4-3 Recommendations

This project entails the provision of road construction equipment, etc., and its actual use; the transfer of technological skills in the use of construction equipment and its maintenance, also in construction technology and management to Mongolia. Therefore, inclusion of operation and management of rock asphalt excavation, operation of asphalt plant, supply of high-quality mixtures, and pavement construction are all necessary from the viewpoint of total overall operation.

The project must be conducted under the assumption that after the Japanese side has completed construction, Mongolia will have developed organizational capability and a system to execute the same type of construction on its own. Therefore we propose that the Mongolian government recognize the importance of the following points and endeavor to improve its system.

- Personnel selected as recipients of technology transfer training should be chosen in regards to their future potential.

- A maintenance responsibility system for provided equipment must be established as soon as possible.

- Regarding equipment provided by Japan and roads constructed by Japan, Road Department must put aside a certain amount as a regular budget for maintenance to ensure continued use.

APPENDIX

List of Appendixes

Appendix 1 Member List of Survey Team

(1) Team Leader	INADERA, Takashi	Deputy Director of the Research and Information Division, Economic Affairs Bureau, Ministry of Construction
(2) Plan Management	TOZUKA, Shinji	Second Basic Study Division, Grant Aid Study & Design Department, Japan International Cooperation Agency
(3) Chief Consultant /Road Design	ENDO, Hiroyuki	Pacific Consultants International
(4) Road Equipment	KOHSAKA, Yukio	Pacific Consultants International
(5) Construction Planning	KANEDA, Koki	Pacific Consultants International
(6) Cost Estimation	NOMIYAMA, Koreaki	Japan Overseas Consultants Co., Ltd.
(7) Interpreter	KAMIMURA, Akira	Pacific Consultants International

Appendix 2 Survey Schedule (1)

Day No.	Date	Day	Survey Content
1.	Sep. 21	Wed.	Depart Narita for Ulaanbaatar
2.	Sep. 22	Thu.	Arrive in Ulaanbaatar, Pay visit to Japanese embassy and JOCV office
3.	Sep. 23	Fri.	Pay visit to MID, MTI, NDB Explanation and discussion of Inception Report
4.	Sep. 24	Sat.	Meeting with ADB, Meeting for topographical map
5.	Sep. 25	Sun.	Project site survey Ulaanbaatar ~ Baganuur
6.	Sep. 26	Mon.	On-site survey of Bayanerhete rock asphalt quarry
7.	Sep. 27	Tue.	Survey of Nalaykh asphalt plant, Discussion of minutes
8.	Sep. 28	Wed.	Signing of Minutes, Report to embassy and JOCV office
9.	Sep. 29	Thu.	Inadera and Tozuka return to Japan, Project site survey between Ulaanbaatar and Erdene
10.	Sep. 30	Fri.	Meeting with Autozam, Collection of reference materials
11.	Oct. 1	Sat.	Meeting with Road Department, Collection of reference materials
12.	Oct. 2	Sun.	Holiday, Review of reference materials
13.	Oct. 3	Mon.	Collection of reference materials, Meeting for traffic volume survey, Meeting with Autozam
14.	Oct. 4	Tue.	Survey of Asphalt-concrete, cement-concrete factory and repair shop in Ulaanbaatar
15.	Oct. 5	Wed.	Traffic volume survey, Sampling of rock asphalt and soil
16.	Oct. 6	Thu.	Meetings and reference material gathering: Autozam, etc.
17.	Oct. 7	Fri.	Survey of Darhan rock-crushing plant
18.	Oct. 8	Sat.	Meetings and reference material gathering: Autozam, etc.
19.	Oct. 9	Sun.	Holiday, Review of reference materials
20.	Oct. 10	Mon.	Meetings and reference material gathering: Road Dept., etc.
21.	Oct. 11	Tue.	Report to embassy, JOCV office
22.	Oct. 12	Wed.	Arrive in Narita

MID : Ministry of Infrastructure Development
MTI : Ministry of Trade and Industry
NDB : National Development Board
R D : Road Department
ADB : Asian Development Bank

Survey Schedule (2)

Day No.	Date	Day	Survey Content
1.	Nov. 20	Sun.	Depart Narita for Ulaanbaatar
2.	Nov. 21	Mon.	Arrive in Ulaanbaatar
3.	Nov. 22	Tue.	Pay visit to MID, MTI, Pay visit to Japanese embassy and JOCV office
4.	Nov. 23	Wed.	Explanation and discussion of Draft Final Report to RD
5.	Nov. 24	Thu.	Explanation and discussion of Draft Final Report to RD, Signing of Minutes
6.	Nov. 25	Fri.	Meeting with RD, Report to Japanese embassy and JOCV
7.	Nov. 26	Sat.	Departure from Ulaanbaatar for Narita
8.	Nov. 27	Sun.	Arrive in Narita

MID : Ministry of Infrastructure Development
MTI : Ministry of Trade and Industry
NDB : National Development Board
R D : Road Department
ADB : Asian Development Bank

Appendix 3 Member List of Party Concerned in the Recipient Country

Ministry of Trade and Industry	
Mr. Yondon	Deputy Minister
Mr. P. Ganhuyag	Assistant of Director, Economy & Foreign Trade Policy Department
Ministry of Infrastructure Development	
Mr. T. Damiran	Deputy Minister
Road Department	
Mr. R. Bud	General Director
Ms. E. Oyunchimeg	Executive Manager
Ms. B. Sarantungalag	Officer, Foreign Relations
Mr. L. Gombo	Manager
Mr. D. Khatanbaatar	Assistant, Foreign Relations
Research and Production Corporation "AUTOZAM"	
Mr. Buriadyn Khundgaa	General Director
Mr. B. Dashnjam	Deputy Director
Mr. Chultemdorj	Head of Design Unit
Mr. G. Davagjantsan	Director of Nalaykh Asphalt Plant
Mr. P. Ganbat	Chief Engineer of Nalaykh Asphalt Plant
Mongolian Road Company	
Mr. S. Ochirbat	General Manager
Mr. I. Gonchigzeveg	Senior Vice Director
Mr. J. Sukhbaatar	Officer in charge of price, norms, normative and tariff
Mr. Niamjav	Officer
AUTOZAM Supply Company	
Mr. Bhatapsuh	General Director
Mr. Ganjaadorj	Engineer
National Development Board	
Mr. C. Ganzorig	General Director, Department of Economic Cooperation
Mr. D. Rentsendorj	Chief of Road, Department of Economic Cooperation
City of Baganuur	
Mr. B. Gav'ya-oroltsoo	Mayor
Mr. S. Boldbaatar	Deputy Mayor
ADB Project Office	
Mr. Roy	Consultant

Science Academy Geography Research Center

Mr. N. Shalq		

Rock-Crushing Factory

Mr. Elbegbayan	General Director	

Company of Roads Repair & Maintenance in Neighborhood of Ulaanbaatar City

Mr. D. Tsend	General Director	
Mr. Odnasan	Manager, Division of Technics	

Tuushin Co., Ltd. (trucking firm)

Mr. P. Batsaikhan	Vice Director	
Mr. B. Purevchuluun	Traffic Manager	International Forwarding Division
Ms. N. Enkhriimaa	Air freight Manager	International Forwarding Division
Mr. H. Davaanyan	Assistant Manager	Import Department

Baramach (Workshop)

Mr. R. Davaajargal	Deputy Director	
Mr. C. Sosorburam	Engineer	

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY ON THE PROJECT FOR THE PILOT CONSTRUCTION WORK OF ULAANBAATAR-BAGANUUR SECTION OF THE STATE ROAD IN MONGOLIA

In response to request from the Government of the Mongolia, the Government of Japan decided to conduct a Basic Design Study on the Project for the Pilot Construction Work in Ulaanbaatar-Baganuur Section of the State Road (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Mongolia a study team headed by Mr. Takashi INADERA, Deputy Director of the Research and Information Division, Economic Affairs Bureau, Ministry of Construction, to stay in the country from September 22 to October 12 1994.

The team held discussions with the officials concerned from the Governmnent of Mongolia and conducted a field survey at the study area.

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

ULAANBAATAR, September 28, 1994

Ts. Yondon
Deputy Minister for Trade
and Industry, Mongolia

Takashi Inadera

Takashi INADERA
Leader
Basic Design Study Team
JICA

R. Bud
Director General,
Road Department
Ministry of
Infrastructure Development
Mongolia

ATTACHMENT

1. Objective

The objective of the Project is to improve the skill of Mongolian Agencies, who administer and execute the construction and maintenance of road network all over the country, through pilot construction and rehabilitation of a part of the Ulaanbaatar-Baganuur Section of the state road using rock asphalt.

2. Project Sites

The site of the Project is from Nalaykh to Erdene of the Ulaanbaatar-Baganuur Section of the state road.

3. Executing Organization

Road Department
Ministry of Infrastructure Development of Mongolia

4. Items requested by the Government of Mongolia

After discussions with the Basic Design Study team, the following items were finally requested by the Mongolian side.

(1) Rehabilitation work of the road in the Nalaykh-Aguitiin Hutul section which has been paved using rock asphalt by the Government of Mongolia,
(2) The new pilot road construction of Bayan pass - Erdene section using rock asphalt,
(3) Procurement of equipment for the rock asphalt exploitation such as diesel excavator, screw type drilling machine, etc.,
(4) Procurement of equipment for the road construction and rehabilitation work such as backhoe, bulldozer, waterlorry, roller, etc.

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

5. Japan's Grant Aid System

(1) The Government of Mongolia has understood the system of Japanese Grant Aid as explained by the team.

(2) The Government of Mongolia will take necessary measures, described in ANNEX-1 for smooth implementation of the Project, on condition that the Grant Aid Assistance by the Government of Japan is extended to the Project.

6. Schedule of the study

(1) The consultants will proceed to further studies in Mongolia until October 12.
(2) JICA will prepare the draft report in English and dispatch a mission in order to explain its contents around November, 1994.
(3) In case that the contents of the report is accepted in principle by the Mongolian side, JICA will complete the final report and send it to the Government of Mongolia by March, 1995.

ANNEX I

Necessary measures to be taken by the Government of Mongolia in case that Japan's Grant Aid is executed.

1. To secure the site for the Project

2. To involve the skilled staff and technicians of the implementation organization in the Project during the term of construction for technical transfer

3. To bear commission to the Japanese Foreign Exchange Bank for the banking services based upon the Banking Arrangement

4. To exempt taxes and to take necessary measures for customs clearance of the materials and equipment brought for the project at the port of disembarkation

5. To exempt taxes including V.A.T. (value added tax), and other fiscal levies for purchase and import of the products provided 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 Mongolia and stay therein for the performance of their work

7. To maintain and use properly and effectively the facilities constructed and equipment purchased under the Grant Aid

8. To bear all the expenses other than those to be borne by the Grant, necessary for consruction of the facilities as well as for the transportation and the installation of the equipment

Minutes of Discussions (2)

BASIC DESIGN STUDY ON THE PROJECT FOR ROAD CONSTRUCTION UTILIZING ROCK ASPHALT IN MONGOLIA

In September 1994, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study team on the Project for Road Construction Utilizing Rock Asphalt in Mongolia (hereinafter referred to as "the Project") to Mongolia, and through discussions, field survey, and technical examination of the results in Japan, JICA has prepared a draft report of the study.

In order to explain about and to consult with the Mongolian side on the components of the draft report, JICA dispatched to Mongolia a study team headed by Mr. Takashi INADERA, Deputy Director of the Research and Information Division, Economic Affairs Bureau, Ministry of Construction, and is scheduled to stay in the country from November 21 to 26, 1994.

As a result of discussions, both parties confirmed the main items described in the attached sheets.

Ulaanbaatar, November 24, 1994

Ts. Yondon
Deputy Minister for Trade
and Industry, Mongolia

Takashi Inadera

Takashi INADERA
Leader
Study Team for Explanation
of Draft Report
JICA

R. Bud
Director General,
Road Department
Ministry of
Infrastructure Development
Mongolia

ATTACHMENT

1. Components of Draft Report

The Government of Mongolia agreed and accepted in principle the components of the Draft Report explained by the team as follows:

(1) rehabilitation work of the road in the Terelj Fork-Aguitiin Hutul (17.8Km) section which has been paved utilizing rock asphalt by the Government of Monglia.

(2) new pilot road construction of Bayan pass - Erdene (13.3Km) section utilizing rock asphalt.

(3) procurement of equipment for the rock asphalt exploitation such as diesel excavator, screw type drilling machine, etc.

(4) procurement of equipment for the road construction and rehabilitation work such as backhoe, bulldozer, waterlorry, roller, etc.

2. Project Site

Location of the Project site is shown in ANNEX-1.

3. Characteristics of the Japan's Grant Aid Programme

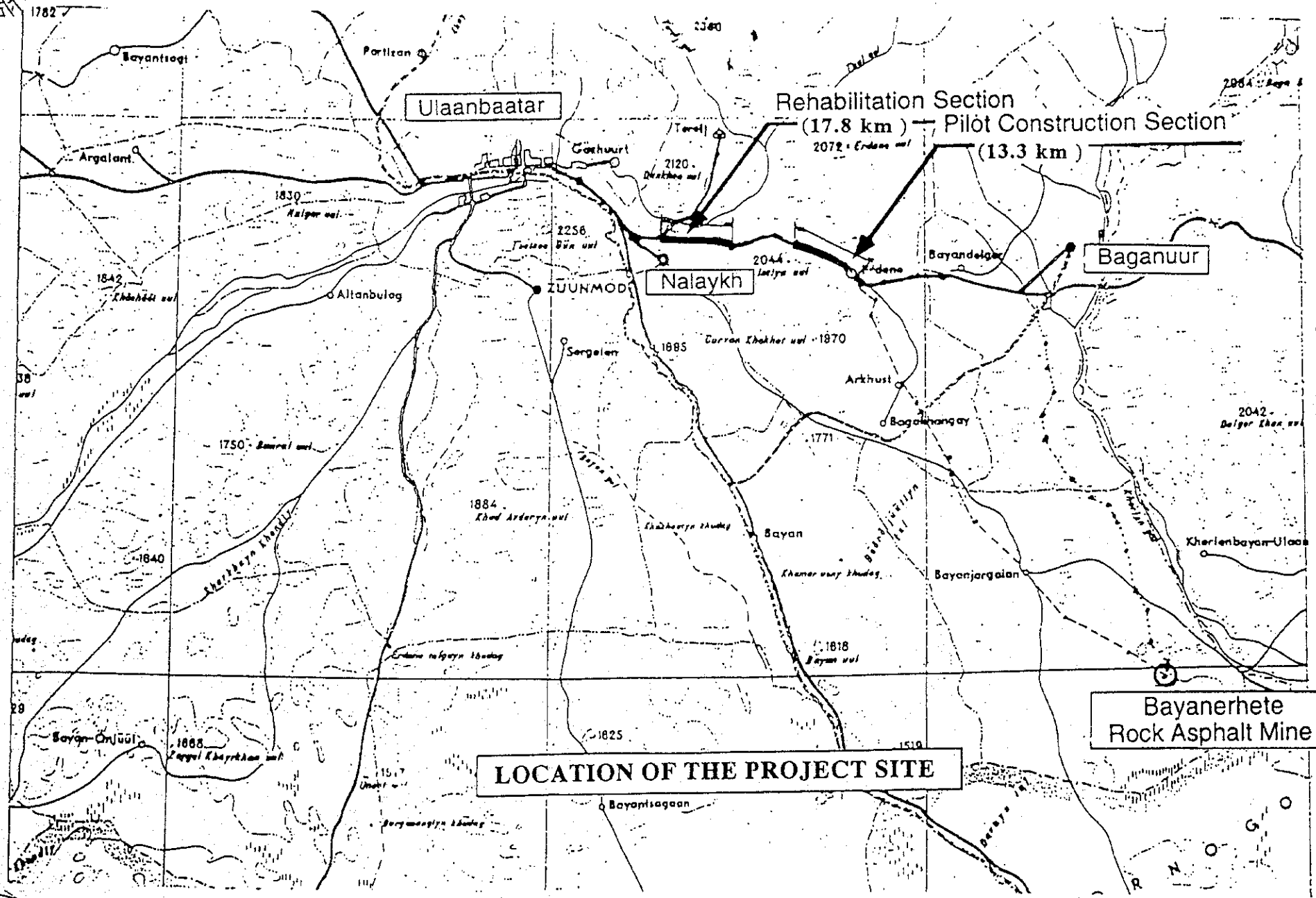
The Mongolian side understood the system and characteristics of Japan's Grant Aid Programme explained by the team as shown in ANNEX-2.

4. Necessary Measures to be taken by the Mongolian Side

The Government of the Mongolia will take necessary measures described in ANNEX-3 for smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

5. Further Schedule of the Study

The team will compile a final report in accordance with the confirmed items and send it to the Government of Mongolia by the end of January, 1995.


Ulaanbaatar
Rehabilitation Section
(17.8 km)
Pilot Construction Section
(13.3 km)
Nalaykh
Baganuur
Bayanerhete
Rock Asphalt Mine
LOCATION OF THE PROJECT SITE
Bayantsogt
Argalant
Altanbulag
ZUUNMOD
Sergelen
Arkhust
Bayan
Bayanjargalan
Bayan-Onjuul
Bayantsagaan
Kherlenbayan-Ulaan

ANNEX-2 Japan's Grant Aid Programme

1.Japan's Grant Aid Procedures

The Japan's Grant Aid Programme is extended in the following procedures:

1) · Application (A request made by a recipient country)
· Study (Basic Design Study conducted by JICA)
· Appraisal & Approval (Appraisal by the Government of Japan and Approval by the Cabinet of Japan)
· Determination of Implementation (Exchange of Notes between both Governments)
· Implementation (Implementation of the Project)

2) At the first step, a request as application made by the recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs),whether or not it is viable for Grant Aid. If the request falls under high priority as the Project for Grant Aid, the Government of Japan instructs JICA to conduct a study.

At the second step, the Study (the Basic Design Study) is conducted by JICA basically contracting with a Japanese consulting firm to carry it out.

At the third step (appraisal & approval), the Government of Japan appraises whether or not the Project is viable for Japan's Grant Aid Programme based on the Basic Design Study report prepared by JICA ,and submits for approval by Cabinet.

At the fourth step the Project approved by the Cabinet is officially determined to implement by signing the Exchange of Notes between both Governments.

In the course of implementation of the Project, JICA will take charge of expediting the execution by assisting the recipient country in tender, contract and others.

2. Contents of the Study

1) Contents of the Study

The purpose of the study (the Basic Design Study), conducted by JICA, is to provide basic document necessary for the appraisal by the Government of Japan whether or not the project is viable for Japan's Grant Aid Programme. The contents of the study are as follows:

a) to confirm the background of the request, objectives, effects of the Project and maintenance ability of the recipient country necessary for the implementation,

b) to evaluate the appropriateness of the Grant Aid from technological, social and economic points of view,

c) to confirm the basic concept of the plan mutually agreed upon through discussion between both sides,

d) to prepare a basic design of the Project,

e) to estimate rough cost of the Project,

The contents of the original request are not necessarily approved as the contents of the Grant Aid as they are. The Basic Design of the Project will be conducted considering the Japan's Grant Aid Scheme.

In implementation of the Project, the Government of Japan requests the recipient country to take necessary measures in order to promote its self-reliance. Those undertakings must be guaranteed even if the recipient implementing entity does not have jurisdiction. Therefore the implementation of the Project is confirmed by all relevant organizations in the recipient country in the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the Study, JICA selects a consultant among those consultants who registered to JICA by evaluating proposals submitted by those consultants. The selected consultant carries out the Basic Design Study and prepares a report based upon the terms of reference made by JICA.

At the stage of implementation after the Exchange of Notes, for concluding the contract regarding the detailed design and construction supervision of the Project between a consultant and the recipient country, JICA recommends the same consultant who participated in the Basic Design Study to the recipient country in order to maintain technical consistency between the Basic Design Study and the Detailed Design as well as to avoid undue delay caused by selection of a different consultant.

3. Japan's Grant Aid Scheme

1) What's is Grant Aid ?

The Grant Aid Programme provides the recipient country with nonreimbursable funds needed to construct facilities, and procure equipment and services (labor or transportation, etc.) for economic and social development in the country under the following principles in accordance with the relevant laws and regulations of Japan. The Grant Aid is not extended in a form of donation in kind to the recipient country.

2) Exchange of Notes (E/N)

The Japan's Grant Aid is extended in accordance with the Exchange of Notes between both Governments, in which the objectives of the Project, period, conditions and amount of the Grant, etc. are provided for.

3) "The period of the Grant Aid" is within the Japanese fiscal year in which the Cabinet approved the Project. Within the fiscal year, all procedures such as Exchange of Notes, concluding contracts by the recipient country with the consultant and contractor and the final payment to them must be completed. In the case of a big project which requires net construction period more than 12 months, the period of the Grant Aid is designated covering more than one fiscal year depending on Basic Design Study Report.

However in case of the delay of delivery, installation or construction due to constraints such as weather condition, the period of the Grant Aid can be further extended by one fiscal year at most, if agreed mutually by both Governments.

4) The Grant Aid should be used properly and exclusively for the purchase of the products, in principle, of Japan or the recipient country and services of the Japanese or the recipient country's nationals. The term "Japanese nationals" means "Japanese physical persons." When both Governments deem it inevitable, part of the Grant Aid may be used for the purchase of the products or services of a third country (other than Japan or the recipient).

However in terms of the principle of the Grant Aid, prime contractors, which are consultant, contractor and procuremant firm assigned for implementation of the Grant Aid are limited to "Japanese nationals".

5) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. "The verification" is necessary because fund source of the Grant Aid is tax payment of Japanese nationals.

6) Undertakings required of the Government of the recipient country as described in ANNEX- 3.

7) "Proper Use"

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

8) "Re-export"

The products purchased under the Grant Aid should not be exported from the recipient country during or after completion of the Grant Aid.

9) Banking Arrangement (B/A)

a) The Government of the recipient country or its designated authority shall 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 Government of the

recipient country or its designated authority under the verified contract.

b) The payments will be made when payment requestd are presented by the Bank to the Government of Japan with an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

ANNEX-3

Following necessary measures shall be taken by the Government of the Mongolia on condition that the Grant Aid by the Government of Japan is extended to the Project.

1. to secure a site for the Project;
2. to provide proper access road to the Project area;
3. to bear commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to pay" and payment commission;
4. to ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation in Mongolia and prompt internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid;
5. to exempt Japanese jurisdical and physical nationals engaged in the Project from customs duties, internal taxes (sales tax, etc.) and other fiscal levies which may be imposed in Mongolia with respect to the supply of the products and services under the verified contracts;
6. to accord Japanese nationals whose services may be required in connection with the supply of the products and the survices under the verified contract such facilities as may be necessary for their entry into Mongolia 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 and the equipment provided under the Project; and
9. to bear all expenses other than those to be borne by the Japan's Grant Aid within the scope of the Project.

Appendix 5 Traffic Volume Survey

(1) Points of Survey

The survey was conducted at the three following locations.

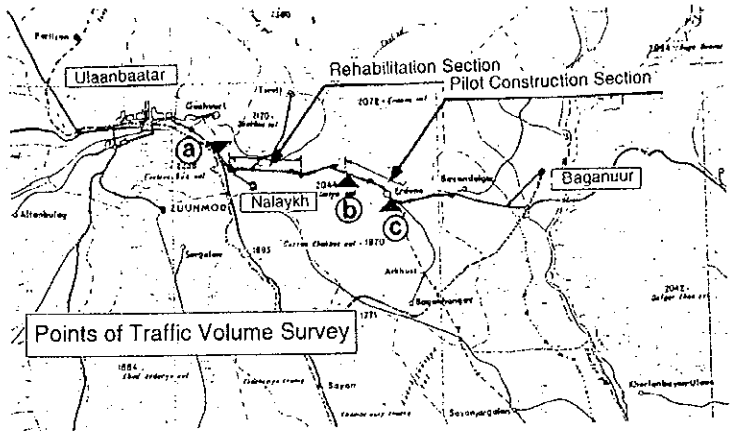
a. Before the Nalaykh fork (to direction of Baganuur and direction of Zamyn-Uud)

b. Bayan pass (intermediate point between Nalaykh and Erdene)

c. Point 2 km east of Erdene

(2) Object of Survey

Survey of vehicle volume according to direction and vehicle classification.



(3) Contents of Survey

Points a and c were observed over 12 hours (6:00 AM to 6:00 PM). Points b was observed over 24 hours.

The survey was conducted on a weekday, October 5 (Wednesday).

(4) Method of Survey

A survey table for traffic volume according to vehicle classification, as shown separately, was used. The survey was conducted with the cooperation of the road department.

(5) Compilation of Survey Results

The survey results were compiled as shown.

Traffic Volume Survey Result (1/2)

BAYAN PASS INBOUND

	1	2	3	4	5	6	7	TOTAL
	MOTOR C.	CAR	L. BUS	M. BUS	L. BUS	JEEP	TRUCK	
06:00-07:00	0	0	0	0	0	0	2	2
07:00-08:00	1	0	1	0	0	2	0	4
08:00-09:00	0	0	0	0	0	2	2	4
09:00-10:00	0	5	1	0	0	1	0	7
10:00-11:00	0	1	0	0	1	2	2	6
11:00-12:00	2	4	1	1	0	6	5	19
12:00-13:00	1	0	1	0	0	1	1	4
13:00-14:00	0	0	0	0	0	2	3	5
14:00-15:00	0	3	1	1	1	1	3	10
15:00-16:00	0	1	0	0	0	1	3	5
16:00-17:00	0	1	0	0	0	2	3	6
17:00-18:00	0	1	0	0	0	3	2	6
18:00-19:00	0	2	0	0	0	0	3	5
19:00-20:00	0	1	0	0	0	3	6	10
20:00-21:00	0	3	0	0	0	0	2	5
21:00-22:00	0	1	0	0	0	1	1	3
22:00-23:00	1	1	0	0	0	0	0	2
23:00-24:00	0	1	0	0	0	0	2	3
24:00-01:00	0	0	0	0	0	1	0	1
01:00-02:00	0	1	0	0	0	0	1	2
02:00-03:00	0	0	0	0	0	0	1	1
03:00-04:00	0	0	0	0	0	0	0	0
04:00-05:00	0	0	0	0	0	2	0	2
05:00-06:00	0	0	0	0	0	0	1	1
SUB-TOTAL	5	26	5	2	2	30	43	113

BAYAN PASS OUTBOUND

	1	2	3	4	5	6	7	TOTAL
	MOTOR C.	CAR	L. BUS	M. BUS	L. BUS	JEEP	TRUCK	
06:00-07:00	0	0	0	0	0	0	2	2
07:00-08:00	0	0	1	0	0	1	2	4
08:00-09:00	0	4	0	0	0	1	0	5
09:00-10:00	0	0	0	0	0	2	3	5
10:00-11:00	4	0	0	0	0	3	3	10
11:00-12:00	0	3	1	0	0	5	3	12
12:00-13:00	1	0	2	0	0	6	2	11
13:00-14:00	2	0	0	0	0	7	2	11
14:00-15:00	0	2	1	0	0	1	6	10
15:00-16:00	0	1	1	0	0	0	2	4
16:00-17:00	2	2	0	3	1	4	9	21
17:00-18:00	0	1	1	1	0	7	6	16
18:00-19:00	1	0	2	1	0	2	5	11
19:00-20:00	0	0	1	0	0	2	2	5
20:00-21:00	0	1	0	0	0	1	2	4
21:00-22:00	0	2	1	0	0	1	2	6
22:00-23:00	0	2	0	0	0	1	2	5
23:00-24:00	0	0	0	2	0	0	0	2
24:00-01:00	0	0	0	0	0	1	0	1
01:00-02:00	0	0	0	0	0	0	1	1
02:00-03:00	0	0	0	0	0	0	0	0
03:00-04:00	0	0	0	0	0	0	0	0
04:00-05:00	0	0	0	0	0	0	1	1
05:00-06:00	1	0	0	0	0	1	0	2
SUB-TOTAL	11	18	11	7	1	46	55	149

Traffic Volume Survey Result (2/2)

NALAYHK — INBOUND

	1 MOTOR C.	2 CAR	3 L. BUS	4 M. BUS	5 L. BUS	6 JEEP	7 TRUCK	TOTAL
06:00-07:00	0	1	2	0	0	1	2	6
07:00-08:00	0	3	3	0	0	1	1	8
08:00-09:00	1	6	4	2	4	8	5	30
09:00-10:00	0	10	8	2	3	5	10	38
10:00-11:00	0	18	12	0	2	13	15	60
11:00-12:00	0	8	11	1	2	9	16	47
12:00-13:00	0	13	12	2	4	10	20	61
13:00-14:00	0	8	10	2	3	4	18	45
14:00-15:00	1	2	16	0	2	9	23	53
15:00-16:00	0	7	7	2	3	7	20	46
16:00-17:00	0	11	6	1	5	0	21	44
17:00-18:00	4	8	7	3	2	6	36	66
SUB-TOTAL	6	95	98	15	30	73	187	504
TERELJ INTERSECTION	OUTBOUND							
06:00-07:00	0	2	0	0	0	3	6	11
07:00-08:00	0	3	0	0	0	3	7	13
08:00-09:00	0	4	0	0	3	3	12	22
09:00-10:00	2	9	0	0	2	5	21	39
10:00-11:00	0	6	0	0	2	7	22	37
11:00-12:00	2	5	2	0	2	15	29	55
12:00-13:00	0	8	1	0	2	11	18	40
13:00-14:00	0	14	3	0	2	4	30	53
14:00-15:00	0	8	2	0	2	11	22	45
15:00-16:00	0	16	3	0	4	11	28	62
16:00-17:00	0	12	2	2	3	12	28	59
17:00-18:00	1	25	8	0	3	27	36	100
SUB-TOTAL	5	112	21	2	25	112	259	536

ERDENE — INBOUND

	1 MOTOR C.	2 CAR	3 L. BUS	4 M. BUS	5 L. BUS	6 JEEP	7 TRUCK	TOTAL
06:00-07:00	0	0	0	0	0	0	0	0
07:00-08:00	0	0	1	0	0	4	0	5
08:00-09:00	0	4	2	0	0	1	1	8
09:00-10:00	0	0	0	0	0	1	2	3
10:00-11:00	1	1	0	1	0	6	4	13
11:00-12:00	0	2	1	0	0	4	1	8
12:00-13:00	1	0	1	0	0	6	2	10
13:00-14:00	0	0	2	1	0	1	0	4
14:00-15:00	0	0	1	0	0	2	4	7
15:00-16:00	0	1	0	0	0	3	3	7
16:00-17:00	0	1	2	0	0	1	3	7
17:00-18:00	0	2	2	0	0	0	4	8
SUB-TOTAL	2	11	12	2	0	29	24	80
ERDENE	OUTBOUND							
06:00-07:00	0	0	0	0	0	0	3	3
07:00-08:00	0	0	0	0	0	0	0	0
08:00-09:00	1	1	1	0	0	2	3	8
09:00-10:00	0	3	0	0	0	1	2	6
10:00-11:00	0	0	1	0	0	3	3	7
11:00-12:00	0	0	0	0	0	2	4	6
12:00-13:00	1	1	1	0	0	4	5	12
13:00-14:00	5	1	1	0	0	7	3	17
14:00-15:00	0	1	0	0	0	2	5	8
15:00-16:00	1	1	0	0	0	1	5	8
16:00-17:00	0	1	2	0	0	2	8	13
17:00-18:00	0	1	1	0	0	3	3	8
SUB-TOTAL	8	10	7	0	0	27	44	96

Appendix 6 Cost Estimation born by the Recipient Country

(1) A rental cost of land for asphalt plant and mining site including accommodations and offices area for two years. Basical rental fee is Tg 9-/m^2 per year.

1) A site for a yard at Bayanerhete Rock Asphalt Mine.

120,000m^2 (400m x 300m) x Tg 9-/m^2 per year x 2 years = Tg 2,160,000-

2) A site for crusher plant at the Bayanerhete Rock Asphalt Mine

10,000 m^2 (100m x 100m) x Tg 9-/m^2 per year x 2 years = Tg 180,000-

3) A site for asphalt plant in Erdene

20,000 m^2 (200m x 100m) x Tg 9-/m^2 per year x 2 years = Tg 360,000-

4) A site for crusher plant in Erdene

10,000 m^2 (100m x 100m) x Tg 9-/m^2 per year x 2 years = Tg 180,000-

Total Amount of (1) = Tg 2,880,000- (US$ 7,198-)

(2) A fee of a mining concession

1) Rock Asphalt

3,789 tons x US$ 2 ton = US$ 7,758-

2) Subbase materials

27,754 tons x US$ 2 ton = US$ 55,508-

Total Amount of (2) = US$ 63,266-

Grand Total of (1) + (2) = US$ 70,464-

JICA