

STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF EQUIPMENT FOR
PRESERVATION OF CULTURAL HERITAGE IN KHIVA,
BUKHARA, SHAKHRISABZ, SAMARKAND AND OTHER
AREAS (CULTURAL GRANT AID)
IN
THE REPUBLIC OF UZBEKISTAN

December 2002

JICA
(Japan International Cooperation Agency)

STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF EQUIPMENT FOR
PRESERVATION OF CULTURAL HERITAGE IN KHIVA,
BUKHARA, SHAKHRISABZ, SAMARKAND AND OTHER
AREAS (CULTURAL GRANT AID)
IN
THE REPUBLIC OF UZBEKISTAN

December 2002

JICA
(Japan International Cooperation Agency)

PREFACE

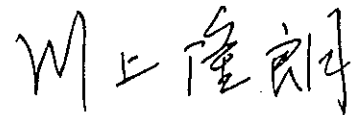
In response to a request from the Government of the Republic of Uzbekistan, the Government of Japan decided to conduct a study on the Project for Improvement of Equipment for Preservation of Cultural Heritage in Khiva, Bukhara, Shakhrisabz, Samarkand and Other Areas and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Republic of Uzbekistan a study team from September 7, 2002 to September 28, 2002.

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

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Uzbekistan for their close cooperation extended to the team.

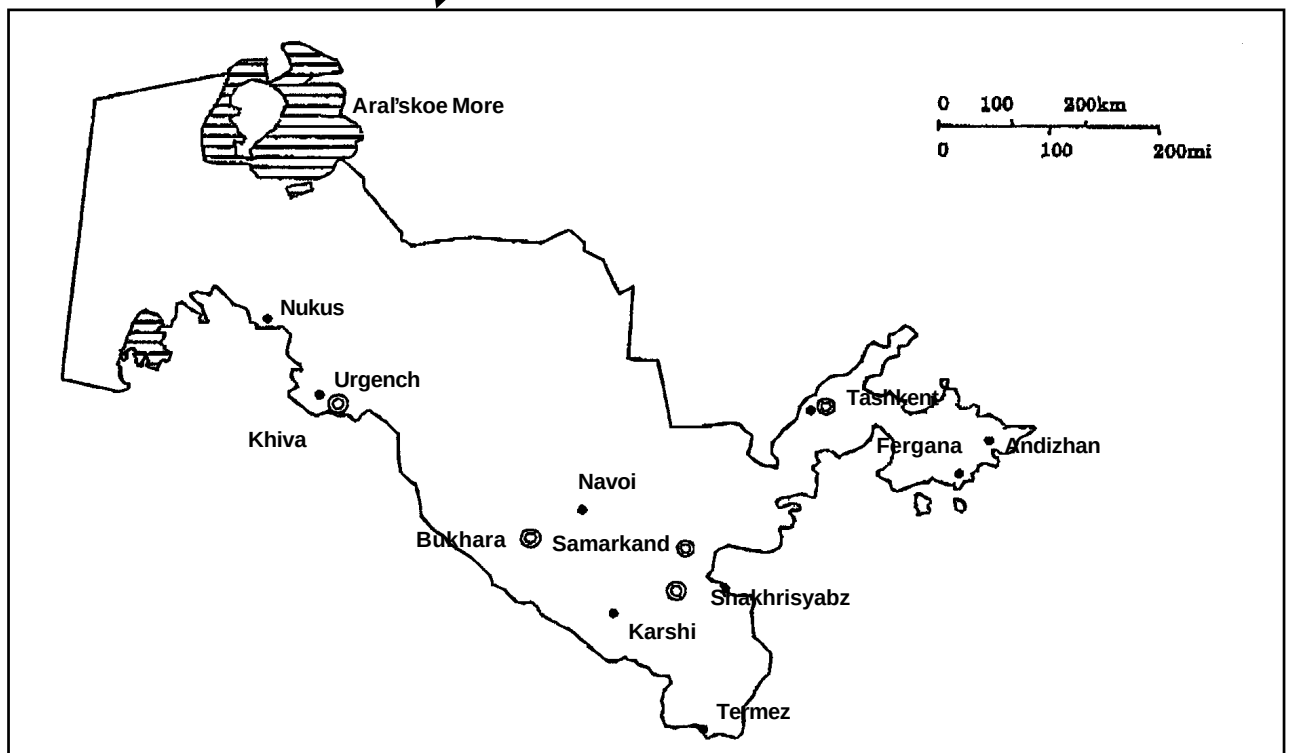
December 2002

A handwritten signature in black ink, consisting of stylized Japanese characters, likely reading '川上隆明' (Takao Kawakami).

Takao Kawakami

President

Japan International Cooperation Agency



**Map of the Republic of Uzbekistan
(Location of the sites)**

Tables

No.	Title	Page
Table 1-1	Equipment items requested by Uzbekistan	1
Table 2-1	Equipment allocation plan	5
Table 2-2	Equipment items	6
Table 2-3	Work sharing between Japan and Uzbekistan	10
Table 2-4	Engineer dispatch schedule	11
Table 2-5	Planned main source countries	14
Table 2-6	Software component schedule and personnel	17
Table 2-7	Work schedule	18
Table 2-8	Breakdown of operation and maintenance costs	21

Abbreviations

A/P	Authorization to Pay
GDP	Gross Domestic Product
GPS	Global Positioning System
IMF	International Monetary Fund
UPS	Uninterruptible Power Supply

Contents

Introduction

Map of the Republic of Uzbekistan (Location of the sites)

Tables/ Abbreviations

Chapter 1 : Project background and process 1

Chapter 2 : Project contents 2

2-1 Project outline..... 2

2-2 Basic designs of the projects for cooperation..... 2

2-2-1 Design principles 2

2-2-2 Basic plan (Equipment plan) 3

2-2-3 Procurement Plan..... 9

2-2-3-1 Procurement policy..... 9

2-2-3-2 Points to notice in procurement 9

2-2-3-3 Work sharing for procurement and installation 10

2-2-3-4 Procurement management plan..... 10

2-2-3-5 Materials and Equipment Procurement Plans 12

2-2-3-6 Software Component Plans 15

2-2-3-7 Implementation schedule 18

2-3 Overview of Operation Shared by the Counterpart Country..... 19

2-4 Project Operation and Maintenance Plans 19

2-4-1 Approximate Cost of the Project Concerned 19

2-4-2 Operation and Maintenance Costs 20

2-5 Points of Concern regarding the Implementation of the Project Relating to the Cooperation..... 21

Chapter 3: Verification of the Validity of the Project..... 22

3-1 Effects of the Project 22

3-2 Challenges and Recommendations 22

[References]

1. Investigation staff/names
2. Investigation schedule
3. List of persons concerned (interviewed persons)
4. Minutes of discussion (M/D)
5. Cost borne by the counterpart
- 6 Reference material/collected material lists
7. Other references

Chapter 1: Project background and process

The Ministry of Culture of Uzbekistan is currently conducting cultural activities including the investigation, preservation and restoration of ancient remains and buildings, with a view to preserving the value of its cultural heritages. However, insufficiency in the governmental budget allotment as well as in aid cooperation from donors is impeding the preservation and restoration work of ancient remains, partially because of aged machines and equipment, and because of the transition of the country to a new political system after the breakdown of the Soviet Union. Under these circumstances, the Republic of Uzbekistan has asked Japan to provide the equipment necessary for the projects. Table 1-1 below shows the requested equipment.

Table 1-1 Equipment items requested by Uzbekistan

No.	Category	Equipment items
1	Construction equipment	Motorized work lift (wagon type), vertical brick polishing equipment, material tester (for restoring materials such as brick, slab, etc.), injector for reinforcing sun-dried-brick wall (5 m deep), diamond cutter for stone, beam lifter (30 m)
2	Tools	Drilling machine, wood polisher (for parquet), marble polisher, power planer, power saw (small), power drill, electric fusing cutter, welding unit (220 – 380 V), compressor, hydraulic press 10-50-100 tons, porcelain tile cutter, circular saw, scaffold set
3	Equipment for exploration and study	Laser theodolite with PC, CCD camera for field work, automatic level, prism, signal, scanning electron microscope, portable X-ray equipment, stereomicroscope, stereomicroscope with video tape recorder, polarizing microscope (for minerals), video recording and videotape running equipment, electron microscope, scale, cooling storage, automatic muffle furnace, automatic distiller, automatic level for survey, industrial fiber scope set for search of inner walls, photographing equipment, geophysical equipment for archeological investigation, concrete humidity meter, rock physical measurement instruments, groundwater level meter, seismograph, vibration tester, hardness tester, Schmidt hammer, clearance gauge, thickness gauge
4	Field exploration equipment	Tent for 2-4 persons, sleeping bag, air mattress, work clothes (overalls, shoes, etc.), water filter, vehicle for exploration (four-wheel-drive), compass, metal detector (small), zooming telescope x8 to 12, bag for geologist, vinyl bag with zipper
5	Office equipment	Computer (with laser printer, scanner, laptop unit)

Chapter 2: Project contents

2-1 Project outline

The aim of the project is to promote preservation activities of cultural heritage at four sites including Khiva, Bukhara, Shakhrisyabz and Samarkand in cooperation with the Cultural Heritage Agency of the Ministry of Culture of Uzbekistan in accordance with the “Historic and Cultural Buildings Preservation Regulations” established by the Uzbekistan government, by providing equipment for restoration, transportation, measurement and monitoring.

2-2 Basic designs of the projects for cooperation

2-2-1 Design principles

The aim of this project is to provide the necessary equipment to support a preservation project established by the Uzbekistan government. The design is based upon the following policy.

1) Basic policy

Criteria for site selection

- Site that meets the requirements of the priority plan by Uzbekistan (sustainability)
- Site that has substantial management budget and human resources
- Site that includes a world heritage (cultural heritage or mixed heritage) (publicity effect)
- Site that has the potential to attract many domestic and foreign visitors and researchers, and has great effects on them
- Site where the preservation of remains shall be treated as urgent

Criteria for equipment selection

- Equipment essential for minimum improvement of the present condition
- Equipment easy to handle and maintain
- Equipment that is available under the centralized management of the Ministry of Culture
- Equipment that contributes to digitization
- Equipment compatible with the power supply situation and friendly to the natural environment of the site
- Equipment whose introduction is consistent with the existing equipment (suitability of the new equipment).

2) Policy with respect to natural conditions

The major sites concerned in this project belong to a continental semi arid climate characterized by deserts and steppe with a drastic variation in temperature. It is therefore necessary to select equipment considering these conditions.

3) Policy with respect to socioeconomic conditions

Although the country's official language is Uzbek, considering the versatility of computer hardware and software, it will be appropriate to provide all-purpose equipment in Russian and English versions.

4) Policy with respect to the project implementing organizations' capability for management and maintenance

It is essential to select the types of equipment that are currently being widely used in the republic so that local engineers can handle and maintain them easily. The amount of spare parts for the equipment shall be limited to a certain volume necessary for the initial phase. For elevating work vehicles, the continuous procurement of spare parts and repair guidance are necessary, so parts and materials shall be selected that can be obtained from a supplier that has a local agent. At the time of delivery, manufacturers shall explain how to use and maintain the equipment.

5) Policy for selecting the equipment grade

The equipment grade shall be selected referring to the general specification of the equipment and to the existing equipment used in the implementing organization.

6) Policy with respect to the procurement method and delivery period

The equipment will be procured in three ways: from Japan, from a third country or procured locally. The delivery period is limited to one year, since the plan is concerned with standard equipment.

2-2-2 Basic plan (Equipment plan)

(1) Overall plan

This project includes the plans in the scope of the "Historic and Cultural Buildings Preservation Regulations" and the restoration plans for ancient remains until the year 2010 established by the Cultural Heritage Agency.

The procured equipment shall be disposed at the following sites to conduct the plans mentioned above. The reasons for the site selection are also mentioned below.

- **Tashkent (Cultural Heritage Agency)**

This Agency serves as a post to administer this project, where all the necessary equipment is managed. The main equipment is stored in a warehouse in Tashkent and it is rented out to each site as the need arises.

- **Khiva, Bukhara, Shakhrysbaz, Samarkand**

These four sites are designated as world heritage sites. They are the most important places for promoting the restoration plans for ancient remains until the year 2010, set up by the Cultural Heritage Agency under the Uzbekistan government. Basic

equipment for investigation and registration and vehicles for maintaining the remains will be arranged.

The equipment arrangement plan is shown in Table 3-1.

Table 2-1 Equipment arrangement plan

Site Equipment	Tashkent	Khiva	Bukhara	Shakhrisayabz	Samarkand
Restoration, transport	Mortar injector Work lift Elevating work vehicle Cargo truck with crane Rolling tower Hand piece Pickup truck	Hand piece Pickup truck	Hand piece Pickup truck	Hand piece Pickup truck	Hand piece Pickup truck
Survey, drawing	Plotter (AO) Scanner (AO) Automatic level Total station Survey instruments GPS (Global Positioning System) Drawing equipment Distance meter (2 types)	Drawing equipment Distance meter (2 types)	Drawing equipment Distance meter (2 types)	Drawing equipment Distance meter (2 types)	Drawing equipment Distance meter (2 types)
Monitoring	Fiber scope for investigation Photographing equipment Environmental monitoring equipment Equipment for restoration site investigation Digital image processor	Photographing equipment Environmental monitoring equipment Equipment for restoration site investigation Digital image processor	Photographing equipment Environmental monitoring equipment Equipment for restoration site investigation Digital image processor	Photographing equipment Environmental monitoring equipment Equipment for restoration site investigation Digital image processor	Photographing equipment Environmental monitoring equipment Equipment for restoration site investigation Digital image processor

*All the equipment items shall be managed in Tashkent.

*The equipment for Tashkent will be used for sites that require intensive restoration and detailed monitoring.

The initial request of Uzbekistan included advanced equipment and instruments for analysis and exploration (electron microscope, underground probe radar, etc.), large-size stationary equipment for workshops (marble cutter, welder and press, etc.), equipment for field investigation (tent, sleeping bag, etc.). These items were excluded in consideration of the policies mentioned above. However, equipment indispensable for surveying and monitoring were added.

(2) Equipment plan

The following table shows the items, specifications, application and quantity of equipment.

Table 2-2 Equipment items

No.	Equipment name	Specifications	Application	Quantity
1	Mortar injector	Max. discharge approx. 7 m ³ /hr, vertical transport approx. 50 m	Relics restoration	1 unit
2	Work lift	Motorized, max. elevation 12 m or more	Relics restoration	2 units
3	Elevating work vehicle	Truck mount type, max. elevation 25 m class	Relics restoration	2 units
4	Cargo truck with crane	4x2, diesel, with 3 t crane	Material transport	2 units
5	Rolling tower	6 stages, total height approx. 10 m	Relics restoration	10 sets
6	Hand piece	AC power source, grinding stone set	Relics restoration	5 sets
7	Pickup truck	4 x 4, diesel, double cabin	Material transport	5 units
8	Plotter (A0)	Ink jet, max. A0 format or larger	Drawing	1 unit
9	Scanner (A0)	Full color, A0 format or larger	Digital drawing	1 unit
10	Automatic level	Standard error per 1 km shuttling ± 1.5 mm	Survey	2 units
11	Total station	Max. accuracy 5 mm $\pm$ 3ppm.D, with non-prism measurement function	Survey	2 units
12	GPS (Global Positioning System)	One-frequency type, L1 carrier, cinematic function, horizontal resolution = approx. 10 mm $\pm$ 2 ppm	Survey	2 sets
13	Survey instruments	Binoculars, hand level, aluminum staff, civil-engineering level, clinocompass, measuring tape, "Convex" rule	Survey	2 sets
14	Drawing equipment	PC, printer, scanner, UPS, drawing software	Drawing	5 sets
15	Distance meter 1	Laser type, 30 m	Survey	5 units
16	Distance meter 2	Laser type, 800 m	Survey	5 units
17	Fiber scope for investigation	Diameter 10 mm or less, 2 to 3.5 m long	Exploration for restoration	1 set
18	Environmental monitoring equipment	Temperature/humidity data logger, temperature/humidity recorder, magnifying lens, stereo microscope, pH-meter, soil acidity meter, soil hardness meter, vibrometer	Monitoring	5 sets
19	Equipment for restoration site investigation	Water content meter, inspection mirror, Schmidt hammer, crack gauge, metal detector, sliding calipers, sieve, scale	Exploration for restoration	5 sets
20	Photographing equipment	35 mm single reflex camera, CCD camera, lens, speed light, tripod, recording media, light box	Monitoring, registration of relics	5 sets
21	Digital image processor	PC, printer, scanner, UPS	Monitoring	5 sets

Equipment for restoration and transport

These are used to restore buildings and transport equipment for restoration.

1) Mortar injector

Used to restore tiles detached from buildings at the archaeological sites. One unit is provided at the Cultural Heritage Agency. It is used at each site (Khiva, Bukhara, Shakhriyabz, Samarkand, etc) when necessary.

2) Work lift

Used for preservation and restoration of wall surfaces of buildings at the archaeological sites. Two units are provided at the Cultural Heritage Agency and they are used at each site when necessary.

3) Elevating work vehicle

Used for preservation and restoration at elevated positions of buildings at the archaeological sites. Two units are allotted at the Cultural Heritage Agency and they are used at each site when necessary.

4) Cargo truck with crane

Used to transport the equipment necessary for the restoration of buildings. It is equipped with a hydraulic crane to facilitate the loading of the equipment. Two units are allotted to the Cultural Heritage Agency and they are used at each site when necessary.

5) Rolling tower

Used for preservation and restoration of buildings at the archaeological sites. Ten units are provided at the Cultural Heritage Agency and they are used at each site when necessary.

6) Hand piece

Polishing tool for stone, wood and iron, used for preservation and restoration of buildings at the archaeological sites. Five sets are provided in total, one at the Cultural Heritage Agency and four at each of the four sites; that is, Khiva, Bukhara, Shakhriyabz and Samarkand.

7) Pickup truck

Used to transport preservation and restoration working staff to the archaeological sites. Five trucks are provided in total: one truck is available at the Cultural Heritage Agency and four trucks at Khiva, Bukhara, Shakhriyabz and Samarkand.

Equipment for investigation and registration

Used for archaeological investigation, making surveys of the restored sites, preparing and outputting survey maps.

8) Plotter

Used to output maps and drawings of the archaeological site and artifacts. One unit is

provided at the Cultural Heritage Agency.

9) Scanner

Used to digitize maps and drawings and the drawn artifacts. One unit is provided at the Cultural Heritage Agency.

10) Automatic level

Used to make surveys of the buildings at the archaeological sites. Two units are provided at the Cultural Heritage Agency and they are used at each site when necessary.

11) Total station

Used to make surveys of buildings at the archaeological sites. Two units are provided at the Cultural Heritage Agency and they are used at each site when necessary.

12) GPS (Global Positioning System)

Used for surveys in the investigations at the archaeological sites. It provides precise geographical information of the unregistered remains throughout the country of Uzbekistan and records the data. Two units are provided at the Cultural Heritage Agency and they are used at each site when necessary.

13) Survey instruments

Essential equipment for making surveys at the archaeological sites, including binoculars, compass, measuring tape, level, etc. Two sets are provided at the Cultural Heritage Agency and are used at each site when necessary.

14) Drawing equipment

Used to register archaeological sites, analyze investigation data and draw maps. A total of five sets are provided, one at the Cultural Heritage Agency and one for each of the designated sites; that is, Khiva, Bukhara, Shakhrisyabz and Samarkand.

15) Distance meter 1

Used to make simple surveys at the archaeological sites. A total of five sets are allocated, one at the Cultural Heritage Agency and one for each of the designated sites; that is, Khiva, Bukhara, Shakhrisyabz and Samarkand.

16) Distance meter 2

Used to make simple surveys at the archaeological sites. A total of five sets are provided, one at the Cultural Heritage Agency and one for each of the designated sites; that is, Khiva, Bukhara, Shakhrisyabz and Samarkand.

Monitoring Equipment

Used to monitor the current condition of the cultural heritage and determine whether restoration is required and how the preservation and restoration should be implemented.

17) Fiber scope for investigation

Used for the restoration study of tiles that have fallen off buildings at the archaeological sites. One unit is allocated at the Cultural Heritage Agency and is used at each site (Khiva, Bukhara, Shakhrisyabz and Samarkand, etc) on request.

18) Environmental monitoring equipment

Buildings at the archaeological sites are mainly built from bricks and tiles and factors such as temperature, moisture and salt content in water have an impact on their preservation. The equipment is used to gather environmental data for the future preservation of the remains. A total of five sets are allocated, one at the Cultural Heritage Agency and one for each of the four sites; that is, Khiva, Bukhara, Shakhrisyabz and Samarkand.

19) Equipment for restoration site investigation

Used for restoration related investigations at the archaeological sites. A total of five sets are allocated, one at the Cultural Heritage Agency and one for each of the four sites; that is, Khiva, Bukhara, Shakhrisyabz and Samarkand.

20) Photographing equipment

Used to make a record of artifacts and the restored relics and remains. A total of five sets are prepared, one at the Cultural Heritage Agency and one for each of the four sites; that is, Khiva, Bukhara, Shakhrisyabz and Samarkand.

21) Digital image processor

There is a plan to develop a database of the registered cultural heritage across Uzbekistan. Database development and guidance for operation and input of the database are introduced as a “software component.” In future, survey data, monitoring data and image data will be incorporated into the database. A total of five sets are arranged, one at the Cultural Heritage Agency and one for each of the four sites; that is, Khiva, Bukhara, Shakhrisyabz and Samarkand.

2-2-3 Procurement Plan

2-2-3-1 Procurement policy

This project is an equipment procurement plan. The equipment will be procured according to the above policies. The source countries eligible for procurement are Japan, Uzbekistan and other third countries. Suppliers will be selected by ordinary competitive bidding. The lump-sum contracts will be awarded to Japanese corporations. In addition, inspection will be conducted by a third-party inspection agency before shipment of the procured equipment.

The procured equipment will be handed over under the responsibility of the Ministry of Culture.

2-2-3-2 Points to note in procurement

Uzbekistan is a landlocked country. The combination of marine and railway transport via China and Russia is the typical transport route.

There is a road route via Iran instead of railway, but the political conditions of the countries on the way are unstable and robbery and accidents are frequent. As for container transport, the route via China is the most popular because of the low cost. However, for transporting large vehicles, railway via Russia is used because of the ease of equipment transfer work. Since the equipment for the present project (except vehicles) will be transported by containers, the possibility of robbery during transport is low.

2-2-3-3 Work sharing for procurement and installation

The table below shows the work sharing between Japan and Uzbekistan.

Table 2-3 Work sharing between Japan and Uzbekistan

Sharing	Items
Japan	Provision of equipment Transport of equipment to the hand-over site (The hand-over site shall be the central warehouse of the Ministry of Culture in Tashkent. The locally supplied equipment shall be delivered to the Cultural Heritage Agency of the Ministry of Culture in Tashkent.)
Uzbekistan	Distribution of equipment from the hand-over site to the facilities that will use the equipment

The work in the scope of Uzbekistan may be implemented without problem, with the level of staff, budget and technical capability. The development of a database for the registered remains, using the drawing equipment and digital image processor, will be performed by the implementing organization of the counterpart country. However, this work may be difficult with the current technical level and budgetary limitations. For this reason, Japan will undertake, as the “software component” provision, the system development of remains registration databases, preparation of manuals and instructions for the utilization method.

2-2-3-4 Procurement management plan

A person in charge of procurement will be dispatched from Japan as a local procurement manager to facilitate the inspection and delivery of the equipment in Uzbekistan in accordance with the delivery schedule. In addition, a technician will be dispatched from Japan or a third country according to the delivery schedule as follows.

Table 2-4 Engineer dispatch schedule

No.	Engineer (Equipment)	No. of persons		Length of stay (in days)	Frequency of travel	Engineer's Origin	Mission
1	Japanese engineer (Elevating work vehicle)	1	4	7	1	Japan	In the operation guide for the elevating work vehicle, it is necessary to give safety instructions in addition to ordinary operation guide. Work in an elevated position can cause serious accidents if the outriggers and lift are not correctly operated. In addition, to ensure proper operation, it is essential to give instructions on maintenance.
2	Third country's engineer (Total station, GPS)	1		7	1	Netherlands	This is the first time that precision survey equipment (total station and GPS) has been introduced to the project implementing organization. Although local engineers have the fundamental survey techniques, it is necessary to provide guidance for operation and installation, including field survey training, because the precision survey equipment will not produce correct results unless properly operated. It is also necessary to give guidance for data transmission and analysis of the measurement results.

2-2-3-5 Materials and Equipment Procurement Plans

- The following equipment shall be procured from Japan:

Equipment names: mortar injector, elevating work vehicle, cargo truck with crane, rolling tower, hand piece, survey instruments, fiber scope for investigation, photographing equipment

These equipment items are usually imported to the counterpart country. However, they are used as general purpose articles in Japan, where there are a number of manufacturers of such equipment items.

- The following equipment shall be procured locally:

Equipment names: drawing equipment, digital image processing equipment

These equipment items can be bought without restraint locally and are constantly on the market. However, such products come from Southeast Asian countries, China, Taiwan and U.S.A. and procurement from third countries is allowed.

- The following equipment shall be procured from Japan and/or third countries:

Equipment name: work lift, pickup truck, plotter (A0), scanner (A0), total station, distance meter (two types), environmental monitoring equipment, equipment for restoration site investigation

With regard to pickup trucks, while there are a number of manufacturers in Japan, their production bases have been transferred or are in the process of being transferred to Southeast Asian countries. Environmental monitoring equipment and restoration site investigation equipment include components that are not produced in Japan and procurement from third countries is allowed. Regarding other equipment items, there are only one or two manufacturers in Japan, which creates the danger that fair competitive bidding will be hampered if the products are limited to those of Japanese makes.

There is not much difference between such products procured from Japan and those procured from third countries in view of the availability of spare parts, repair, maintenance, etc. in the counterpart country.

- The following equipment shall be procured from third countries:

Equipment name: GPS

This equipment is not manufactured in Japan and will be of American, Swiss or Canadian make.

With regard to personal computers, although models generally available in Uzbekistan are made in third countries, procurement in Uzbekistan is desirable in consideration of warranties and the need for daily maintenance. Of other products that are expected to be procured from third countries, those that are generally available in Japan shall be procured

from Japan. Table 2-5 shows the countries from which procurement can be expected.

Table 2-5 Planned main source countries

Equipment name	Source countries			Remarks
[Equipment]	Local	Japan	Third country	
Mortar injector		○		
Work lift		○	○	
Elevating work vehicle		○		
Cargo truck with crane		○		
Rolling tower		○		
Hand piece		○		
Pickup truck		○	○	
Plotter (AO)		○	○	
Scanner (AO)		○	○	
Automatic level		○	○	
Total station		○	○	
GPS (Global Positioning System)			○	
Survey instruments		○	○	
Drawing equipment	○		○	The countries of origin may include third countries.
Distance meter 1		○	○	
Distance meter 2		○	○	
Fiber scope for investigation		○		
Environmental monitoring equipment		○	○	
Equipment for restoration site investigation		○	○	
Photographing equipment		○		
Digital image processor	○		○	The countries of origin may include third countries.

2-2-3-6 Software Component Plans

(1) Background

The problems to be dealt with as soon as possible that are presented in the Historic and Cultural Buildings Preservation Regulations drawn out by the government of Uzbekistan include digitization of the cultural heritage register and creation of databases. The survey instruments, monitoring equipment and photographing equipment introduced into this project are intended for creating data for registration.

At present, cultural heritage registrations, which are expected to be completed next April, are made manually in Uzbekistan. There is a plan to input these digital data into the drawing equipment and digital image processing equipment to be introduced in this project for integrating the images and drawings with the text data of monuments. Although it is possible to secure personnel required for this purpose, the Cultural Heritage Agency of the Ministry of Culture of Uzbekistan currently does not have the technical capability to develop database software for monument data and to create databases in common formats for branch offices (Monument Inspection Bureau) in various parts of the country.

The introduction of the technology as described above in line with the introduction of equipment is considered especially important to the success of this project, which leads to the conclusion that implementation of a software component should be appropriate.

(2) Achievements (Direct Effects)

The achievements expected by the introduction of software components are as follows:

- The databases of cultural monuments in Uzbekistan, which amounted to 5,877 as of January 1, 2000, can be searched.
- The creation of common databases allows more efficient and better-designed monitoring and restoration.
- Unregistered cultural heritage data can be entered at branch offices in various parts of Uzbekistan.
- The ability to send common data to the central office allows central management of all data.

(3) Activities (Implementation Plans)

The implementation plans concerning the development and operation training of the databases for the registration of cultural heritages are as follows:

Implementation Procedure

- 1) Arrangement with the local organization concerned and sample collection and interviews on registration databases

Timeframe: 6 days

Personnel: 2 engineers (1 supervisor: Japanese engineer; 1 project manager: local

consultant)

2) Development of the database software and preparation of the instruction manual

Time frame: 12 days

Personnel: 2 local consultants

Product expected: database software and instruction manual

3) Demonstration and operation training

Time frame: 3 days

Personnel: 3 local consultants

4) Evaluation of the result

Time frame: 10 days (including the period for 3) above)

Personnel: 1 Japanese engineer

•Procurement of Services

Recommission method mainly using local resources shall be employed.

Most of the activities described above will be conducted in Russian. In addition, if any failure occurs after the delivery, it will be necessary to request maintenance from the software developer on the budget of the Ministry of Culture of Uzbekistan. Accordingly, a Japanese engineer will supervise the work concerning the software component but local consultants will preferably take a leading role in the development of the software and the provision of operation training.

Table 2-6 Software component schedule and personnel

	Items		2003					
			July	August	September	October	November	December
Software components	Equipment distribution, adjustment		▽					
	Contract meeting			■				
	Contract conclusion with local consultant			▽				
	Design meeting				■			
	System development, preparation of manual				■			
	Demonstration, operation guide					■		
	Evaluation at completion					■		
	Preparation of completion report					□		

	Engineers	Grade	2003						Man-days	
			July	August	September	October	November	December	Domestic	Local
Japanese	Overall management	3			■	■			0.33	0.20
Local consultant	Project manager				■	■			0.00	0.20
	System engineer 1				■				0.00	0.50
	System engineer 2				■				0.00	0.50

2-2-3-7 Implementation schedule

The implementation will span 11.5 months, as detailed in Table 2-7.

Table 2-7 Implementation schedule

	No. of month	1	2	3	4	5	6	7	8	9	10	11	12
Whole period		▼	Signature on Exchange of Notes (E/N)										
			▼	Consultant contract									
	Detail design		■	Final confirmation of planning									
			□	Preparation of tender document									
				■	Approval of document								
				▼	Bid announcement								
				□	Questions and answers								
					□	Bidding, bid evaluation							
					▼	Contract with successful bidder							
	Procurement	□	Meeting with contractor										
			■		Equipment manufacture/procurement								
						□	Inspection before shipment						
							Equipment transport						
	Software components						Data base development, operation guidance						
							Preparation of report						

□ implementation in Japan ■ implementation in third country ■ Local implementation

2-3 Overview of Operation Shared by the Counterpart Country

- In principle, the incurrence of expenses for customs clearance and domestic transportation from the delivery site of the materials and equipment purchased based on the grant and guarantee of quick procedures.
- Opening of an account with a bank in Japan and issuance of authorization to pay (A/P); payment of processing fees incurred.
- Of the customs and inland duties and other financial surcharges levied on equipment items and services procured according to authenticated contracts, arrangements for exemption of those imposed on Japanese nationals.
- With regard to the services to be provided by Japanese nationals according to authenticated contracts, affording of facilities required for entry into and remaining in the country for the execution of such services.
- Proper and effective maintenance and use of the equipment items purchased based on the grant for the implementation of the project in question and securing of personnel, etc. required. Incurrence of all maintenance and administrative expenses required for the implementation of the project, except the costs borne by grant.
- Distribution of the procured equipment to the intended facilities in the country.

2-4 Project Operation and Maintenance Plans

The equipment for this project will be centrally managed by the headquarters of the Cultural Heritage Agency. The procured equipment will be stored in the central warehouse of the Ministry of Culture in Tashkent, and lent to the individual sites as required. The equipment maintenance costs such as fuel cost will be borne by the Cultural Heritage Agency and the restoration workshop that utilizes the equipment according to the contract with the Agency. The increased amount of maintenance costs for the equipment that conceivably requires such costs (vehicles) of all the equipment items for this project is expected to be 1.78 million yen (per annum). This is approximately 3 percent of the restoration budget of the Cultural Heritage Agency for fiscal 2001 and can be easily covered by the current budget. In addition, the Inspection Bureaus of the individual provinces have their own budgets, which can be allotted for maintenance. Furthermore, use of the equipment of the Cultural Heritage Agency allows the rental costs of the equipment that is rented at present to be appropriated for the maintenance costs. Regarding the personnel required, the equipment to be introduced that requires operators and drivers are replacements and the present number of personnel is sufficient.

The increased amount of maintenance costs required for the operation and maintenance of this project is shown in 2-4-2.

2-4-1 Approximate Cost of the Project Concerned

The total amount of the project cost required for the implementation of the project relating to the cooperation is 141 million yen. The breakdown of the expenses borne by Japan and Uzbekistan according to the burden share between the two countries described above is expected to be as follows, based on the estimation conditions shown in (3) below:

(1) Expenses borne by Japan

(in 100 million yen)

Project cost category		Amount
(1) Equipment procurement cost		1.12
	Equipment cost	(1.08)
	Cost for local procurement/installation, etc.	(0.04)
(2) Design management cost		0.29
	Detail design cost	(0.16)
	Work management cost	(0.7)
	Software component cost	(0.6)
Total		1.41

(2) Expense borne by Uzbekistan

Expense for the distribution of equipment from the delivery site to the intended facilities

(3) Estimation conditions

1) Time of estimation: October 2002

2) Exchange rate: 1 US dollar = 121.92 yen, 1 euro = 118.45 yen

3) Implementation period: the project is a single-year project and the periods of detailed design and equipment procurement are as shown in the implementation schedule.

4) Other: this project shall be conducted according to the grant aid system of the Japanese government.

2-4-2 Operation and Maintenance Costs

The increased amount of maintenance costs for the equipment items that conceivably require such costs (vehicles) of all the equipment for this project is expected to be 1.78 million yen (per annum). This is approximately 3 percent of the restoration budget of the Cultural Heritage Agency for fiscal 2001 and can be easily covered by the current budget. The breakdown of the operation and maintenance costs is shown in Table 2-8.

Table 2-8 Breakdown of operation and maintenance costs

Summary

(in million yen)

Cost item	Elevating work vehicle	Cargo truck	Pickup truck	Subtotal
Maintenance/repair	0.29	0.36	0.26	0.91
Manpower	0.00	0.00	0.00	0.00
Fuel	0.19	0.29	0.36	0.91
Oil and grease	0.01	0.01	0.01	0.03
Total	0.49	0.66	0.63	1.78

Maintenance/repair cost for vehicles

Equipment name	Q'ty	Unit cost (million yen)	Ratio of maintenance/repair cost (%)	Service life (years)	Procured part ratio (%)	Amount (million yen)
Elevating work vehicle	2	9.70	25	10	10	0.29
Cargo truck	2	5.00	35	7	10	0.36
Pickup truck	5	1.50	35	7	10	0.26

Fuel cost for vehicles

Equipment name	Q'ty	Fuel consumption per horsepower	Horsepower	Annual use hours	Cost per liter	Total (million yen)
Elevating work vehicle	2	0.030	130	1200	20	0.19
Cargo truck	2	0.040	150	1200	20	0.29
Pickup truck	5	0.037	80	1200	20	0.36

Oil and grease for vehicles

Equipment name	Q'ty	Capacity	Replacement frequency	Price per liter	Total (million yen)
Elevating work vehicle	2	20	2	100	0.01
Cargo truck	2	20	2	100	0.01
Pickup truck	5	5	2	100	0.01

2-5 Points of Concern regarding the Implementation of the Project Relating to the Cooperation

For this project, the Ministry of Culture takes responsibility for distributing the equipment to the intended sites, which is considered to cause no problem in the implementation of the operation in terms of personnel and operating budget.

Chapter 3: Verification of the Validity of the Project

3-1 Effects of the Project

1) Direct Effects

- The replacement of restoration equipment will allow quicker restoration of cultural monuments. The introduction of elevating work vehicles and work lifts, in particular, will enable timely restoration of small exfoliations and falls that have been left unattended so far.
- The introduction of environmental measuring equipment will improve the methods of monument restoration and allow appropriate selection of restoration materials.
- The introduction of monitoring equipment will allow regular recording of conditions of monuments, which makes it possible to work out appropriate restoration plans including objects and times of restoration.
- The introduction of monitoring equipment will facilitate scientific research of monuments and improve the methods of preservation.
- The introduction of surveying equipment will show the degrees of inclination and subsidence of and the changes in monuments.
- The introduction of surveying equipment will enable creation of accurate drawings, which will improve the quality of restoration plans and restoration work.
- The replacement of photographing equipment will improve the quality of the entire archaeological research of Uzbekistan, which will enable the exchange of digital data.

2) Indirect Effects

- Cultural heritages are an important resource for tourism for Uzbekistan. Improvement of the quality of their restoration and preservation will enhance the value of monuments and increase the number of visitors to the tourist sites.
- The increase in the number of visitors may increase the tourism revenue including hotel income and souvenir sales.
- Digitization of information will make it possible to share registered data on research, restoration and monuments/unearthed articles, which will allow the provision of data and information for researchers and other people.
- The domestic monuments related to the Silk Road are the pride of the people of Uzbekistan and are also popular in Japan and across the world. The assistance rendered for the monument restoration project will allow us to make our cultural cooperation widely known internationally as well as to the people of Uzbekistan.

3-2 Challenges and Recommendations

While the Ministry of Culture of Uzbekistan has long experience in cultural heritage preservation and restoration activities and its ability to implement this project is considered high, the following points must be noted:

- 1) Personnel and budget required for the operation and maintenance of the procured equipment must be secured without fail. Restoration and material handling equipment, in particular, will be used and maintained by restoration workshops that will conduct

preservation and restoration activities by contract with the Ministry of Culture, which will require guidance and supervision by the Ministry so that the equipment will be properly maintained.

- 2) The project sites include many monuments registered on the world heritage list and the preservation and restoration activities must be conducted in partnership with UNESCO.

Reference 1. Investigation staff/names

1. Ms. Kae YANAGISAWA
(Leader)
Resident Representative Uzbekistan Office, JICA
2. Mr. Tatsuo SUNAHARA
(Cultural Policy)
Cultural Policy Div. Cultural Affairs Dept. MOFA
3. Ms. Akiko KAWATA
(Program Coordinator)
Second Project Management Division, Grant Aid Management, JICA
4. Mr. Hiroshi MATSUMURA
Survey/Procurement Planner 1
(Equipment Planner)
Japan International Cooperation System
5. Mr. Masahiro TANAKA
Survey/Procurement Planner 2
(Procurement and Cost Planner)
Japan International Cooperation System
6. Ms. Kumiko IKAWA
(Interpreter)
Japan International Cooperation Center

Reference 2. Investigation schedule

Schedule for the investigation of basic equipment from September 8 to 27

No.	Date		Government mission	JICS mission and interpreter	Lodging
1	9/8	S	Arrived in Tashkent	Government mission personnel	Tashkent
2	9/9	M	10:00; Paid courtesy visit to JICA Local office and had a meeting. 11:30; Paid courtesy visit to UNESCO Local Office and had a meeting 14:30; Courtesy visit to MCA and meeting 16:30; Courtesy visit to MFER and meeting		Tashkent
3	9/10	T	10:00; Courtesy visit to the Japanese Embassy in Tashkent and meeting 14:30; Explaining the schedule to MC and conference		Tashkent
4	9/11	W	AM; Traveling to Samarkand PM; Site survey		Samarkand
5	9/12	T	AM; Traveling to Shakhrysyabz PM; Site survey and moving to Bukhara		Bukhara
6	9/13	F	AM; Site survey at Bukhara PM; Moving to Khiva		Khiva
7	9/14	S	AM; Site survey at Khiva PM; Meeting at the mission and moving to Tashkent		Tashkent
8	9/15	S	Meeting at the mission		Tashkent
9	9/16	M	9:00; Visiting the research institution. 10:30-18:00; Conference		Tashkent
10	9/17	T	AM: Confirming the minutes and signing PM: Reporting to JICA local office and Japanese Embassy Leaving Tashkent		On board (Tashkent)
11	9/18	W		AM/PM; Discussion of the specifications of equipment at MCA	Tashkent
12	9/19	T		AM; Investigation of the Central Warehouse at MCA PM; Investigation of the specifications of equipment at MCA	Tashkent
13	9/20	F		AM; Investigation of commercial agencies PM; Investigation of equipment specifications at MCA	Tashkent
14	9/21	S		Holiday	Tashkent
15	9/22	S		Holiday	Tashkent
16	9/23	M		AM/PM; Meeting on software components at MCA	Tashkent
17	9/24	T		AM/PM; Investigation of software components	Tashkent
18	9/25	W		AM; Conference on local consultants PM; Investigation of commercial agencies	Tashkent
19	9/26	T		AM; Final report to MCA PM; Reporting to UNESCO Local Office, and investigation	Tashkent
20	9/27	F		10:00; Report to JICA Local Office 11:00; Report to the Japanese Embassy 22:30; Leave Tashkent (OZ574)	On board

3. Reference List of persons concerned (interviewed persons)

Organization	Name	
Ministry of Culture	Mr. Hairulla Juraev	Minister
	Ms. Karimova Shirin Minovarovna	International Relations Department Chief
	Mr. Mansurov Ravshan Abdunazarovich	Main Scientific-Production Board for Preservation of Monuments Chief
	Mr. Rakhmonov Abdusafi Rafikovich	Main Scientific-Production Board for Preservation of Monuments Principal Architect
	Mr. Ashirov Server Ashirovich	Republican Inspection for preservation and maintenance of the monuments of history and culture Head
Ministry of Foreign Economic Relations		Asian-Pacific Region Bureau, Bureau head
UNESCO	Dr. Komiljon Karimov	National Program Officer
	Mr. Aybek Erkabaev	Architect
Embassy of Japan in Uzbekistan	Mr. Imahashi, Counselor	
	Mr. Kuwako, Officer	
JICA office in Uzbekistan	Ms. Yanagisawa, Resident Representative	
	Mr. Tanabe	
	Mr. Sarvar Gulyamov	

Reference 4. Minutes of discussion (M/D)

**MINUTES OF DISCUSSION
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR IMPROVEMENT OF EQUIPMENT FOR PRESERVATION
OF THE CULTURAL HERITAGE OF UZBEKISTAN : KHIVA, BUKHARA,
SHAKHRISABZ, SAMARKAND AND OTHER CITIES**

In response to a request from the Government of the Republic of Uzbekistan (hereinafter referred to as "Uzbekistan"), the Government of Japan decided to conduct a basic design study (hereinafter referred to as "the Study") on the project for improvement of equipment for preservation of the cultural heritage of Uzbekistan: Khiva, Bukhara, Shakhrisabz, Samarkand and other cities (hereinafter referred to as "the Project") and entrusted the Study to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent the study team (hereinafter referred to as "the Team"), headed by Ms. Yanagisawa, Resident Representative of the Uzbekistan Office, JICA, to Uzbekistan and is scheduled to stay in the country from September 8 to September 27, 2002.

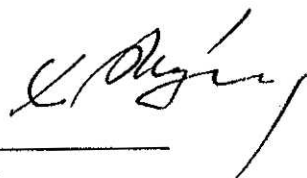
The Team held discussions with the officials concerned of the Government of Uzbekistan (hereinafter referred to as "the Uzbekistan side") and conducted a field survey at the study area.

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 Study Report.

Tashkent, the Republic of Uzbekistan, September 17, 2002



Kae Yanagisawa
Leader
Study Team
Japan International Cooperation Agency



Khayrulla Djuraev
Minister of Cultural Affairs
The Republic of Uzbekistan



Kh. S. Islamkhodjaev
Deputy Minister of Foreign Economic Relations
The Republic of Uzbekistan

ATTACHMENT

1. Objective of the Project

The objective of the Project is to contribute to improvement of equipment for preservation of the cultural heritage of Uzbekistan.

2. Project Site

The site of the Project includes the following cities: Tashkent, Khiva, Bukhara, Shakhrisabz and Samarkand.

3. Coordinating, Responsible and Implementing Agencies

3-1. The Coordinating Agency is the Ministry of Foreign Economic Relations of the Republic of Uzbekistan.

3-2. The Responsible and Implementing Agency is the Ministry of Cultural Affairs of the Republic of Uzbekistan.

4. Items requested by the Government of Uzbekistan

4-1. After discussions with the Team, the equipment plan described in Annex-1 was finally requested by the Uzbekistan side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

4-2. The Uzbekistan side has described their priorities on the requested equipment listed in Annex-1.

A = 1st priority/essential

B = 2nd priority/necessary to study

C = 3rd priority/if possible

5. Japan's Grant Aid Scheme

The Uzbekistan side understood the Japan's Grant Aid Scheme explained by the Team, as described in Annex-2 and 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 Team will proceed to further studies in Uzbekistan until September 27, 2002.

6-2. JICA will prepare the study report in English and send it to the Government of Uzbekistan by March 2003.

6-3. After the Team leaves Uzbekistan, further discussions necessary for the basic design of the Project will be made through such means as facsimile and e-mail.

7. Other relevant issues

7-1. All equipment procured under the Project will belong to Ministry of Cultural Affairs of the Republic of Uzbekistan. Ministry of Cultural Affairs of the Republic of Uzbekistan shall be responsible for proper utilization and maintenance of the equipment. Utilization of the equipment shall be limited to monitoring, research and restoration of the cultural heritage.

7-2. Both sides agreed that technical assistance under the Project is necessary to support Ministry of Cultural Affairs for effective maintenance and management of the equipment to promote activities in relation to the Project. Specific contents of the above technical assistance will be requested by the Uzbekistan side by September 27.

7-3. Staff Assignment

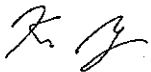
The Uzbekistan side agreed to assign appropriate number of staff for operation and maintenance of the equipment procured under the Project.

7-4. Budget Allocation

The Ministry of Cultural Affairs agreed to allocate necessary budget for operation and maintenance of the equipment procured under the Project.

7-5. Publicity Activities

The Uzbekistan side agreed to promote publicity activities of Japanese cooperation under the Project and take actions to disseminate information to peoples of Uzbekistan as well as visitors from foreign countries.



Item	Quantity	Priority
A. Restoration & Transport Equipment		
Wagon lift	2	A
Equipment for grinding vertical brick wall	1	B
Injection equipment for strengthening raw wall (thickness up to 5m)	1	B
Vehicle for high place works	2	A
Set of light scaffolding capable to be assembled and disassembled	10	A
Cargo Truck with crane for the above equipment	2	A
Weighing device 31kg × 0.1, 2100g × 0.01	5	A
Hand piece for both stone and wood material	5	A
Pickup Truck	5	A
B. Land Survey & Registration Equipment		
Laser Distance Meter (30m)	5	B
Laser Distance Meter (800 to 1000m)	5	B
Automatic level with tripod, rod	2	A
Total Station with Prism, Tripod	2	A
Land Survey Instrument (Level, Binocular etc.)	2	A
Drawing software with P/C, printer, scanner	5	A
Inkjet Printer for drawing (A0)	1	A
Scanner for designing (A0)	1	A
GPS	2	A
C. Equipment for Monument Monitoring		
Concrete & Mortar Moisture tester	5	A
Photographing Equipment	5	A
Complete set of the equipment on examination of walls by a method of an endoscope	1	B
Mirror for examination almost inaccessible places	5	A
Shmit hammer	5	A
Width gauge of crack opening	5	A
Thickness gauge of protected layer	5	B
Data logger (temperature & humidity)	5	A
Thermometer & Humidity recorder (Analog)	5	A
Ph meter	5	A
Metal Detector	5	A
Material testing instruments at site	5	A

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.

Fourthly, 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

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 Basic Design 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 views,
- 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 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 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 (from April 1st until March 31st), 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.

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

(4) Under the Grant, 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 (Verified 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,
- 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 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 facilities constructed and 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 deemed necessary 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 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.

(10) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions to the Bank.



Major Undertakings to be Taken by Each Government

NO	Items	To be covered by the Grant	To be covered by the Recipient
1	To bear the following commissions to 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 or Land) 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 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		●

R. 9.

L. P. Singh

Reference 5. Cost borne by the counterpart

Breakdown of the operation/maintenance cost

Summary

(in million yen)

Cost item	Elevating work vehicle	Cargo truck	Pickup truck	Subtotal
Maintenance/repair	0.29	0.36	0.26	0.91
Manpower	0.00	0.00	0.00	0.00
Fuel	0.19	0.29	0.36	0.91
Oil and grease	0.01	0.01	0.01	0.03
Total	0.49	0.66	0.63	1.78

Maintenance cost for vehicles

Equipment name	Q'ty	Unit cost (million yen)	Ratio of maintenance/repair cost (%)	Service life (years)	Procured part ratio (%)	Amount (million yen)
Elevating work vehicle	2	9.70	25	10	10	0.29
Cargo truck	2	5.00	35	7	10	0.36
Pickup truck	5	1.50	35	7	10	0.26

Fuel cost for vehicles

Equipment name	Q'ty	Fuel consumption per horsepower	Horsepower	Annual use hours	Cost per liter	Total (million yen)
Elevating work vehicle	2	0.030	130	1200	20	0.19
Cargo truck	2	0.040	150	1200	20	0.29
Pickup truck	5	0.037	80	1200	20	0.36

Oil and grease cost for vehicles

Equipment name	Q'ty	Capacity	Replacement frequency	Price per liter	Total (million yen)
Elevating work vehicle	2	20	2	100	0.01
Cargo truck	2	20	2	100	0.01
Pickup truck	5	5	2	100	0.01

Reference 6 Reference material/collected material lists

Reference name	Original/copy	Q'ty	Source
The "Meros" (Heritage) Program	Copy	1	Ministry of Culture
The Decree of the Parliament of the Republic of Uzbekistan	Copy	1	Ministry of Culture
Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No.269	Copy	1	Ministry of Culture
Answers to questionnaire	Copy	1	Ministry of Culture
Map of Uzbekistan	Original	1	Ministry of Culture

Reference 7. Other references

Existing equipment list (Bukhara, Shakhryabz, Khiva, Samarkand)

Bukhara: Existing equipment

No.	Equipment name	Q'ty	Manufactured in	Origin	Application
1	Brick treatment machine tool	1	1998	Russia	Special treatment of bricks for restoration
2	Concrete mixer	3	1991	Russia	Preparation of concrete
3	Vacuum pump	2	1994	Russia	Delivery of concrete mixture
4	Vibrating sieve	1	1994	Russia	Sand sieving
5	Ball mill	1	1993	Russia	Processing metal unit
6	Membrane pump	2	1995	Russia	
7	Solution pump	2	1995	Russia	Delivery of solution
8	Puncher	1	1996	Russia	Drilling hole in concrete
9	Muffle furnace	1	1992	Russia	Burning of articles
10	Magnetic separator	1	1995	Russia	Cleaning of mixture
11	Heating generator	1	1996	Russia	Room heating
12	Solution mixer	1	1987	Russia	Preparation of solution
13	Thermocouple	6	1992	Russia	Temperature control
14	Welding tool	1	1989	Russia	Electric welding
15	Disc machine tool	1	1988	Russia	Wood works
16	Mark machine tool	1	1989	Russia	Wood works
17	Jointer	1	1989	Russia	Wood works
18	Carving jointer	1	1984	Russia	Wood works
19	Grinding machine tool	1	1982	Russia	Sharpening of tools
20	Milling machine	1	1986	Russia	Metal processing
21	Crane "Pioneer"	1	1978	Russia	Freight shifting
22	Tractor "Belorussia"	1	1984	Russia	Excavation work
23	Mine lifter	1	1986	Russia	Freight shifting
24	Tractor T-28 with cart	5	1991	Russia	Excavation work

Shakhrisyabz: Existing equipment

No.	Equipment name	Q'ty	Manufactured in	Origin	Application
1	Tractor T-28	1	1989	Russia	Excavation work
2	Tractor T-29	1	1984	Russia	Excavation work
3	Tractor T-30	1	1990	Russia	Excavation work
4	Tractor T-31	1	1995	Russia	Excavation work
5	Tractor T-40	1	1994	Russia	Excavation work
6	Tractor "Belorussia"	1	1994	Russia	Excavation work
7	Jointer	1	1982	Russia	Wood works
8	Welding tool	1	1979	Russia	Electric welding
9	Saw frame	1	1985	Russia	Wood works
10	Grinding machine tool	1	1980	Russia	Sharpening of tools
11	Brick kiln	1	1994	Handicraft	Kiln for bricks
12	Circular saw	1	1995	Russia	Wood works
13	Air-brush	1		Russia	Painting of surface
14	Breeze block line	1	1995	Handicraft	Production of breeze blocks
15	Electric winch-2t	1	1996	Russia	Freight shifting
16	Electric polishing machine	1	1996	Russia	Metal works
17	Gas generator	1	1996	Russia	Gas welding
18	Woodworking machine tool	1	1996	Russia	Wood works
19	Woodworking machine tool	1	1999	Russia	Wood works

Khiva (Itchan kala): Existing equipment

No.	Equipment name	Q'ty	Manufactured in	Origin	Application
1	Pump NSh-50	1	1989	Russia	Water pump
2	Polishing tool	1	1992	Russia	Metal treatment
3	Drilling machine tool	1	1984	Russia	Metal treatment
4	Air-brush	1	1993	Russia	Painting of surface
5	Tractor T-28	4	1990, 1991, 1998, 1999	Russia	Excavation work
6	Caterpillar excavator	1	1993	Russia	Excavation work
7	Disc machine tool	2	1994, 1996	Russia	Wood works
8	Woodworking machine tool	1	1983	Russia	Wood works
9	Compressor	1	1987	Russia	High pressure air
10	Crane	1	1988	Russia	Freight shifting
11	Truck MAZ-555	1	1973	Russia	Freight transportation
12	Universal machine tool	1	1988	Russia	Metal processing

Samarkand: Existing equipment

No.	Name of equipment	Q'ty	Manufactured in	Origin	Application
1. Restoration site					
1	Deep vibrator	1	1996	-	-
2	Wood processor	1	1995	-	-
3	Mast lift	1	1996	-	-
4	Deep pump	1	1991	-	-
5	Milling machine	1	1997	-	-
6	Planer	1	1981	-	-
7	Concrete mixer	1	1993	-	-
8	Marble cutter	1	1998	-	-
9	Marble cutter	1	1998	-	-
10	Welding machine, complete	1	1996	-	-
11	Rolling mill	1	1998	-	-
12	Field vibrator	1	1996	-	-
13	Mast lift	1	1990	-	-
2. Marble workshop					
1	Stone cutter	1	1981	-	-
2	Stone cutter	1	1984	-	-
3	Marble cutter	1	1995	-	-
4	Marble cutter	1	1998	-	-
3. Stone cutting workshop					
1	Pipe sheet	1	1981	-	-
2	Clay mixer	1	1992	-	-
3	Clay mixer	1	1992	-	-
4	Ball mill	1	1996	-	-
5	Spherical crusher	1	1996	-	-
4. Transport machines					
1	Truck	1	Available	-	-
2	Elevating work vehicle	1	Available	-	-
3	Dump truck	1	Not available	-	-
4	Dump truck	1	Not available	-	-
5	Truck	1	Not available	-	-
6	Truck	1	Not available	-	-
7	Bus	1	Not available	-	-
8	Passenger vehicle	1	Available	-	-
9	Passenger vehicle	1	Available	-	-
10	Passenger vehicle	1	Available	-	-
11	Truck	1	Available	-	-

