

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT
FOR
THE IMPROVEMENT OF EQUIPMENT
FOR
RESTORATION AND PRESERVATION
OF ARG-E-BAM(BAM CITADEL)
IN
THE ISLAMIC REPUBLIC OF IRAN**

DECEMBER 2004

**JAPAN INTERNATIONAL COOPERATION AGENCY
TAIYO CONSULTANTS CO., LTD.**

| |
|---------------|
| GM |
| JR |
| 04-244 |

PREFACE

In response to a request from the Government of Islamic Republic of Iran, the Government of Japan decided to conduct a basic design study on the Project for the Improvement of Equipment for Restoration and Preservation of Arg-e-Bam (Bam Citadel) and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Iran a study team from August 11th to September 7th, 2004.

The team held discussion with the officials concerned of the Government of Iran, and conducted a field study at the study area. After the team returned to Japan, further studies were mad. Then, a mission was sent to Iran in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Islamic Republic of Iran for their close cooperation extended to the teams.

December 2004

Seiji KOJIMA
Vice-President
Japan International Cooperation Agency

December, 2004

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for the Improvement of Equipment for Restoration and Preservation of Arg-e-Bam (Bam Citadel) Islamic Republic of Iran.

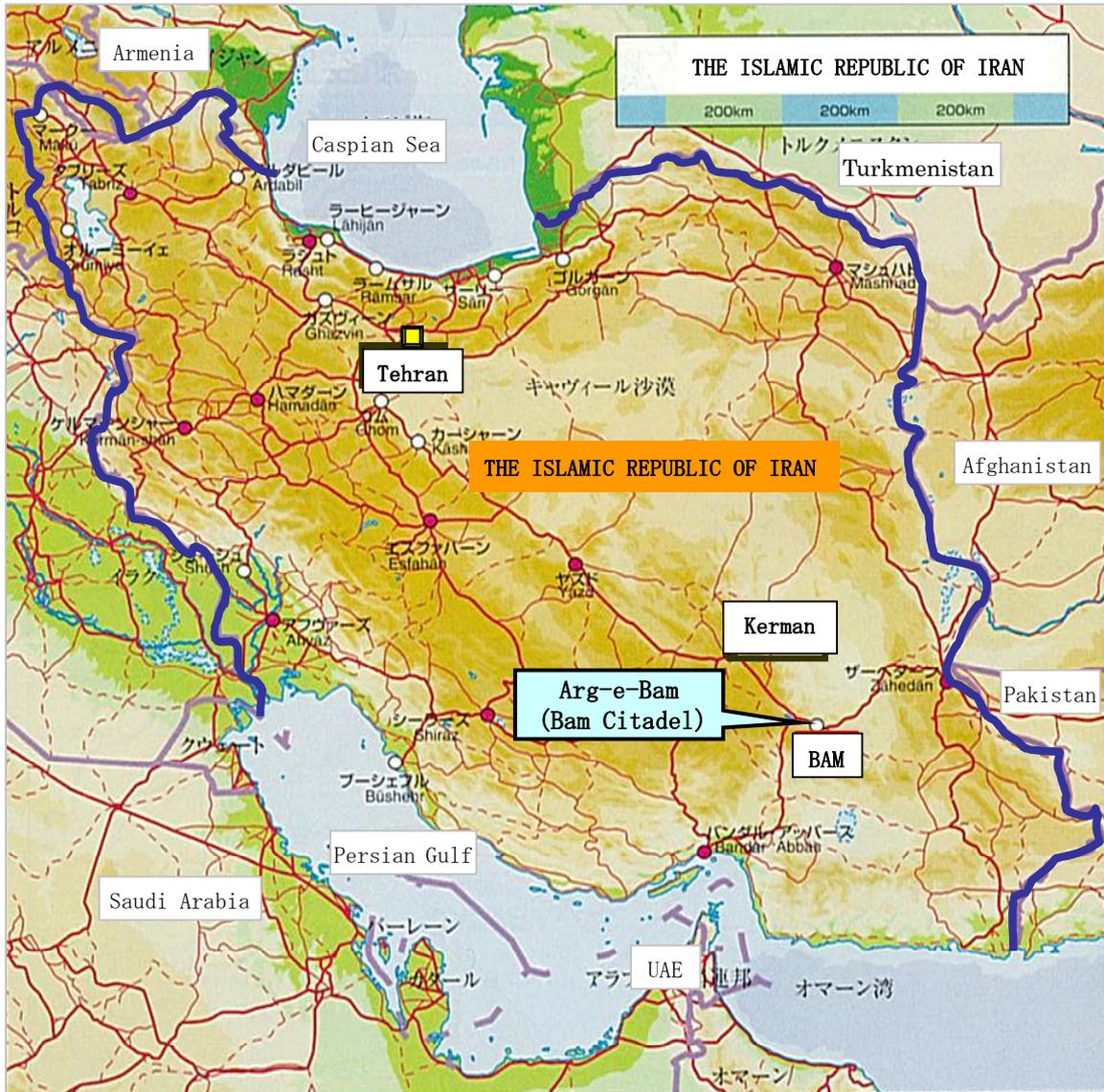
This study was conducted by Taiyo Consultants Co., Ltd., under a contract to JICA, during the period from July, 2004 to December, 2004. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Iran and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

Ryosuke SAKANASHI
Project Manager,
Basic design study team on
the Project for the Improvement of
Equipment for Restoration and
Preservation of Arg-e-Bam (Bam
Citadel)
Taiyo Consultants Co., Ltd.

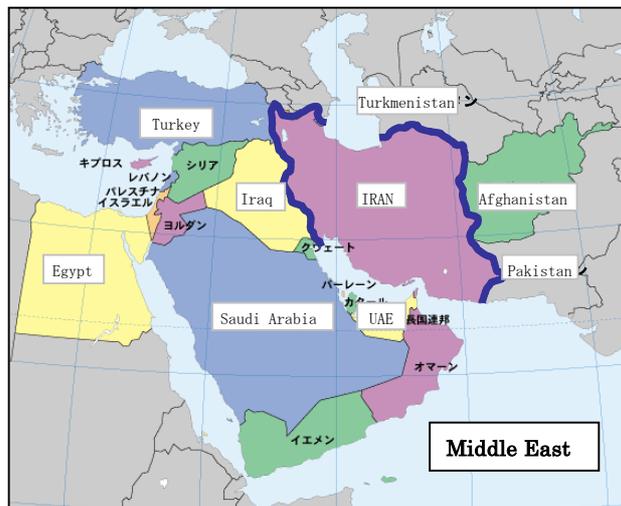
LOCATION MAP



THE ISLAMIC REPUBLIC OF



| Legend | |
|-----------------|---|
| National Border |  Capital  |
| Trunk Road |  City  |
| Other Road |  |



List of Figures and Tables

1. List of Figures

| | | |
|----------|--|----|
| Fig. 2.1 | Use map of Scaffoldings and Steps for Slope area | 11 |
| Fig. 2.2 | Proposed Storage Places for Procured Equipment | 14 |
| Fig. 2.3 | Project implementation relationships | 15 |
| Fig. 2.4 | Organization Chart of ICHTO | 16 |
| Fig. 2.5 | Organization Chart of Arg-e-Bam Project office | 27 |

2. List of Tables

| | | |
|-----------|--|----|
| Table 2.1 | Proposed Equipment List after discussion | 9 |
| Table 2.2 | Final Equipment List to be procured | 13 |
| Table 2.3 | Local Agent of Main Equipment | 20 |
| Table 2.4 | Work Implementation Schedule | 21 |
| Table 2.5 | Expenses borne by Japanese Side | 23 |
| Table 2.6 | Personnel Planning for Bam Office | 26 |
| Table 2.7 | Budget Transitions for the ICHTO Bam Office | 28 |
| Table 2.8 | Breakdown of operation and maintenance costs | 29 |

Abbreviations

1. Abbreviations

| | |
|------------|---|
| BS | : British Standard(s) |
| FA | : Financial Assistance |
| GDP | : Gross Domestic Product |
| ICCROM | : International Center for the Study of the Preservation and Restoration of Cultural Property |
| ICHTO | : Iranian Cultural Heritage and Tourism Organization |
| ICOMOS | : International Council on Monuments and Sites |
| JICA | : Japan International Cooperation Agency |
| JIS | : Japanese Industrial Standard |
| Ms, Mb, MI | : Magnitude |
| OSF | : Oil Stabilization Fund |
| UNESCO | : United Nations Educational, Scientific and Cultural Organization |
| US | : United States |
| TA | : Technical Assistance |
| 4WD | : Four-Wheel Drive (Vehicle) |

2. Units

| | |
|-----------------|------------------------|
| m | : meter |
| mm | : millimeter |
| km ² | : square kilo meter |
| m ³ | : cubic meter |
| °C | : Centigrade |
| m/s | : meter per second |
| kW | : kilowatt(s) |
| E/N | : Exchange of Notes |
| B/A | : Banking Arrangement |
| A/P | : Authorization to Pay |

3. Exchange Rate

| | |
|---|-------------------|
| US\$1.00 = ¥109.80 (US Dollar-Japanese Yen) | (September, 2004) |
| US\$1.00 = Rls8,591 (US Dollar-Iranian Real) | (September, 2004) |
| Rls\$1.00 = ¥0.0128 (Iranian Real-Japanese Yen) | (September, 2004) |

Summary

Arg-e-Bam Cultural Heritage (Bam Citadel) is the largest earth building that constructed during Safavid period (1501 - 1736). Restoration and preservation works for this heritage have been continuing to date. However, by the earthquake occurred on December 26th 2003, more than 80% of the Citadel had collapsed.

Considering the great damage to Bam Citadel, the Government of Japan (hereinafter referred to as "GOJ") has pledged the assistance on the procurement of equipment for restoration and preservation of Arg-e-Bam under a bi-lateral cooperation scheme.

In response to the pledge, the Government of Iran (hereinafter referred to as "GOI") requested a Japan's Grant Aid for cultural heritage for the improvement of equipment for restoration and preservation of Arg-e-Bam.

In answer to the request from GOI, GOJ decided to conduct a basic design study on the Project for the Improvement of Equipment for Restoration and Preservation of Arg-e-Bam (Bam Citadel) and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

Based on the decision of GOJ, JICA dispatched a study team to Iran during a period between August 11 and September 7, 2004. The team made a series of discussions with the Iranian officials in order to confirm the contents of the request, and conducted a field survey at the study area such as an investigation of the damage, examination of the schedule of repair works and data collection on the related matters.

Further studies were conducted after the team returned back to Japan. Based on the results of the field survey, the team examined appropriateness of this project, decided specifications of the most suitable equipment items and drew up an implementation schedule for the project. Then, the team compiled a document titled Draft Basic Design Study Report composed of the result of the study.

On November 8 to November 17, 2004, JICA sent a mission to Iran to explain the Draft Basic Design to GOI and discuss the details of the Design.

The Bam Citadel is not only valuable as a ruin, but is also a psychological symbol of support to the people of Bam who suffered from the earthquake. From that standpoint as well, the ruins have a high degree of importance and high priority in

terms of restoration and preservation, and restoring and conserving the site is an important issue in Iran. At the Bam Citadel International Workshop that was conducted in Bam in April 2004, a declaration (General Management Plan of the site) was formulated, and detailed plans are currently being formulated for the repair and preservation of the citadel. This Project is aimed at procuring the equipment necessary in order to repair and preserve the Arg-e-Bam based on this restoration and preservation planning.

The equipment targeted for procurement selected based on the following policy, taking the contents of this declaration.

- Equipment that is coordinated to the repair and preservation planning for the Bam Citadel will be procured. Because the equipment will be transferred to the Iranian side around December 2005, equipment that will be necessary in 2006 and later will be selected.
- Equipment targeted by the Project will be used only in the repair and preservation of the Bam Citadel (Arg-e-Bam), and no equipment will be targeted for use in any other ruins.
- Taking export regulations and other procedures into consideration, equipment will be targeted that can be procured by the end of March 2006, which is the end of the fiscal budget year in Japan.
- When selecting equipment, priority will be given to equipment that is difficult to procure domestically in Iran.
- Under the restrictions imposed by the system for Japan's Grant aid Program for cultural heritages, the minimum equipment that will be used directly in the restoration and preservation activities and is necessary and indispensable to those activities will be selected.

As equipment targeted for procurement, it was decided that generators, various kinds of vehicles and equipment for experimental purposes were not appropriate for inclusion as target equipment for the Project. While belt conveyors were decided to include these in the final request as additional equipment.

Based on the investigation results and conducting in-country analysis, it was found that when exporting a set of equipment for geophysical exploration to Iran, export permits would be required for both Japan and a third country, and it cannot be predicted

with any certainty at the present stage whether we will be able to secure the permits, or how much time it will take for the permit applications to be processed. Consequently, given that there is a possibility that the delivery of the equipment may not be completed by March 2006, this equipment was excluded from the equipment targeted for cooperation in the Project.

Consequently, the following table shows the final list of equipment planned for procurement.

| No. | Equipment name | Principal specifications | Qty. | Purpose of use |
|-----|---|---|---------|--|
| 1 | Scaffolding | All framework scaffolds, vertical supports for braces, etc., reinforced single-tube scaffolds, 1 set: 10 m x 20 m | 10 sets | Storage and repair work |
| 2 | Steps for use on slopes | All steps, guardrails and posts made of aluminum alloy, 1 set: L = 50m | 15 sets | Studies, storage, repair work |
| 3 | Excavators | | | |
| 3-1 | Small-sized hydraulic shovel (1) for use in castle | Bucket: 0.09 m ³ , Output: 19 kW min. Crawler type, cab specifications, with air conditioner | 2 | Rubble excavation and removal inside the castle |
| 3-2 | Small-sized hydraulic shovel (2) for use outside castle | Bucket: 0.14 m ³ , Output: 26 kW min. Crawler type, cab specifications, with air conditioner | 1 | Rubble excavation and removal outside the castle |
| 4 | Forklifts | Load weight: 2.5 tons | 2 | Moving, removing and transporting large sections of collapsed rubble |
| 5 | Loader | | | |
| 5-1 | Wheeled loader for use outside castle | Bucket: 1.3 m ³ Output: 63 kW Wheeled type, cab specifications, with air conditioner | 1 | Removal and loading of rubble outside the castle and rubble transported from inside the castle |
| 5-2 | Small-sized wheeled loaders for use inside castle | Bucket: 0.4 m ³ , Output: 21 kW Wheeled type, cab specifications, with air conditioner | 2 | Removal, moving and loading of rubble inside the castle |
| 6 | Belt conveyors | Length: 7 m, belt width: 350 mm, engine, portable | 5 | Removal, transport and loading of rubble inside the castle |

The total project cost if this cooperation project is implemented would be 116 million yen (of which Japan will bear 113 million yen and Iran 3 million yen).

The effect for the implementation of this project is shown as below.

1) Direct Effect

- Speed up of the investigation of actual earthquake's damage in higher place and ramparts of the Citadel
- Make easy the restoration and preservation works for Arg-e-Bam (Bam Citadel) by increased efficiency of heavy debris removal in the Citadel.

2) Indirect Effect

- Recovery the visitors to Arg-e-Bam, contribute to the revival of tourism in Bam city and activation of local economy.

In order to ensure the effectiveness and sustainability of this project, we propose the followings.

- Since a long-term tackling of the restoration and preservation of Arg-e-Bam is inevitable, ICHTO shall not make the reinforcement of the budgets and personnel planned for the project momentary, and shall designate the project as a national priority project sustaining the budgets and the personnel continuously to the future.
- ICHTO shall secure the budgets and the personnel as scheduled needed for operation and maintenance (O/M) of the equipment to be procured. Staff members in charge of the construction machines shall continuously endeavor to increase their ability in O/M technique of the machines in order to make their effective use, even after receiving the training in acquiring basic operating skills for the machines to be given at the delivery stage.
- Arg-e-Bam (Bam Citadel) was registered as World Heritage list of UNESCO recently. Therefore, Arg-e-Bam is widely acknowledged at present compared with before. Since these ruins are the pride and support of Bam citizen, ICHTO shall implement the restoration and preservation works in cooperation with UNESCO, other donors and local people steadily.

*BASIC DESIGN STUDY REPORT
ON THE BASIC DESIGN STUDY ON THE PROJECT
FOR THE IMPROVEMENT OF EQUIPMENT FOR RESTORATION AND PRESERVATION
OF ARG-E-BAM (BAM CITADEL)*

| |
|--------------------------|
| Preface |
| Letter of Transmittal |
| Location Map |
| List of Figures & Tables |
| Abbreviations |
| Summary |

CONTENTS

| | Page |
|---|-----------|
| Chapter 1 Background of the Project | 1 |
| Chapter 2 Contents of the Project | 2 |
| 2-1 Basic Concept of the Project | 2 |
| 2-2 Basic Design of the Requested Japanese Assistance | 3 |
| 2-2-1 Design Policy | 3 |
| 2-2-2 Basic Plan / Equipment Plan | 6 |
| 2-2-3 Basic Design Drawing | 13 |
| 2-2-4 Procurement Planning | 15 |
| 2-2-4-1 Procurement Policies | 15 |
| 2-2-4-2 Considerations Concerning Procurement | 17 |
| 2-2-4-3 Procurement and Installation Divisions | 18 |
| 2-2-4-4 Procurement Supervision Planning | 18 |
| 2-2-4-5 Quality Control Planning | 19 |
| 2-2-4-6 Equipment Procurement Planning | 20 |
| 2-2-4-7 Implementation Process | 21 |
| 2-3 Obligations of Recipient Country | 22 |
| 2-4 Project Operation Plan | 24 |
| Chapter 3 Project Evaluation and Recommendations | 30 |
| 3-1 Project Effect | 30 |
| 3-2 Recommendations | 30 |

Appendices

| | |
|---|------|
| 1. Member List of the Study Team | A-1 |
| 2. Study Schedule | A-2 |
| 3. List of Parties Concerned in the Recipient Country | A-4 |
| 4. Minutes of Discussions | A-6 |
| 5. Cost Estimation Borne by the Recipient Country | A-21 |

Chapter 1 Background of the Project

Chapter 1 Background of the Project

(1) Background of the request

Arg-e-Bam Cultural Heritage (Bam Citadel) is the largest earth building that constructed during Safavid period (1501 - 1736). Restoration and preservation works for this heritage have been continuing to date. However, by the earthquake occurred on December 26th 2003, more than 80% of the Citadel had collapsed. The Government of Japan has supported through dispatch of International Emergency Supporting Medical Team, supply of Emergency Supporting Goods, implementation of Emergency Grand Aid and others. In the field of culture, the Government of Japan committed to provide US\$500,000 to Japanese Fund for UNESCO Cultural Heritage in January, 2004 which included the dispatch of Japanese experts.

Simultaneously, the Government of Japan has pledged the assistance on the procurement of equipment for restoration and preservation of Arg-e-Bam under a bi-lateral cooperation scheme up to one hundred fifty million thousand yen (¥150,000,000).

In response to the pledge, the Government of Iran has requested a Japan's Grant Aid for cultural heritage for the improvement of equipment for restoration and preservation of Arg-e-Bam (Bam Citadel).

(2) Outline of the request

The outline of the request is as bellow.

- Overall Goal: Restoration and preservation of Arg-e-Bam (Bam Citadel)
- Project Purpose: Improvement of the restoration and preservation activities for Arg-e-Bam (Bam Citadel)
- Expected Outputs: Improvement of equipment for restoration and preservation of Arg-e-Bam (Bam Citadel)
- Activities:
 - 1) Requested Equipment: Scaffoldings, Sliding Step, Diesel Generator, Geophysics facilities, Workshop Equipment, Motor Transport, Soil survey equipment, Glassware and chemicals, Lab-instruments and equipment
 - 2) Implementation plan for Iranian side: Implementation of the restoration and preservation activities for Arg-e-Bam (Bam Citadel)
- Project Area (Site): Iran (Bam City in Kerman province)
- - Direct Beneficiaries: researcher and workers, residents around the Arg-e-Bam, visitors of Arg-e-Bam
- - Indirect Beneficiaries: Sixty four million and nine hundred thousand of Iranian people in Iran
- Recipient Agency: Iranian Cultural Heritage and Tourism Organization (ICHTO)

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

The Arg-e-Bam (Bam Citadel) in Iran, located to the northwest of Bam City, is the ruins of a castle town surrounded by castle walls on all four sides. The citadel first originated during the Sassanian Period (227 – 651) and acquired its current form during the Safavid Period (1501 – 1736). It functioned as a base for interaction and exchange in the West Asian world for many years, but fell into ruins following an assault by the Pashtuns in 1722. The Bam Citadel is the largest earthen building in the world, and the urban structure of the Safavid Period is completely preserved within it, providing a clear look not only at the ruling classes of that time, but at how the common people lived as well. However, as a result of the Bam earthquake that took place on December 26, 2003 (magnitude 6.3, total number dead: 43,200, approximately 75,600 victims), more than 80% of the citadel was destroyed, and sections where restoration work had been carried out over the past 32 years were completely demolished. Since the earthquake, the Iranian Cultural Heritage Organization has been formulating plans for repairing and restoring the citadel, with support from UNESCO, the International Council on Monuments and Sites (ICOMOS), the International Center for the Study of the Preservation and Restoration of Cultural Property (ICCROM) and other organizations.

Because the Bam Citadel was an important source of tourism for the country, no serious excavation studies had been carried out at the site for many years. However, in the collapse caused by the earthquake, a large number of sun-dried bricks were found that are thought to be from the Sassanian Period, and the discovery has been evaluated by experts as comprising important evidence to substantiate the country's history. The Government of Iran had nominated the Bam Citadel to the UNESCO World Heritage Committee as a candidate site for a world heritage and an endangered heritage, and at the 28th Session of the World Heritage Committee held in China (Suzhou) from June 28 to July 7, 2004, registration of the Bam Citadel on the World Heritage List and the List of World Heritages in Danger was approved.

The Bam Citadel is not only valuable as a ruins, but is also a psychological symbol of support to the people of Bam who suffered from the earthquake. From that standpoint as well, the ruins have a high degree of importance and high priority in terms of restoration and preservation, and restoring and conserving the site is an important issue in Iran. At the Bam Citadel International Workshop that was conducted in Bam in April 2004, a declaration (General Plan for Repair) was formulated, and detailed plans are currently being formulated for the repair and preservation of the citadel. This Project is aimed at procuring the equipment necessary in order to repair

and preserve the Arg-e-Bam based on this restoration and preservation planning.

2-2. Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Basic Policy / Equipment Plan

Based on the declaration (General Plan for Repair) formulated at the Bam Citadel International Workshop held in Bam in April 2004, detailed repair and preservation planning for the Bam Citadel is currently being put together on the Iranian side.

The equipment targeted for procurement will be selected based on the following policy, taking the contents of this declaration as the starting point.

- Equipment that is coordinated to the repair and preservation planning for the Bam Citadel will be procured. Because the equipment will be transferred to the Iranian side around December 2005, equipment that will be necessary in 2006 and later will be selected.
- Equipment targeted by the Project will be used only in the repair and preservation of the Bam Citadel (Arg-e-Bam), and no equipment will be targeted for use in any other ruins.
- Taking export regulations and other procedures into consideration, equipment will be targeted that can be procured by the end of March 2006, which is the end of the fiscal budget year in Japan.
- When selecting equipment, priority will be given to equipment that is difficult to procure domestically in Iran.
- Under the restrictions imposed by the system for grant aid for cultural heritages, the minimum equipment that will be used directly in the repair and preservation activities and is necessary and indispensable to those activities will be selected.

(2) Policies concerning natural conditions

The Bam region is located in the highlands in the southeast of Iran, at an altitude of approximately 1,000 m. Because the area is very dry, there is little rainfall, and the annual rainfall comprises only several tens of millimeters. Because of the desert climate, there is a broad spread of temperatures, with July being the hottest (the average monthly temperature is 45°C). There is strong sunshine during the day, so canopies and cabs will be provided for the driver's seats on the machinery used in construction.

Furthermore, the soil is silt-based soil with the fine granules that are peculiar to the desert, and at times clouds of dust are raised by the hot winds. In order to prevent engine wear caused by grains of dirt getting into the engines, it will be important to preserve the filtering function of the engines. This will be done by providing large amounts of filtering and sealing equipment as expendable commodities.

(3) Policies concerning the situation particular to the site

In Iran, Farsi (Persian) is the official language, but English is becoming more widespread. Instruction manuals and other manuals pertaining to the construction machinery and equipment planned for procurement as imported equipment will be prepared in English, which has a high level of commonality.

Moreover, under the systems in place on the Iranian side, one condition of importing products is that there must be companies that can handle maintenance control of the products, meaning agents. Import permits will not be issued unless an agent has been registered for the products, and the products will not be allowed through Customs at the ports. For this reason, the products of companies that have local agents will be selected. Currently, a large volume of construction machinery made in Japan is being exported, and there are companies that are carrying out production in the local area as well. These companies have local subsidiary corporations and agents. Principal European and U.S. construction machinery companies similarly have local companies or agents.

(4) Policies for dealing with the ability of the implementing organization to carry out operation and maintenance control

The Bam Citadel was registered as a world heritage this July, and the restoration and preservation of the citadel are an important issue for Iran. Because of this, it is anticipated that future budgets and the assurance of personnel will be given a high priority. Consequently, there are no particular problems involving the budget, personnel, or technical levels at the Bam office of Iran's Cultural History and Tourism Organization (ICHTO), which is the local implementing organization in the Project.

With respect to technical handling as well, experts from both Iran and foreign countries are being utilized and the detailed repair work plans that were formulated are now being implemented. With respect to the equipment planned for procurement under the Project, the only task to be dealt with is finding operators and other necessary personnel, and the equipment to be procured is well within the range of what can be

handled locally. It is planned that maintenance of the construction machinery and equipment will be handled by consigning it to outside companies specializing in such operations, as has been done in the past.

(5) Policies concerning the setting of grades for facilities, equipment, etc.

In setting the grades for the equipment to be procured, the general material specifications used in Iran, the equipment currently possessed by the implementing organization and other information sources will be taken into consideration and the levels at which the appropriate operation and maintenance control can be carried out by Iran, or equivalent grades, will be used. In the event that higher-grade control is carried out, it will be within a range in which Iran can provide the appropriate operation and maintenance control.

Specifically, the equipment is to meet Japanese standards (JIS) and European standards (BS, etc.), and the policy of the procurement is to target certain grades of equipment that can withstand the elements peculiar to the local area, such as high temperatures, the wide difference between high and low temperatures, the dryness of the region, dust and dirt, and other conditions.

(6) Policies concerning procurement methods and work periods

Because the Project is planned to be implemented as a fiscal 2004 project, the policy is to select equipment for which the transfer to the Iranian side can be completed by March 2006.

Exports to Iran are regulated by regulations that are imposed on Japan and other sources from which products are imported, and are based on international agreements. For Japanese products as well, exports of some materials (equipment) are regulated by export trade control ordinances and ministerial ordinances governing cargo from the standpoint of secure trade management. Also, even if equipment is procured in Canada and Britain and imported to Japan, and then re-exported to Iran, it is necessary in some cases to obtain export permission not only for Japan, but for the country of origin as well.

Taking these circumstances into consideration, equipment will be selected for which there are no problems with exports to Japan, and for which procurement can be expected to be completed by March 2006. For equipment that requires export approval before being exported to Iran, confirmation will be made prior to selecting equipment for the Project that the process for transferring the equipment, from the point of procurement to the point of transfer, and including the time required to submit a request for approval, can be completed within the construction period.

2-2-2. Basic Plan / Equipment Plan

(1) Overall Plan

The overall plan for equipment procurement corresponds to the general repair plan noted below that was proposed at the Bam Citadel International Workshop held in Bam in April 2004. This general plan calls for the repair plan to be carried out in the following three stages. The detailed contents of the repair plan are currently being formulated on the Iranian side.

Site management plan and statement of objectives

The general management plan of the site was approved in the International Workshop on Bam, 17-21 April, 2004. However, there are three phases of work as follows:

I. Emergency:

1. Physical security and establishment of safe paths and scaffolding for working.
2. Detection of dangerous structures which may collapse any day:
 - a. Consolidation of historical structures.
 - b. Examination of the parts which had been repaired before the earthquake, and are dangerous or may fall on other structures.
3. Removal of debris and their evacuation from the site.
4. Providing facilities for restorers and experts.
5. Continuation of research to recover official documents which have been buried under the debris.
6. Daily monitoring of the site and historical structures, including taking photographs of the structures.

II. Mid-term (5 years):

- To begin multidisciplinary researches (archaeology, ethnography, geography, work on intangible heritage).
- Installment of different educational/training work shops both for experts and technical staff (the general project is now being prepared by an international committee).
- To investigate on the possibility of a permanent base for restoration and research activities in Bam. The base would also serve as the consolidation centre of old mud brick structures in the country. This task would be carried out with the financial support of the World Bank and other international institutions.
- To bring in the local people whose participation is a very important factor in the restoration and conservation of the historical site of Bam. People's participation is both a moral and social duty. People's participation can be envisaged in two forms:
 - a. To give the priority to the restoration of those structures with religious and local

importance. The religious structures with prime value are the Congregational Mosque in the Arg, the Tekiyeh; the important historical structures are the edifice known as the Governor's Residence on top of the citadel wherein ceremonies for the New Year are held.

- b. People's participation would provide jobs in the region, and would bring in income by means of employing local workers in restoration activities. Consequently, tourism would develop along with the relevant facilities such as hotels, restaurants, shops, etc. It is because it is indispensable to work on the retrieval of local industries especially the old ones like the silk and cotton fabrics.

III. Long-term (10 years):

- a. To establish a permanent plan of restoration/conservation of mud brick structures in Bam, and also in national level.
- b. To establish a permanent research base and visitor centre for tourism (exhibition and museum, etc.).
- c. To revival of the intangible heritage of the site.
- d. To publish documents relevant to the site and make them available.
- e. To develop international cooperation in a broader level.
- f. To develop local participation in a broader level.
- g. To revive and encourage old industries such as silk and cotton fabrics.

Specifically planning for repair and preservation are currently being formulated, but the equipment necessary for the "Emergency Measures and Short-term Planning" noted in the above proposal will be targeted by the Project.

(2) Selection of the Necessary Equipment

i) Target equipment

As equipment targeted for procurement, it was decided, for the reasons given below, that generators, various kinds of vehicles and equipment for experimental purposes were not appropriate for inclusion as target equipment for the Project.

- Generators

The purpose of the generators is to serve as an alternative source of power if the power fails in the management office and the lodging for experts, and as a power supply for lighting up the Bam Citadel at night in the event of a power failure. Emergency power supplies for the management office and the lodging for experts are outside of the scope of grant aid for cultural heritages. Additionally, although night lighting of the citadel is intended as a theft prevention measure, the crime prevention effect sought by assuring a power supply during power failures is thought to be limited, so it was

ultimately decided to exclude generators from the list of requested equipment.

Generators that will be necessary in order to use the procured equipment within the citadel will be studied in conjunction with the relevant equipment.

- Passenger cars

Buses, vans and four-wheel drive vehicles were requested as vehicles for getting experts and workers from one place to another, but passenger vehicles are outside the scope of grant aid for cultural heritages. This equipment would be used primarily to take people to citadels other than Arg-e-Bam, and the Bam office already has several vehicles. It was confirmed in the Basic Design Study that transporting people around the Arg-e-Bam grounds could be handled by putting the currently owned vehicles to full use, and so the above vehicles were excluded from the final request for the Project.

- Laboratory equipment

Laboratory equipment was requested for the purpose of soil studies and testing. However, with respect to this equipment, Iran has already begun conducting soil tests on the sun-dried bricks, and cannot wait until the period planned for procurement on the Japanese side (around December 2005), so the request was turned down. Ultimately, however, only endoscopes with monitors, which are difficult for Iran to procure on its own, were requested as laboratory equipment. It was decided, however, that in the future endoscopes would be included in the category of equipment for geophysical exploration.

The following equipment was added as new items to be studied.

- Equipment for transporting bricks (handcars, belt conveyors)

As explained above, there are large numbers of bricks still lying wherever they fell inside the collapsed citadel, and workers are currently moving the bricks to a storage space using carts (wheelbarrows). It is thought that belt conveyors and handcars would be an effective means for transporting the bricks within the citadel, and would make the work more efficient and lighten the burden on the workers. Thus, it was decided to include these in the final request. In subsequent studies, however, it became clear that handcars can be purchased easily and cheaply in Iran, so it was decided to exclude these from the list of materials to be procured.

The following table shows the materials targeted for procurement at the stage when the field study was concluded.

Table 2.1 Materials targeted for procurement following in-country discussions

| No. | Item | Request record | Discussion agenda | Notes |
|-----|--|----------------|-------------------|---------------------------------------|
| 1 | Scaffolding materials | ○ | ○ | (10 sets) |
| 2 | Steps for slopes | ○ | ○ | (10~15 sets), high priority |
| 3 | Generators | ○ | × | Canceled |
| 4 | Equipment for geophysical exploration | | | |
| 4-1 | - Underground radar probe | ○ | } ○ | 2~3 types envisioned (1 of each) |
| 4-2 | - Electrical probe | ○ | | |
| 4-3 | - Magnetic probe | ○ | | |
| 4-4 | - Electromagnetic probe | ○ | | |
| 4-5 | - Endoscope for industrial use | — | ○ | Added (1 unit) |
| 5 | Construction machinery | | | |
| 5-1 | - Small-sized excavators | ○ | } ○ | Grouped together as excavators |
| 5-2 | - Excavator | ○ | | |
| 5-3 | - Forklifts | ○ | | |
| 5-4 | - Loaders | ○ | | |
| 5-5 | - Handcars | — | | |
| 5-6 | - Belt conveyors | — | | |
| 6 | Vehicles | | | |
| 6-1 | - Mini-buses | ○ | × | } Canceled |
| 6-2 | - Vans | ○ | × | |
| 6-3 | - 4 WD vehicles | ○ | × | |
| 7 | Testing instruments | | | |
| 7-1 | - Vitrics, pharmaceuticals | ○ | × | } Canceled |
| 7-2 | - Instruments for soil mechanics testing | ○ | × | |
| 7-3 | - Laboratory equipment | ○ | × | |

After receiving the above investigation results and conducting in-country analysis, it was found that when exporting a set of equipment for geophysical exploration to Iran, export permits would be required for both Japan and a third country, and it cannot be predicted with any certainty at the present stage whether we will be able to secure the permits, or how much time it will take for the permit applications to be processed. Consequently, given that there is a possibility that the delivery of the equipment may not be completed by March 2006, this equipment was excluded from the equipment targeted for cooperation in the Project.

ii) Equipment planning

Materials were selected after investigating the necessity and appropriateness of each item through discussion with the Iranian side, in view of the purpose for which it would be used, the location where it would be used, the quantity, and other aspects. The following describes the contents of each equipment item and the grounds for selecting it.

- Scaffolding and steps for slopes

Scaffolding that is outstanding in terms of light weight, durability, and operability and will not rust easily, and steps for slopes that will make it possible to carry out studies and repair operations in high places such as castle walls and towers safely and smoothly, cannot be procured domestically in Iran, and are necessary regardless of the contents being surveyed and the method of repair, so they will be procured through the Project.

The scaffolding and other materials selected to be procured through the Project will be framework types that are easy to handle even at high temperatures.

Moreover, along with excluding equipment for geophysical exploration from the equipment targeted by the Project, 15 sets of steps for use on slopes will be procured, as requested in the original request from the Iranian side.

Fig. 2.1 shows the locations in which the scaffolding and steps for slopes will be used.

- Small-sized construction machinery (excavators, forklifts, loaders)

Even now, there are still large numbers of sun-dried bricks lying where they collapsed within the citadel. In order to make the work of removing the bricks and preparing the site more efficient, small-sized construction machinery that can be taken into the citadel will be procured.

THE BASIC DESIGN STUDY ON THE PROJECT
FOR THE IMPROVEMENT OF EQUIPMENT FOR RESTORATION AND PRESERVATION
OF ARG-E BAM (BAM CITADEL)

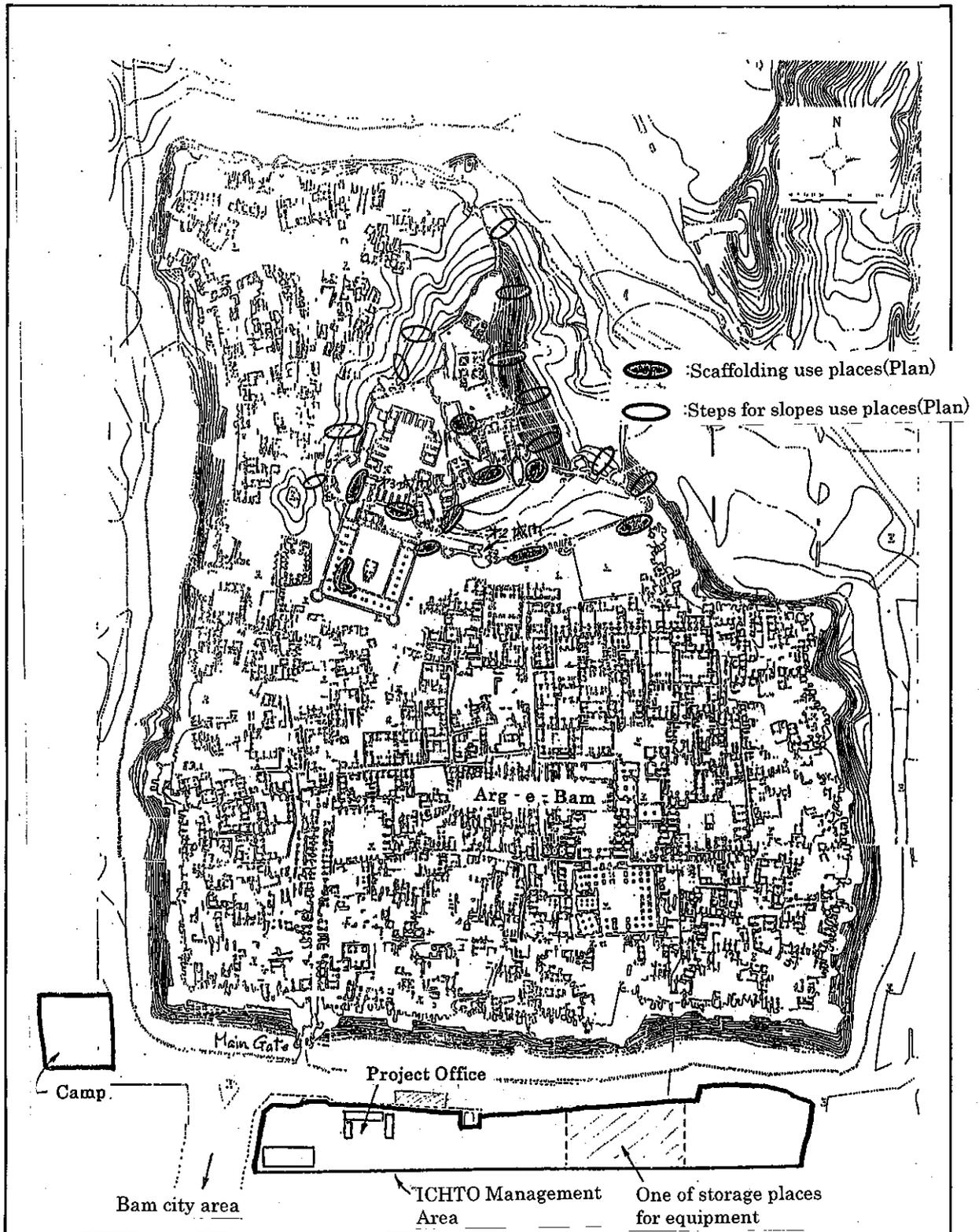


Fig. 2.1 Locations where scaffolding and steps for slopes will be used, and locations where materials and equipment will be placed (delivery locations)

With respect to excavators, taking into consideration the access situation to the target area and the work locations (narrow roads and storage areas inside the castle, etc.), small-sized (overall width 1.6 m max.) and highly mobile equipment will be selected. These will be used for excavating and removing collapsed rubble both inside and outside the area, and two excavators will be provided for use inside the castle (bucket capacity 0.09 m³), where two or so work locations are envisioned, and one will be provided for use outside the castle (bucket capacity 0.14 m³). This will make it possible to collect and transport significantly larger volumes using the current number of workers.

The forklifts (2.5-ton types, overall width 1.6 m max.) will be used to transport blocks, bricks, scaffolding and other items both inside and outside the castle. A total of two are being considered, one for inside and the other for outside the castle.

Because of the vast quantity of collapsed bricks, the loaders will be used together with the excavators to remove and transport collapsed bricks inside and outside the castle walls. Two small-sized loaders (bucket capacity 0.4 m³, overall width 1.6 m max.) will be provided for use inside the castle and a medium-sized loader (bucket capacity 1.3 m³) will be provided for use outside the castle.

Additionally, belt conveyors will be installed as an effective means for transporting bricks inside the citadel. As explained earlier, there are still large numbers of bricks lying where they collapsed inside the citadel, and the workers are currently moving the bricks to a storage space little by little, using carts (wheelbarrows). Belt conveyors will be installed in order to make the work more efficient and lighten the burden on the workers. Five sets of engine-driven conveyors with a length of 7 meters will be procured.

iii) Final list of equipment to be procured

Based on the above, the following table shows the final list of equipment planned for procurement.

Table 2.2 Final list of equipment to be procured

| No. | Equipment name | Principal specifications | Qty. | Purpose of use |
|-----|---|---|---------|--|
| 1 | Scaffolding | All framework scaffolds, vertical supports for braces, etc., reinforced single-tube scaffolds, 1 set: 10 m x 20 m | 10 sets | Storage and repair work |
| 2 | Steps for use on slopes | All steps, guardrails and posts made of aluminum alloy, 1 set: L = 50m | 15 sets | Studies, storage, repair work |
| 3 | Excavators | | | |
| 3-1 | Small-sized hydraulic shovel (1) for use in castle | Bucket: 0.09 m ³ , Output: 19 kW min. Crawler type, cab specifications, with air conditioner | 2 | Rubble excavation and removal inside the castle |
| 3-2 | Small-sized hydraulic shovel (2) for use outside castle | Bucket: 0.14 m ³ , Output: 26 kW min. Crawler type, cab specifications, with air conditioner | 1 | Rubble excavation and removal outside the castle |
| 4 | Forklifts | Load weight: 2.5 tons | 2 | Moving, removing and transporting large sections of collapsed rubble |
| 5 | Loader | | | |
| 5-1 | Wheeled loader for use outside castle | Bucket: 1.3 m ³ Output: 63 kW Wheeled type, cab specifications, with air conditioner | 1 | Removal and loading of rubble outside the castle and rubble transported from inside the castle |
| 5-2 | Small-sized wheeled loaders for use inside castle | Bucket: 0.4 m ³ , Output: 21 kW Wheeled type, cab specifications, with air conditioner | 2 | Removal, moving and loading of rubble inside the castle |
| 6 | Belt conveyors | Length: 7 m, belt width: 350 mm, engine, portable | 5 | Removal, transport and loading of rubble inside the castle |

2-2-3. Basic Design Drawing

The procured equipment will be stored and kept at the locations described below (please refer to Figs. 2.2).

- Scaffolding: Park next to the Bam office (area for which usage permission has been obtained)
- Construction machinery: Western area next to the Bam Citadel which obtained as new blocks for the project facilities area such as project office, staff quarters, garage for construction machineries and others.

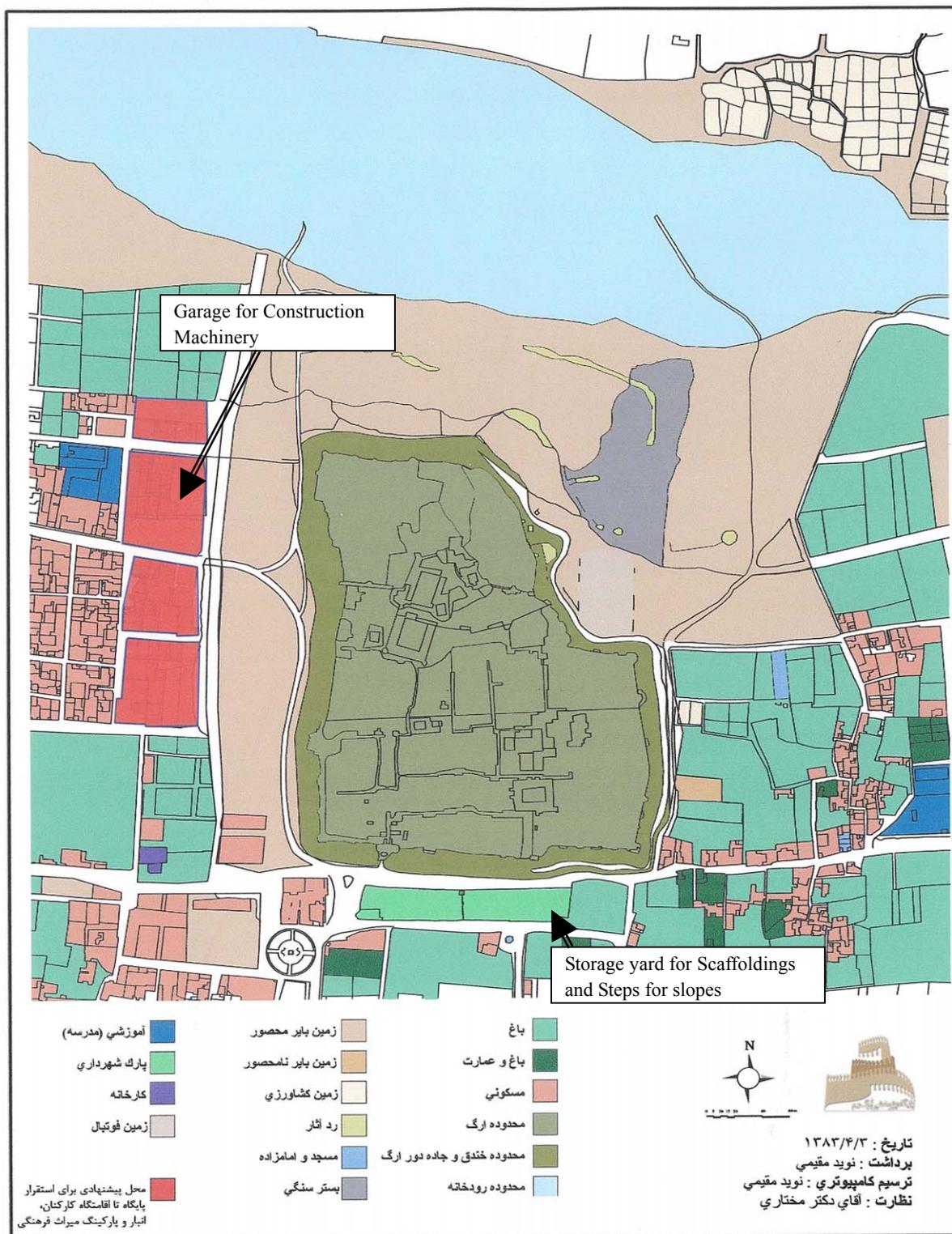


Fig.2.2 Proposed Storage Places for Procured Equipment

2-2-4 Procurement Planning

2-2-4-1 Procurement Policies

(1) Project implementation subject

If this Project is implemented through grant aid cooperation from the Government of Japan, the overall relationship of the implementing organizations would be as shown in the illustration below.

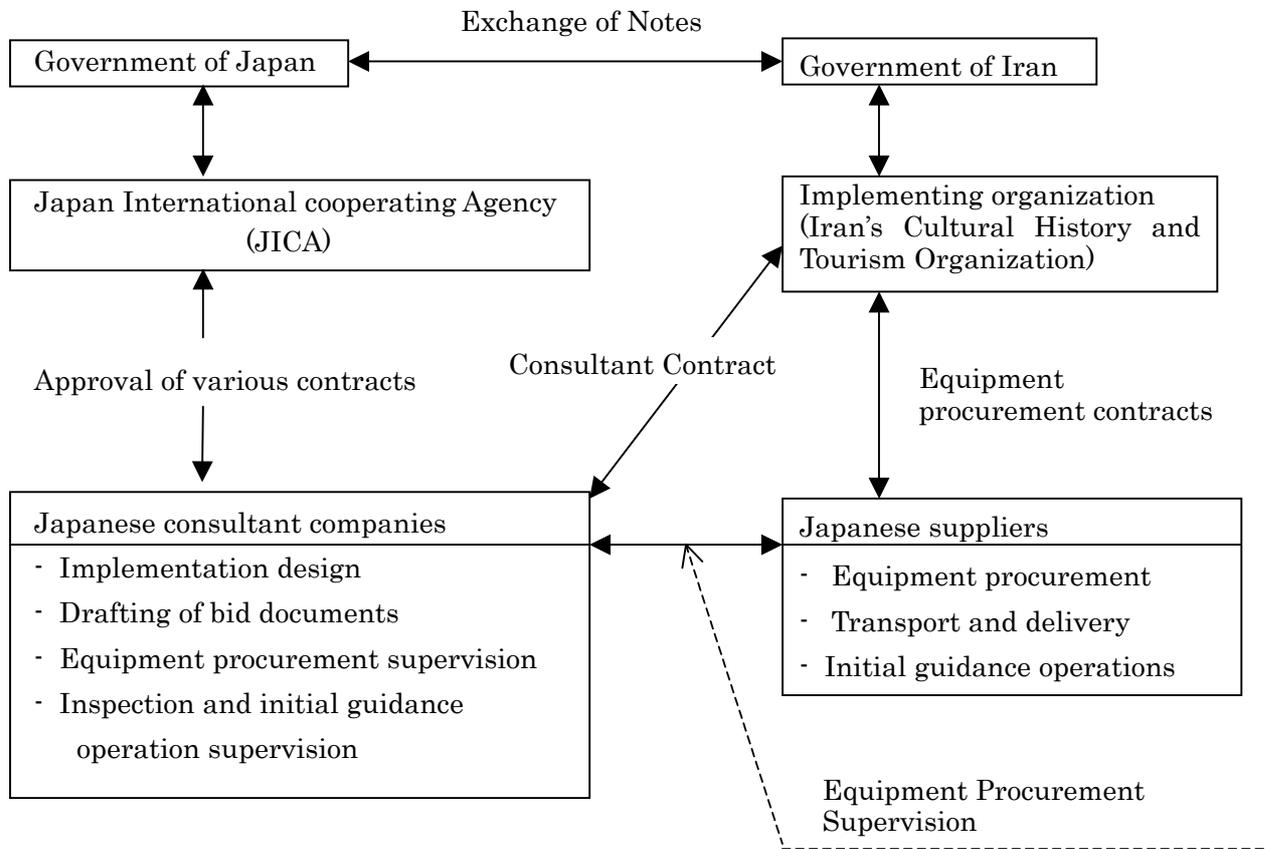


Fig. 2.3 Project implementation relationships

The organization in charge of implementing the Project on the Iranian side is Iran's Cultural History and Tourism Organization (ICHTO) shown in Fig.2.4. The person with the highest level of responsibility within this organization is the agency head, but following recent restructuring, the vice president doubles as the agency head. Moreover, practical business is handled by the Arg-e-Bam Research Foundation Project

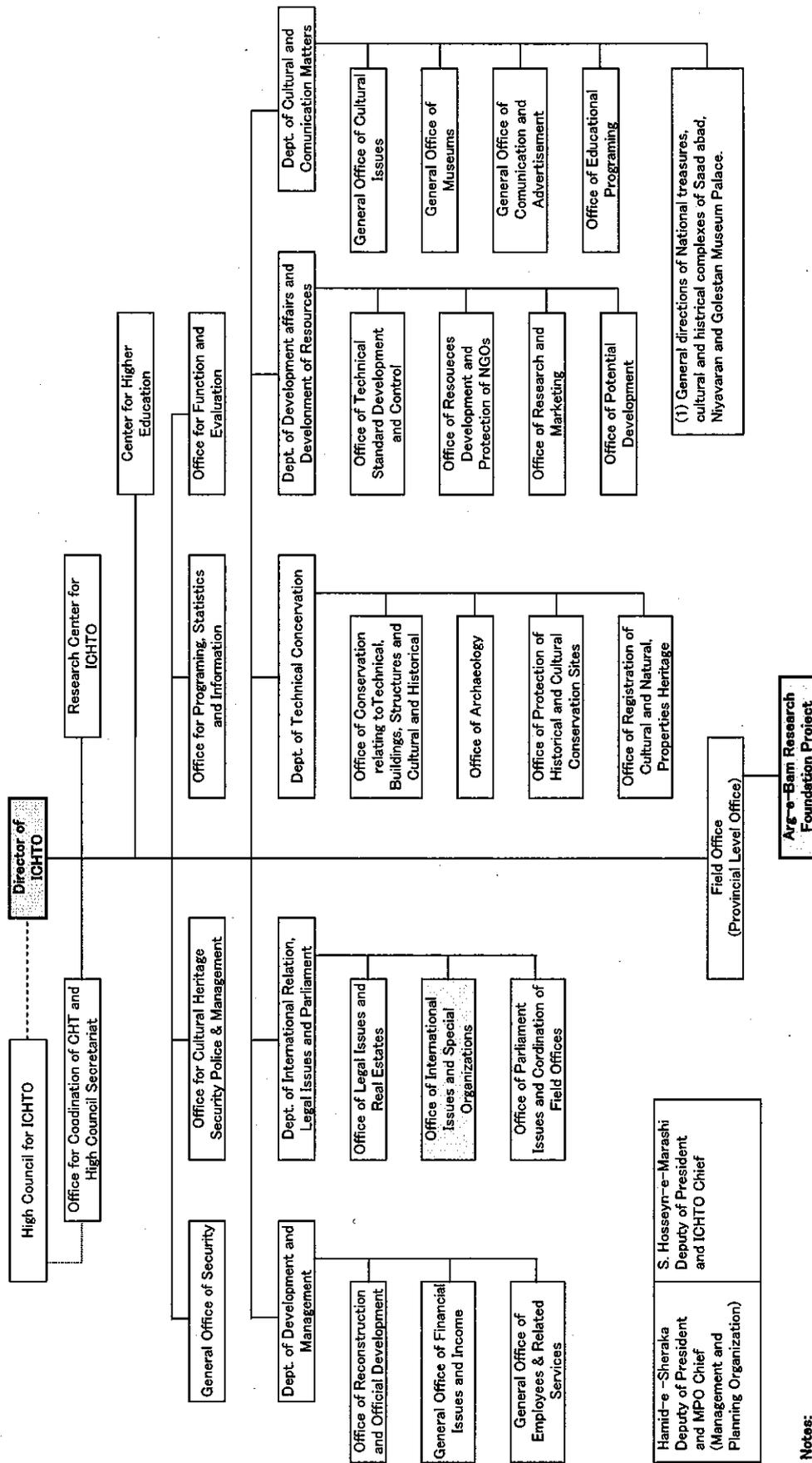


Fig. 2.4 Organization Chart of Iranian Cultural Heritage and Tourism Organization
(Iranian Cultural Heritage and Tourism Organization)

- Notes:**
1. This managements, will be operated by the mentioned organizational chart, until changing to provincial level. This Chart of Directions must be approved.
 2. The Center of Higher Education has to be approved by the High Council of Offices
 3. The organizational chart is valid for 18 months after approved.

Source:
1. Received from UNESCO, Tehran.

Office. There is also a Bam head office in Teheran. In accordance with the grant aid cooperation system, the implementation design and procurement supervision will be handled by Japanese consultants, and suppliers of Japanese corporations will be the prime contractors for procurement of the Project equipment.

(2) Consultants

Following the conclusion of the E/N, Iran's Cultural History and Tourism Organization, as the implementing organization for the Project, will conclude service contracts (consultant contracts) with Japanese consultants. The consultants with whom Iran's Cultural History and Tourism Organization has signed contracts will design the implementation of the planned equipment, draft the bid documents, oversee the bidding, supervise procurement, carry out inspections (performance confirmation), and take care of other engineering services, and will be responsible for these duties until the transfer of the Project equipment has been completed.

(3) Equipment suppliers

Suppliers will be used who pass the screening for the required quality and are awarded bids in the open bidding, in which there will be restrictions on bidding participation qualifications, and the selected suppliers will conclude contracts with Iran's Cultural History and Tourism Organization concerning the delivery of the Project equipment. The suppliers will deliver the equipment requested by Iran's Cultural History and Tourism Organization within the time period specified by the contracts, and will implement initial guidance operations.

2-2-4-2. Considerations Concerning Procurement

Iran's Cultural History and Tourism Organization has no experience concerning equipment procurement through grant aid cooperation from Japan. For this reason, it will be necessary to see that ample explanation and discussion with Iran's Cultural History and Tourism Organization are provided concerning procedures and other matters when consultant contracts are signed and at every other stage of the equipment procurement supervision, in order to make sure that none of the work processes are delayed or left out.

Equipment procured from Japan will be transported by sea to the Bandar Abbas Port facing the Straits of Hormuz in the south of Iran, and after clearing Customs will be transported domestically to the Bam Citadel Office, where it is to be transferred.

With respect to responsibility for vice such as damages, theft and other problems that are likely to occur when the equipment is being transported by sea, going through Customs, being unloaded, and being transported domestically, equipment suppliers will need to work with the Iranian side to make sure that measures are taken to prevent problems

2-2-4-3 Procurement and Installation Divisions

Procurement costs, including the marine transport costs and domestic shipping costs needed to transport the equipment to the Bam Citadel Office, where it is to be transferred, will be borne by the Japanese side. For its part, the Iranian side will be responsible for tax-exemption measures involved in importing the equipment, and for Customs clearing expenses.

2-2-4-4 Procurement Supervision Planning

(1) Basic policy for procurement supervision

If this Project is implemented through grant aid cooperation from the Government of Japan, the following items will be given particular consideration when executing the implementation design and procurement supervision, and an implementing system will be put together that comprises competent persons in place who have ample experience in procurement supervision.

1. Background up to the point of formulating the work implementation
2. Basic design study report
3. Mechanisms involved in grant aid cooperation
4. Exchange of Notes concluded between the two countries

Based on the above, the following overview describes the contents, entities in charge and points to be considered concerning the implementation design and procurement supervision work.

(2) Work description

Following the conclusion of the E/N, the consultants will sign consultant agreements with the organizations implementing the Project, covering the range of work specified by the E/N. The following is an overview of those work contents.

1) Implementation design work

- Consultant contracts (local), approval (Japan)
- Proceeding with the work for issuing an A/P (local)
- Final confirmation of the Project contents / drafting of the bid documents and discussion concerning the documents (local / Japan)
- Obtaining approval of the bid documents on the Iranian side (local)
- Announcements of the bidding and distribution of bid documents (Japan)
- Implementation of the bidding and evaluation, reporting and approval of the bidding results (Japan)
- Being present for (Japan) and approving (Japan) the signing of the trade contracts
- Confirmation of items for which the Iranian side will assume responsibility (local / Japan)

2) Equipment procurement supervision work

- Confirmation of the issuance of procurement order documents
- Confirmation of the procurement situation
- Pre-shipping inspections at plants and pre-loading inspections
- Reports on progress conditions
- Inspection of the transfer at the site
- Drafting of the completion report

3) Initial guidance operations

With respect to the procurement equipment, initial operation guidance and guidance pertaining to the preliminary refurbishment and maintenance control refurbishment will be implemented by materials and mechanical engineers at the site of the maker supplying the equipment, under the guidance of the consultant engineers.

(3) Points to be considered concerning the work

- 1) Confirmation must be made of whether there were any changes in the equipment procurement conditions that were made clear at the basic design study stage.
- 2) In keeping with the purpose of the equipment project as grant aid cooperation, sufficient discussion must be carried out with the Iranian side at the final confirmation of the Project contents, to ensure that bid documents that include detailed designs are approved by the Iranian side.

2-2-4-5. Quality Control Planning

With respect to quality control, contractors will be made to strictly observe

equipment specifications, and product (plant) inspections, pre-shipping inspections, and pre-loading equipment verification inspections (consigned to specialized contractors) will be carried out to a sufficient degree. Confirmation will be made that the equipment (products) matches the contracts and specifications manuals. It is planned that pre-loading inspections will be consigned to a third-party organization.

2-2-4-6 Equipment Procurement Planning

(1) Procurement sources

With respect to sources of procurement, discussions were carried out with Iran's Cultural History and Tourism Organization and the Bam office, but where the Bam office possesses equipment such as scaffolding, it has no construction machinery for repair work. However, it is hoped that the construction machinery planned for procurement in this Project will be Japanese-made, which demonstrates superior performance and quality.

With respect to the requested equipment, studies were conducted of the quality and performance of the Japanese products and the service systems and parts replenishment systems that would be used following introduction of the products. No particular problems were found, and in view of the fact that Iran's Cultural History and Tourism Organization is still strongly hoping to procure the products early on, Japanese sources are highly reliable in terms of delivery. It was therefore decided that products will, as a rule, be procured in Japan.

As indicated by the table below, leading Japanese product makers have a substantial complement of agents in the local area, as well as fully equipped service systems. These agents were surveyed, and it was judged that none of them have any problems in terms of the level of maintenance control technology for the equipment, procurement of replenishment parts or other areas.

Table 2.3 Local Agent of Main Equipment

| Agent Name | Base City | Dealing Equipment Maker |
|---------------------|-------------------|---|
| Mahvar Ltd. | Tehran | Komatsu Falk-track Ltd. |
| Hamkar Machine Ltd. | Tehran, Kerman | Mitsubishi Heavy Industry Ltd. Shin Caterpillar Mitsubishi Ltd. |
| Hamrah Machine Ltd. | Tehran | Hitachi Construction Machinery Ltd. Mitsubishi Motor-grader Ltd. |
| Toronto Ltd. | Tehran | Kobelco Ltd. |

(2) Spare parts

Spare parts will be procured at the same time, primarily the parts noted below that need to be serviced at periodic intervals or those that are short-term expendable parts, and which require replacement at a point corresponding to the initial 2,000 hours (two years). This is aimed at improving the operation rate of the equipment that is provided.

1) Parts serviced at regular intervals

Engine oil filters, engine oil coolant elements, fuel filter elements, hydraulic oil filters, Breather, air cleaner, air cleaner, air filter element, strainer, V-belts, hose assembly, seal assembly, etc.,

2) Short-term expendable items

Side cutter with bolts and nuts, cutting edge with bolts and nuts, etc.,

2-2-4-7. Implementation Process

The work implementation process for the Project will generally be as indicated in the following table, based on grant aid cooperation from Japan.

Table 2.4 Work implementation process (tentative)

| Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|-----------|---------------------------|--|-----------------------------|------------------------|---|---------------------------------------|-----------------------------|---|---|----|----------------|
| | ▼ Exchange of Notes (E/N) | | | | | | | | | | |
| | | ▼ Consultant Contract | | | | | | | | | |
| | | ■ | Final Confirmation of Plan | | | | | | | | |
| | | □ Preparation of Tender Document | | | | | | | | | |
| D/D | | ■ | Approval of Tender Document | | | | | | | | |
| (Detailed | | | ▽ | Tender Announcement | | | | | | | |
| Design) | | | □ | Questionare and Answer | | | | | | | |
| | | | | | ■ | Tender and Tender Evaluation | | | | | |
| | | | | | | ▼ | Equipment Supplier Contract | | | | |
| | □ | Confirmation of Equipment Specification and others | | | | | | | | | |
| S/V | ████████████████████ | | | | | Equipment Manufacture and Procurement | | | | | |
| (Procure- | | | | | | ▤ | Examination of Pre-shipping | | | | |
| ment | | | | | | | □ | | | | Transportation |
| Super- | | | | | | | | | | ▼ | Inspection |
| vision) | | | | | | | | | | | and Transfer |

2-3 Obligations of Recipient Country

2-3-1 Outline of undertakings by Iranian side

If this Project is implemented as grant aid cooperation, the following tasks will be overseen (handled) by the Iranian side.

- (1) Payment of fees to Japanese banks based on the Banking Arrangement (B/A)
- (2) Facilitating procedures for Japanese persons involved in the Project who will be entering and residing in Iran for the purpose of executing the work of the Project, and facilitating visits by such persons to government-related organizations
- (3) Exemption for Japanese corporations and Japanese persons involved in the Project from Customs duties and other taxes imposed domestically in Iran (except for consumption taxes)
- (4) Drafting of the procedural documents required in order to execute Customs tasks promptly when the equipment procured in the course of the Project arrives at the Bandar Abbas Port, and distribution of the documents to related organizations
- (5) Appropriate and efficient use and maintenance control of equipment procured in the Project
- (6) Assumption of all expenses incurred by the Project other than those borne by the Japanese side as grant aid cooperation

2-3-2. Estimation of Costs for the Cooperation Project

The total project cost if this cooperation project is implemented would be 116 million yen (of which Japan will bear 113 million yen and Iran 3 million yen). The breakdown of the expenses for Japan and Iran, based on the division of expense assumption as mentioned earlier, is estimated as follows, assuming the calculation conditions outlined in (2) below.

However, this cost estimate is provisional and would be further examined by the Government of Japan for the approval of the Grant.

(1) Expenses to be borne by the Japanese side

As shown in the table below, expenses to be borne by the Japanese side would include, in addition to the equipment units, expenses for packing, transport to the local site, and dispatching engineers involved in the initial guidance.

Table 2.5 Expenses borne by Japanese side

| Project cost group | | Amount (million yen) | |
|--------------------|------------------------|----------------------|----|
| Equipment | Construction Materials | 48 | 92 |
| | Construction Machinery | 44 | |
| Consultant Service | | 21 | |

(2) Expenses to be borne by Iranian side

1) Expenses for procedures

Expenses to be borne by the Iranian side include Customs expenses when shipments arrive, expenses for storing the cargo during the Customs procedures, and other expenses incurred for business and clerical procedures.

For these expenses, once they have been approved by the Government Council (an organization corresponding to the Cabinet in Japan) and documents have been providing assuring a tax-exempt status for the equipment, it is possible that Customs can be cleared and the cargo stored during the Customs procedures free of charge.

2) Construction cost of garage for construction machinery

Iranian side must prepare a garage for construction machinery that procures by Japanese side. The proposed area is a part of the western plots next to Bam Citadel. The structure is made by concrete basin and sleet roof. The cost is estimated as below.

- Garage area: 140m²
- Unit construction price: 200\$/m²
- Construction Cost = 140m² x 200\$/m² = 28,000\$ (3 million yen)

Iranian side is planning to prepare the garage by January, 2006.

(2) Calculation conditions

1) Point of calculation: September 2004

2) Exchange rate: US\$ 1.00 = ¥109.80

3) Implementation period: This is a single fiscal year project, and the duration of the detailed design and equipment procurement periods would be as indicated in the implementation process.

4) Other: The Project would be implemented in accordance with the grant aid cooperation system of the Government of Japan.

2-4. Project Operation Plan

(1) Equipment maintenance control system

With respect to a system for maintenance control of the equipment, the Bam office does not have construction machinery, and in the past has handled construction and work in which construction machinery is used by consigning it to outside sources. For procurement of the construction machinery for this Project, personnel consisting of three operators, one mechanic and one engineer are being assured for the Workshop Department in the organizational structure of the Bam office, and these personnel will handle maintenance control. However, although maintenance control of the construction machinery (regular servicing, repairs that cannot be handled at the site, etc.) will be carried out through outside consignment, daily maintenance control tasks will be handled by the mechanic. Maintenance control of other equipment such as scaffolding and steps for slopes will be carried out by the Workshop Department, just as it is at present.

The maintenance control system for construction machinery being newly installed will be as follows.

1) Servicing plant

For maintenance control of construction machinery, servicing space will be assured at the location where equipment and machinery are stored (the current park), and the mechanic will handle daily inspections and servicing. Other regular inspection-type maintenance will be consigned to outside contractors.

2) Daily inspections

For daily inspections, the operators will inspect the machinery as indicated on the daily inspection chart, and will make notes in the record of the operation times and the amounts of fuel and lubrication that have been consumed, each time these are replenished. If there are any signs of problems, these will also be noted on the daily inspection charts, and the problem will be reported to the mechanic and engineer at the site. The daily inspection charts will be kept in order and provided for confirmation purposes whenever regular servicing is carried out by an outside contractor.

3) Regular servicing

Regular servicing will be carried out by engineers dispatched by companies to

which the work is consigned through outside contracts (companies in charge of maintenance for the maker). Regular servicing will be done at the location where the construction machinery is housed (garages).

The mechanic at the Bam office will give the daily inspection charts to the contractor and report on the condition of the various equipment units when regular servicing is carried out, and will work to keep the equipment in good functioning condition. If there are any parts that are necessary at the regular servicing stage, procurement will be requested in advance and replacement or repair will be requested when regular servicing is carried out. If it is judged at the regular servicing stage that large-scale repair is necessary, the machinery will be transported to the maker's plant or another location and will be repaired.

4) Repair work

If the operators find any irregularities in the work performance of the machinery during their inspections, including fuel or lubrication leaks or sharp increases in the volumes being consumed, the mechanic will be asked to inspect the machinery and repair it. The mechanic will seek out the cause of the problem and repair it, and will also note the contents of the irregularity, the repair procedures, the number of man hours required, any parts replaced, the repair period and other pertinent information on the repair chart, and will report the contents of what was done. The numbers of parts used, the part names, and the quantities will also be noted in the report. If the cause of the problem cannot be identified at the site, or if it is judged that the machinery cannot be repaired at the site, the agency that has the maintenance contract will be contacted and a request will be made for immediate repairs. After the repairs have been made, the costs and a description of the repairs will be noted in the machinery log as repair contents, and will be kept.

5) Spare parts control

Spare parts control will be carried out by keeping records of information such as the maker's name, part number, part name, quantity in stock, and inventory location both in a card system and on computers. To procure replacement parts used for regular inspection and servicing and expendable parts that are predicted, a system will be used in which procurement plans are formulated at the beginning of the fiscal year and budgets will be requested.

(2) Personnel planning

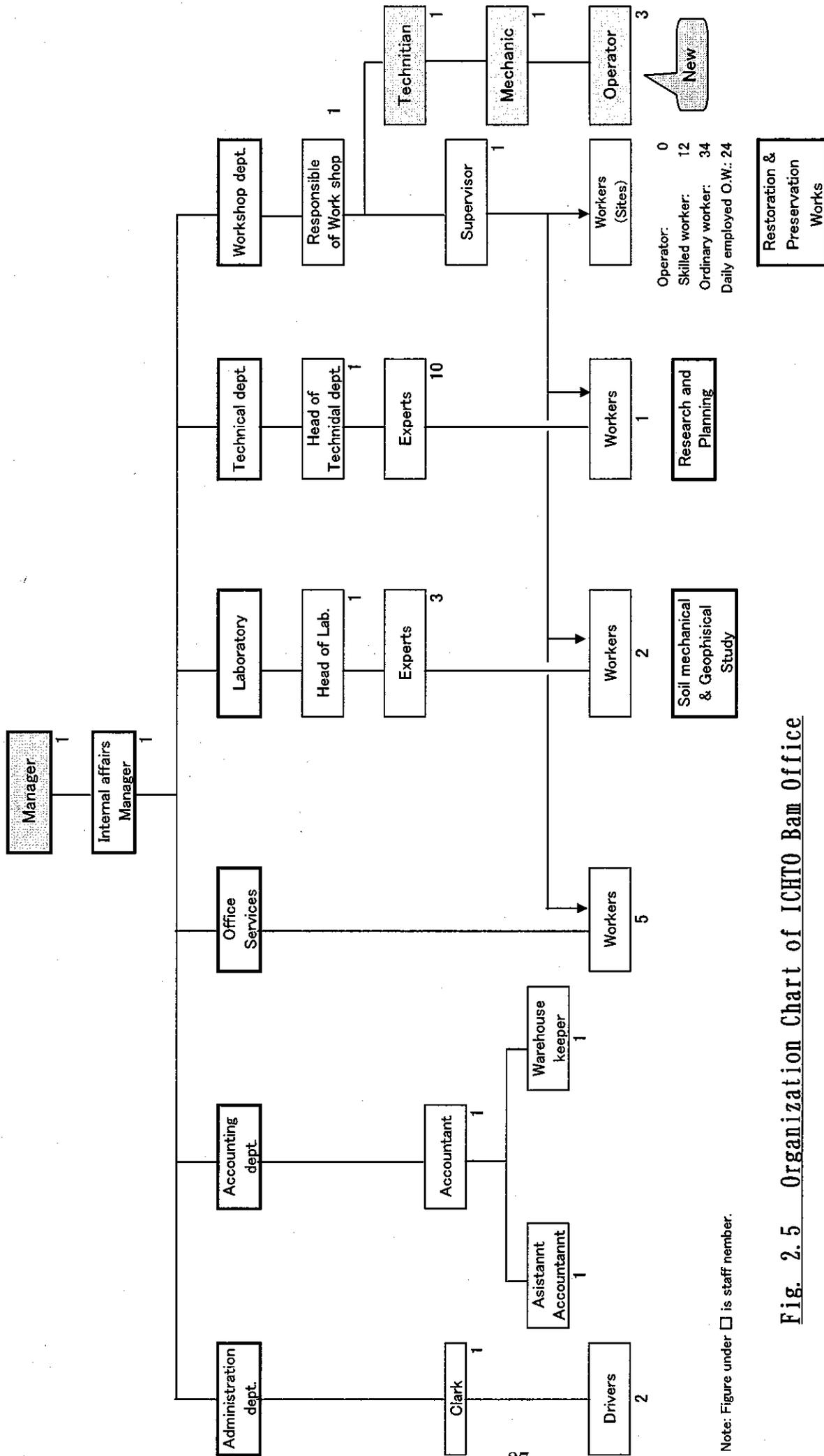
Personnel directly involved in repairing and preserving the Bam citadel are experts, researchers, and other staff at the Bam citadel office. The Workshop Department will handle maintenance control of the materials for scaffolding, materials for steps for slopes and construction machinery planned for introduction through this Project. Currently, there is one person in charge in the department and one in charge at the site (primarily to supervise the workers), but three construction machinery operators, one mechanic and one engineer will be newly assigned to the department in the future, and will handle maintenance control of construction machinery. Along with adding these personnel, a simple garage will be built on the park site as a place for housing the construction machinery, and will serve as a place where daily inspections can be carried out and as a guardroom for the equipment. It is planned that the current staff of maintenance control personnel (except for workers) handling the scaffolding, steps for slopes and the geophysical exploration equipment can be used to cover this facility.

The following table shows the personnel planning for the Bam office. The organizational diagram is shown in Fig.2.5.

Table 2.6 Personnel planning for the Bam office (numbers in parentheses indicate numbers of increased personnel)

| Dept. | Stuff | Engineers / experts | Construction machinery operators | Drivers | Workers | Total |
|----------------------------|-------|---------------------|----------------------------------|---------|---------|--------|
| General Affairs Dept. | 1 | | | 2 | | 3 |
| Financial Affairs Dept. | 3 | | | | | 3 |
| Building and Repairs Dept. | | | | | 5 | 5 |
| Laboratory | | 4 | | | 2 | 6 |
| Engineering Dept. | | 11 | | | 1 | 12 |
| Workshop Dept. | | (2) | (3) | | 70 | 70+(5) |
| Total | 4 | 15+(2) | (3) | 2 | 78 | 99+(5) |

Source: Bam Project Office, ICHTO



Note: Figure under □ is staff member.

Fig. 2.5 Organization Chart of ICHTO Bam Office

Note: Skilled worker & Ordinary worker are employed by one-year contract

(3) Budget

The budget for the ICHTO Bam office comprises operating costs such as personnel and management costs, as well as repair and construction costs. The table below indicates budget transitions over the years from 2001 through 2004. A study relating to restoration is being carried out this fiscal year, and the personnel expenses (for additional experts and researchers, and dispatched personnel) are showing a sharp increase. Allocation of the budget for the Bam office, for restoration work following the earthquake, is being made a priority, and it is expected that the necessary budget, including personnel costs accompanying future increases in personnel and costs for maintenance control of the construction machinery, will be appropriated.

Table 2.7 Budget transitions for the ICHTO Bam office (Fiscal 2001 ~ 2004)

(Unit: 1 million Iranian rials, as of August 18, 2004)

| Expense item | 2001 | 2002 | 2003 | 2004 |
|-------------------------------------|------------|------------|------------|--------|
| Personnel costs | 800M | 900M | 540M | 3,920M |
| Facility maintenance control costs | - | - | - | - |
| Equipment maintenance control costs | 150M | 30M | 20M | - |
| Office expenses | 60M | 30M | 20M | 500M |
| Repair work costs | 480M | 300M | 70M | 120M |
| Total | 1,700M.IRS | 1,500M.IRS | 1,300M.IRS | |

Source: Bam Project Office, ICHTO

Note) Figures for fiscal 2004 are cumulative figures for the period of January through August 2004.

(4) Operation and Maintenance Cost

Attendant to the provision of equipment for the Project, the following items will be necessary with respect to the construction machinery, as the operating and maintenance control expenses for which the Iranian side will be responsible.

- Assurance of construction machinery maintenance control costs: Repair costs, fuel costs, oil and grease costs
- Personnel costs for the personnel needed for construction machinery maintenance control: Operators, mechanics, engineers

Based on the table below, operating and maintenance control costs that will be newly necessary are estimated to amount to approximately 3.58 million yen (annually).

This comprises approximately 6% of the amount budgeted by the Bam office for repairs and restoration in fiscal 2004 (for the first half of the fiscal year, from March through August), and is an amount that can be sufficiently covered within the scope of the current budget. Moreover, the government is making the restoration of the Bam Citadel a priority in allocating its budget, so it is thought that there will be no problem in terms of increasing the operating and maintenance control expenses.

Table 2.8 Breakdown of operation and maintenance costs

(Unit: 1,000 yen)

| | | Excava- Tors (1) (0.09m ³) | Excava- Tors (2) (0.14 m ³) | Forklifts (2.5t) | Loaders (1) (1.30 m ³) | Loaders (2) (0.40 m ³) | Belt Conveyors (W=350mm, L=7.0m) | Total |
|----------|---------------------------------|--|---|---------------------|--|--|---|-------|
| (1)-1 | Maintenance and repair costs | 356 | 229 | 208 | 439 | 438 | 225 | 1,895 |
| (1)-2 | Fuel, oil and grease costs | 46 | 32 | 156 | 59 | 40 | 25 | 358 |
| Subtotal | | 402 | 261 | 364 | 498 | 478 | 250 | 2,253 |
| (2) | Personnel costs | 1,581 (for 5 persons) | | | | | — | 1,581 |
| | Operators | | | | | | | |
| | Mechanic | | | | | | | |
| | Technician | | | | | | | |
| Subtotal | | 1,581 | | | | | — | 1,581 |
| Total | | 3,584 | | | | | 250 | 3,584 |

Chapter 3 Project Evaluation and Recommendations

Chapter 3 Project Evaluation and Recommendations

3-1 Project Effect

The project purpose is the procurement of equipment for restoration and preservation of Arg-e-Bam (Bam Citadel). The effect for the implementation of this project is shown as below.

1) Direct Effect

- Speed up of the investigation of actual earthquake's damage in higher place and ramparts of the Citadel
- Make easy the restoration and preservation works for Arg-e-Bam (Bam Citadel) by increased efficiency of heavy debris removal in the Citadel.

2) Indirect Effect

- Recovery the visitors to Arg-e-Bam, contribute to the revival of tourism in Bam city and activation of local economy.

3-2 Recommendations

Implementation of this Project is expected to produce the abovementioned effects. However, in order to ensure the effectiveness and sustainability of this project, we propose the followings.

- Since a long-term tackling of the restoration and preservation of Arg-e-Bam is inevitable, ICHTO shall not make the reinforcement of the budgets and personnel planned for the project momentary and shall designate the project as a national priority project sustain the budgets and the personnel continuously to the future.
- ICHTO shall secure the budgets and the personnel as scheduled, needed for operation and maintenance (O/M) of the equipment to be procured. Staff members in charge of the construction machines shall continuously endeavor to increase their ability in O/M technique of the machines in order to make their effective use, even after receiving the training in acquiring basic operating skills for the machines to be given at the delivery stage.

- Arg-e-Bam (Bam Citadel) was registered as World Heritage list of UNESCO recently. Therefore, Arg-e-Bam is widely acknowledged at present compared with before. Since these ruins are the pride and support of Bam citizen, ICHTO shall implement the restoration and preservation works in cooperation with UNESCO, other donors and local people steadily.

[Appendices]

Appendices

| | |
|---|------|
| 1. Member List of the Study Team | A-1 |
| 2. Study Schedule | A-2 |
| (1) Field Study Team | A-2 |
| (2) Draft Report Explanation Study Team | A-3 |
| 3. List of Parties Concerned in the Recipient Country | A-4 |
| 4. Minutes of Discussions | A-6 |
| (1) Field Study Team | A-6 |
| (2) Draft Report Explanation Study Team | A-17 |
| 5. Cost Estimation Borne by the Recipient Country | A-21 |

1. Member List of the Study Team

(1) Field Study Team : 10th August, 2004~8th September, 2004

| Name | Specialty | Status |
|-------------------|---|---|
| Yumiko ASAKUMA | Leader | Project Officer Second Project Management Division, Grant Aid Management Department, JICA |
| Ryosuke SAKANASHI | Chief Consultant / Equipment Plan 1 | Chief Engineer Taiyo Consultants Co., Ltd. |
| Fumio TAMURA | Equipment Plan 2 / Cost Estimation / Procurement Plan | Advisor Taiyo Consultants Co., Ltd. |

(2) Draft Report Explanation Study Team : 7th November, 2004~18th November, 2004

| Name | Specialty | Status |
|-------------------|--|--|
| Yumiko ASAKUMA | Leader | Program Officer Social Development Team JICA Tokyo JICA |
| Ryosuke SAKANASHI | Chief Consultant / Equipment Plan 1 | Chief Engineer Taiyo Consultants Co., Ltd. |

2. Study Schedule

(1) Field Study : 10th August, 2004~8th September, 2004

Study Schedule on Field Study

| No. | Date | | Itinerary | Work Item | | | Stay |
|-----|----------------------|---|-------------------------------|---|------------------|------------------------------|----------------|
| | | | | Leader | Chief Consultant | Consultant (2) | |
| 1 | 10 th Aug | T | Haneda⇒Kansai Kuko⇒ | Traveling (21 : 00/JL1321/22 : 15) Traveling (23 : 20/JL5099⇒) | | | (Plane) |
| 2 | 11th | W | ⇒Dubai⇒Tehran | Traveling (JL5099/05:15 ⇒ 07 : 45/EK971/10 : 15) Courtesy Call to EOJ, Courtesy Call and Discussion with ICHTO | | | Tehran |
| 3 | 12th | T | | Visit EOJ (Briefing on Safety Management in Iran) | | | Tehran |
| 4 | 13th | F | Tehran⇒Kerma Kerman⇒Bam | Traveling (10 : 00/IR472/11 : 25) Courtesy Call to Kerman Provincial Office, Traveling to Bam | | | Bam |
| 5 | 14th | S | | Discussion and site survey in/at ICHTO Bam Office | | | Bam |
| 6 | 15th | S | Bam⇒Tehran (Leader, C. C.) | Traveling | | Existing Equipment Survey | Tehran /Bam |
| 7 | 16th | M | | Discuss with ICHTO | | ditto | T/B |
| 8 | 17th | T | | Courtesy Call to UNESCO Office | | Study on O/M | T/B |
| 9 | 18th | W | | Signing of Minutes of Discussion | | ditto | T/B |
| 10 | 19th | T | Tehran⇒Bahrain (Leader) | Reporting to EOJ Traveling | | ditto | T/B |
| 11 | 20th | F | Tehran⇒Kerman⇒ Bam (C. C.) | | Traveling | Data Arrangement | Bam |
| 12 | 21st | S | | Discussion with ICHTO Bam Office | | | Bam |
| 13 | 22nd | S | | Ditto, Site Survey | | | Bam |
| 14 | 23rd | M | Bam⇒Kerman | Discussion with ICHTO Bam Office, | | | Kerman |
| 15 | 24th | T | Kerman⇒Tehran | Visit Const. Machinery Co., Traveling | | | Tehran |
| 16 | 25th | W | | Visit Const. Machinery Co. & Transp. Co. | | | Tehran |
| 17 | 26th | T | | Reporting to EOJ | | | Tehran |
| 18 | 27th | F | | Data Arrangement | | | Tehran |
| 19 | 28th | S | | Discussion with ICHTO | | | Tehran |
| 20 | 29th | S | | Ditto, Visit to Import Office | | | Tehran |
| 21 | 30th | M | (Holiday) | Discussion with ICHTO | | | Tehran |
| 22 | 31st | T | | Visit to PSO, TTO Office and ICHTO | | | Tehran |
| 23 | 1 st Sep | W | | Discussion with ICHTO, Data Collection | | | Tehran |
| 24 | 2nd | T | | Data Collection on Const. Machinery, etc | | | Tehran |
| 25 | 3rd | F | Tehran⇒B. Abbas | Traveling | | | B. Abbas |
| 26 | 4th | S | B. Abbas⇒Tehran | Visit PSO, TTO Office & B. Abbas Port | | | Tehran |
| 27 | 5th | S | | Data Arrangement | | | Tehran |
| 28 | 6th | M | | Data Collection on Const. Machinery, etc | | | Tehran |
| 29 | 7th | T | Tehran⇒Dubai | Discussion with ICHTO, Reporting to EOJ | | | (Plane) |
| 30 | 8th | W | Dubai⇒Kansai Kuko⇒Haneda | Traveling (02 : 30/JL5090/17 : 00⇒ 18 : 40/JL1316/19 : 45) | | | — |

Note. 1) Team Leader traveled to Egypt from Iran on 19th August.

Note. 2) ICHTO : Iranian Cultural Heritage and Tourism Organization

PSO : Port and Shipping Organization, Min. of Road and Transportation

TTO : Transportation and Terminals Organization, Min. of Road and Transportation

Note. 3) C. C. : Chief Consultant

(2) Draft Report Explanation Study Team : 7th November, 2004~18th November, 2004

Study Schedule on Draft Report Explanation Study Team

| Order | Date | | Itinerary | Work Item | | Stay |
|-------|---------------------|---|---|---|---|--------------------|
| | | | | Leader | Chief Consultant/ Equipment Plan 1 | |
| 1 | 7 th Nov | S | Haneda⇒Kansai Kuko ⇒ | | Traveling (EK6251⇒EK317) | (Plane) |
| 2 | 8 th | M | ⇒Dubai⇒Tehran | | Traveling (EK317⇒EK971), Courtesy Call to EOJ | Tehran |
| 3 | 9 th | T | | | Visit ICHTO, DBD Explanation and Discussion | Tehran |
| 4 | 10 th | W | | | Visit ICHTO, DBD Explanation and Discussion | Tehran |
| 5 | 11 th | T | | | Preparation of visiting ICHTO Bam office | Tehran |
| 6 | 12 th | F | Narita⇒Bangkok⇒ Dubai | Traveling (JL717⇒TG517) | Data Arrangement | (Plane) /Tehran |
| 7 | 13 th | S | Dubai⇒Tehran (T.L.) Tehran⇒Bam (C.C.) | Traveling (EK975), Courtesy Call and Discussion with ICHTO, Preparation of Minutes | Courtesy Call and Discussion with ICHTO, Traveling to Bam | Tehran /Bam |
| 8 | 14 th | S | Bam⇒Tehran (C.C.) | Preparation of Minutes | Study in Bam Office, Traveling to Tehran | Tehran |
| 9 | 15 th | M | | Courtesy Call to UNESCO Office, Courtesy Call to EOJ | Courtesy Call to UNESCO Office, Courtesy Call to EOJ | Tehran |
| 10 | 16 th | T | Tehran⇒Dubai (T.L.) | Discussion of Minutes, Signing of Minutes, Reporting to EOJ, Traveling (EK978) | Discussion of Minutes, Reporting to EOJ | (Plane) /Tehran |
| 11 | 17 th | W | Dubai⇒Kansai Kuko ⇒Haneda Kuko (T.L.) Tehran⇒Dubai (C.C.) | Traveling (EK316⇒JL1316) | Meeting with ICHTO, Data Collection Traveling(EK978) | (Plane) |
| 12 | 18 th | T | Dubai⇒Kansai Kuko⇒ Haneda Kuko (C.C.) | | Traveling (EK316⇒EK6252) | |

Note 1) ICHTO : Iranian Cultural Heritage and Tourism Organization

Note 2) Departure and Arrival times of used flights are as below.

- EK6251: Haneda Kuko/20:40⇒Kansai Kuko/21:55
- EK 317: Kansai Kuko/23:20⇒Dubai/05:15
- EK 971: Dubai/07:45⇒Tehran/10:15
- JL 717: Narita/10:55⇒Bangkok/15:55
- TG 517: Bangkok/17:50⇒Dubai/21:50
- EK 975: Dubai/01:15⇒Tehran/02:55
- EK 978: Tehran/21:20⇒Dubai/23:55
- EK 316: Dubai/02:35⇒Kansai Kuko/16:25
- JL1316/EK6252: Kansai Kuko/18:30⇒Haneda Kuko/19:35

Note 3) 「T.L.」 : Team Leader (JICA)、 「C.C.」 : Chief Consultant

3. List of Parties Concerned in the Recipient Country (without his/her title)

(1) Relevant in Iranian Side

1) Iran Cultural Heritage and Tourism Organization (ICHTO)

| | |
|--------------------------|---|
| Seyyed Mohammad Beheshti | Vice President |
| Rasool Vatandoust | Director, Research Center for Conservation of Cultural Relics (RCCCR), Department of International & Cultural Relations |
| Mojdeh Momenzadeh | Assistant Director Department of International & Cultural Relations |
| Eskandar Mokhtari | Director, Recovery Project on Bam's Cultural Heritage |
| Shirin Shad | Assistant Director of Tehran Technical Office |
| Hadi Ahmadi | Internal Manager, Arg-e-Bam Office |
| Manijeh Hadian Dehkordi | Head of Laboratory, Arg-e-Bam Office |
| Narges Ahmady | Archaeologist, Arg-e-Bam Office |
| Mansor Asadi | Responsible for Workshop, Arg-e-Bam Office |
| Jim Kennedy | Volunteer Expert, Arg-e-Bam Office |
| Sayed Mostafa Ghashemy | Deputy Director, Department of Planning, Statistics and Information |

2) Ministry of Road

① Terminals and Transportation Organization (TTO)

| | |
|----------------|---|
| Chasem Bagheri | Deputy of Goods & Passenger Transportation Office, Tehran Head Quarter |
| Mahdi Hosseini | Director General of Hormozgan, B-Abbas Office |

② Port & Shipping Organization (PTO)

| | |
|-------------------|--|
| R. Behzadian | Staff, Export Tariff Office, Tehran H.Q. |
| Hosein Cheraghi | Terminal Expert, B-Abbas Office |
| Majtaba Khoshniat | Planning Manager, B-Abbas Office |

3) Ministry of Finance

① Import Office :

| | |
|----------------|--|
| Ali Jahanshahi | Deputy of Managing Director, Import Office, Tehran H.Q. |
|----------------|--|

| | |
|--------------------|-------------------------|
| Mohammad Qolizadeh | Expert of Import Office |
|--------------------|-------------------------|

4) Kerman Provincial Government Office

| | |
|------------------------|------------------------------|
| M. J. Fadaee | Governor General's Deputy |
| Akhgar Alavi | Office Director of Mr Fadaee |
| Fakoor Pass | Office Staff |
| Abdol Hossein Maghfory | Office Staff |

5) Bam Municipal Government Office

| | |
|------------------------|---------------------------|
| A. Bagherizadeh | Mayer of Bam City |
| Akbar Arivi | Chief of Secretary |
| Fakoor Pass | Stuff of Secretary Office |
| Abdol Hossein Maghfory | Stuff of Secretary Office |

(2) Relevant of Japanese Government

1) Embassy of Japan in Iran

| | |
|-------------------|-----------------|
| Hideki Ito | Minister |
| Hiroko Matsuo | First Secretary |
| Watanabe Noriyuki | Specialist |

2) JICA

| | |
|-------------|-------------------|
| Junji Wakui | ODA Advisor, Iran |
|-------------|-------------------|

(3) Other

1) UNESCO Tehran Cluster Office

| | |
|--------------------------|----------------------------------|
| Taniguchi Junko | Programme Specialist for Culture |
| Graciela Gonzalez Brigas | Staff, Asia and Pacific Unit |

4. Minutes of Discussion
(1) Field Study Team: 18 August, 2004

MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT
FOR IMPROVEMENT OF EQUIPMENT FOR RESTORATION AND PRESERVATION
OF ARG-E BAM (BAM CITADEL)
IN THE ISLAMIC REPUBLIC OF IRAN

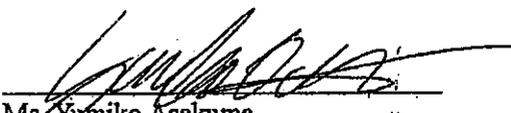
In response to a request from the Government of the Islamic Republic of Iran (hereinafter referred to as "Iran"), the Government of Japan decided to conduct a basic design study on the Project for Improvement of Equipment for Restoration and Preservation of Arg-e-Bam (Bam Citadel) (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

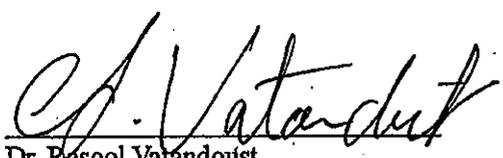
JICA sent to Iran the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Ms. Yumiko Asakuma, Grant Aid Management Department, Japan International Cooperation Agency, and is scheduled to stay in the country from 11th of August to 7th of September.

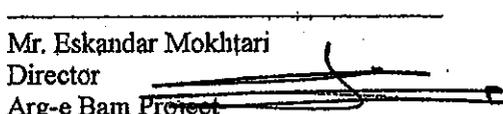
The Team held discussions with the officials concerned of the Government of Iran and conducted a field survey at the study area.

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

Tehran, 18 August, 2004


Ms. Yumiko Asakuma
Leader
Basic Design Study Team
Japan International Cooperation Agency
Japan


Dr. Rasool Vatandoust
Director of the Research Center for
Conservation of Cultural Relics (RCCCR)
/Head of International Department
Iranian Cultural Heritage and Tourism Organization
Islamic Republic of Iran


Mr. Eskandar Mokhtari
Director
Arg-e Bam Project
Iranian Cultural Heritage and Tourism Organization
Islamic Republic of Iran

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve restoration and preservation activities through procurement of necessary equipment.

2. Project Site

The project site is Bam City in Kerman Province.

3. Responsible and Implementing Agency

The responsible and implementing agency is Iranian Cultural Heritage and Tourism Organization (hereinafter referred to as "ICHTO").

4. Items requested by the Government of Iran

After discussions with the Team, the items described in Annex-1 were finally requested by Iranian side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

5-1 Iranian side understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex-2.

5-2 Iranian side will take the necessary measures, as described in Annex-3, for smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented.

6. Schedule of the Study

6-1 The consultants will proceed to conduct further studies in Iran until 7th of September, 2004.

6-2 JICA will prepare the draft report in English and dispatch a mission in order to explain its contents in the beginning of November, 2004.

6-3 In case that the contents of the report is accepted in principle by the Government of Iran, JICA will complete the final report and send it to the Government of Iran around January, 2004.

ym *ed.v*

E.M

7. Other relevant issues

- 7-1 Iranian side mentioned that the conservation programme of Arg-e Bam is under development based on the recommendations by the International Workshop on April, 2004, and it would be accomplished in 2005. Iranian side assured that all of the items of equipment requested by Iranian side as listed in Annex-1 would be conformable to the conservation programme and would be used in mid-term and long-term conservation actions after 2006.
- 7-2 Iranian side guaranteed that using all of the requested items of equipment but a loader would be permitted inside Arg-e Bam.
- 7-3 For effective use of geophysical equipment, ICHTO will collaborate with Iranian and foreign research centers and universities on geophysical investigations. Moreover, before the equipment is delivered to the site, ICHTO will train two of the specialists of Bam office who would be mainly use the equipment. The following information regarding the training should be submitted to the Team before 6th of September, 2004.
- Trainee's names
 - Name of training institution(s)
 - Duration of the training
 - Curriculum (contents of the training)
 - Budget for training
- 7-4 Iranian side requested technical cooperation for geophysical investigations. They also understood that another official request on technical cooperation should be submitted through diplomatic channels.
- 7-5 All of the equipment procured by the Grant Aid should be kept in ICHTO Bam Office and used properly for restoration/preservation of Arg-e Bam. When it becomes unusable for operations or conservation/preservation works by the equipment are completed, Iranian government will be required to consult with the Embassy of Japan before it is disposed, transferred to the other place, or used for other purposes.
- 7-6 ICHTO will secure necessary budget and personnel for operation and maintenance of the procured equipment.
- 7-7 Any equipment which will be difficult to be procured by the end of March, 2006 for some reason or will be under embargo by the Japanese government will be excluded from the Project.
- 7-8 Iranian side understood that the equipment for the Project as the Japanese Cultural

ym cd.V

E.M

Heritage Grant Aid Project would be procured according to "Guidelines of the Japanese Grant Aid for General Projects and for Fisheries", which was submitted by the Team.

Annex-1: List of Equipment

Annex-2: Japan's Grant Aid Scheme

Annex-3: Major Undertakings to be taken by Each Government

ya ed.V

E.M

List of Equipment

| No. | Items of Equipment |
|-----|---|
| 1 | Scaffolding |
| 2 | Slicing step |
| 3 | Geophysical equipment |
| 4 | Remote visual inspection (RVI) with photographic system |
| 5 | Excavator (Small class) |
| 6 | Lift truck (fro R lift) |
| 7 | Loader |
| 8 | Handcart |
| 9 | Belt conveyer |

ya cd.v

E.M

Japan's Grant Aid Program

1. Japan's Grant Aid Procedures

(1) The Japan's Grant Aid Program is executed by 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 the Cabinet of Japan)

Determination of Implementation (Exchange of Notes between both Governments)

Implementation (implementation of the Project)

(2) Firstly, an application or a request for a Grant Aid project submitted by the recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Japan's Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA 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.

Fourth, the project approved by the cabinet becomes official with the Exchange of Notes signed by the Government of Japan and the recipient country.

Finally, for the implementation of the Project, JICA assists the recipient country in preparing contracts and so on.

2. Contents of the Study

(1) Contents of the Study

ya cd.v

E.m.

The purpose of the Basic Design Study conducted by JICA on a requested project is to provide a basic document necessary for appraisal of the project by the Japanese Government. The contents of the Study are as follows:

- a) confirmation of the background, objectives, benefits of the project and also institutional capacity of agencies concerned of the recipient country necessary for project implementation,
- b) evaluation of the appropriateness of the project for the Grant Aid Scheme from a technical, social and economical point of view,
- c) confirmation of items agreed on by the both parties concerning a basic concept of the project,
- d) preparation of a basic design of the project,
- e) estimation of cost of the project.

The contents of the original request 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.

Final project components are subject to approval by the Government of Japan and therefore may differ from an original request. Implementing the project, the Government of Japan requests the recipient country to take necessary measures involved which are itemized on Exchange of Notes:

(2) Selection of Consultants

For smooth implementation of the study, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on the proposals submitted by the interested firms. The firm(s) selected 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 a recipient country after Exchange of Notes, in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

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 equipment and services (engineering services and transportation of the

ym ed-V

E.m.

products, etc.) for economic and social development of the country under principles in accordance with relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials or such.

(2) Exchange of Notes (E/N)

Both Governments concerned extend Japan's Grant Aid in accordance with the Exchange of Notes in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid etc., are confirmed.

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

(4) Under the Grant, in principle, products and services of origins of Japan or the recipient country are to be purchased.

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

However the prime contractors, namely, consulting, contractor 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 the "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. The Government of Japan shall verify those contracts. The "Verification" is deemed necessary to secure accountability to Japanese tax payers.

(6) Undertakings Required to 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:

a) to secure land necessary for the sites of the project prior to the installation work in case

ym Cd, V

E.M.

the project is providing equipment,

b) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,

c) to secure buildings prior to the installation work in case the project is providing equipment,

d) 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,

e) 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,

f) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(7) Proper Use

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

(8) Re-export

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

(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 a bank in Japan. The Government of Japan will execute the Grant Aid by making payments in Japanese yen to

MA

Ed. V

E.M

cover the obligations incurred by 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.

mm *Ch. V*

Em

Major Undertakings to be taken by Each Government

| NO | Items | To be covered by Grant Aid | To be covered by Recipient side |
|----|--|----------------------------|---------------------------------|
| 1 | To bear the following commissions to be a bank of Japan for the banking services based upon the B/A | | |
| | 1) Advising commission of A/P | | ● |
| | 2) Payment commission | | ● |
| 2 | To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country | | |
| | 1) Marine (Air) transportation of the products from Japan to the recipient country | ● | |
| | 2) Tax exemption and custom clearance of the products at the port of disembarkation | | ● |
| | 3) Internal transportation from the port of disembarkation to the project site | ● | |
| 3 | To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work | | ● |
| 4 | To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract | | ● |
| 5 | To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid | | ● |
| 6 | To bear all the expenses, other than those to be borne by the Grant Aid, necessary for the transportation and installation of the equipment | | ● |

ya Cd ✓

E.M

(2) Explanation on Draft Report Team
: 16 November, 2004

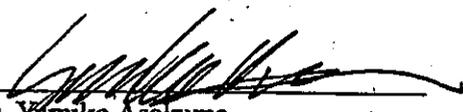
MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT
FOR IMPROVEMENT OF EQUIPMENT FOR RESTORATION AND PRESERVATION
OF ARG-E BAM (BAM CITADEL)
IN THE ISLAMIC REPUBLIC OF IRAN
(EXPLANATION ON DRAFT REPORT)

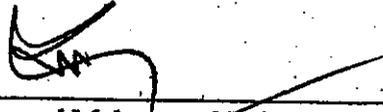
In August 2004, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for Improvement of Equipment for Restoration and Preservation of Arg-e Bam (hereinafter referred to as "the Project") to the Islamic Republic of Iran (hereinafter referred to as "Iran"), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the Study.

In order to explain to and consult with Iranian side on components of the draft report, JICA sent to Iran the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Ms. Yumiko Asakuma, a program officer of the Social Development Team, Tokyo International Center, JICA, from 8th to 17th of November, 2004.

As a result of discussions, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Tehran, 16 November, 2004


Ms. Yumiko Asakuma
Leader
Draft Final Explanation Team
Japan International Cooperation Agency
Japan


Mr. Seyyed Mohamad Beheshti
Vice President
Iranian Cultural Heritage and Tourism
Organization
Islamic Republic of Iran

ATTACHMENT

1. Components of the Draft Report

The Government of Iran agreed and accepted in principle the components of the draft report explained by the Team.

The list of equipment is attached to Annex-1.

The final decision will be made by the Government of Japan based on the examination of the result of the Basic Design Study.

2. Japan's Grant Aid scheme

The Iranian side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Iran as explained by the Team and described in Annex-2 and Annex-3 of the Minutes of Discussions signed by both parties on 18th of August, 2004.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of Iran in February 2005.

4. Other relevant issues

4-1 The objective of the Project is to improve restoration and preservation activities at Arg-e Bam through procurement of necessary equipment.

The equipment procured by the Grant Aid should be used only for the objective of the Project at the site of Arg-e Bam by Iranian Cultural Heritage and Tourism Organization (hereinafter referred to as "ICTHO"), not be used for other purposes or at other places.

When it becomes unusable for operations after it has used properly and effectively for a reasonable period of time, Iranian side is required to consult with the Embassy of Japan before it is disposed, transferred, or used for other purposes.

4-2 ICTHO will have completed the following works before the end of January, 2006.

- to built construction machinery parking at the west side of Arg-e Bam approximately 140m².

- to prepare the main gate for carrying the equipment to the inside of Arg-e Bam

4-3 ICTHO will have hired following additional personnel before the end of January,

ma

[Handwritten signature]

2006.

- one (1) construction machinery technician
- one (1) construction machinery mechanic
- three (3) construction machinery operators
- more than fifty (50) workers working on the site

Japanese supplier will instruct technician, mechanic, operators and skilled workers in operation and maintenance of the equipment at the time of delivery.

4-4 ICHTO will take necessary measures for operation and maintenance of the equipment as follows:

- to secure additional budget for operation and maintenance, such as personnel costs, spare parts, fuel, oil, and service charge for inspection and repair.
- to hire additional personnel as mentioned in 4-3
- to conduct daily inspection of construction machinery by the mechanic
- to conduct regular inspection of construction machinery by the outside repair shop every six month

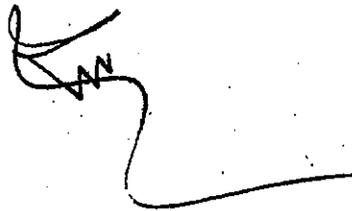


Annex-1: List of Equipment

YH

List of Equipment

| No. | Name of item | quantity |
|-----|--|----------|
| 1 | Scaffoldings | 10 sets |
| 2 | Steps for use on slopes | 15 sets |
| 3-1 | Excavators (use in the Citadel) | 2 |
| 3-2 | Excavator (use around the Citadel) | 1 |
| 4 | Forklifts | 2 |
| 5-1 | Wheeled loader (use in the Citadel) | 2 |
| 5-2 | Wheeled loaders (use around the Citadel) | 1 |
| 6 | Belt conveyors | 5 |



y/h

5. Cost Estimation Borne by the Recipient Country

➤ Break down of O/M cost borne by Recipient country side

(1)-1 O/M cost for construction machinery (per year)

| Equipment | Quantity | Base Cost ('000yen) | % of O/M | Life | Cost ('000yen) |
|---------------|----------|---------------------|----------|------------|----------------|
| Excavator (1) | 2 units | 3,340 | 40 | 7.5 years | 356 |
| Excavator (2) | 1 unit | 4,300 | 40 | 7.5 years | 229 |
| Falk truck | 2 units | 2,530 | 35 | 8.5 years | 208 |
| Loader (1) | 1 unit | 6,900 | 70 | 11.0 years | 439 |
| Loader (2) | 2 units | 3,440 | 70 | 11.0 years | 438 |
| Belt Conveyor | 5 units | 242 | 60 | 3.2 years | 225 |

(1)-2 Cost of fuel, oil and fats (per year)

| Equipment | Quantity | % of fuel consumption (L/kW-h) | Output of engine | Average use hours in a year | Unit price of fuel | Cost ('000yen) |
|---------------|----------|--------------------------------|------------------|-----------------------------|--------------------|----------------|
| Excavator (1) | 2 units | 0.175 | 18kW | 720Hrs | 10yen | 46 |
| Excavator (2) | 1 unit | 0.175 | 25kW | 720Hrs | 10yen | 32 |
| Falk truck | 2 units | 0.175 | 37kW | 1200Hrs | 10yen | 156 |
| Loader (1) | 1 unit | 0.153 | 63kW | 610Hrs | 10yen | 59 |
| Loader (2) | 2 units | 0.153 | 21kW | 610Hrs | 10yen | 40 |
| Belt Conveyor | 5 units | 0.293 | 3kW | 720Hrs | 10yen | 25 |

(2) Personnel Expenses (per year)

| Equipment | Quantity | No. of operation Staff | No. of Maintenance Staff | No. of Technical Staff | Annual Payment* ('000yen) |
|---------------|----------|------------------------|--------------------------|------------------------|---------------------------|
| Excavator (1) | 2 units | 1 person | 1 person | 1person | 1,581 |
| Excavator (2) | 1 unit | | | | |
| Falk truck | 2 units | | | | |
| Loader (1) | 1 unit | 1 person | | | |
| Loader (2) | 2 units | | | | |
| Belt Conveyor | 5 units | — | — | — | — |

*) Annual Payment (5 persons) = 1,200 (\$) × 109.80 (yen/\$) × 12months = 15,811,000yen

*) Data source : ICHTO Bam office