No.

MINISTRY OF HIGHER AND SECONDARY SPECIALIZED EDUCATION
THE REPUBLIC OF UZBEKISTAN

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF EQUIPMENT FOR THE TASHKENT INSTITUTE OF TEXTILE AND LIGHT INDUSTRY
IN
THE REPUBLIC OF UZBEKISTAN

OCTOBER 2000

JAPAN INTERNATIONAL COOPERATION AGENCY
UNICO INTERNATIONAL CORPORATION

G R 1
CR (2)
00-170

MINISTRY OF HIGHER AND SECONDARY SPECIALIZED EDUCATION
THE REPUBLIC OF UZBEKISTAN

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF EQUIPMENT FOR THE TASHKENT INSTITUTE OF TEXTILE AND LIGHT INDUSTRY
IN
THE REPUBLIC OF UZBEKISTAN

October 2000

JAPAN INTERNATIONAL COOPERATION AGENCY
UNICO INTERNATIONAL CORPORATION

PREFACE

In response to a request from the Government of the Republic of Uzbekistan, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Equipment for the Tashkent Institute of Textile and Light Industry and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Uzbekistan a study team from April 5 to May 3, 2000.

The team held discussions with the officials concerned of the Government of Uzbekistan, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Uzbekistan 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 the Republic of Uzbekistan for their close cooperation extended to the teams.

October, 2000

Kunihiko Saito
President
Japan International Cooperation Agency

October, 2000

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of Equipment for the Tashkent Institute of Textile and Light Industry in the Republic of Uzbekistan.

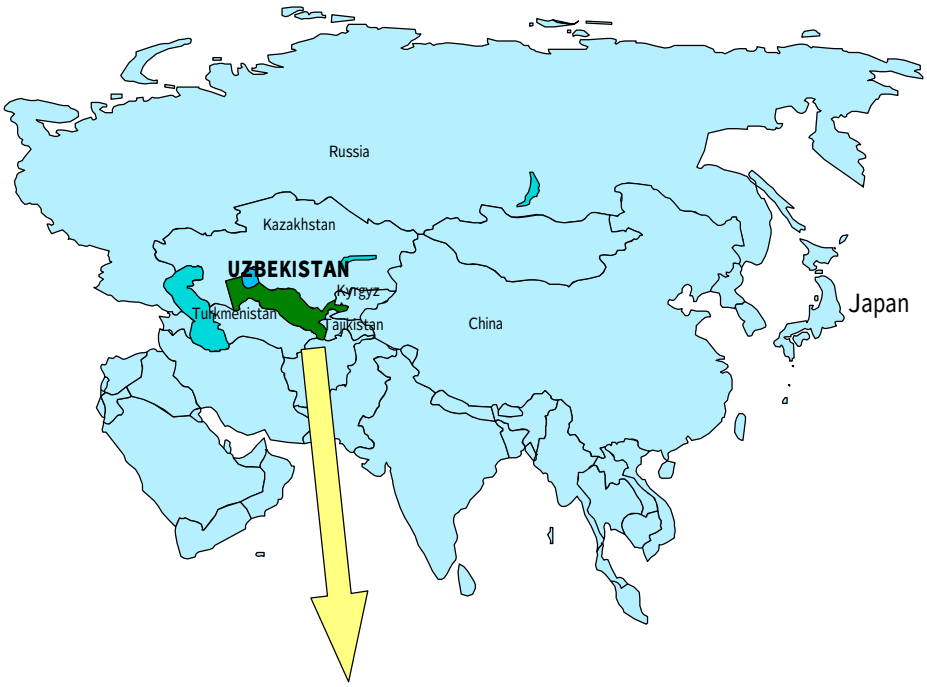
This study was conducted by UNICO International Corporation, under a contract to JICA, during the period from March 15, 2000 to November 10, 2000. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Uzbekistan and formulated 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.

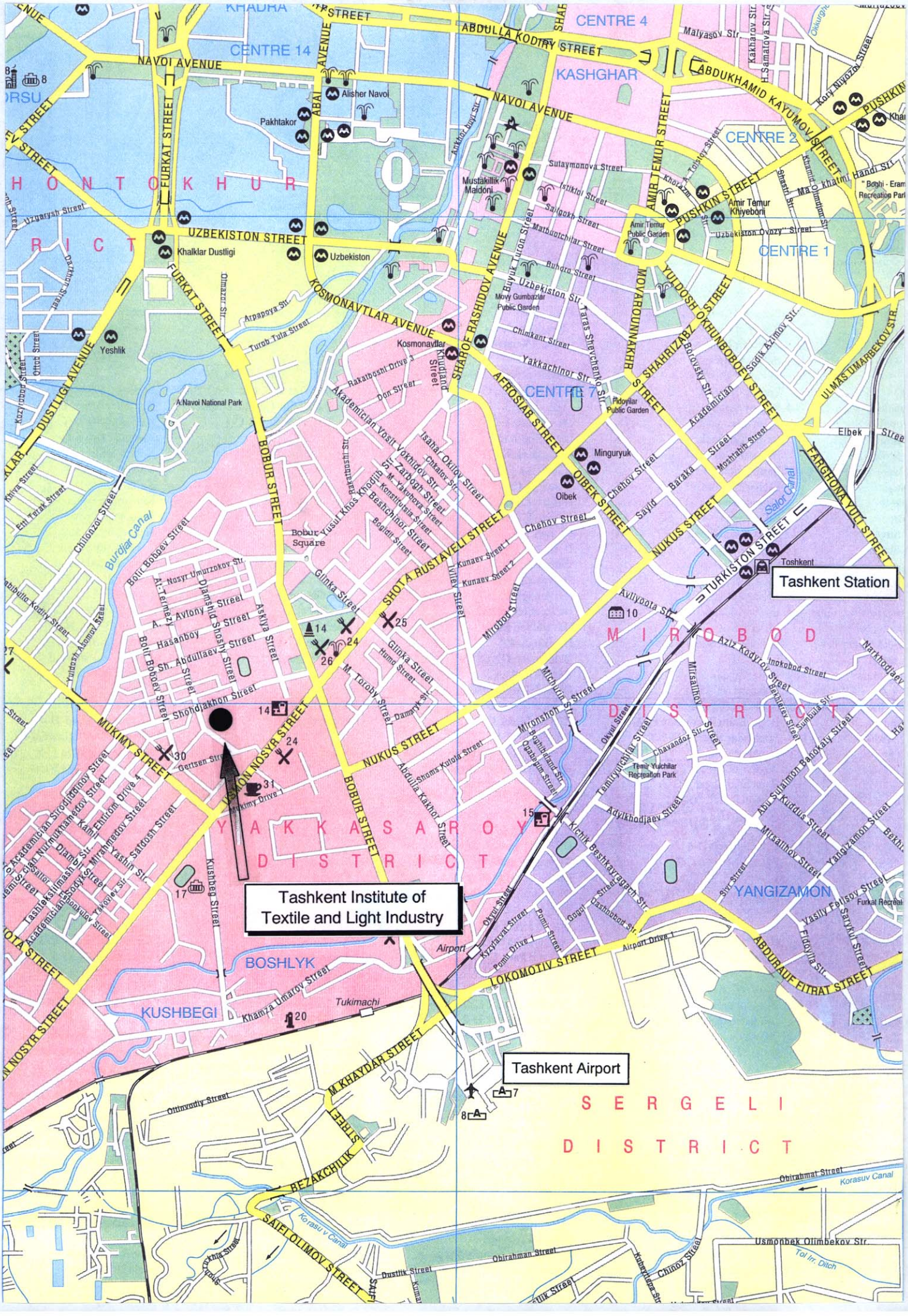
Very truly yours,

Wataru Shiga
Project manager,
Basic design study team on the
Project for Improvement of
Equipment for the Tashkent
Institute of Textile and Light
Industry,
UNICO International Corporation

Location Map



Location of Project Site



ABBREVIATIONS

ADB	:	Asian Development Bank
A/P	:	Authorization to Pay
CAD	:	Computer Aided Design
CIS	:	Commonwealth of the Independent States
EBRD	:	European Bank for Reconstruction and Development
E/N	:	Exchange of Notes
EU	:	European Union
GDP	:	Gross Domestic Product
IBRD	:	International Bank for Reconstruction and Development
ICAC	:	International Cotton Advisory Committee
IDA	:	International Development Association
JBIC	:	Japan Bank for International Cooperation
JICA	:	Japan International Cooperation Agency
J/V	:	Joint Venture
LAN	:	Local Area Network
MHSSE	:	Ministry of Higher and Secondary Specialized Education
TACIS	:	Technical Assistance for CIS
TEMPUS	:	Trans European cooperation scheme for higher education
TITLI	:	Tashkent Institute of Textile and Light Industry
UNDP	:	United Nations Development Program
UNICEF	:	United Nations International Children's Emergency Fund
UPS	:	Uninterruptible Power Supply

TABLE OF CONTENTS

Appendices

CHAPTER 1 Background and History of the Project

Chapter 1 Background and History of the Project

1-1 Present Situation of the Relevant Sectors

1-1-1 Higher Level Plans

(1) Overview

Since attaining independence in 1991, the Government of Uzbekistan has pursued a process of transitioning towards a market economy that has been gradual in comparison with other Central Asian countries. Domestic affairs have progressed in conformity with the five principles championed by President Islam A. Karimov, namely (1) priority of the economy over politics, (2) government-led reform, (3) constitutional government, (4) improvement of social security, and (5) phased, sustained, stable reform, relations with other CIS nations have been improved, and a basic stance of reintegration with Asia has been at the heart of foreign policy. Further, foreign direct investment and improved economic relations with advanced countries has been emphasized as part of the efforts to establish a new national economy and achieve a higher degree of economic independence, and a proactive policy has been adopted with regard to enlisting the assistance of international organizations for improvement of the national infrastructure and development of human resources. Uzbekistan in comparison to other Central Asian nations is populous (about 23 million capita), has high birth and literacy rates (about 2.3% and 97% respectively), has an economy that is based largely on agricultural products (about 36% of GDP), is well endowed with mineral resources (gold, copper in particular) and energy resources (petroleum and gas), and in geophysical terms is located at a critical point in the region. For these reasons the country has been recognized as having high potential for development.

The composition of GDP by sector is 36% is accounted for by agriculture, 29%

by industry, 13% by construction and about 22% by services. The composition of employment is about 42% of jobs are in agriculture, 14% in industry, 8% in construction, 11% in other productive sectors combined, and about 25% in the nonproductive sectors (social services). Uzbekistan's industrial sector in world standings is fifth in cotton production, third in cocoons and eighth in gold; because the nation is well endowed with agricultural, mineral and energy resources, emphasis has been given to manufacturing industry that processes domestic resources. The textile industry, utilizing domestic cotton and silk, accounts for a share of industrial output that exceeds 37% while machinery industry, supplying a variety of agricultural equipment, cotton yarn reeling equipment, cottonseed oil pressing equipment, leather processing equipment and other types of equipment and machinery for the agricultural production and processing industries accounts for about 10%, and the energy industry accounts for about 7%. In the industrial sector, processing of agricultural resources, particularly cotton, is of central importance.

(2) The Textile Industry

During the Soviet Union era, Uzbekistan produced more than 60% of Soviet cotton, and because of the existence of a monoculture economy that was skewed towards supplying raw materials through cultivation of cotton, the domestic processing rate was limited to about 10% as almost all of the cotton crop was exported to former Soviet Union countries. This created a barrier to the development of textile processing industry in Uzbekistan, and under conditions of the command economy that then prevailed most production was in very large mills that made textile goods for export of other Central Asian nations. According to statistics for 1998-99 from the International Cotton Advisory Committee, Uzbekistan is in fifth place in the world in cotton production, sixth in cotton yarn production, and seventh in cotton textile production, but for all three categories production had declined

relative to 1993.

Since attaining independence, in the field of cotton processing, that is at the core of the country's industrial sector, spinning, dyeing and finishing, and sewing of cotton yarn and cotton textile products has been done in integrated cotton mills, and all of these have been owned by companies under the control of Uzbeklegprom (light industry organization) which is an equivalent of a ministry. Major products of these mills include cotton yarn, wool yarn, cotton fabric, natural silk fabric, chemical fiber fabric, sewing thread, embroidery thread, cotton garments, woolen fabric, carpets, and nonwoven fabric, etc. Under the control of Uzbeklegprom there are large textile combines in the cities like Tashkent, Bukhara, Andijan, Fergana, Namangan. At most of these combines both cotton spinning and cotton fabric production are performed. In general, yarn spun at any mill is used at the same mill to make fabric. The combines at three locations, namely in Tashkent, Bukhara, and Andijan, are integrated spinning and processing mills and also do dyeing and finishing of fabric produced elsewhere including other combines. The major characteristics of the textile products of Uzbekistan, and the production facilities, are that the count of cotton yarn is low, many of the spinning facilities are of the high productivity open-ended type, many of the machines are of the former Soviet air rapier type, and more than 30% of the facilities are antiquated or of the old types. The Uzbek Government is well aware that the technology, equipment, production control and quality of products of the country's textile industry are lower than the international standard, and is intent on making a strong effort to raise the value added of products of the textile industry.

Production of cocoons, the source of silk yarn, is at the level of third in the world. Silk yarn output, moreover, is fifth in the world. In the past the administrative oversight for cocoon production planning was at the Ministry of Agriculture while the production and processing of yarn was controlled by Uzbeklegprom. In the absence of an organization having overall control of the silk industry, however, the situation deteriorated and from 1991 to 1998 production volume of silk yarn fell 77% and silk fabric output fell 89%. Background factors of this include loss of coordination between

producers and processes, as sericulturists shifted to the higher-price export markets in efforts to achieve short-term improvements in corporate financial conditions, so that of their output of dry cocoons, 82% in 1997 and 94% in 1998 were shipped directly to export markets, making precipitous drops in domestic processing unavoidable. The Government, taking note of this situation, established the Uzbek Ipagi (silk industry association) in 1998, to bring oversight of silk related companies, which had previously been the concern of the Ministry of Agriculture and Uzbeklegprom, to a single place. The association has separate divisions for silk yarn related companies and for silk fabric related companies, and also carries out activities related to foreign companies investing in the industry. The foreign presence has been increasing steadily in recent years. As the grade of yarn produced in the country is at this time low, plans have been made to change over to production of higher grades, that meet international standards, to stimulate domestic demand, and to substitute for imports. For this reason improving the rate of domestic processing, and raising quality levels, have become urgent issues.

(3) Industrial Policy

On the basis of the foregoing situation, the Uzbekistan targets now are to raise the domestic production rate from 10% to 25% in 2000, to raise the quality levels of textile products, to raise the value added of those products, to ensure competitiveness against imported products in the domestic market, and to establish an industrial structure that contributes to improvement of the balance of payments by substituting for imports. In recent years there has been a surge in the inflow of foreign investment, responding to this industrial policy. As of the most recent tabulation, 23 joint ventures (JVs) factories have been established under the auspices of Uzbeklegprom, for production of cotton yarn and cotton fabric. At these factories the installation of state of the art production equipment as used in automated mills in

Japan and Europe is evident. There are four joint ventures with foreign equity participation under the auspices of Uzbek Ipagi, including JVs that are being planned, and the manufacture of silk products characterized by higher competitiveness than those previously made in Uzbekistan has begun. Consonant with this process of modernization of industrial production facilities keyed to the new industrial policy, need has arisen for both modern technology and software, and the education and training of technical specialists who understand and can work with the new hardware.

1-1-2 Present Situation and Issues

Establishment of a new educational system that can prepare the human resources needed by industry is progressing at the initiative of the Uzbek Government and with the highest priority assigned to it. The Government is seeking to optimize the realization of the intellectual potential of the nation's human resources, through elevating the levels of education and culture, and by improving both the content of all educational courses and subjects as well as the quality of educators. The nation had already adopted a nine-year compulsory education program (four years of primary school, five years of lower middle school) and attained the extremely high literacy rate of over 97%. Up to the present, 55% of those who completed the lower middle school program or equivalent advanced to obtain a general or vocational education in the higher middle school program, and about 10% advanced to institutions of higher learning. Almost all graduates of the latter subsequently obtained employment. These latter programs, however, are threatened by the return of Russian academics and technicians to their own country following Uzbekistan's attainment of independence, causing a shortage of intermediate-qualification technicians and senior technicians -- that is, a shortage of technical personnel. The major problems confronted by the education system in

Uzbekistan, then, are:

- Insufficient technical subjects and information in all education curricula
- Shortage of experienced educators
- Shortage of educational equipment, high-quality scientific equipment, and reference books
- Insufficient, inadequate coordination between academia, the scientific community, and the industrial community

To deal with these conditions, the Uzbek Government has done the following. It has streamlined the higher middle school institutions, which hitherto had lacked a system of unification. It has formulated a new law called " On Education" in August of 1997 as a means of developing the human resources, through implementation of a systemic educational program, that have the capability of functioning in a market economy. Further, in September of the same year it announced a "National Program for a Human Resources Training System" and is working at a fundamental reform of the educational system, including higher middle school education in the tiers of compulsory education.

The National Program designates 1997-2001 as the "Preparatory Stage for Reform," 2001-2005 as the "Implementation Stage for Reform," and 2005 onward as the "Reform Follow-Up and Improvement Stage." Because this program seeks to establish an educational system capable of complying with the rapidity of social change, it incorporates plans for improvement of vocational education at all levels including compulsory education, and assigns emphasis to educating workers who will be able to be immediately useful in industry after they complete their studies. A reorganization of schools at the level of higher middle school has been begun in accordance with that, and completion of vocational education courses has been made a requirement at the professional colleges and academic lyceums. Special support for changes in the higher middle school program has been provided by the Asian Development Bank, the Japan Bank for International Cooperation, the Government

of the Republic of Korea, and other sources of assistance.

The National Program provides for measures for the improvement of higher education and postgraduate education in order to establish a driving force for the reform of higher middle school education. With regard to university education, the former standard course for technicians (five years duration) has been revised by creating a two-stage program, comprising a baccalaureate program (minimum four years) and a master's program (minimum two years) so as to enable the supply of a greater, more specialized education. In proceeding with these reforms, the most important policies related to university education are these:

- Establishment of public educational standards for bachelors' and masters' degree programs
- Re-education and refresher courses for educators (including study experience at foreign schools and research institutes)
- Structural reform of higher education institutions
- Improvement of the management of higher education institutions, augmenting their autonomy, and making them more open
- Realization of coordination or cooperation of academia, the research community, and the industrial community
- Establishing private ownership of education, self-education, distance learning, etc.
- Supplementing education by means of new pedagogical methods and information technology

This project has the objective of improving educational and learning equipment required for the field of education for supply of textile engineers to the industry, so that the Tashkent Institute of Textile and Light Industry can accomplish its goals in accordance with the higher-level National Program.

1-2 Summary of Grant Aid Request

The Tashkent Institute of Textile and Light Industry was established in 1932

as the Textile Institute, with the objective of educating technical personnel for the textile and light industry sector of the economy, Uzbekistan's major industrial sector. Education was provided in four areas, cotton primary processing, cotton spinning, silk processing, and weaving, and in 1935 the first graduates, in the cotton primary processing department, left the school to take up employment. In the subsequent years the institution performed an important function as the only place in the former Soviet Union and then the CIS countries where advanced education in textile industry subjects was provided as a college program. Over the years, the Tashkent Institute of Textile and Light Industry educated about 40,000 persons in its special fields, namely cotton spinning, chemical fibers, silk yarn, textile materials, woven and knits production, apparel, shoemaking, and so on. During the former Soviet Union era, this school, located in one of the world's major cotton producing regions, attracted students from all over the world. They came from about 30 countries, in Asia, Africa, Latin America and elsewhere and number more than 700.

At the university, on the basis of the National Program for a Human Resources Training System, the educational offering comprises a baccalaureate course designed to prepare graduates for production work assignments in industry promptly upon graduation, and a master' s course in which emphasis is given to the application of researches to actual production work. Both are degree programs. Lab courses cover a wide span, matching the requirements of industry: spinning, weaving and knitting of cotton, silk and chemical fiber yarn, sewing, dyeing, finishing and processing. Thus, coverage is both downstream and upstream in industry terms. There are six faculties, namely Cotton Technology and Mechanics, Mechanical-Technological, Light Industry, Engineering Economics and Chemical Technology, Engineering Pedagogy, and Correspondence Courses. From two to eight departments offer courses in each faculty. Research work is done in laboratories of which there is one lab for each specialized subject. According to evaluations released in 1999 by the State Testing Center, that administers the uniform entrance exam for all Uzbek colleges, the Tashkent Institute

of Textile and Light Industry is in the No. 1 position among leading 32 colleges evaluated. Indicators used to arriving at the evaluation were level of knowledge of students, pedagogical methods, repleteness of faculty and equipment, spontaneity of the students, repleteness of testing and practical work, accomplishments in scientific research, moral education activities, school-to-work connections, international cooperation, and others. This rating does not reflect only the abilities of the students but is thought to signify that the Institute occupies a prominent position in education in Uzbekistan.

At present the number of students is about 2,500 and the faculty number 820. Many graduates are now working in positions in corporate management, or as senior engineers at government offices, public corporations, academic institutions, research institutions, joint ventures and elsewhere. Two branch colleges that have been separated from the Tashkent Institute of Textile and Light Industry and five others on an affiliate basis send students to the Institute for applications-centered studies. Addition of these students brings another 10,000 trained at Tashkent Institute of Textile and Light Industry in the course of a year. In terms of administrative affairs Tashkent Institute of Textile and Light Industry is under the Ministry of Higher and Secondary Specialized Education but at the same time ties to industry are strong as a result of the applications-centered courses. There is a particularly strong relationship with Uzbeklegprom. About nine out of ten of the employees of companies that for which this organization has administrative responsibilities are graduates of the Institute. Moreover, as a public entity that has a relationship with the Institute there is Uzpahtasanoatsotish which is the cotton industry association that represents primary processors, as well as Uzbek Ipagi. Together with Uzbeklegprom, the three organizations make up the Guardian Council for the Institute. Relations between the university and industry thus are very strong, and it is said that during the Soviet era the intake capacity of students of the Tashkent Institute of Textile and Light Industry was determined on the basis of the production plans and labor requirements

of the state-owned textile mills. Influence of the industry extends to the Institute's curriculum. Recently the Institute, in response to needs in industry has increased the emphasis given to practical experience in instrumentation and certification testing for the improvement of textile product quality, for computer applications for production and management control, and foreign language education.

Much of the equipment presently in use in the Institute is 20 years old or older, and has Russian or East European origin. These pieces of equipment are old in type and obsolescent, in addition to which as in many cases the original manufacturer is no longer in business, replacement parts cannot be obtained. In contrast, graduates are likely to find that at the textile industry firms where they go to work, and especially the joint ventures, both the technology and equipment are new and quite different from that which they experienced in school. And because a vigorous movement to acquire new testing equipment and replace older equipment as means for making breakthrough gains in quality control is now evident in industry, the curriculum at the Tashkent Institute of Textile and Light Industry in this respect cannot keep up with changes in industry and in industry's desiderata regarding education. Because of this reason, a request for cooperation through grant aid was made to the Government of Japan. Specifically, the request was for equipment for which need was extremely urgent and extremely important, for replacement of outdated equipment, for supply of equipment not now available at the Institute, and acquisition of new equipment. The equipment requested is as summarized in Table 1-1.

Table 1-1 Outline of the Requested Equipment

Equipment	Q'ty
1. Natural Silk Processing	
(1) Equipment for Raw Silk Certification Technology	1 lot
(2) Equipment for Silk Filature and Weaving	1 lot
2. Textile Testing	
(1) Equipment for Cotton Spinning	1 lot
(2) Equipment for dyeing, finishing and printing	1 lot
3. Garment Processing	
Equipment for Sewing and Embroidery	1 lot
4. Socks Production	
Socks Knitting Machine, Overlock Machines	1 lot
5. Underwear Production	
Circular Knitting Machines	1 lot
6. Shoe Design and Production	
CAD System, Cutting Machine	1 lot
7. Computers for Training and Management	
Computers, Peripherals	1 lot

1-3 Trends of Japanese Official Development Assistance

Japanese assistance for the development of Uzbekistan began in 1991 with the acceptance of trainees and dispatch of specialists, followed by the start of grant aid cooperation in 1994 and loan facilities in 1995. Grant aid cooperation at present comprises general grant aid, non-project grant aid, grant aid for increased food production, and grant aid for cultural activities. The areas of emphasis for Japanese assistance are support for the transition to a market economy, improvement of transport infrastructure, protection of the environment, medical care services in regional communities, and support for establishment of democratic institutions and public administration. The major national suppliers of development aid to Uzbekistan are Japan, Germany and the United States, and during fiscal 1997 Japan accounted

for 75% of all bilateral aid. Grant aid from Japan provided to assist Uzbekistan is as summarized in Table 1-2.

Table 1-2 General Grant Aid Projects by Japan

Year	Project Tile	Amount (million yen)
1994	The Project for Improvement of Medical Equipment for Maternal and Child Hospitals in Samarkand and Navoi	650
1995	The Project for Improvement of Maternal and Child Medical Equipment in the Eastern Provinces	400
1996	The Project for Supply of Road Construction and Maintenance Equipment	960
1997	The Project for Improvement of Medical Equipment for Maternal and Child Hospital in Middle Provinces	676
1998	The Project for Supply of Medical Equipment for Maternal and Child Hospitals in Karakalpakstan	470

In the area of human resources, the Government of Uzbekistan plans to include higher middle school (the professional colleges and the academic lyceums) in the compulsory education program in 2005, and to increase the number of academic lyceum to 181 and professional colleges to 1,611. In accordance with that, plans are being made to reform facilities, improve equipment, rewrite textbooks and improve the book distribution process, and train teachers. This is being done with, in particular, support from the Asian Development Bank and the Government of Japan. Tashkent Institute of Textile and Light Industry has been designated as one of the institutions that have a role in educating and re-educating higher middle school teachers as part of these activities. Further, study is being made by the Japan Bank for International Cooperation for provision of financial assistance for this program while the Japan International Cooperation Agency is studying the offer of technical cooperation through means including the dispatch of experts.

1-4 Assistance by Other Donors

Assistance is being provided to Uzbekistan by financial institutions and international agencies such as the European Committee of the European Union, UNICEF, UNDP, IBRD, IDA, EBRD and ADB. Noteworthy among these efforts is assistance provided through TACIS, the technical assistance program for CIS nations established by the EU, which has been a source of assistance since 1991. These activities are contributing to change in the areas of administrative reform, social security, education, agriculture, energy, improvement of public corporations, promotion of privatization, and more, making TACIS the largest single source of assistance to Uzbekistan. The value of assistance by TACIS up to 1999 planned figures totals 130 million ECU. Also significant is the aid by the World Bank group for public health and health care (drinkable water project), waste management, and support for privatization, and loans and credits from the EBRD in support of industry and infrastructure projects. The ADB is supportive of infrastructure improvement, financial system reform, human resources development, and agricultural sector development projects, through loans and technical cooperation.

By way of cooperation for human resources development for higher education, a number of projects are now being implemented by TACIS (see Table 1-3). These comprise the Uzbek portion of what is called TEMPUS, for the Trans European Cooperation Scheme for Higher Education. This is part of "soft" cooperation on behalf of educational system reform in the CIS countries, including reform of college education. Tashkent Institute of Textile and Light Industry has sent faculty to Ghent University in Belgium and others as part of the program. In the event that Japan provides educational equipment as grant aid it is expected that those persons being trained in Belgium will have a central role especially in the operation and maintenance of the equipment.

Table 1-3 Assistance by EU in Human Resource Development

Project Name	Executor	Period	Project Component
Post academic degree in telematic	Coordinator: Antveroen Institute of Electric Techniques (Belgium)	1997-1999	Work out restructure program of training for post-graduates in field of telematic
	Recipient: Tashkent Institute of communication		
	Partners: University of Patra (Greece)		
Pchycology of health (Master course)	Coordinator: Sunderland University (GB)	1997-1999	Work out of Master course in pshycology of health, creation of centre of psychology of health.
	Recipient: Tashkent State University		
	Partners: University of Salamanka, Valencia (Spain)		
Economy of tourism (educational program)	Coordinator: Grenoble University (France)	1998-	Work out of curriculum in economy of tourism.
	Recipient: Bukhara State University		
	Partners: University of Toronto (Italy). University of Lymeric (Ireland)		
Management study in energetical field	Coordinator: Athens Technological Educational Institute (Greece)	1998-2000	Creation the course of study in management in field of energy supply, work out of curriculum and methodical materials.
	Recipient: Tashkent State Technical University		
	Partners: Berlin Technical University (Germany).		
Modernization of curriculum in field of textile industry	Coordinator: Piraeus Technological Educational Institute (Greece)	1998-2000	Assistance to TITLI in adaptation and mod-ernization of curriculum and methods of teaching in accordance with new demands of textile industry.
	Recipient: TITLI		
	Partners: Ghent University (Belgium)		
Reforming of teacher's training with use of information technologies	Coordinator: Biostone State College	1999-2001	Work out of new curriculum in teacher's train-ing in field of constant study in two higher institutions of the Republic of Uzbekistan.
	Recipient: Samarkand Institute of Foreign Languages		
	Partners: University of Oulu (Finland). Karshy State Uni.		
Teacher's training for the program of Masters in field of information	Coordinator: Technical University of Hamburg (Germany)	1999-2001	Training of the professor-teachers' staff on work out of curriculum in field of information technologies with a view of
	Recipient: Tashkent State Technical University		
	Partners: Karshi Institute of Economical Engineering		
Improvement of University management	Coordinator: University of Fonties (Holland)	1999-2000	Management improvement of external and internal systems of information provision.
	Recipient: Tashkent State University		
	Partners: University of Central Lankashire (GB)		
Development of modernization of University management structure	Coordinator: University of Granada (Spain)	1999-2000	Improvement of management system of higher educational institutions by teaching admini-stration and academic management, interfac-ulty communication net and student
	Recipient: Uzbek State University of World Languages		
	Partners: University Abo Academy (Finland), Tashkent Medical Institute-2		
Remote education in Uzbekistan	Coordinator: Technical University of Hamburg (Germany)	1999-2001	Work out of the remote education system and teachers training for its apply in two technical institutions with a view of further spreading their experience among the other higher educa-tional institutions of the republic.
	Recipient: Tashkent State Technical University		
	Partners: University ofTwente (Holland), Navoiy Mining		
Democracy and transition to market economy	Coordinator: University of Exeter (GB)	1999-2001	Support of the democracy formation process and transition to market economy in the Re-public of Uzbekistan. Assistance in work out of prospective directions of development of the republic and Central Asian region in a whole.
	Recipient: Tashkent State University		
	Partners: Gent University (Belgium), University of Bielfeld (Germany)		
IROTAS-department of interna-tional relations in TSEU	Coordinator: Institute of Higher Architecture (Belgium)	1999-2000	Creation of mobile department of international relations, its apply in system of international activity of TSEU, mounting of necessary equipment.
	Recipient: Tashkent State Economical University		
	Partners: Milan Politechnical Institute (Italy), Gent University (Belgium).		

CHAPTER 2 Circumstances Surrounding the Project

Chapter 2 Circumstances Surrounding the Project

2-1 Implementation of the Project

2-1-1 Organizations and Staffing

(1) Competent Government Agency

The administrative agencies responsible for the education sector in Uzbekistan are the Ministry of Public Education, for primary and lower middle school education, and the Ministry of Higher and Secondary Specialized Education, for higher middle school and college education. The host body for the project will be the Ministry of Higher and Secondary Specialized Education. This Ministry oversees colleges, research institutions, professional colleges, academic lyceums and other educational institutions, and has authority to approve personnel and budget allocations for the Tashkent Institute of Textile and Light Industry (TITLI). The Ministry has a staff of over 30 persons under the Minister and Vice-Minister. It is the General Department of International Relations that is specifically in charge of the project; its head and staff members supervise the Institute. Of the administrative affairs handled there, the following would have particular relevance to the project:

Control of educational methods
Control of compliance with laws and regulations including the National Program for s Human Resources Training System
Management of scientific methods for special skill training and improvement of techniques
Awarding of degrees
Formulation of regulations for admission
Management of levels of faculty staffing
Financial management

The organization chart for the Ministry of Higher and Secondary Specialized Education is shown in Fig. 2-1.

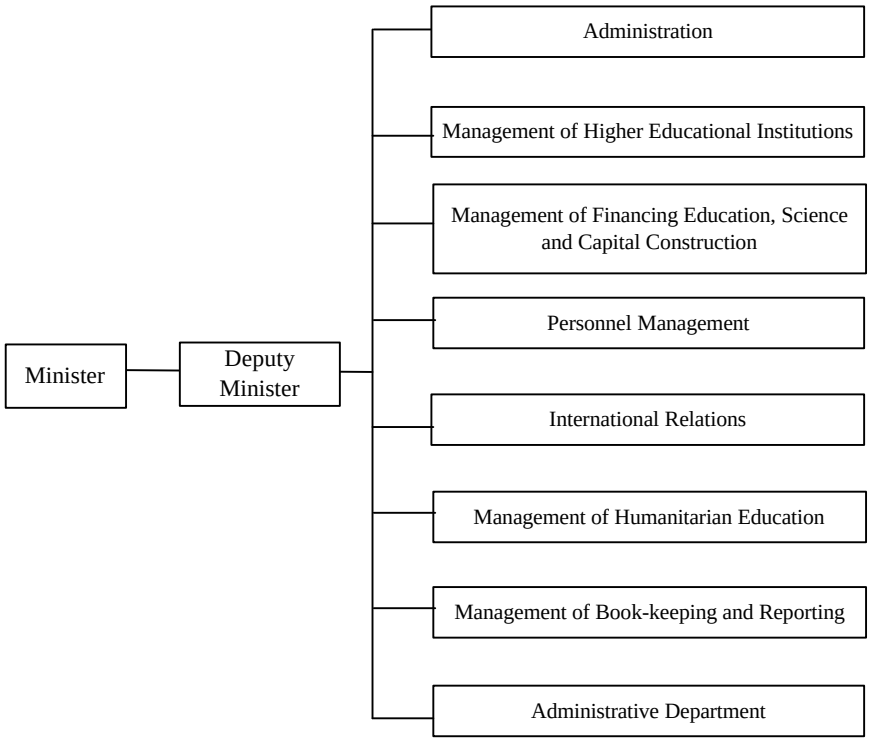


FIG 2-1 Organization Chart of the Ministry of Higher and Secondary Specialized Education

(2) Implementing Agency

The Tashkent Institute of Textile and Light Industry is to be the implementing agency for this project. This Institute is a public organization established under the laws of Uzbekistan and its Rector is appointed by the President of the republic. The school was established with the objective of providing education and training to the students who would work in textile industry, light industry, papermaking industry and printing industry. It has the following autonomous powers.

Decision-making powers within the limits of duties allocated by related laws and regulations that do not conflict with those of the Ministry of Higher and Secondary Specialized Education

Organization of colleges and labor organizations
Approval of hours and wages based on regulations
Establishment of small-scale business activities within the college
Purchase and leasing of materials and equipment by use of subsidies or own funds
Improvement of campus infrastructure

The Tashkent Institute of Textile and Light Industry had employed 820 persons as of 2000. Of these, 281 were academic staff, 74 were lab staff, and 465 had other jobs. The number of academic staff in each department is shown in Table 2-1.

TABLE 2-1 Numbers of Academic Staff by Department

Faculty/Department	Professors	Ass. Professors	Senior Lecturer	Lecturer	Total
Cotton Technology & Mechanics					
1. Initial processing of cotton	2	3	1	1	7
2. Machines and equipment	1	10	3	-	14
3. Theory of mechanisms and machinery details	2	6	1	2	11
4. Foreign languages	-	1	3	11	15
5. Electric technics and automation	1	3	-	1	5
Sub Total	6	23	8	15	52
Mechanical-technological					
1. Spinning department	1	5	1	2	9
2. Technology of weaving and tricot manufacture	2	4	1	6	13
3. Silk technology	2	5	-	1	8
4. Resistance of materials and theoretical mechanic	2	4	1	-	7
5. Engeneering polygraphy	-	4	2	2	8
6. High mathematics	2	7	1	-	10
7. Labor security and heat engineering	1	5	2	-	8
8. Philosophy	2	2	5	3	12
Sub Total	12	36	13	14	75
Light Industry					
1. Technology of garment articles	1	4	3	1	9
2. Design of garment articles	2	6	2	4	14
3. Technology and design of leather articles	2	3	3	1	9
4. Physics	1	6	1	2	10
5. History and law	-	2	2	4	8
Sub Total	6	21	11	12	50
Engineering Economics & Chemical Technology					
1. Management	1	10	2	3	16
2. Marketing and audit	-	6	4	1	11
3. Theory of economy	-	2	3	-	5
4. Polygraphy and design of printing products	-	3	2	1	6
5. Finishing of textile materials & tech. of chem. fibe	3	3		1	7
6. Theoretical chemistry	2	6	-	3	11
Sub Total	6	30	11	9	56
Engineering Pedagogy					
1. Textile materials technology	2	5	1	2	10
2. Information science	-	5	3	-	8
3. Uzbek and Russian languages	1	1	2	2	6
4. Physical training	2	-	6	-	8
Sub Total	5	11	12	4	32
Correspondence					
1. Correspondence	-	1	1	-	2
2. Adult Education	-	1	13	-	14
Sub Total	0	2	14	0	16
TOTAL	35	123	69	54	281

The organization chart of the Institute is shown in Fig. 2-2.

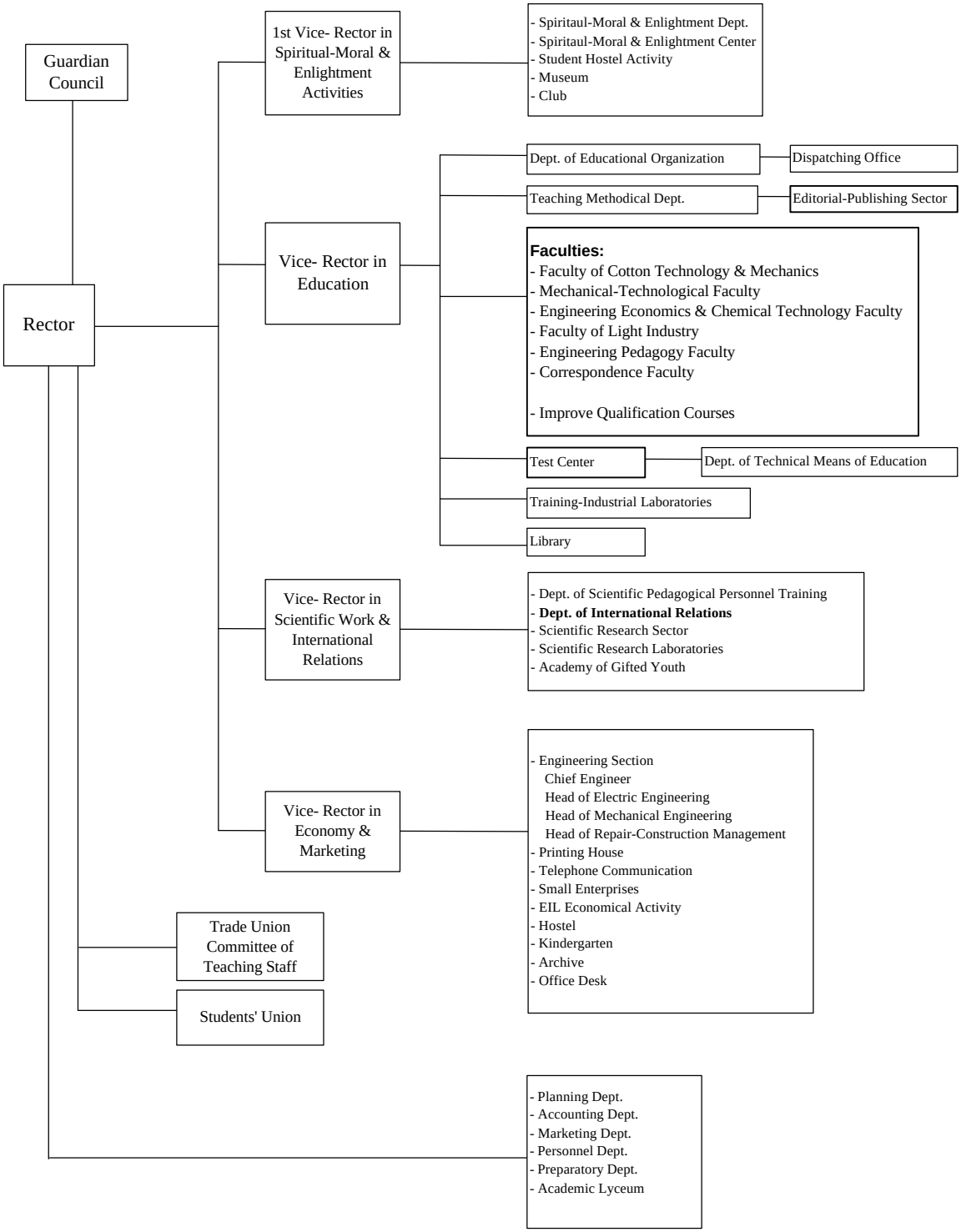


FIG. 2-2 Organization Chart of the Tashkent Institute of Textile and Light Industry

It will be primarily the academic staff and lab staff that will be using the equipment to be furnished by this project, but in some cases students will make direct use of the equipment. The composition of the academic staff, as shown in Table 2-1, is 35 professors, 123 assistant professors, 69 senior lecturers, and 54 lecturers. Many of them have studied in Russian or European universities and have acquired experience in utilizing the latest technology in their fields. The lab staff include lab heads, assistants (senior and ordinary levels), training masters, and others; they are assigned to one or another department where they are in charge of the equipment used by that department. The status of these staff members is various, and includes engineers (engineering school graduates), senior staff (liberal arts graduates), technicians (high school graduates; licensed mechanics), and technicians (high school graduates); among them are some persons with considerable experience and ability, who have acquired their technology during the Soviet era and the level of that technology is high. The Institute intends to hire another nine engineers (five for the silk certification lab and four for the weaving lab) for maintenance assignments in the event that the project is realized. The incremental cost of these employees is expected to be met by a supplementary budget allocation. If these steps are taken, it is expected that there will be sufficient personnel for operation and maintenance of the equipment.

The student body at the Institute is as shown in the tables below. The number of enrolled students is down relative to before attainment of independence, but this is a statistical matter as a number of schools have been split off from the Institute. The Institute, however, is providing lab work opportunities to students at these schools, in addition to which the Institute at times sends its instructors to these schools for lectures there. Further, cooperation is also provided to institutions other than these for lab work, and the students at all of these are at times users of equipment at the Institute.

TABLE 2-2 Number of Enrolled Students (Undergraduate Courses)

Year	1992	1995 (*)	1996	1997	1998	1999
Cotton Technology and Machanics	1,613	708	590	569	583	632
Mechanical-technological	2,220	974	811	784	803	870
Engineering Economics & Chemical Technology	1,549	680	566	547	560	607
Light Industry	1,058	464	387	373	383	415
Total	6,440	2,826	2,354	2,273	2,329	2,524

*) Branches of institute in Andijan, Namangan and Margelan became financially self-supporting but in educational-methodical field still depend on TITLI.

TABLE 2-3 Number of Enrolled Students (Postgraduate Courses)

Faculties	Master Course					Doctor Course				
Year	95	96	97	98	99	95	96	97	98	99
Cotton Technology & Mechanics	26	27	30	25	30	2	3	3	3	2
Mechanical-technological	42	32	32	32	30	2	2	1	3	3
Engineering Economics & Chemical Technology	19	15	17	18	18	2	2	2	2	3
Light Industry	3	4	3	3	3	1	2	2	2	2
Total	90	78	82	78	81	7	9	8	10	10

TABLE 2-4 Numbers of Students and Teachers at Relevant Schools

Name of Institute	No. of Students	No. of Teachers
Andijan Engineering-Economic Institute	2,679	240
Namangan Industrial Technological Institute	1,352	120
Bukhara Technological Institute of Food and Light Industry	2,602	246
Djizak Politechnical Institute	821	81
Fergana Politechnical Institute	2,078	204
Margilan College of Textile	600	N.A.
College of Light Industry	700	N.A.
Total	10,832	891

N.A.: Not available.

2-1-2 Finances and Budgets

The education budget and higher education budget in the Uzbek national budget is shown in Table 2-5.

TABLE 2-5 Education Budget

Year	National budget (Total)-A	Allocation for Education Sector-B	Allocation for Higher Education Sector-C	Share (B/A)	Share (C/A)
1996	133,246	40,265	3,561	30.2%	2.7%
1997	95,683	36,985	2,412	38.7%	2.5%
1998	94,316	40,629	3,053	43.1%	3.2%
1999	548,093	182,681	10,046	33.3%	1.8%
2000	712,463	215,060	11,611	30.2%	1.6%
2001	810,608	253,315	12,366	31.3%	1.5%
2002	820,496	256,405	12,204	31.3%	1.5%

The budget of the Tashkent Institute of Textile and Light Industry over the past five years and plans for the coming three years is shown in Table 2-6. The funding of the budget is shown in Table 2-7.

TABLE 2-6 Budget of Institute

Year	Personnel expenses	Procurement of equipment	Repair and maintenance of equipment	Utilities-power, water, gas, etc.	Scholarship, purchase of equipment, educational expenses, etc.	Total
1995	12.0	1.2	0.8	14.0	11.0	39.0
1996	50.0	3.7	2.3	87.0	51.0	194.0
1997	70.0	8.3	5.7	64.0	117.0	265.0
1998	105.0	13.0	19.0	108.0	163.0	408.0
1999	164.0	15.6	22.8	142.0	258.6	603.0
2000	196.0	17.1	11.3	160.4	318.0	702.8
2001	227.4	19.7	13.0	178.0	328.4	766.5
2002	263.8	22.8	14.8	197.6	315.5	814.5

TABLE 2-7 Budgets by Financing Source

Years	Subsidy from Government	Own income-Tuition Fee	Own income-Research contract	Donation from industries	Others(*)	Total
1995	35.0	2.0	0.5	0.5	1.0	39.0
1996	145.0	23.0	2.9	14.1	9.0	194.0
1997	154.0	55.0	2.1	24.9	29.0	265.0
1998	244.0	86.0	2.4	31.6	44.0	408.0
1999	360.0	150.0	3.4	36.6	53.0	603.0
2000	396.0	206.8	6.0	39.0	55.0	702.8
2001	435.0	228.5	6.0	39.0	58.0	766.5
2002	479.0	230.5	6.0	39.0	60.0	814.5

(*) 1- "Qualification improvement" faculty; 2 - Paying courses; 3 - Building lease

Review of the 2000 budget shows that government subsidies accounts for about 56%, followed by tuition that accounts for about 30%. Because the Institute's own income, from tuition and charges for research services, can be used at the discretion of the Institute, it is thought that the Institute places emphasis on allocating of budget funds to construction costs and maintenance of equipment relating to this project.

2-1-3 Technology Levels

(1) Production Equipment in Industry

Uzbekistan has been widely known since the Soviet era as one of the world's major producers of cotton and cocoons. This provided the impetus for the development of the machinery industry in Uzbekistan, as primary processing (ginning, cleaning, drying) of domestically grown cotton was done in ginning mills, and much of the machinery in those mills has come to be made in Uzbekistan.

Textile companies, moreover, have since the Soviet era operated very large integrated plants where spinning, weaving, dyeing, printing and finishing have been performed. These plants are located in six locations in Tashkent and other major

cities (of these plants, three do spinning and weaving only). Most of their production facilities, however, are still in use despite being old, having been installed in the Sixties and Seventies. The equipment has been well maintained, and the utilization of capacity is thought to be on the order of 80%. Factory management is being accomplished with competence. Following the attainment of independence from the former Soviet Union, Uzbekistan has experienced an inflow of foreign investment attracted by the textile resources and capability of the textile industry, and on the strength of this investment, 23 joint venture factories have been established under the auspices of Uzbeklegprom. Of these, 16 are textile mills producing cotton yarn, fabric and other textile products. Uzbeklegprom itself has invested in seven joint stock companies, that are producing cotton yarn, cotton fabric, and textile products. At these plants, progress is evident in the form of installation of state-of-the-art equipment, that is, automated machinery made in Japan and Europe. As of May 2000, it may be noted, the Japan Bank for International Cooperation (formerly the Japan EximBank) is planning on financing three spinning mills. At these mills, Japanese-and European-made equipment is to be installed and several hundred jobs will be created.

The silk industry in Uzbekistan has attracted increasing attention recently. In Uzbek Ipagi there are 135 companies that dry cocoons, 13 that reel silk yarn, and eight that are joint stock companies producing silk fabric. There are four joint ventures with foreign investors, one of which is Japanese. The quality of domestic cocoons is generally low, and much of the silk reeling facilities are of the old type and are remnants of the Soviet era, but at the new joint ventures modern equipment has been installed. Management of these plants is generally being done well. Some have adopted a payment system based on output, and some are giving emphasis to the training of workers.

Testing facility at the plants is minimal and most measuring and testing

equipment is old. This is true at both cotton and silk mills, and signal an inadequate grasp of operating conditions. It cannot be said that the mill operators are forward-looking in seeking to improve inspection technology, and this is judged to be a limitation to the improvement of product quality. Recently, equipment for export certification of cotton has been installed at 14 places in Uzbekistan. The equipment, financed by the World Bank, is a sign that progress is being made toward the improvement of quality.

(2) Practical Lab Work at the Institute

Class size varies but most classes have 20-40 students. For basic and required courses, a lecture hall with capacity for more than 100 is used. Class duration is 80 minutes, and the periods are: first, 8:30 to 9:50, second, 10:00 to 11:20, followed by lunch hour, third, 12:10 to 13:30, and fourth, 13:40 to 15:00. Evening classes are also offered, in the fifth period, 17:30 to 18:50 and sixth period, 19:00 to 20:20.

Labs are provided with desks and chairs for students and blackboards, as well as the equipment. Inspection of the equipment indicates that labs are also used for supplementary lectures. Videotapes and monitors are used for instruction in recent equipment, but the AV equipment is old and the monitor screens are small. When instruction is given in subjects for which Institute equipment is lacking, classes are held at the nearby integrated textile mill. Students from the branch schools and other related schools also are given instruction in the Institute, that also on occasion sends instructors to those schools.

Many of the textbooks in use at the Institute are of Soviet origin, dating from the Sixties and Seventies. The level of instruction seems to be relatively high. In some instances texts written by faculty members, in Uzbek, are being used. In conformity

with recent policy of the Uzbek Government, further, efforts have been increased to improve students' understanding of the English language. It is thought that this is related to the diffusion of computers and increase in computer use.

2-1-4 Existing Facilities and Equipment

It is suitable to examine the Institute's existing facilities and equipment by separating them into two groups, i.e., those related to textile processing and those related to measuring and testing.

2-1-4-1 Textile Processing Facilities and Equipment

The greater part of the equipment used for instruction and practice related to spinning and weaving is of Soviet era origin, during the period for the Fifties through the Eighties. Spinning machines that have been in use for 20 years or so are still in good condition. The equipment is used to work with relatively low-grade materials and as such the yarn produced is not of higher count. Because the Institute does not possess equipment that can be used with the long fiber cotton which is a specialty of Uzbekistan, lessons including practice sessions are held at private companies possessing modern facilities and production systems where students can benefit by exposure to both modern equipment and modern management methods. It is to be noted that among the equipment requested for the Institute under this project there is no equipment exclusively for use in working with cotton.

Equipment for working with silk are, with the exception of that used for boiling cocoons, old, and of Soviet era vintage; the production process as is possible at the Institute is not an integrated one. The reeling and winding machines are old and out of date in terms of functioning and utility for education. There is no yarn-setting

machine for the twisting process, and cone winders do not function well. Some of the reeling machinery dates to the Thirties. Among the weaving machinery are two rapier type general-purpose machines but they were manufactured in the Sixties and are extremely different from what is in use today. The level of technology in education is primarily keyed to that in the textbooks, but practical lessons in use of production equipment have to be given at nearby mills, creating an inconvenience for students and faculty alike. Among the equipment for inspection of silk there are no seriplane machines (for inspection of raw silk for evenness, knots, etc.), and the machinery that is on hand is not complete and is old. Thus it is not possible to carry out full inspection of silk yarn. Improvement of the quality of raw silk yarn is a high-priority subject in the national plan, and it is in this light as well indispensable for this equipment to be improved so that a stronger link between education and industry can be forged.

2-1-4-2 Measuring and Testing Equipment

(1) Overview

Measuring and testing equipment is almost entirely of Russian origin. As to the age of the equipment, 12% was made 40 years or more ago, 16% is 30-40 years old, 30% is 20-30 years old, and more than 60% of all equipment is at least 20 years old. About half of the equipment that is 30 years old or older is unusable.

(2) Situation in the Labs

a) Cotton Fiber Lab

Instruction in cotton fiber is the oldest subject taught at the Institute, and as such the Institute does have more or less of a full line of inspection equipment. Overall, most of the equipment is less than 30 years old. The lab has close working

ties with ginning mills and machinery shops.

b) Cotton Spinning Lab

The Cotton Spinning Lab is furnished with the minimum equipment needed, and much of it is outdated, having been made in the Sixties and Seventies. The only equipment that can be said to be modern is a Japan-made yarn evenness tester.

c) Weaving Lab

Inspection equipment in the Weaving Lab is old and much of it is outdated. There are only a few pieces of equipment of what would be considered as essential.

d) Dyeing and Finishing Lab

In contrast to the situation for spinning and weaving, there is almost no dyeing equipment in the lab. Samples of silk and cotton are dyed in any sort of convenient vessel by hand. There is a scanning electron microscope, and a spectrometer of high standard, of Russian manufacture, but not in operation.

e) Textile Materials Technology Lab

The Textile Materials Technology Lab has three rooms, one each for fiber, yarn and textiles. In comparison to the other labs, here the equipment is numerous but many pieces are at least 20 years old and unusable. There are almost no equipment for inspection and evaluation of finished textiles, quality of textiles, or functionality of textiles. An assistant professor is in charge of the equipment and there are three assistants who operate it, so it can be said that management and use of the equipment are being properly done.

2-2 Conditions at the Project Site and Vicinity

2-2-1 Socio-economic Conditions

The Institute is located in the capital of Uzbekistan, that has a population of about 2.1 million. During the Soviet era this was the fourth largest city in the Union. It has the only subway system in Central Asia with three lines. Most of the buildings in the city were destroyed by an earthquake in 1966, subsequent to which the city was rebuilt along unique lines that have provided a connection between the new city and the old city that retains traces of the days of the ancient Silk Road.

Tashkent can be considered as the most important place in the nation for economic activity. In and near the city there are about 130 companies that have been established by foreign investment, among a total of about 9,000 companies. The major industries are textile processing, cotton ginning, farm product processing, metalworking, machinery, energy, manufacture of electronic products, etc.

2-2-2 Relevant Infrastructures

Uzbekistan, situated in the inner area of the Eurasian subcontinent, is linked to other countries by air, road and rail. Because the overland system was well developed during the Soviet era, transport infrastructure linking Uzbekistan with other Central Asian countries, and particularly the rail system, is at a high level in international terms. For the categories of goods transport by rail that are in greatest demand, the most-used routes for shipping are the Russian route (via Russia and Kazakhstan), and the Chinese route (via China and Kazakhstan) is also serving for goods from the Far East. The major route by road is the Iran route (via Iran and Turkmenistan). Air transport service from and to Tashkent is available for Europe,

the Far East, Southeast Asia and adjacent countries. Freight sent to a consignee in Tashkent arrives at either the central station or the airport; within the city road conditions are good and there are ample roads that can be used by trailer trucks.

Roads in the vicinity of the Institute are similarly in good condition and there are no outstanding problems associated with the movement of goods. Roads within the campus are in good condition and there is adequate parking space. There is adequate space for unloading trucks. No problems would be encountered in transporting equipment to the Institute.

There are six transformer stations on campus. They are supplied with 6,000V from the city, step it down to 380V and supply power to all campus buildings. Most of the power supply is generated thermally and the supply planning has favored industry. The rated power supply after the distribution boards comprise single-phase 220V 50Hz and three-phase 380V 50Hz. There are occasional but by no means frequent power outages.

Supply of drinking water is from the municipal system; water for lab use is from a well on campus and water is supplied to all buildings on the campus. The quality of municipal water is good, but the well water may need treatment when it is to be directly used for sophisticated equipment. A central hot water furnace supplies all buildings with hot water. Piping has been installed to service each room. Dual-pane glazing ensures that heat loss through windows is minimized. Buildings themselves are relatively well insulated. With the exception of major rooms no air conditioning is installed.

2-2-3 Natural Conditions

To the north of Uzbekistan is Kazakhstan, to the east, Kyrgyz and Tajikistan, to the southeast Turkmenistan, to the south Afghanistan; Uzbekistan is a landlocked nation. The area is 447,400 square kilometers; longitudinally the nation measures 930 km; latitudinally it is 1,400 km. Characteristically, the climate is continental, with wide differences in temperature during the year and relatively little rainfall and low humidity. A mountain range, the Tian Shan, is in the east, and from it two large rivers, the Amu Darya and Syr Darya flow toward the Aral Sea in the northwest. The basin is relatively level and has as its major features steppes and desert. The centrally located Kyzyl Kum desert is one of the world's largest. Tashkent in which the Institute is located is at 41 degrees 20 seconds north latitude and 420-500 meters above mean sea level. The typical continental climate has wide diurnal-nocturnal variations in temperature. Meteorological conditions in Tashkent are summarized in Table 2-8.

TABLE 2-8 Meteorological Conditions in Tashkent

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ave.
Temperature(℃)	0.9	2.1	7.9	15.1	20.1	25.0	27.2	25.0	19.7	13.0	6.8	2.5	13.7
Relative Humidity (%)	65	66	59	60	50	39	37	41	42	57	63	66	54
Precipitation (mm)	50.6	51.4	79.1	61.9	31.6	10.5	4.0	3.0	2.2	31.6	47.8	54.0	429.0

Temperature: 1951-1980, Relative Humidity: 1961-1967, Precipitation :1951-1980

2-2-4 Relationship with Industry, Research Institutions and Other Bodies

The Institute has close ties with textile firms in Uzbekistan, research centers and various educational institutions in the country and abroad. Because the Institute was established with the purpose of educating workers who would be of immediate value to employers in the target industries, the Institute offers refresher courses, dispatches instructors, provides instructor training, is involved in technology exchange and technology transfer, joint research projects and other activities over a

broad range, with the cooperation of industry, research institutions, and others. In particular, on the basis of the directive of the Ministry of Higher and Secondary Specialized Education "On Higher Education," the Institute is continuing to progress in providing specialized, practical training and education by using facilities at corporations and factories. The domestic research institutions that have close working ties with Tashkent Institute of Textile and Light Industry are listed in Table 2-9.

TABLE 2-9 Uzbek Research Institutions

Name	Location	Year of Establish-ment	Main Activity	Number of Scientific Personnel	Relations with TITLI
Uzbek Scientific Research Institute	Tashkent	1928	Research on Silkworm etc.	138	Joint Scientific Research Works
“Pahtasanoatilm”	Tashkent	1926	Research on Cotton	140	Joint Scientific Research Works
Research Institute “Shoyi”	Margilan	1927	Research on Silk	92	Joint Scientific Research Works
Open Stock Venture “SKB”	Tashkent	1953	Design and Research Work	180	Joint Scientific Research Works
The Republic Center of Assortment Fashion of Light Industry	Tashkent	1949	Design of Fashion	250	Joint Scientific Research Works
Stock Venture “Nafis”	Tashkent	1979	Footwear Design	58	Joint Scientific Research Works

Further, the foreign educational and research institutions that have a relationship with Tashkent Institute of Textile and Light Industry are as shown in Table 2-10.

TABLE 2-10 Collaborating Foreign Institutions

Name of Institution	Country
Bergishe Universitat Gesamthochshule	Germany
University of Gent, Dept. of Textile	Belgium
University of Piraeus, Dept. of Textile	Greece
International Association of Printing Educational Institutions	Germany
International Silk Association	France
International Textile Academia	Switzerland
Moscow State University of Printing	Russia
Ivanovo Textile Academy	Russia
Gyandja State University	Azerbaijan
Saint Petersburg State Wood Technical Academy	Russia
Kostrama State Technological University	Russia
Moscow Textile University	Russia
Moscow State University of Design and Technology	Russia
Saint Petersburg University of Technology and Design	Russia

Graduates of the Institute follow the paths as shown in Table 2-11.

TABLE 2-11 Employer of Graduates (1937-1999)

Faculty	Course	No. of graduates	Typical employer	Type of job
Cotton Technology & Mechanics	Engineer(*)	270	Higher school	Teacher
		200	Scientific-research institute	Researcher
		1,110	Private enterprises	Engineer
		10,300	Stock company enterprises	Engineer
	Bachelor (**)	18	Master's course	Student
		10	Private enterprises	Engineer
		16	Stock company enterprise	Engineer
Mechanical- technological	Engineer(*)	380	Higher school	Teacher
		270	Scientific-research institute	Researcher
		2,400	Private enterprises	Engineer
		13,650	Stock company enterprises	Engineer
	Bachelor (**)	24	Master's course	Student
		8	Private enterprises	Engineer
		12	Stock company enterprise	Engineer
Engineering Economics & Chemical Technology	Engineer(*)	220	Higher school	Teacher
		110	Scientific-research institute	Researcher
		1,190	Private enterprises	Engineer
		6,780	Stock company enterprises	Engineer
	Bachelor (**)	23	Master's course	Student
		16	Private enterprises	Engineer
		27	Stock company enterprise	Engineer
Light Industry	Engineer(*)	160	Higher school	Teacher
		100	Scientific-research institute	Researcher
		920	Private enterprises	Engineer
		5,220	Stock company enterprises	Engineer
	Bachelor (**)	18	Master's course	Student
		10	Private enterprises	Engineer
		18	Stock company enterprise	Engineer
Total	Engineer(*)	1,030	Higher school	Teacher
		680	Scientific-research institute	Researcher
		5,620	Private enterprises	Engineer
		35,950	Stock company enterprises	Engineer
	Bachelor (**)	83	Master's course	Student
		44	Private enterprises	Engineer
		73	Stock company enterprise	Engineer

* Engineer: Title given in the old teaching courses (5 years education)
**Bachelor: Title given in the current teaching courses (min. 4 years education)

CHAPTER 3 Details of the Project

Chapter 3 Details of the Project

3-1 Outline of the Project

This project has the dual purpose of assisting (1) the qualitative and quantitative improvement of engineering education and technological updating in the textile and light industry sector in Uzbekistan and (2) training of capable engineers for work in companies in the textile and light industry sector -- one of the most important in Uzbekistan -- as well as public bodies, educational and research institutions, whereby they will be able to make greater contributions to economic growth and development. In order to achieve this objective, specifically, this project will replace old and outdated equipment in the Tashkent Institute of Textile and Light Industry, one of the country's most important institutions in the field, as well as supply new equipment needed but not now at the Institute; by supplying equipment now in short supply or absent, the quality of advanced education will be improved.

In the textile companies, that are the major employers of graduates of the Institute, advances are evident especially in the companies having foreign equity participation, in the use of new production equipment embodying the latest technology. As can be judged additionally from the trend in the textile goods industry to improve quality control and acquire new testing equipment in order to enhance the competitiveness of the products, the contents of educational programs at the Institute where the equipment available is outmoded no longer closely matches the needs of industry. The objective of this project is, on the basis of the idea of seeking to comply with the human resource development needs of the textile industry, that is a key industry in Uzbekistan, to improve the facilities for education in this field. The project therefore will supply the following equipment, selected on the basis of giving priority to processing of cotton and silkworm cocoons as they are important domestic raw materials, as well as the processing of finished and semi finished products so that their value added

can be improved.

1) Equipment for natural silk processing technology
   a) Equipment for raw silk certification technology
   b) Equipment for silk filature and weaving technology
2) Equipment for cotton processing technology
   a) Equipment for cotton spinning laboratory
   b) Equipment for dyeing and finishing laboratory
3) Equipment for knitting and sewing technology
4) Computers and audio-visual equipment for engineering education

Regarding the Institute's request for educational equipment for poligraphy and editorial design, although it is evident that need exists in the Faculties of Engineering Economics and Chemical Technology for education in printing technology and for such equipment for use in producing various materials and publications needed by the Institute, because these have low priority relative to the specific objective of this project, they are not included in the project scope.

3-2 Basic Design of the Project

3-2-1 Design Policy

(1) Basic Policy

1) The objective of the plan is to contribute to raising the rate of processing of textile materials produced in Uzbekistan.
2) It is anticipated that implementing this project will increase domestic demand for textile products and replace part of such products now being imported, in which case the equipment selected will be primarily for production of medium-grade goods, for which the level of domestic demand is high.
3) Selection of equipment and materials will be done to match the contents of plans for educating and training senior engineers for work in the textile companies and mills that employ the majority of graduates of the Institute.

(2) Scope of the Project

The needs of the Institute in areas related to the planned cooperation are classified as shown in Table 3-1 below. While domestic investment in plant and equipment, and induction of direct foreign investment, are advancing on the basis of the nation's industrial policy for elevating the level of processing by domestic industry, in recent years the Uzbekistan textile industry has focused on quality control of the industry's products, making elevation of technical levels and replacement of equipment critical issues. At the same time, education circles are at a turning point with regard to human resources development in keeping with this high-priority policy and trends in the industry. In particular, the training of technicians so as to give them abilities and skills that they can immediately put to use is needed. The scope of the Project planned, based on these considerations of needs in Uzbekistan, is as shown in Table 3-2.

Table 3-1 Needs of the TITLI

Industrial strategy :
- Improvement of the domestic textile processing rate
- Induction of foreign capital and new technology
- Improving textile product quality, and augmenting competitiveness

Industry trends :
- Improvement of production management and administrative management abilities
- Elevation of quality control and metrology technology
- Modernization of spinning facilities
- Improvement of weaving technology and modernization of equipment
- Improvement of knitting technology and modernization of equipment
- Establishing a system for certification of silk products
- Raising the value added of traditional silk fabric goods
- Increasing demand for senior engineers
- Promoting computer use
- Improving foreign language ability

National education programs :
- Improvement of technology and information
- Training and re-training of teaching staff
- Supplementing educational equipment and teaching materials
- Application of information technology
- Enhancement of industry-institute collaboration
- Improvement of equal opportunity for education, and distance learning

Table 3-2 Scope of Cooperation

Faculty	Main Area of Use/Technology	Planned Equipment						
		Raw silk certificatio	Silk filature,	Cotton spinning	Dyeing and	Knit production	Light industry	Computers & AV
A. Cotton Technology and Mechanics	Primary processing of cotton (ginning)			○				○
B. Mechanical-Technological	Spinning - weaving - knitting of cotton, silk reeling	◎	◎	◎	○	◎	○	○
C. Light Industry	Textile product design & sewing, leather product design & processing		○	○	○	◎	◎	○
D. Engineering Economics and Chemical Technology	Dyeing & finishing, poligraphic design, business management				◎			○
E. Engineering Pedagogy	Textile materials, information technology	○		○	○			◎
F. Correspondence Courses	General textile engineering	○	○	○	○	○	○	○

◎ : Faculty where equipment is to be installed and principally used.
○ : Faculty that will use equipment.

(3) Design Concept

The level and specifications of equipment is to be decided on the basis of the following policy considerations.

1) All pieces of equipment are to be of a suitable level for institute education.
2) The equipment plan is to reflect the trends of production facilities and technology in Uzbekistan, as well as relationship between industry and the institute.
3) Selection of equipment is to reflect efforts to minimize requirements of technology, labor and cost for operation, maintenance and management.
4) Domestic Uzbek laws, regulations and standards shall be employed wherever applicable, while international standards are to be principally taken into consideration.
5) Spares and consumable as required are to be included with the equipment and materials supplied.
6) The cost of suitable post-installation training in operation and maintenance, provided by technical personnel employed by the makers of the equipment, is to be included in the budget for purchase of equipment.
7) Equipment operation manuals in the Russian language for major pieces of equipment will be included with the equipment supplied.

3-2-2 Equipment Plan

On the basis of discussions with the Institute regarding the required equipment, the plan described below has been developed. Results of study of requests made are shown in Table 3-3.

Table 3-3 Study Result of the Request

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Replacement	Addition	New					A	B	C	
1	**Natural Silk Processing**																
1-1	Raw Silk Certification Technology																
1-1-1	Seriplane Winder	1	MT Silk Technology (for certification of raw silk, etc.)						1	Used for winding raw silk on the black board for intensity variation test, and cleanness test to identify knots (large, middle and small)	○	○	○	1			This item comprises a line of seriplane equipment used for testing and certification of raw silk. Same type of equipment is installed at domestic silk reeling factories. This item will be used very frequently in the practical of the Dept. of Silk Technology. Currently, students are trained at local reeling factories since the Institute is not equipped with this item. This consumes much time for transportation thus causing interruption of other courses. The item should be installed at the Institute in due consideration of the role of the Institute as premier and leading educational organization in the textile sector so that it can contribute to industry-institute collaboration in the future.
1-1-2	Seriplane Illumination Apparatus	1	MT Silk Technology (for certification of raw silk, etc.)						1	Illumination source for intensity variation test, and cleanness test of raw silk to identify knots (large, middle and small)	○	○	○	1			This item comprises a line of seriplane equipment used for testing and certification of raw silk. Same type of equipment is installed at domestic silk reeling factories. This item will be used very frequently in the practical of the Dept. of Silk Technology. Currently, students are trained at local reeling factories since the Institute is not equipped with this item. This consumes much time for transportation thus causing interruption of other courses. The item should be installed at the Institute in due consideration of the role of the Institute as premier and leading educational organization in the textile sector so that it can contribute to industry-institute collaboration in the future.
1-1-3	Seriplane Standard Photographs	1	MT Silk Technology (for certification of raw silk, etc.)						1	Standard photographs to be used for comparative check of defects of raw silk	○	○	○	1			This item comprises a line of seriplane equipment used for testing and certification of raw silk. Same type of equipment is installed at domestic silk reeling factories. This item will be used very frequently in the practical of the Dept. of Silk Technology. Currently, students are trained at local reeling factories since the Institute is not equipped with this item. This consumes much time for transportation thus causing interruption of other courses. The item should be installed at the Institute in due consideration of the role of the Institute as premier and leading educational organization in the textile sector so that it can contribute to industry-institute collaboration in the future.
1-1-4	Measuring Meter	1	MT Silk Technology (for certification of raw silk, etc.)			① 1960	1			Used for measuring and winding of raw silk	○	○	○	1			There is an existing item which is old and outdated. The Institute needs to be furnished with a standard type multi-thread lines with constant measuring length should be supplied to replace the old one.
1-1-5	Denier Scale with Weighing Scale	1 set	MT Silk Technology (for certification of raw silk, etc.)		① 1975			1		Used for measuring denier and weight of raw silk to identify its size deviation	○	○	○	1 unit			To weigh denier of raw silk is very basic technology and the denier scale is therefore frequently used in the training. The Institute has an old and manual type scale. In consideration of the educational efficiency, a new model with recording function should be supplied.
			MT Silk Technology (for certification of raw silk, etc.)		② 1984	③ 1950		1		Used for measuring precise weight of silk and cotton	○	○	○	1 unit			Existing scales are being used very frequently, but their measuring accuracy is not to the standard of Institute's use. The Institute should be equipped with a model which has a reading unit of at least 1g.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
1-1-6	Serigraph	1	MT Silk Technology (for certification of raw silk, etc.)		2				1	Used for tenacity and elongation test of raw silk	○	○	○	1			This item is used for measuring the typical technical indicator of raw silk, and is indispensable for its certification. The existing units are already outdated and do not show accuracy. Therefore, at least one unit shall be replaced with a new one.
1-1-7	Bobbin Winder	1	MT Silk Technology (for certification of raw silk, etc.)						1	Used for winding raw silk in bobbins	○	○	○	1			This is an equipment used for winding raw silk from skein to bobbin so that the wound bobbin shall be sent to the seriplane or to the weaving process. This is a very basic preparation machine and therefore one unit shall be supplied to the Institute.
1-1-8	Conditioning Oven	1	MT Silk Technology (for certification of raw silk, etc.)			① 1971	1			To measure moisture content and conditioned mass of raw silk precisely	○	○	○	1			Moisture content and conditioned mass are important indicators in certifying and trading raw silk because these indicators alter the prices. This item is used for conditioning raw silk. The Institute has an old oven which is out of order and not in use. Therefore, a new item should be supplied o replace above broken one.
1-1-9	Winding Machine	1	MT Silk Technology (for certification of raw silk, etc.)			① 1953	1			To check breakage count in winding raw silk (rereeling)	○	○	○	1			This machine is used to rereel raw silk from smaller skein to larger skein while being dried in the important process called soaking treatment of silk. This process affects largely to the efficiency of following processes. The Institute has an old unit which is out of order and not in use, and needs to be replaced with a new machine.
1-1-10	Duplan Cohesion Tester	1	MT Silk Technology (for certification of raw silk, etc.)		① 1965			1		To check the grade of cohesion of raw silk between cocoon filaments	○	○	○	1			Duplan Cohesion is an important indicator in quality control of raw silk since this will affect the efficiency of down stream process. The Institute has an old model manufactured 35 years which is no more effective due to deterioration in measuring accuracy. A new model with precise accuracy needs to be installed at the Institute.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
1-1-11	Kett Oven	1	MT Silk Technology (for certification of raw silk, etc.)						1	To dry raw silk to measure its size deviation (denier) in a dry atmosphere	○	○	○	1			This is an important equipment to keep atmospheric condition constantly dry to measure the accurate denier of raw silk. This comprises a part of raw silk certification process and therefore it is indispensable to the Institute.
1-1-12	Twist Counter	2	MT Silk Technology (for certification of raw silk, etc.)			① 1968	1	1		Used for counting twists of raw silk	○	○	○	2			The traditional Uzbek silk fabric called "Atlas" is woven by twisted raw silk. Proper twisting technology is trained at the Institute as a part of study on the traditional domestic silk fabrics. Existing unit is outdated and not in use. The needs of this item is high because above study is offered not only to the proper students but also to the public. Therefore, 2 units shall be supplied to the Institute, 1 being replacement and the other being an addition.
1-1-13	Moisture Meter	1	MT Silk Technology (for certification of raw silk, etc.)						1	Used to measure moisture content of raw silk and cotton yarn	○	○	○	1			This is a standard moisture meter equipped with infrared ray drying system. This is indispensable in the testing process to keep appropriate atmospheric condition when measuring raw silk, cotton yarn, etc. Therefore, one unit shall be supplied to the Institute.
1-2	Silk Filature and Weaving																
1-2-1	Doubling Twister	1	MT Silk Technology (for resistance of materials)		① 1963	① 1963				Used for doubling as well as for twisting of raw silk.	○	○	○	1			The Institute is equipped with 2 old models, one being out of order and not in use, and the other one being deteriorated in twisting process. The traditional Uzbek silk fabrics like "Atlas" and "crepe de chine" etc. are made of twisted raw silk due to inferior quality of domestic cocoons. This machine is used for twisting and doubling raw silks in one unit and is indispensable for preparation process of weaving. Therefore, one unit shall be replaced with a new machine.
1-2-2	Vacuum Heat Setter	1	MT Silk Technology (for resistance of materials)						1	Used to heat set the twisted raw silk.	○	○	○	1			This machine is used for after treatment process of twist yarn to keep the twist constant so that the quality of down stream woven fabric of "Atlas", "crepe de chine", georgette crepe" etc. are kept in good condition. This is indispensable in the weaving process of silk yarn at the Institute. Currently, the students are trained in this process at the nearby textile factory, but the Institute needs its own machine so that the training of weaving process within the Institute can be complete. One unit shall therefore be installed at the Institute.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
1-2-3	Sectional Warper	1	MT Technology of Weaving and Tricot Manufacture (Preparation of warp and weft)		① 1980			1		To prepare warps of raw silk for weaving by looms.	○	○	○	1			The Institute has an old sectional warper of 20 years ago which, in comparison with the production facility of textile industries, is inferior in its function. Recent models are more efficient in the education of students because these are adopting higher warping speed and equipped with tension control system of creel for higher quality assurance. This new technology should be introduced to the Institute and, therefore, one unit shall be supplied to be used for silk fabrics, keeping old one operable for cotton fabrics.
1-2-4	Reeling Machine	1	MT Technology of Weaving and Tricot Manufacture (Preparation of warp and weft)		② 1962 1974	② 1932 1954		1		To produce raw silk for cocoons and wind in a reel.	○	○	○	1			The Institute has 3 old conventional type models and one semi-automatic model. Comparing with the ones introduced in the industries, these machines are old by 2 to 3 technological generations. In consideration of the quality of cocoon produced in Uzbekistan, it is not recommendable to install fully automated machine in the top technological generation to the educational institutions, but one in the second generation shall be installed at the Institute. The Institute has to prepare assorted cocoons of better quality for running this new equipment.
1-2-5	Rapier Loom for Silk	2	MT Technology of Weaving and Tricot Manufacture (Fabric formation and properties, etc.)		① 1992			2		To weave silk cloth by rapier type loom.	○	○	○	1	1		The Institute has a basic unit of rapier loom without any attachment, which is considered incomplete as a training facility of weaving technology. In consideration of the production facilities in the weaving factories, the students need to be trained with advanced weaving technologies of silk fabrics. Therefore, one unit of rapier room with dobby and one unit with jacquard shall be supplied to the Institute. The new units shall be used for weaving silk fabrics by using twisted silk yarn while the existing unit shall be used for weaving cotton fabrics.
1-2-6	Automatic Cone Winder	1	MT Technology of Weaving and Tricot Manufacture (Preparation of warp and weft)			① 1980	1			To wind raw silk in bobbins for preparation of weaving process.	○	○	○	1			There is a twenty-year old cone winder in the Institute but it is not in use due to breakage. This is an important machine to wind raw silk to cones for further handling in the down stream process or for sale in the market. For the training purpose of the students of the Institute, a smaller scale model which is on the same technical level with those recently introduced to the industries shall be installed.
1-2-7	Braiding Machine	1	MT Technology of Weaving and Tricot Manufacture (Fabric formation and properties, etc.)						1	Used for knitting braids and narrow silk fabrics.	○	○	○	1			The institute undertakes education of students in designing and producing value added silk fabrics using domestic raw silk. Design of garments includes trimmings of lapels, collars, edges, etc. using a braid or narrow woven fabrics. It is expected that the machine will be used very frequently in consideration of the needs of industries towards the student's knowledge of this design. Therefore, one unit shall be installed at the Institute.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Replacement	Addition	New					A	B	C	
2	**Cotton Processing**																
2-1	Spinning Laboratory																
2-1-1	Portable Evenness Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To evaluate the intensity of variation of yarn in the spinning process.	○	x	x			1	The request for this items was made that the testing of intensity of variation of yarn be undertaken at the production site by a portable type tester. But a portable type tester has low accuracy. Further, the Institute has a yarn tester which can better be used for the purpose. Therefore, this item shall be excluded from the Project component.
2-1-2	Optical Hairiness Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	Used for measuring number and length of fuzz of yarn.	○	○	○	1			This tester is used for evaluating the quality of spun yarn and raw silk by measuring surface fuzz and, therefore, it is closely related to the operability of down stream process and the quality of its products. This is an indispensable technology which every textile engineer has to be familiar with. One unit shall be installed at the Institute.
2-1-3	Dynamometer	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	Used for tenacity and elongation test for staple of cotton, silk, synthetic fibers, etc.	○	○	○		1		This equipment is used for measuring important property such as tenacity and elongation of staple. In consideration of the domestic staple used for blend spinning and weaving of Uzbek traditional fabrics, it is indispensable for students to be trained in measuring the tenacity as well as the elongation in one unit comparatively. One unit shall be supplied to the Institute.
2-2	Dyeing and Finishing Laboratory																
2-2-1	Color Matching System	1 set	EECT Finishing of Textile Materials and Technology of Chemical Fibers						1 set	Used for evaluation of color of textile materials and preparation of dyeing solution by using prepared dye staff and chemicals.	○	○	○	1 set			Dyeing is affected by complex factors physically and chemically. This system comprises a spectrophotometer, a dyestuff dispensing machine, and a solution making machine, and is widely used in the industries to obtain the target color objectively. The Institute is required by the relevant policies to look for the technologies that are needed for the country to seek more value added products specially in the dyeing and finishing processes. Therefore, one set shall be installed at the Institute.
2-2-2	Tearing Strength Tester	1	EECT Finishing of Textile Materials and Technology of Chemical Fibers						1	To measure the tearing strength of woven fabrics.	○	○	○	1			The tearing strength is an important indicator in testing the fabrics and is indispensable for education in the Institute. One unit shall be supplied.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
2-2-3	Fade Meter	1	EECT Finishing of Textile Materials and Technology of Chemical Fibers						1	To measure color fading of woven and knitted fabrics caused by the sun beam.	○	○	○	1			The color fading is an important indicator of fabrics and is indispensable for education in the Institute. This equipment enables students to make comparative studies color fading by the sun beam. The Institute has no such meter and, therefore, one unit shall be supplied.
2-2-4	Test Dyeing Machine	1	EECT Finishing of Textile Materials and Technology of Chemical Fibers						1	Used for test dyeing of woven and knitted fabrics of cotton, silk, synthetic fibers.	○	○	○	1			The Institute has no dyeing facility within the compound. This is a test scale dyeing machine to be used in line with the spectrophotometer, dyestuff dispensing machine, and solution making machine of the Color Matching System. One unit shall be installed at the Institute.
2-2-5	Cloth Tensile Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics		② 1970	② 1956	1			To measure tensile strength of woven fabrics.	○	○	○	1			The Institute has 4 old testers that are most frequently used but their measuring accuracy is deteriorated. In order for the students to learn properties of strength of fabrics more precisely, a new type of tester which can display the tensile strength and elongation of fabrics in curves shall be supplied.
2-2-6	Abrasion Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure abrasion resistance of woven and knitted fabrics.	○	○	○	1			The Institute has a similar tester for measuring abrasion resistance of heavy cloth but not of thin silk fabrics. Therefore, one unit for the thin fabrics shall be supplied.
2-2-7	Pilling Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure pilling of woven and knitted fabrics.	○	○	○	1			This is a very important tester for measuring pilling of woven and knitted cloths. This will enable students to learn the mechanism of generation of pilling.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
2-2-8	Wrinkle Recovery Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the crease resistance and recovery of woven fabrics.	○	○	○	1			There is a similar type tester in the Institute but it does not show accurate result of crease recovery. One unit of a new type tester which will enable the students to learn elaborate wrinkle properties shall be supplied.
2-2-9	Slip Resistance Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the strain of yarn caused by abrasion.	○	○	○	1			This will enable students to learn an important factor, mechanism of strain on the yarn, caused by abrasion of woven and knitted fabrics. One unit shall be supplied to the Institute.
2-2-10	Air Permeability Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics			① 1979	1			To measure the air permeability of woven and knitted fabrics.	○	○	○	1			The existing tester is old and outdated, showing no accurate result. This needs to be replaced with a new one.
2-2-11	Water Resistance Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics			① 1955	1			To measure the water resistance of woven fabrics.	○	○	○	1			The existing tester is old and outdated, showing no accurate result. This needs to be replaced with a new one.
2-2-12	Flammability Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the flammability of woven and knitted fabrics.	○	○	○	1			Flammability is an important factor to learn functions of textile products including their safety. This tester will enable students to learn safety of woven and knitted fabrics against fire by measuring their flammability.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
2-2-13	Color Fastness to Washing Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the color fastness to washing of woven and knitted fabrics.	○	○	○	1			This is a very basic and important testing apparatus but the Institute has not one. It is important for the students to learn color fastness of silk and cotton products to washing that are using indigenous materials of Uzbekistan so that the students can know the quality and characters of Uzbek textile products. One unit shall be supplied.
2-2-14	Color Fastness to Rubbing Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure color fastness to rubbing of woven and knitted fabrics.	○	○	○	1			This is a very basic and important testing apparatus but the Institute has not one. It is important for the students to learn color fastness of silk and cotton products to rubbing that are using indigenous materials of Uzbekistan so that the students can know the quality and characters of Uzbek textile products. One unit shall be supplied.
2-2-15	Color Fastness to Perspiration Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure color fastness to perspiration of woven and knitted fabrics.	○	○	○	1			This is a very basic and important testing apparatus but the Institute has not one. It is important for the students to learn color fastness of fabrics to perspiration. One unit shall be supplied.
2-2-16	KES Hand Evaluation Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the handling of fabrics by such properties as hardness, sliminess, repulsion, etc.	○	x	x			1	This tester is based on the technology developed by a Japanese scholar, and is used worldwide in the researches and thesis of engineers. The needs toward this tester is high in Uzbekistan since the country is concentrating improving silk products by measuring handlings objectively. However, in consideration of educational effectiveness, it is not justified as useful and, therefore, it shall be excluded from the Project component.
2-2-17	Warmth Retaining Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the warmth retaining capacity of cloths.	○	○	○	1			This tester is used for numerically evaluate the warmth retaining capacity of various textile products and is useful for students in learning relationship between the mechanism of fabrics and warmth retaining function. One unit shall be supplied to the Institute.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
2-2-18	Yarn Tensile Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics		③ 1972 1978	④ 1970 1979	1			To measure tenacity and elongation of spun yarn and filament yarn.	○	○	○	1			Existing testers are old and outdated showing low accuracy. In order for the students to learn properties of strength of yarn more precisely, a new type of tester which can display the tensile strength and elongation of yarn in curves shall be supplied.
2-2-19	Yarn Tension Meter	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the tensile strength of yarn in the spinning process	○	○	○	1			This tester measures the proper tension of yarn in reeling, spinning, weaving processes and therefore it is indispensable in the teaching laboratories. One unit shall be supplied to the Institute.
2-2-20	High Speed Tachometer	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the rotating speed of various machines and instruments.	○	○	○	1			This apparatus measures the basic function of rotating speed of machines in reeling, spinning, weaving processes and therefore it is indispensable in the teaching laboratories. One unit shall be supplied to the Institute.
2-2-21	Thermo Hygrometer	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure temperature and humidity of atmosphere in laboratories.	○	○	○	1			In order to undertake experiments or testing of textile materials according to the international as well as domestic standards, it is necessary to keep the temperature and humidity in constant condition. For this purpose, it is indispensable for the Institute to keep one unit.
2-2-22	Density Meter-Thread Picking Meter	4	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						4	To measure the density of woven and knitted fabrics.	○	○	○	4			This is a simple but important apparatus in the study of principles and mechanism of woven and knitted fabrics. One unit is normally used by 5 students, therefore 4 units shall be supplied to meet approx. 20 students in a class.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
2-2-23	High Magnification Microscope	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics		① 1970		1			To observe and to make photographic record of sliced fiber, yarn, fabrics, etc.	○	○	○	1			The Institute is equipped with an old microscope which is deteriorated functionally. The purpose of this item is to observe and take photographic materials of sliced sections of fibers, yarns, cloths, etc. It is commonly practiced to study mechanism textile materials by microscopic observation and is useful for students to learn such method. One set of microscope with attachments including microtome shall be supplied to the Institute.
2-2-24	Static Meter	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the static electricity generated by abrasion to woven and knitted fabrics.	○	○	○	1			This measures electrostatic propensity of woven and knitted fabrics and enables students to learn the important properties of textile products such as the relationship among the kinds of textile and atmospheric/environmental conditions. One unit shall be supplied.
2-2-25	Portable Cloth Balance	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the weight per square unit of woven and knitted fabrics.	○	○	○	1			This is a set of sample cutter and weighing balance for evaluation of textile products. One set shall be included in the Project.
2-2-26	Rotational Type Viscometer	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the viscosity of various liquid materials used in the textile processing.	○	○	○	1			This is useful apparatus to evaluate sizing and other finishing materials by measuring the viscosity. One unit shall be included in the Project.
2-2-27	Hardness Tester	1	MT Spinning - Technology of Weaving and Tricot Manufacture - Resistance of Materials and Theoretical Mechanics						1	To measure the hardness of cheese.	○	○	○	1			It is important to measure the hardness of cheeses because it affects the quality of yarn as final products or the operational process in the down stream. One unit shall be supplied.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
2-2-28	Air Conditioner	6	Textile Products Testing Lab. and Color Matching Lab.						6	To control temperature and humidity of Textile Products Testing Lab and Color Matching System Lab.	○	○	○	2 sets			Textile materials particularly the natural fibers like cotton are easily affected by atmospheric conditions and, therefore, international standards define the conditions when evaluating physical and mechanical properties of these materials, i.e.; ISO139 defines 1) temperature 20±2℃, humidity 65±2% for temperate weather, 2) temperature 27±2℃, humidity 65±2% for tropical weather. The condition in the Textile Products Testing Lab needs to be maintained closer to such standard as much as possible while the Color Matching System Lab shall be maintained good enough to keep the proper operation of equipment.
3	**Knitting and Sewing Processing**																
3-1-1	Lockstitch Buttonholing Machine	1	LI Technology of Garment Articles			① 1970		1		To make lockstitch buttonholing of garments.	○	○	○	1			The existing item is old manual type model which is not in consonance with the technology applied in the sewing factories where automated machines are in operation. A new model which can produce button holes both for woven and knitted fabrics shall be supplied to the Institute.
3-1-2	Automatic Embroidery Machine	2	LI Technology of Garment Articles						2	To make embroidery automatically with a preset design.	○	○	○	1		1	Sawing factories recently started mass production of fabrics with embroidery made by the automated machines. It is indispensable for the students to learn the technology of automated machinery in order for them to make comparative study on production facility in the value added down stream processes of garment production. The request was made for 2 units, but one unit of 4 head type model is sufficient for educational purposes.
3-1-3	Side, Reverse & Box Pleating Machine	1	LI Technology of Garment Articles						1	To make pleating of silk fabrics.	○	○	○		1		The institute undertakes education and research on value added silk products by applying pleating finish. This is a part of industry-Institute collaboration for development of new design of domestic textile products. This equipment is already introduced in the factories but the Institute does not have one. in order for the Institute to keep pace with the advancement of production technology with the industry, one batch-type model shall be installed.
3-1-4	Computer Aided Design System	2	LI Design of Garment Articles - Technology and Design of Leather Articles						2	To design patterns and grading of garments and shoe parts.	○	○	○	2			CAD systems for designing apparel and footwear are already in operation in the factories and it seems that these will be introduced to more textile factories. Design of patterns and grading for parts of garments and shoes helps management of factories since these are to maximize the efficiency and effectiveness in utilization of raw materials. In consideration of the needs towards the Institute, 2 sets will be installed. The system will include 2 processors, and one each of digitizer and plotter that can be shared. Cutting machine shall be excluded from the Project component since it is meant for use in the industry.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Replacement	Addition	New					A	B	C	
3-1-5	Socks Knitting Machine	2	MT Technology of Weaving and Tricot Manufacture LI Technology of Garment Articles		⑤ 1975	④ 1965		2		To knit socks automatically.	○	○	○	1		1	There are 9 existing machines, all being old and outdated, thus creating technological gap with those used in the factories. The request was made for 2 units of machines, one with dobby and the other with jacquard. One unit with dobby shall be installed since it is sufficient for the Institute to catch up with the relevant technology.
3-1-6	Overlock Machine for Runstitching	2	MT Technology of Weaving and Tricot Manufacture LI Technology of Garment Articles		④			3		To sew the joints of sleeves, shoulders of garments, and toe of socks.	○	○	○	3			Existing 4 units are all old and is not functioning fully in case of those for knitted fabrics. Those for socks are not sewing evenly and thus degrading the quality. In order to keep technological relevance with the industries and in consideration of frequent use of these machines, 2 units for knitted fabrics and one unit for socks shall be installed at the Institute.
3-1-7	Circular Knitting Machine	1	MT Technology of Weaving and Tricot Manufacture LI Technology of Garment Articles		④ 1970			1		To produce single knitted fabrics.	○	○	○	1			The Institute has 4 old circular knitting machines, but the pattern cams are worn out and these are creating many defects in the knitted fabrics. In order to keep pace with the technological advancement in the industries, a new model shall be installed at the Institute.
3-1-8	Steam Press	1	MT Technology of Weaving and Tricot Manufacture LI Technology of Garment Articles		①		1			To press socks for finishing by steam.	○	○	○	1			The Institute has an experimental production line of socks knitting and finishing, but a steam press to set the form of knitted socks is not installed thus the finished products after the line is not complete without having any added value. The Institute recently started training of silk socks production which definitely need this machine in its finishing process. One unit shall be installed at the Institute.
4	**Computers for Engineering Education**																
4-1-1	Personal Computers	60	EP Information Science MT Engineering Drawing TC Test Center, etc.		25	73		60		To be used for engineering education, industrial design, testing of students, etc.	○	○	○	60			The Test Center of the Institute is equipped with old machines including 25 Pentium machines, 27 486-machines, 19 386-machines and 27 286-machines. Only 6 models in the upper-class can run the heavy application software like engineering drawing soft with difficulties. The frequency of computer use is quite high but students are forced to follow irregular classes due to the limit of number. High-end personal computers that can run heavy applications are needed for 3 rooms, each having 20 units including 1 server. One class shall be for advanced studies to be equipped with a printer, a scanner and a plotter.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Replacement	Addition	New					A	B	C	
4-1-2	Printers	1 set	EP Information Science MT Engineering Drawing TC Test Center, etc.		8			3		To print out reports, papers etc. from computerized data.	○	○	○	3 units			Existing printers can print a paper of up to A4 size. A3 size is necessary for printing the result of engineering drawing etc. Therefore one unit each for 3 rooms shall be supplied.
4-1-3	Scanners	1 set	EP Information Science MT Engineering Drawing, etc.						3	To digitize printed data, graphics, drawings, etc.	○	○	○	3 units			Scanners are needed for courses of information science and course projects employing digitized engineering drawing. Further, the Institute is planning to build a data base of students' project works, and scanners are needed for storing the drawings and data in computers. One unit shall be supplied to the advanced class of the Test Center.
4-1-4	Plotters	1 set	EP Information Science MT Engineering Drawing, etc.						3	To make plotted drawings, etc.	○	○	○	1 unit			The format of drawing compiled in thesis and research papers are defined to be of A2 size. Therefore a plotter of A2 size printing capacity needs to be installed at the advanced class.
4-1-5	Copying Machine	10	EP Information Science MT Engineering Drawing TC Test Center, etc.						3	To reproduce printed materials.	○	○	○	3		7	The teaching staff prepare teaching materials by reproducing the reference books and copying the research results etc. in the Test Center. Therefore the needs for use of a copying machine in the Test Center is very high. In consideration of the maintenance effort of the Institute, 3 units (1 each for a room) shall be supplied.
4-1-6	Scanner Color Drum	2	MT Engineering Drawing, etc.						2	To input large scale drawings in digital signals.	○	x	x			2	These machines are used for large scale drawings, but the large scale models are not used in Uzbekistan currently and efficient service is not expected in terms of maintenance. Therefore, these will be excluded from the Project component.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
4-1-7	Video Display & Video Camera	1	EP Information Science, etc.		4		4			To produce audio-visual education materials for textile engineering education.	○	○	○	1 set			This system is requested for preparation of teaching materials regarding industries, e.g. production facilities, production technology, production management, quality control, etc. of advanced factories particularly of those JVs equipped with advanced production facilities. A set of video camera, editing VTR, and a large scale monitor or projector was requested for an AV class room. The institute has four sets of old VCR and monitors with 2 sets of video cameras for this purpose that are still used. These are however deteriorated and at least one set needs to be replaced with the latest models in consideration of the efficient education.
5	**Editorial Design**																
5-1-1	Scanner with Slide Module	1	EECT Polygraph and Design of Printing Products EO Editorial Design						1	Used for training of technology of poligraphy and design of printing products, and editorial design of educational publications of the Institute.	○	x	x			1	These are the series of equipment to convert the text or command files into bit map images etc. and edit them. The institute is not equipped with digital editing facility, and, therefore the pre-press studies are basically undertaken in the classes by using printed materials. The Institute has a new printing room equipped with relevant plate making, printing and cutting equipment, donated by a German company, but for the pre-press design equipment. In consideration of educational impact, these items shall be excluded from the Project component.
5-1-2	Workstation for Image Processing	2	EECT Poligraphy and Design of Printing Products EO Editorial Design						2	Used for training of technology of poligraphy and design of printing products, and editorial design of educational publications of the Institute.	○	x	x			2	This item comprise the same editing facility and shall be excluded from the Project component for the same reason.
5-1-3	Color monitor	2	EECT Poligraphy and Design of Printing Products EO Editorial Design						2	Used for training of technology of poligraphy and design of printing products, and editorial design of educational publications of the Institute.	○	x	x			2	This item comprise the same editing facility and shall be excluded from the Project component for the same reason.
5-1-4	Color Laser Printer	1	EECT Poligraphy and Design of Printing Products EO Editorial Design						1	Used for training of technology of poligraphy and design of printing products, and editorial design of educational publications of the Institute.	○	x	x			1	This item comprise the same editing facility and shall be excluded from the Project component for the same reason.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
5-1-5	Monochrome Laser Printer	1	EECT Poligraphy and Design of Printing Products EO Editorial Design						1	Used for training of technology of poligraphy and design of printing products, and editorial design of educational publications of the Institute.	○	x	x			1	This item comprise the same editing facility and shall be excluded from the Project component for the same reason.
5-1-6	Network Equipment	1	EECT Poligraphy and Design of Printing Products EO Editorial Design						1	Used for training of technology of poligraphy and design of printing products, and editorial design of educational publications of the Institute.	○	x	x			1	This item comprise the same editing facility and shall be excluded from the Project component for the same reason.
5-1-7	Internal Drum Image Setter	1	EECT Poligraphy and Design of Printing Products EO Editorial Design						1	Used for training of technology of poligraphy and design of printing products, and editorial design of educational publications of the Institute.	○	x	x			1	This item comprise the same editing facility and shall be excluded from the Project component for the same reason.
5-1-8	RIP for Image Setter	1	EECT Poligraphy and Design of Printing Products EO Editorial Design						1	Used for training of technology of poligraphy and design of printing products, and editorial design of educational publications of the Institute.	○	x	x			1	This item comprise the same editing facility and shall be excluded from the Project component for the same reason.
5-1-9	On-line Film Processor	1	EECT Poligraphy and Design of Printing Products EO Editorial Design						1	Used for training of technology of poligraphy and design of printing products, and editorial design of educational publications of the Institute.	○	x	x			1	This item comprise the same editing facility and shall be excluded from the Project component for the same reason.

Code	Name of Equipment	Requested Q'ty	Course	Evaluation of Existing Equipment			Classification			Purpose of Use	Necessity	Appropriateness	Judgment	Planned Q'ty			Examination and Result
				A	B	C	Repla-cement	Addition	New					A	B	C	
5-1-10	Reflection Densitometer	1	EECT Poligraphy and Design of Printing Products EO Editorial Design						1	Used for training of technology of poligraphy and design of printing products, and editorial design of educational publications of the Institute.	○	x	x			1	This item comprise the same editing facility and shall be excluded from the Project component for the same reason.
5-1-11	Transmission Densitometer	1	EECT Poligraphy and Design of Printing Products EO Editorial Design						1	Used for training of technology of poligraphy and design of printing products, and editorial design of educational publications of the Institute.	○	x	x			1	This item comprise the same editing facility and shall be excluded from the Project component for the same reason.

* Course abbreviation:
MT: Mechanical-Technological
CT: Cotton Technology
LI: Light Industry
EECT: Engineering Economics & Chemical Technology
TC: Test Center (Computer
EO: Editorial Office

**Evaluation of existing equipment:
A: Old but still operational.
B: Operational but needs replacement in a few years.
C: Non-operational and urgently needs replacement.

***Category of Planned Q'ty
A: Justified as necessary with higher priority
B: Necessary but comparatively lower priority
C: Justified as less necessary (to be excluded)

3-2-2-1 Equipment for Natural Silk ProcessingTechnology

(1) Equipment for raw silk certification technology

The equipment is that required to for inspection and grade certification of silk yarn. Inspection is now being done on the basis of the domestic standard Uz RST-834-97, that is now under review with the thought of revising it so as to be closer to international standards. The revised standard will have about 7 grades, matching standards in buyer countries including Japan. The equipment planned to be supplied will conform to the requirements of the revised standard and includes seriplane winder, denier scale for denier measurement, serigraph for testing strength and stretch, a conditioning oven for determining dry weight, winder for inspection for rereeling breakage, Duplan cohesion tester, moisture analyzer, and preparatory equipment for winding and other work. By the acquisition of these, the equipment needed for certification of silk yarn will be available and will be satisfactory for educational purposes. Further, the accumulation of data of various kinds related to the improvement of quality of silk products and effects of education and practice in application technology is to match the needs for development of human resources for silk mills.

(2) Equipment for silk filature and weaving technology

The production process for standard raw silk filature and weaving is divided into raw silk reeling, and weaving, dyeing and finishing as shown in Fig. 3-1.

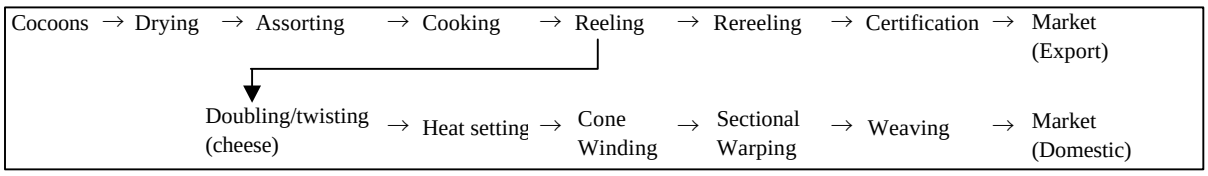


Fig. 3-1 Production Process of Raw Silk and Silk Fabrics

1) Yarn filature process

The Institute has a line of old silk filature equipment including a small cocoon boiling machine made in Japan that it acquired in 1974. A major piece of the equipment on hand, it is functioning well and is judged to satisfy technical standard requirements. Much of the equipment used in reeling is old. As shown in the table below, the major pieces of equipment are the regular reeling machine (old type) and multi-reeling machine (semi-automatic).

Table 3-4 Reeling Machines – Existing and Planned

Type	A Full Automatic	B Automatic	C Semi Automatic	D Old Type
Existing Unit in TITLI	None	1 (Planned)	1 (Old) 1974*	3 (Old) 1932# 1954# 1962*
Quality of Raw Cocoons	Best	Good	Normal	Inferior
Existing Unit in Uzbek Factory	None	3	5	Many

: Not in operation. * : In operation.

At present three mills in Uzbekistan have automatic reeling machines, that are operated using specially selected cocoons. Because the equipment at the Institute has aged it no longer is at the level seen in industry. The project calls for installing an automatic machine rather than a semi-automatic one, and by providing for selecting cocoons of suitable quality, it will be possible to make good quality yarn. The machine to be installed will be adequately automated and capable also of using low-grade cocoons.

Much of the silk textile goods made in Uzbekistan derive added value from twist being added to the yarn. Because of this it is conventionally necessary for silk

weaving mills in Uzbekistan to be equipped for the pre-weaving process with a cheese winding machine fed from the reels, a doubling/twisting machine and a vacuum heat setter machine that does steam setting to add twist. There is strong demand in the silk industry for training and practice in this technology, so the results of improved education should be substantial.

2) Weaving, Dyeing and Finishing Process

The Institute does not possess equipment for dyeing. Because there is no need for the processes of dyeing yarn, dyeing cloth, glossing, and finishing to be done at the Institute, it is expected that the same procedure as used up to this time, namely relying on outside mills' cooperation to give students the opportunity to study and learn these processes, will continue. Thus, the project calls for only replacing aged equipment for cotton and silk cloth production processes. Cloth making equipment now at the Institute is as follows.

Table 3-5 Weaving Machines – Existing and Planned

Type	Standard	With Dobby	With Jaquard	Total
Shuttle	2 (1960) ○	6 (1960) ○ 2 (1960) ×	1 (1965) × 1 (1970) ○	12
Projectile	2 (1975) ○			2
Rapier	2 (1960) ○	1 (Planned)	1 (Planned)	2
Total	6	8	2	16

○ :In operation × :Not in operation

The requested pieces of equipment include an automatic cone winder, sectional warper, rapier loom with dobby, rapier loom with jacquard. All these would be used for producing high value added twist silk fabric. Traditional clothing, that remains quite popular in Uzbekistan, makes liberal use of silk and includes atlas, crepe de chine, crepe georgette, crepe chiffon and other fabric, and for this reason research is

done at the Institute on warp (cotton yarn) and weft (silk splashed yarn) mixed woven fabrics. It is necessary to include this processing technology for weaves in the curriculum. After the new equipment is put to use, it is planned that the existing old equipment will be used for instruction and learning for cotton woven fabrics of relatively low grade.

The automatic cone winder, sectional warper, and the rapier loom with dobby, all are pieces of equipment for which there are substantial differences between the old units to be replaced and the new ones to be acquired. Consequently, there will be corresponding improvements in the education process and results. Because the equipment to be installed operates at high speeds, safety precautions are particularly important, but the problem of damage to yarn is reduced when twisted silk filament is used.

3-2-2-2 Equipment for Cotton Processing Technology

(1) Desiderata for testing and measuring equipment

Testing and measuring equipment in use at the Institute now comprises machines for the cotton spinning lab, the weaving lab, the dyeing and finishing lab, the cotton fiber lab and the textile materials lab. Almost all of the equipment requested by the Institute is not now available there, and is needed for education, while a few are intended as replacements for old equipment. Selection of the equipment was done on the basis of the experience largely in quality control that was gained by trainees sent from the Institute to advanced textile training institutions in Belgium, Greece and elsewhere, and are judged to be suitable. The requested equipment is as follows;

[1] Testing equipment for basic characteristics of apparel

- Tearing strength tester

- Fade meter
- Cloth tensile tester
- Abrasion tester
- Color fastness to washing tester
- Color fastness to perspiration tester
- Color fastness to rubbing tester

[2] Testing equipment for hand and suitability to intended use

- Air permeability tester
- Warmth retaining tester
- Static meter

[3] Functionability testing equipment

- Water resistance tester
- Flammability tester

[4] Testing equipment for color, appearance, other sensual characteristics

- Color matching system
- Test dyeing machine
- Pilling tester
- Wrinkle recovery tester
- Slip resistance tester
- KES hand evaluation tester

[5] Testing equipment for manufacturing and experiment process control and quality control

- Portable evenness tester
- Optical hairiness tester
- Dynamometer
- Yarn tensile tester
- Yarn tension meter
- Tachometer
- Thread picking meter
- Thermo hygrometer
- High magnification microscope
- Portable textile scale
- Rotational type viscometer

- Hardness tester

[6] Other

- Air conditioner

(2) Selection of testing and measuring equipment

The equipment requested is to be installed in the cotton spinning lab and the dyeing and finishing lab. In the cotton spinning lab basic equipment is now in use but is old. Requested for this lab are a portable evenness tester, optical hairiness tester, and dynamometer. All are basic equipment for measurement work, but the precision of portable evenness tester is not very high and as it was judged that the one now in use will be adequate, it has been left off of the list of planned equipment.

There are only several pieces of analytic equipment in the dyeing and finishing lab, but they have been in use for 30-40 years. Dyeing and finishing in Uzbekistan is carried out for the most part in large-scale integrated mills. For this reason, the Institute has made use of facilities in nearby mills when training in dyeing and finishing was to be done. One reason for this situation is the latter-day effects of the former USSR arrangement whereby cotton and silk were exported by Uzbekistan. Recently, however, the Uzbekistan government adopted the industrial promotion policy of raising the processing rate and value added of domestic production using domestic resources. Similar to the situation related to other institutes in the country, there is now greater demand for training in downstream areas of manufacturing at the Institute, and for this reason it is urgent that the past neglect of dyeing and finishing be corrected. In view of this it is judged that the equipment to be provided for the dyeing and finishing lab is essentially suitable for educational purposes. Mention must be made of the exclusion from the plan of the KES hand evaluation tester. Although this is in use in the industrially advanced countries, it is not necessary for educational institutions in Uzbekistan at this time in due consideration of the fact that there is no single unit installed in the textile mills,

which might easily cause maintenance hardships.

3-2-2-3 Equipment for Knitting and Sewing Process Technology

(1) Production lab equipment

In the Institute's Mechanical-Technological Faculty, training is provided in production of knits, using yarn from the cotton spinning lab and purchased from outside. The knit fabric made here, and the wovens from the weaving lab, are used for training in sewing. Laying out and sewing are done as integrated steps for making hosiery and undergarments, domestic demand for which is high.

Among the equipment used in the socks production part of the lab, the socks weaving machine is obsolete, and produces only simple shapes and low quality goods. Domestic mills have already automated the socks production process, and it is now planned to bring the training up to the level matching production in those mills. The existing overlock machine for making toes is obsolete and the appearance of the overlock is poor. Considering that there is a wide gap between processing technology now being used to make goods for the market, and that used in the lab, it is clearly necessary to raise the level of equipment and work in the lab. Regarding the press for forming socks, it is planned to provide production training using raw silk made in Uzbekistan, in which case it will be necessary to install a form press. The Institute had requested two socks knitting machines (one with dobby, one with jacquard) but it has been judged that it is sufficient for the Institute to have one basic unit, with dobby, for study of current technology as well as the mechanics and function of the machine, and no plan has been made to supply a second one.

In the process of manufacturing undergarments, the knitting machine in use is of Russian manufacture and dates from the 1960-1970 period. Worn-out cams and

other problems are causing many defects. Domestic mills have improved their production facilities and it is essential that the Institute's equipment be improved so as to be close to the level of private industry. It is planned to provide equipment suitable for training in overlock stitching of knit undergarments and cut-and-sewn garments and, in view of the quality improvement in knit fabric, sleeves and inserting of sleeves.

Table 3-6 Knitting Machines – Existing and Planned

Item	Existing Machines				Planned Machines	
		Year	Q'ty	Condition		
Circular Knitting Machine	4 units	1961 1962 1964 1979	1 1 1 1	○ ○ ○ ○	1 unit	Automatic Circular Knitting Machine – Single type, Cylinder 30", Gauge 28
Socks Knitting Machine	9 units	1963 1971 1978 1986	3 2 3 1	○○○ ×○ ○○○ ○	1 unit	Socks Knitting Machine with Pattern Program

(2) Equipment for sewing design work

Training in sewing is being limited by the obsolete buttonhole maker, that is manual and cannot be used with certain fabrics. In the country's garment factories machines have been introduced that can do this work automatically and in both woven and knitted fabrics. It is judged necessary that training at the Institute be close to the realities in the industrial sector. Because the number of factories using machines for automatic embroidering, especially for traditional Uzbek garments, study and training using the same equipment as in the factories is deemed necessary. Pleat making machines are used for traditional twist silk woven goods to improve value added relative to woven fabrics made of synthetic fiber. Students at the Institute spend a good deal of time working on pleats, for traditional clothing, and because frequency of use is high, a relatively simple equipment meeting batch processing specifications is called for. The Institute had asked for two automatic

embroidery machines, one 4-head type and one single-head type, but one is deemed sufficient for learning new technology and principles of machinery and plans are for one unit with four heads.

Besides the above production related activities students at the Institute start art and fashion as part of their work at design of apparel and footwear, and hold fashion shows featuring their own creations. Uzbek apparel manufacturers have been switching to CAD for pattern design and grading, and as a means of improving production technology, and correspondingly the Institute's students are keenly interested in design related studies owing the linkage between creative design and production technology. In order to develop the human resources that the industry requires one unit each of CAD equipment for apparel design and for leather processing are to be provided. These units are specifically intended only for educational use, and plans do not go so far as to call for units that can handle raw materials cutting and processing work. Instead the units are to be capable of produce patterns by use of a plotter. One digitizer for design input work and one plotter for output, that can be shared by both apparel and leather processing students, are to be provided.

3-2-2-4 Computers and Audio-visual Equipment for Engineering Education

(1) Computers

The Institute now has 98 computers in the five rooms of the test center, and these are used primarily by undergraduate and postgraduate students in computer courses, research projects, etc. The Information Sciences Department, Faculty of Engineering Pedagogy, is in charge of the test center equipment and has five assistant professors and three lecturers.

Study subjects include, but not limited to, computer theory, computer language,

theory of mechanics, mechanical design, mechanical drawing, metrology, production management, quality control, information management, business management, CAD practice, automated controls and other subjects. The educational software in use includes the following: development language software, graphic software (two and three dimensional CAD), database management software, and scientific calculation software.

The two branch schools created in 1998, at Andijan (Andijan Engineering-Economic Institute) and Namangan (Namangan Industrial Technological Institute) send their students to the test center for computer classes, so there is intensive use of the test center.

Of the 98 computers, 25 were acquired since 1996 and are Pentium type machine; the others were acquired during 1989-1995 and are old models suitable only for use in giving written exams and not for running the above application software. Because of these conditions the Institute wishes to add 20 computers to each of three test center rooms, and keep all equipment under centralized control (Table 3-7). Joint use of peripherals is also planned.

Table 3-7 Computers Distribution Plan

	Lab. 1	Lab. 2	Lab. 3	Lab. 4	Lab. 5
Lab. Type	New/Advance	New	New	Old	Old
Computer	Pentium III	Pentium III	Pentium III	Pentium	486
Quantity	20	20	20	20+5	20+7
User - Grade 1&2		○	○	○	○
User - Grade 3&4	○	○	○		
User - Masters	○	○	○		
User - Teaching Staff	○				
User - General		○	○	○	○

The Institute needs 20 computers for each of three test center rooms (Lab 1, Lab 2, and Lab 3). These may be used in a continuation of the five-room arrangement by locating the 25 existing Pentium machines (5 being spares) in one room (Lab 4), 27

of the old type 486 model (7 being spares) in another room (Lab 5) and planning for use of both these rooms by first or second year students. It is not necessary to provide identical equipment for use together with all 60 of the new computers, and an effort should be made to minimize the number of peripherals and required software. One of the three rooms should be for use by sophomore and senior year students, graduate students, and faculty (e.g., for advanced classes). In view of the foregoing, each of the three classrooms should be provided with its own closed-type LAN so that each room has one server and 19 clients. Among the requests for peripherals a plotter is to be provided but only for the advanced-class room (Lab 1). Regarding software, in principle the plan calls for supply of basic operation system software only and applications software for the various departments is to be acquired by the Institute at its own initiative.

(2) Audio-visual equipment

Audio-visual aids in the following categories are used for education in the Institute.

- To show production technology, production management, quality control, latest textile machinery, etc. of the advanced joint venture factories in Uzbekistan to the students in textile engineering courses
- To edit the video tapes provided to the Institute by foreign textile companies and manufacturers of textile machinery, and show the edited program to the students for learning latest technology
- To make educational programs in the classes of the Institute and use such programs for education at the sister institutes and other related schools

The Institute is currently equipped with audio-visual equipment including 2 video cameras, 4 videocassette recorders, and 4 monitors, most of them are old

enough and functionally deteriorated. The quality of video images made by the existing cameras is not clear enough to show the details of production facilities in a textile mill where the lighting is normally not sufficient for shooting. Without having an editing machine, the Institute is not able to produce efficient educational programs. The monitors are small and the students in the rear rows can hardly see the programs. Therefore, the Institute urgently needs the new set of audio-visual equipment.

The Institute is currently planning to remake existing 282 video programs having unclear images and to add 40 new educational programs by using the planned new equipment. Further, it plans to enhance the educational impact to the students by applying the practical problem-solving method by means of the audio-visual aids, which is valued in Uzbekistan as new educational method. By the year 2002 when the planned equipment are supposed to be installed at the Institute, the existing audio-visual equipment will be further deteriorated and not be efficient for use in the classes. The plan should therefore include the set of equipment of standard level which non-professional staff at the Institute can operate, including a digital video camera, a video editing system, a video projector, a screen, an amplifier and a set of speakers.

3-2-3 Basic Design

Major piece of equipment that are to be supplied, based on the above, are listed in Table 3-8.

The site plan of the entire Institute is shown in Fig. 3-2(1). Locations of the equipment to be supplied are shown in Fig. 3-2(2) to 3-2(10). The equipment is to be located as summarized below, in view of the location of labs and classrooms, installation of existing equipment, relation between new and existing equipment, available space,

etc.

Building 1	3F Computers (test center)
	3F Audio-visual Room
Building 2	1F Fabric processing equipment (weaving lab)
	1F silk processing equipment (silk lab)
	3F Analytic equipment for textiles and yarn (lecture hall, small rooms)
Building 3	2F Analytic equipment for dyeing
Building 4	4F Sewing process equipment
Building 6	1F Knit process equipment

Selection of the locations of the equipment to be provided has been on the basis of concentrating the equipment in the best possible places and where the equipment can be easily maintained.

Table 3-8 List of Planned Equipment

Code	Name of Equipment	Q'ty	Short Specification
1-1-1	Seriplane Winder	1	Comprises of a raw silk winder, inspecting black board and carrier, bobbin driven by motor.
1-1-2	Seriplane Illumination Apparatus	1	Fluorescent lamp, seriplane panel hanger, reflection lamp hanger, vertical lamp stand.
1-1-3	Seriplane Standard Photographs	1	A set of silk quality standard photographs for export, eveness variation, cleanness standard, and neatness standard.
1-1-4	Measuring Meter	1	Raw silk measuring meter, selectable thread lines, motor driven.
1-1-5	Denier Scale with Weighing Scale	1	Denier balance for raw silk, electronic denier balance, max. denier:1,200d, sensitivity:0.1d
		1	Electronic balance, max. 6kg, reading accuracy:1g
1-1-6	Serigraph	1	Recorder type, descending speed:Approx. 15cm/min., measuring capacity:Approx 25kg
1-1-7	Bobbin Winder	1	10 bobbins type, variable winding speed with automatic stopper, motor driven.
1-1-8	Conditioning Oven	1	Drum type raw silk moisture tester, with electric heater, capacity: approx. 1kg, sensibility: approx. 50mg
1-1-9	Winding Machine	1	Raw silk rereeling machine from skein to bobbin, variable winding speed, 10 bobbins or less, motor driven
1-1-10	Duplan Cohesion Tester	1	Duplan type, tension weight: less than 200g, friction strokes:Max.130/min.,weight of upper friction board: Approx. 300g, with friction knives
1-1-11	Kett Oven	1	Infrared ray lamp type, sample weight:50g or less, with sample tray
1-1-12	Twist Counter	2	Untwisting and twisting method type, sample length: 50cm or less, with printer
1-1-13	Moisture Meter	1	Infrared ray drying system, data printing device, automatic/manual operation, with a printer
1-2-1	Doubling Twister	1	Spindles: less than 32, spindle pitch:Approx. 200-240mm, speed: less than 9000rpm, doubling: 6 or more
1-2-2	Vacuum Heat Setter	1	Cylindrical type, sequential program control system, capacity: 100kg/batch, vacuum pump, with thermo recorder
1-2-3	Sectional Warper	1	Effective width: approx. 2200mm, drum circumference: approx. 5000mm, warping speed: 800m/min. or less. Creel: cone creel type
1-2-4	Reeling Machine	1	For silk reeling, 40 ends or less, automatic brushing and end-picking device, cocoon supplying device, dropped cocoon discharge and pupa separator, denier detecting device and indicator
1-2-5	Rapier Loom for Silk	2	Automatic high speed type, one unit with dobby and one unit with jacquard, reed space: approx.1900mm, colors (dobby): max.6, colors (jacquard): max. 8, warp tension control
1-2-6	Automatic Cone Winder	1	Automatic cone winding type, drum: Approx. 5, winding speed: 400-800m/min. (variable)
1-2-7	Braiding Machine	1	No. of spindles: 36 or less, both for flat and round braids, with take up devices and stands
2-1-2	Optical Hairiness Tester	1	Optical type, measuring range: 0-20mm, precision of hair length setting: 1/100mm, to measure length of hair and degree of hairiness, with printer and accessories
2-1-3	Dynamometer	1	Gauge length: 25-50mm, measuring range: 0-1000cN, elongation: max.100%, electromagnetic clamp or manual clamp, accuracy: force ±0.5%, elongation ±0.1%, with printer

Code	Name of Equipment	Q'ty	Short Specification
2-2-1	Color Matching System	1	For plain dyeing, comprises: spectrophotometer; mother dyestuff making system; stock solution making machine etc., number of stock solution: approx. 40, attachments
2-2-2	Tearing Strength Tester	1	Elemendorf type, measuring range: 0-1600g, 0-3200g, 0-6400g (3 stages), min. readings: 20/40/80g
2-2-3	Fade Meter	1	Lighting source: Xenon arc lamps. Control range: Light-on test (Approx.);60℃-80℃±3℃/35-60±5%RH, Dark test(Approx.); 30℃-50℃±3℃/90-95±5%RH, with water purifier
2-2-4	Test Dyeing Equipment	1	Max. working temperature: 140℃, pot inner volume: approx. 400cc, number of pot: 8-16, heaters: electric
2-2-5	Cloth Tensile Tester	1	Load measuring range: 5g-100kg, load cell: 5, 20, 50, 100kg, accuracy of pulling speed: ±1%, recorder
2-2-6	Abrasion Tester	1	Martindale type, number of specimen: 1-6, working pressure on abrasion: approx.9kPa
2-2-7	Pilling Tester	1	ICI type, test box: 3 in 1 row, safety cover
2-2-8	Wrinkle Recovery Tester	1	Monsanto type, balance weight: approx.500g
2-2-9	Slip Resistance Tester	1	Rubber drum: approx.20φ x 25(L)mm (upper), approx.20φ x 50(L)mm (lower), hardness of rubber drum: 60±5 degree, load at rubbing: 500-2500g
2-2-10	Air Permeability Tester	1	Frazier standard type, measuring range: 0.5-390cc/cm^2/sec, area of orifice: approx.40cm^2, nozzle: 9 types
2-2-11	Water Resistance Tester	1	Schopper type, max. water column: 1600mm, sample size: 15-20cm^2
2-2-12	Flammability Tester	1	Specimen clamping angle: 45 deg., burner:micro-burner and meckel burner, melting burner, ignition by electric spark, digital display
2-2-13	Color Fastness to Washing Tester	1	Heat source: electric, automatic temperature control, number of pot: 16-18, volume of pot: Approx. 500cc
2-2-14	Color Fastness to Rubbing Tester	1	Gakushin type, number of sample: less than 6, standard rubbing fingers, load: 200g
2-2-15	Color Fastness to Perspiration Tester	1	Load weight type, weight: 2, 3, 4, 4.5-4.6, 5.1kg, detachable in stages, specimen holder: plastic plate, material of body: stainless steel
2-2-17	Warmth Retaining Tester	1	Thermostatic method type, ASTM standard, test piece space heater, temperature control by thermister, timer:digital, transparent acrylic board cover for heater
2-2-18	Yarn Tensile Tester	1	Max strength: 2kg/5kg, readability: 1g/5g. Elongation: Max. 50%, readability: 0.1%, with recorder and printer
2-2-19	Yarn Tension Meter	1	Digital display type, measuring range: 0-300g
2-2-20	High Speed Tachometer	1	Digital display type, measuring range: 0-15000rpm
2-2-21	Thermo Hygrometer	1	Portable type, Measuring range: -10 to 70℃ (temperature), 20 to 95% (relative humidity)
2-2-22	Thread Picking Meter	4	A set of three-fold inspection glass and 2 inches fabric glass
2-2-23	High Magnification Microscope	1	Magnification: 15-400, with monitor and printer. Microtome: 0.5-25μm(thickness of section), with sample preparation tools and embedding agent
2-2-24	Static Meter	1	Rotary type, measuring range: 0 to 10,000V, with oscilloscope and recorder
2-2-25	Portable Cloth Balance	1	Direct reading balance with sample cutter, max. measuring: Approx. 400g, readability: 0.001g

Code	Name of Equipment	Q'ty	Short Specification
2-2-26	Rotational Type Viscometer	1	Digital type, measuring range: 30-24,000,000mPa.s, accuracy: within ±2% of full scale
2-2-27	Hardness Tester	1	Ball type, measuring range: 0-100 degrees
2-2-28	Air Conditioner	2 sets	For Textile Products Testing Laboratory and Color Matching System Laboratory, room ambient temperature: 20-25℃ (outside temperature: 40℃ in summer, -2℃ in winter)
3-1-1	Lockstitch Buttonholing Machine	1	Max. speed: 3600rpm or less, button hole length (inner): 32mm or less, intermittent cloth feeding
3-1-2	Automatic Embroidery Machine	1	4 heads type, embroidery space per head: approx. 450 x 500mm, speed: 200-1,000rpm
3-1-3	Side, Reverse & Box Pleating Machine	1	Accordion pleats type, for silk and synthetic fabrics, working width: approx. 1,600mm, pleating depth: approx.6mm, electric heater
3-1-4	Computer Aided Design System	2	One each for apparel and shoe pattern design, with a digitizer (A0); computers; a plotter (A2); 2D imput system for shoe CAD
3-1-5	Socks Knitting Machine	1	Cylinder dia.: 3-3/4" or 4", needles:Approx. 140N, gauges: 24G, pattern program
3-1-6	Overlock Machine for Runstitching	1	For sewing edges of sleeves and hems of knitted fabrics, single needle type
		1	For joints of sleeves and shoulders of knitted fabrics, 2-needle type
		1	For toe joints of socks, 2-needle type.
3-1-7	Circular Knitting Machine	1	Cylinder dia.:30", No. of feeds: Approx. 90, gauges: 28G, needles: 2700 or less, with creel
3-1-8	Steam Press	1	Automatic rotary type, production capacity: approx. 400 deca/8 hours
4-1-1	Personal Computers	57	CPU: Celeron or higher, memory: 64MB, HDD: 10GB, OS: Windows98 (client), network: Ethernet, FDD, CD-ROM, monitor display
		3	CPU: PII or higher, memory: 128MB, HDD: 40GB, OS: Windows2000 (server), network: Ethernet with switching hub,I/F: SCSI, FDD, CD-RW, monitor display, UPS
4-1-2	Printers	3	For network use（I/F:IEEE1284 or Ethernet）, Monochrome, paper size: A3～A4, resolution: more than 600dpi
4-1-3	Scanners	3	For network use (I/F:SCSI), monochrome or better, paper size: A3～A4, resolution: approx. 1,200dpi
4-1-4	Plotters	1	For network use (I/F:IEEE1284 or RS232C), monochrome or better, paper size: Min.A2, resolution: 300～400dpi
4-1-5	Copying Machine	3	Max. paper size: A3, desk top type, manual feeding, paper cassette
4-1-7	Audio-visual Equipment	1 set	Digital video camera, video eiditing machine, projector, screen, speakers and amplifier

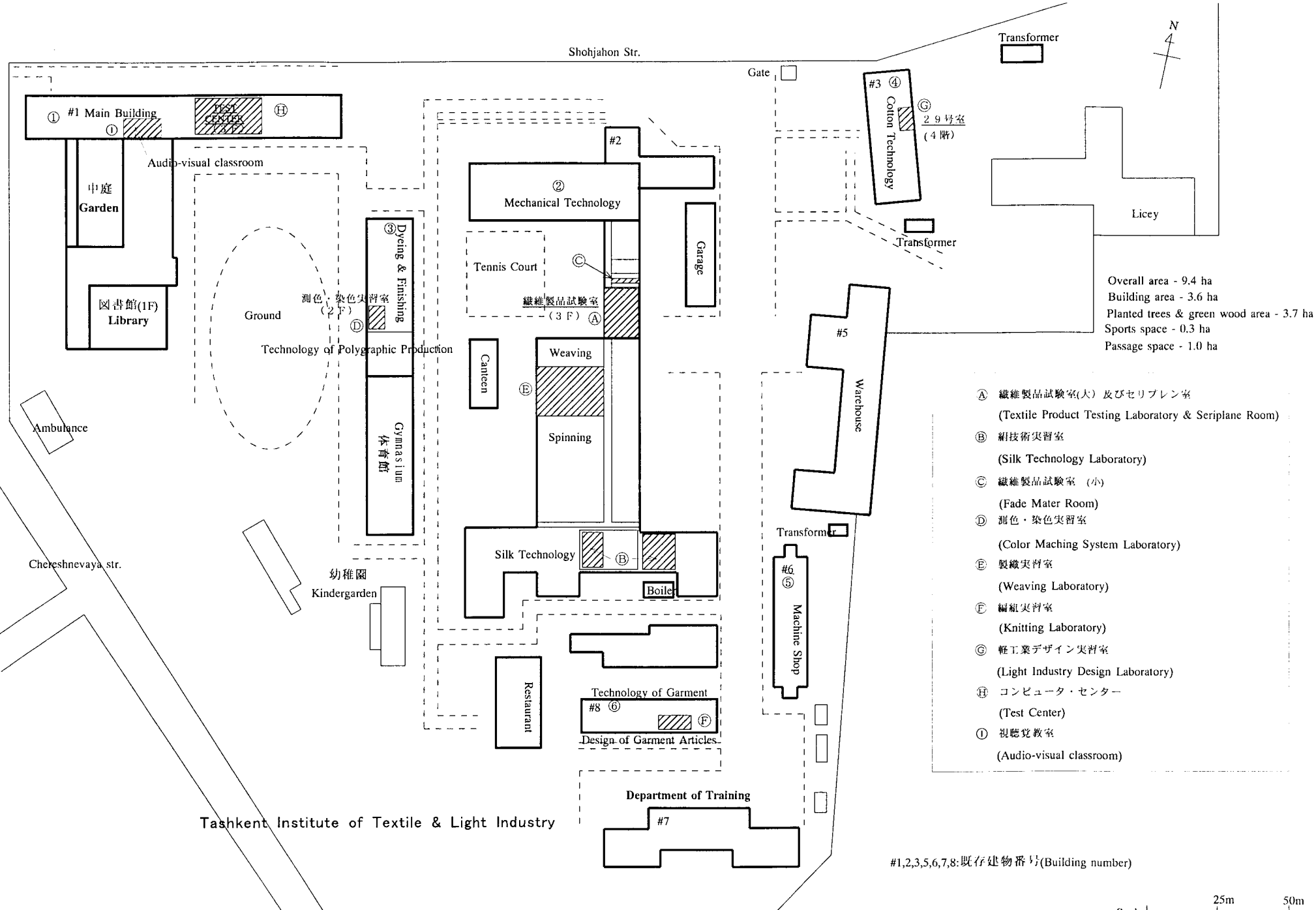


Fig. 3-2 Layout plan (1) site Map

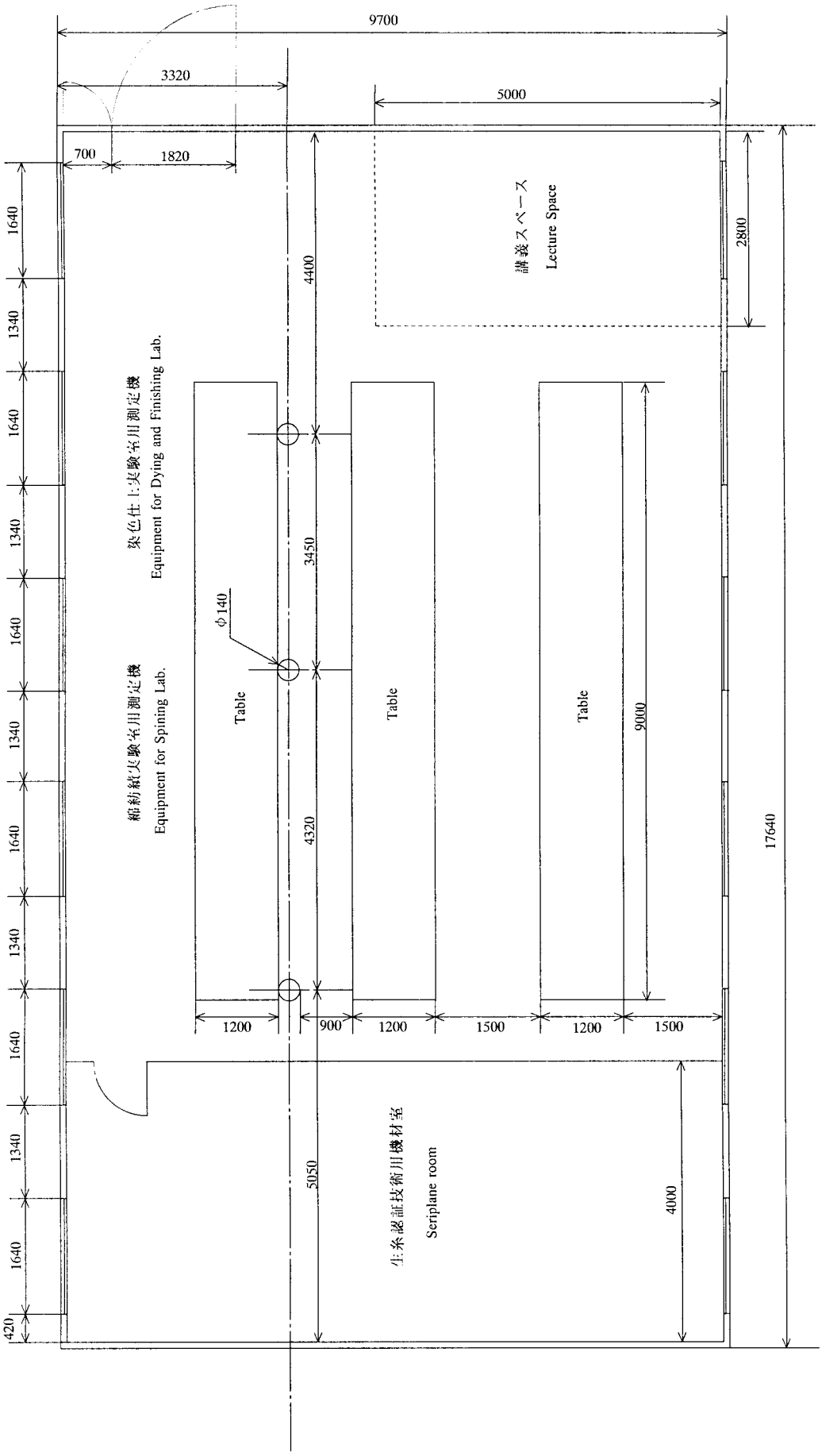
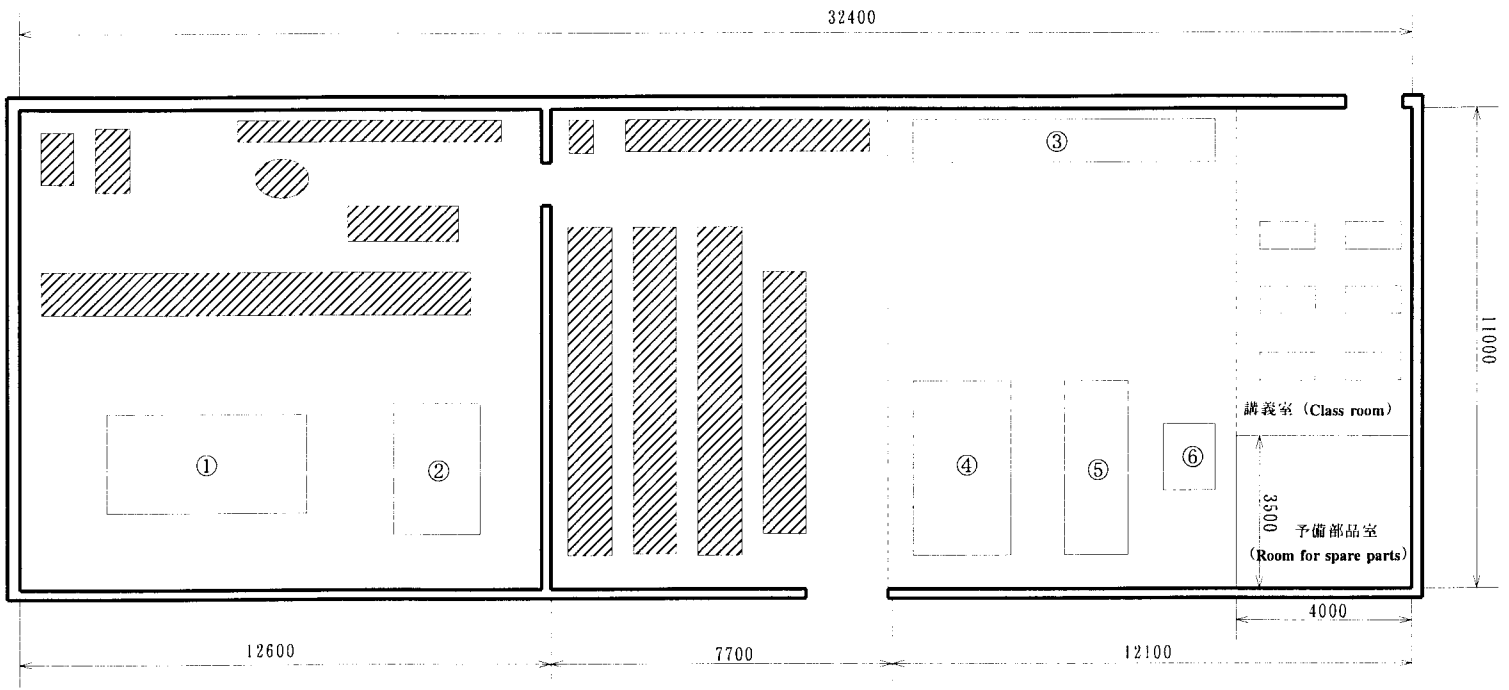


Fig. 3-2 Layout Plan (2)Textile Products Testing Laboratory(No. 1)



計画機材（Planned Equipment）

① : 絹繰糸機（Reeling Machine）

② :丸型真空セット機（Vacuum Heat Setter）

③ : 合撚糸機（Doubling Twister）

④ :再繰巻取機（Winding Machine）

⑤ :ボビン巻取機（Bobbin Winder）

⑥ : 組紐機（Braiding Machine）

：既設機材（Existing Equipment）

Fig. 3-2 Layout Plan (3) Silk Technology Laboratory

フェードメータ

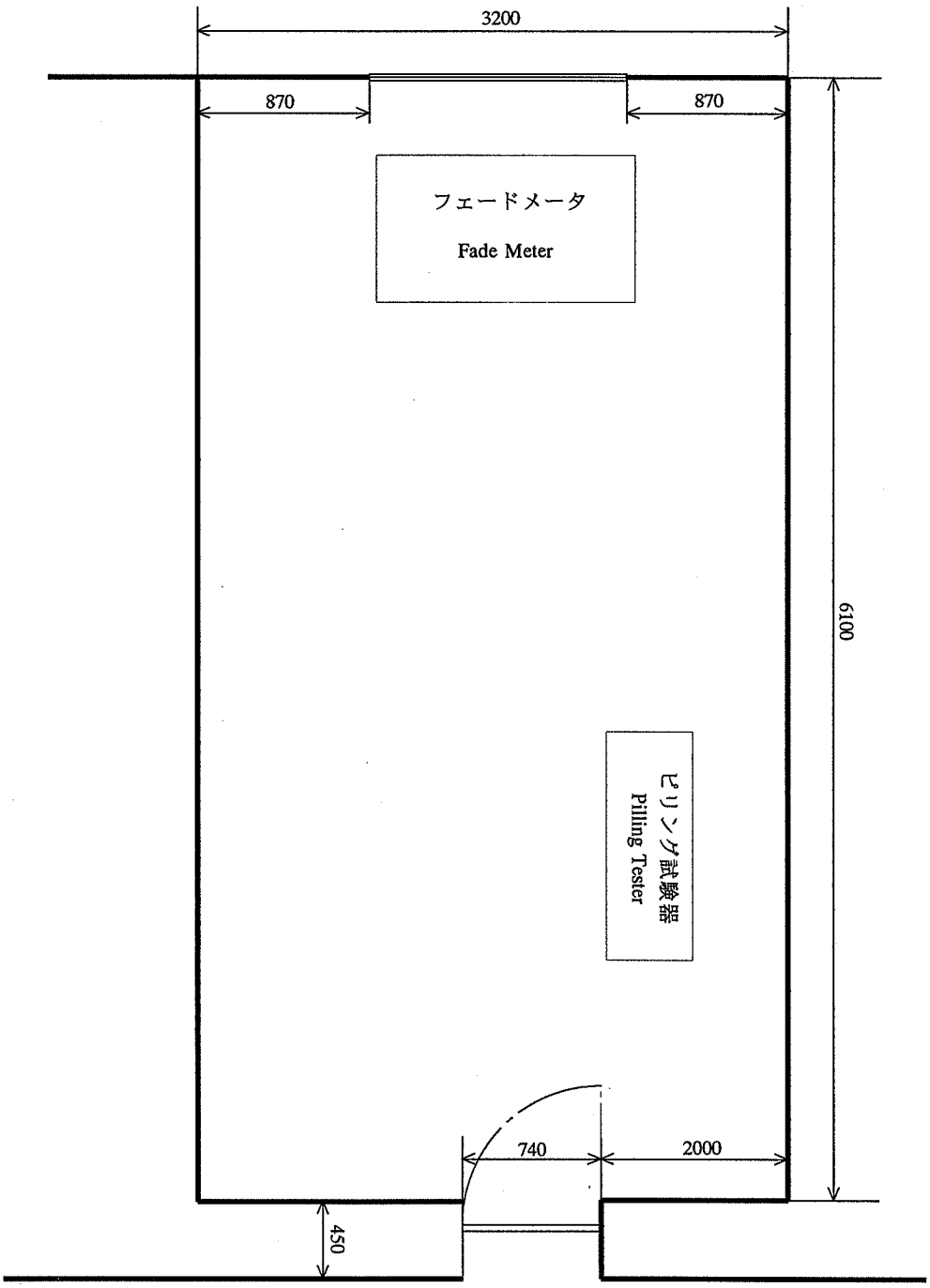


Fig. 3-2 Layout Plan (4)Textile Products testing Laboratory(No. 2)

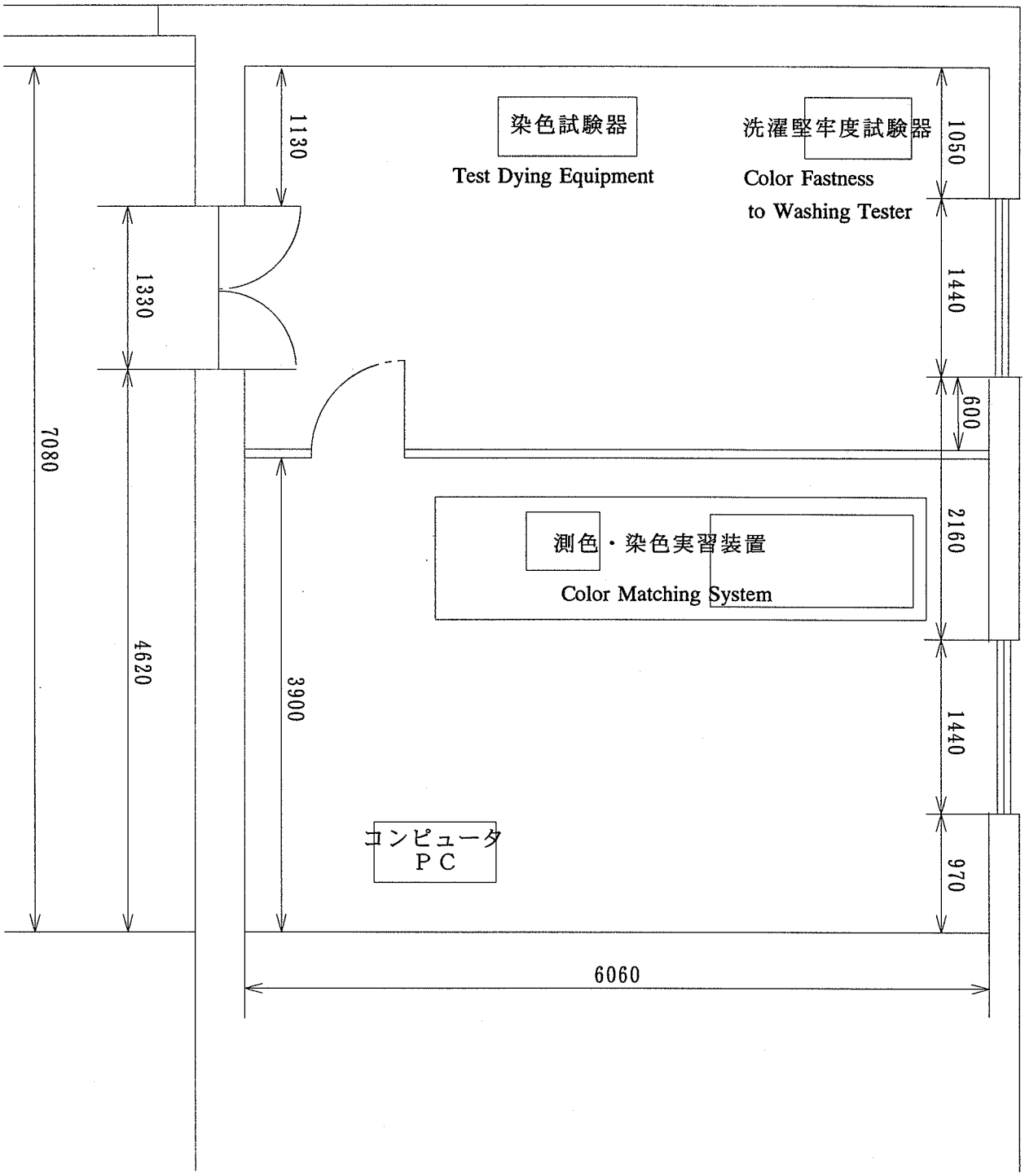


Fig. 3-2 Layout plan (5)Color Matching System Lab.

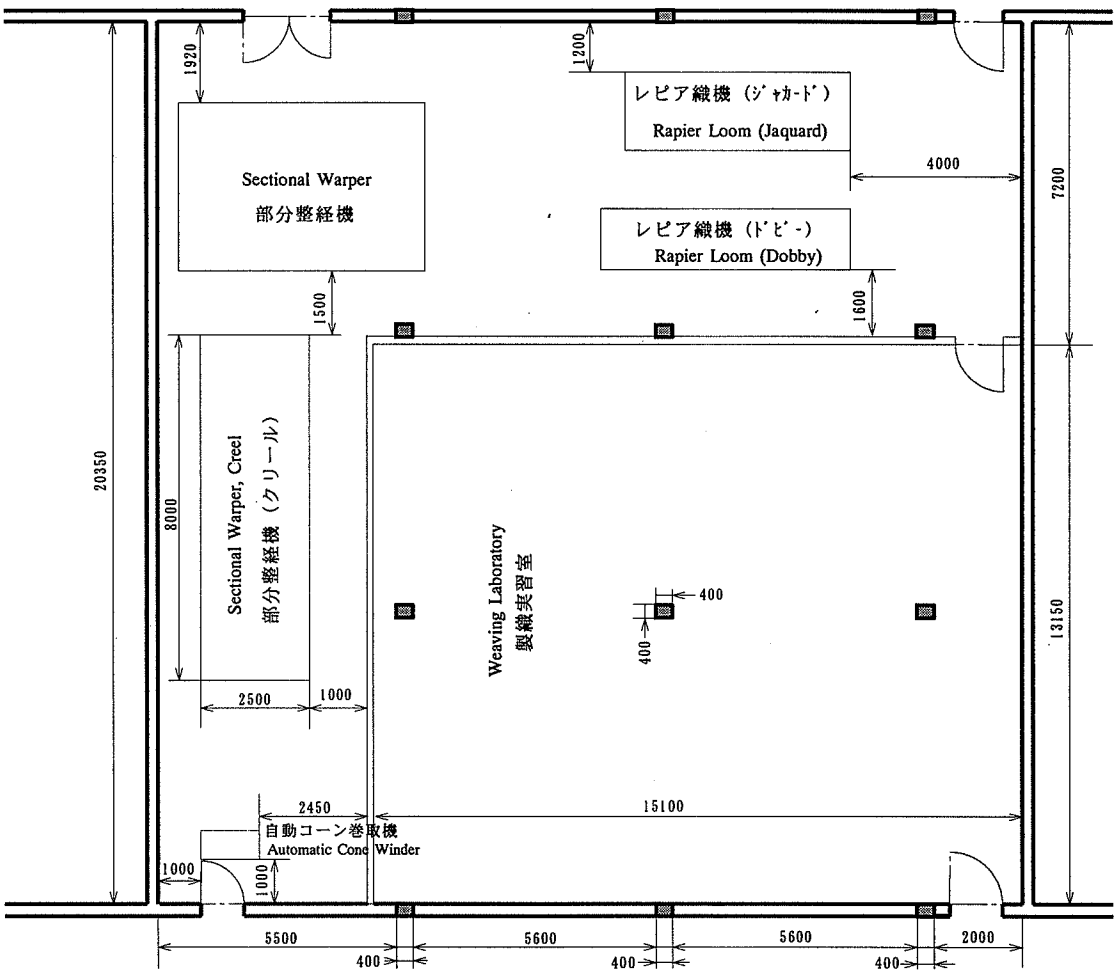


Fig. 3-2 Layout Plan (6) Weaving Laboratory

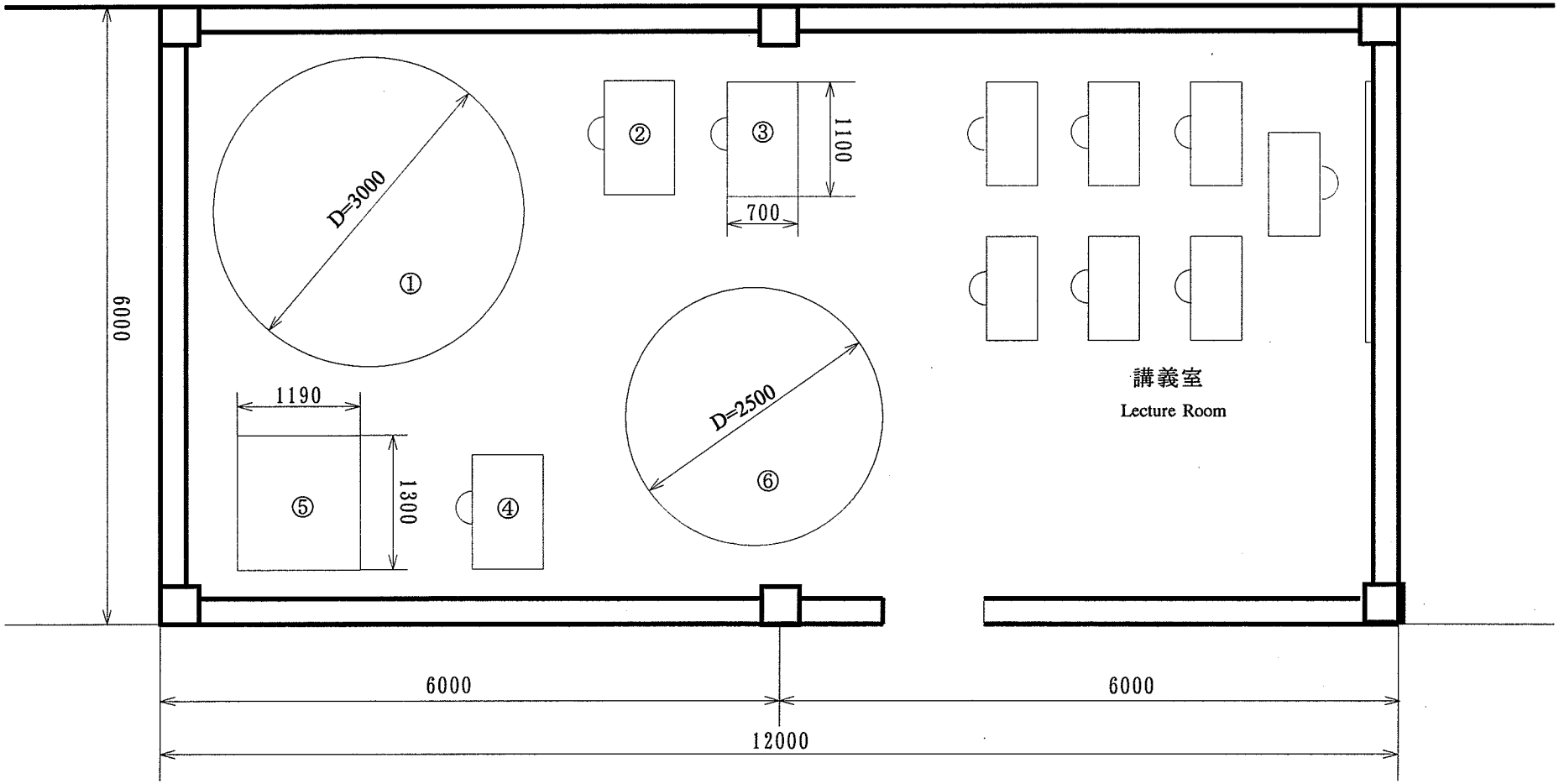


Fig. 3-2 Layout Plan (7) Knitting Laboratory

計画機材　（**Planned Equipment**）

①：丸編み機（**Circular knitting machine**）

②③④ :オーバロックミシン（**Overlock machine for runstiching**）

⑤：靴下丸編み機（**Socks knitting machine**）

⑥：靴下成型プレス機（**Steam press**）

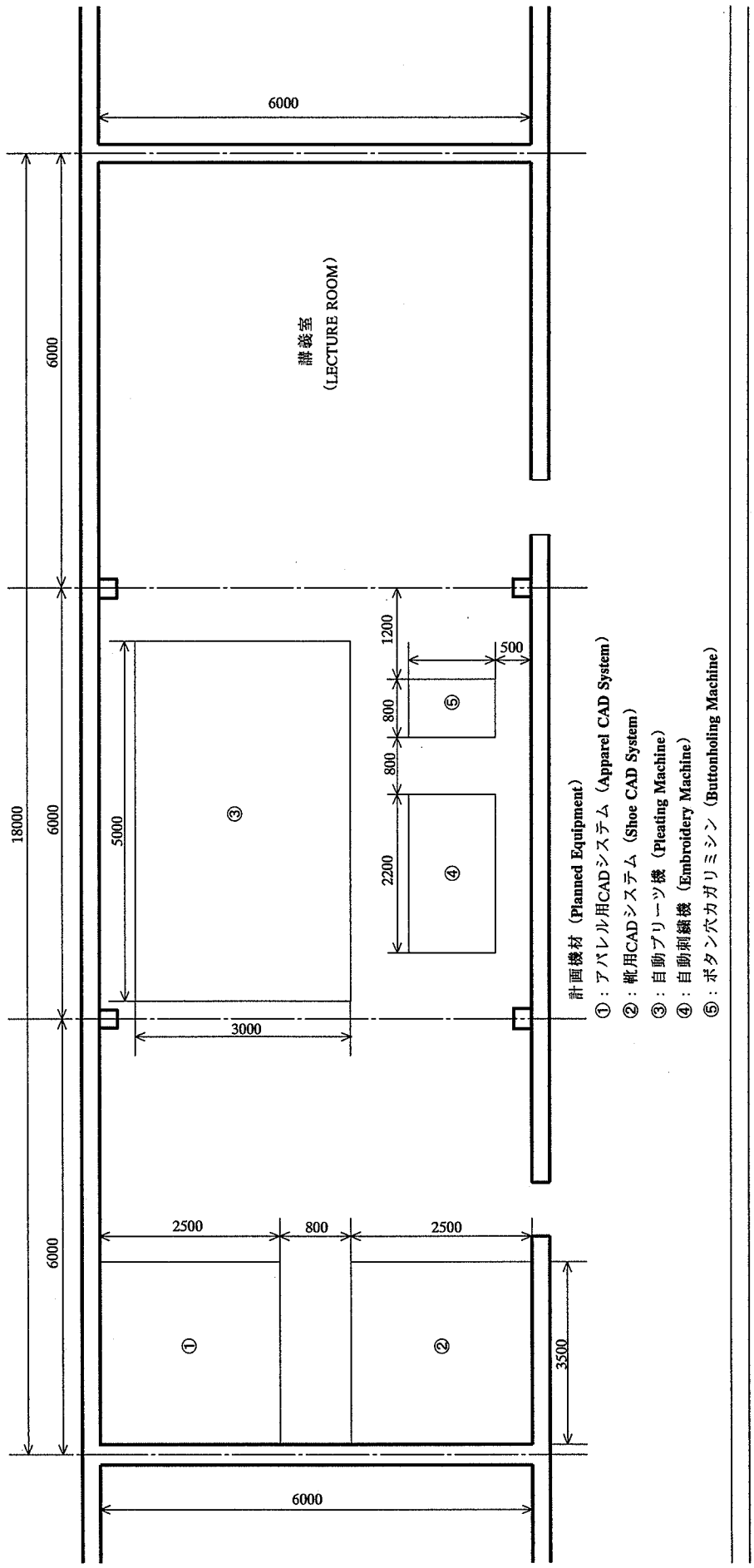


Fig. 3-2 Layout Plan (8)Light Industry Design Lab.

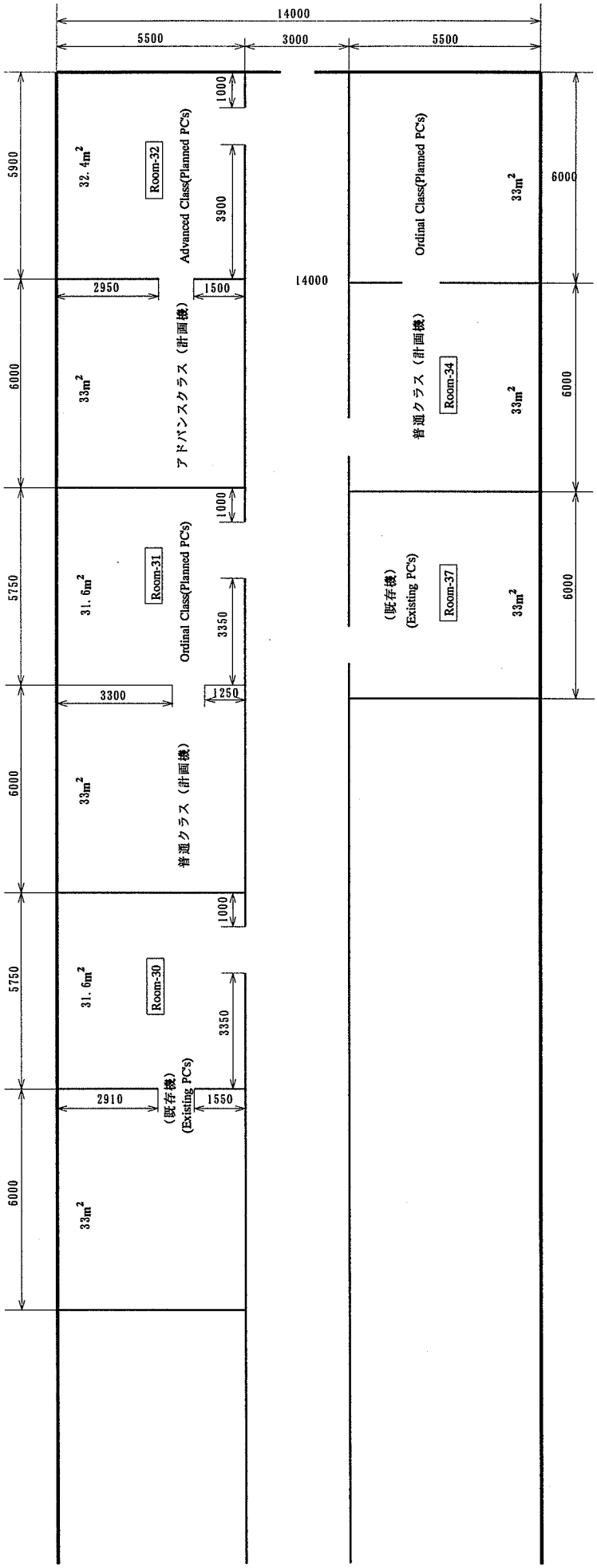


Fig. 3-2 Layout Plan (9) Test Center

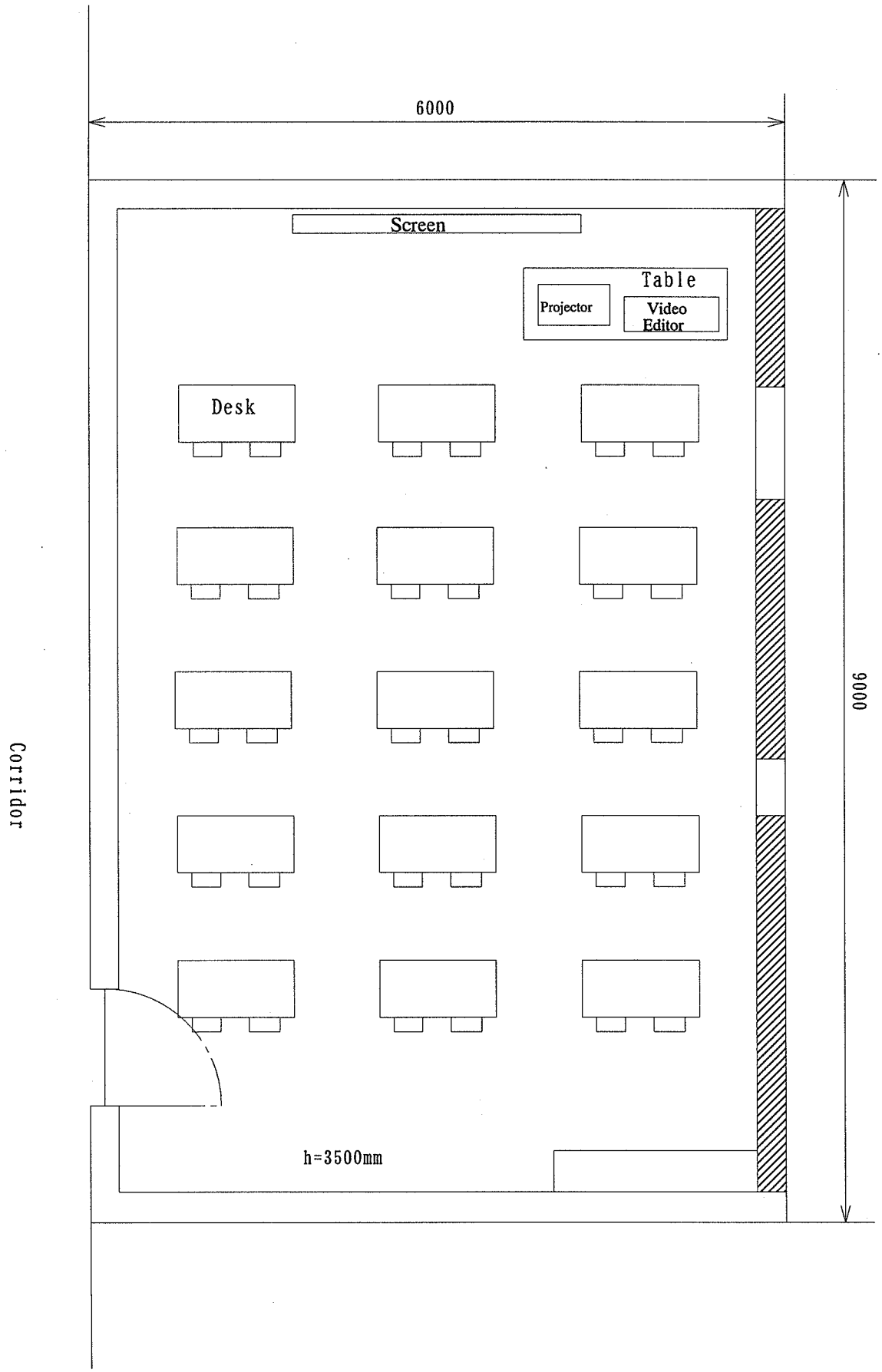


Fig. 3-2 Layout Plan (10)Video Projection Room

3-2-4 Procurement/Installation Plan

3-2-4-1 Policy for Procurement/Installation

This project provides for the supply as grant aid by the Government of Japan of equipment for the Tashkent Institute of Textile and Light Industry, a school under the Ministry of Higher and Secondary Specialized Education of the Government of the Republic of Uzbekistan. This calls for arrangements whereby the Institute signs a contract with a Japanese consultant for assistance in the form of design and planning of installation, preparation and dissemination of bidding documents, supervision of a tender, supervision of procurement, and supervision of installation work. Moreover, the Institute will in accordance with the results of the tender signs a contract with a Japanese company for procurement, manufacturing, transportation, installation, and instructions regarding operation and maintenance. As to the installation work, the company's technical personnel will supervise the unpacking and installation work that will be done by Uzbek workers, and thereafter the technical personnel themselves will undertake the wiring, setting of attachments, trial operation and necessary adjustments. Depending on the piece of equipment involved, an Uzbek specialist such as a computer expert can be used for this work. The organization for this work is as shown in Fig. 3-3.

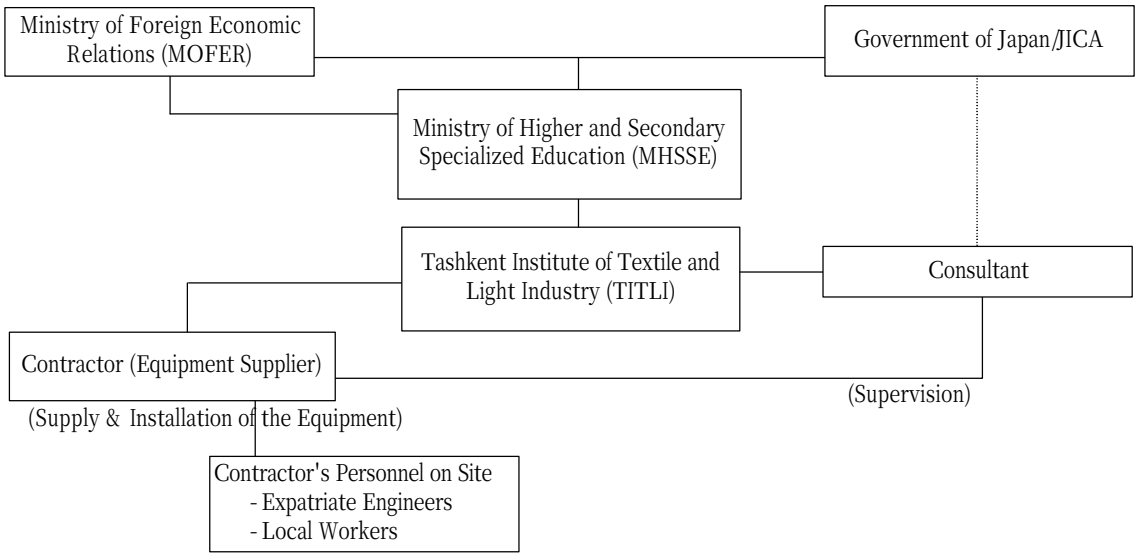


Fig.3-3 Project Implementation System

3-2-4-2 Points of Caution in Procurement/Installation

The Institute uses a trimester system. The first semester is from September to December (17 weeks), the second from January to March (12 weeks) and the third from April to July (15 weeks), including examination weeks in each. The installation, performance trials and adjustments are to be scheduled according to the advice of the Institute; care must be given to prevent or minimize disturbances to the teaching and research work at the Institute.

3-2-4-3 Allocation of Tasks of Procurement/Installation

The tasks to be undertaken by the Japanese side and the Uzbek side are as follows.

Japanese side

① Procurement of equipment and transport and delivery to the site, followed by

installation work

② Wiring for installation of equipment

③ Trial operation, tests; instructions on operation and maintenance

④ Consulting services for detail design, preparation of tender documents, supervision of the tender, and supervision of installation works

Uzbek side

① Improvements to existing buildings (floors, ceilings, walls, dividers etc.)

② Electrical wiring (primary wiring, lighting)

③ Water supply and drainage work

④ Ventilation and air conditioning work

⑤ Telecommunications equipment work

⑥ Furniture, small movable items etc. procurement

⑦ Supplies and consumables

3-2-4-4 Supervision in Procurement/Installation

Accomplishment of this project requires the consultant to undertake the planning for implementation and supervise implementation according to the basic design, with technical support by the Uzbek Government in implementation, and attending to official procedural requirements in Japan for grant aid, all on the basis of the policies and principles of the Government of Japan for provision of grant aid and the contract with the consultant. This in turn requires the consultant to organize a project team for the work and execute contractual duties without undue delay and through to the completion of work. Specifically, this calls for the following: At the implementation planning stage, to confirm the technical specifications for the equipment; to prepare the tender documents; to call for a tender on behalf of the project owner or client and at the implementation stage to provide technical assistance to the Uzbek side in confirmations and meetings in connection with vendor performance, and to ensure that proper preshipment inspections of fabricated equipment have been performed.

3-2-4-5 Equipment Procurement Plan

(1) Procurement method

The equipment to be procured includes computers and peripherals, for which the supply of spare parts, consumable materials, and maintenance is particularly important, so that procurement of these items is to be done through a local agent to ensure that after-sales-service can be obtained. Equipment that is best sought from a third country and the accompanying reasons are as in Table 3-9.

Table 3-9 Equipment To Be Procured from a Third Country

Equipment	Q'ty	Reason for third-country sourcing
Sectional Warper	1	Some European makers may produce similar equipment satisfying the required specification.
Dynamometer	1	In order to secure competition in tendering, the equipment made in a 3rd country but widely available in Japan needs to be considered eligible.
Fade Meter	1	Ditto
Cloth Tensile Tester	1	Ditto
Abrasion Tester	1	Ditto
Yarn Tensile Tester	1	Ditto
High Magnification Microscope	1	Ditto
Computer Aided Design System	2	In order to secure competition in tendering, 3rd country products may be purchased because the number of Japanese manufacturers is limited.
Circular Knitting Machine	1	Ditto
Personal Computer	60	In terms of language and maintenance, it is recommendable to purchase the products in the local market, including those of 3rd country origin.
Printer	3	In terms of maintenance, it is recommendable to purchase the products in the local market, including those of 3rd country origin.
Scanner	3	Ditto
Plotter	1	Ditto
Copying Machine	3	Ditto
Audio-visual Equipment	1 set	Ditto

(2) Method of transport

Equipment procured from Japan or Western countries will be transported by multimodal means by a Russia, China, Iran or European route. For each of these conditions are as follows.

1) Russian route: Off loaded from vessel at an Asian port → Procedures for bonded goods in transit (about 1 day at Russian customs) → Transfer to freight train (4-7 days) → Rail transport through Siberia to Kazakhstan border (10 days) → Procedures for bonded goods in transit → Kazakh rail transport / Uzbek border (7 days) →Document check at border → Freight car to Tashkent, customs inspection (1 day) → Transport in Tashkent (1-2 days). Yokohama to Tashkent: 40-45 days.

2) China route: Off loading at a Chinese coastal port, rail transport from there. From shipment date in Japan to arrival in Tashkent: within 40 days, or a shorter period than via Russia. Containers have to be transferred at the China-Kazakhstan border as the gauge in the two countries is not the same

3) Iran route: Off loading from ship at Bandar Abbas; overland from there by trailer truck. This is the shortest route but has the highest risk. It is the route used for shipment of goods from Southeast Asian factories.

4) European route: European products are collected at Hamburg port, and from there are transported by rail to Poland, Belarus, Russia, and then through Kazakhstan. Between Poland and Belarus there is a change in gauge so the goods have to be transferred. From the time of shipment at Hamburg to arrival in Tashkent takes about three weeks.

3-2-4-6 Implementation Schedule

The schedule for implementation of this project is shown in Fig. 3-4. The total duration from the signing of the Exchange of Notes (E/N) is 17 months.

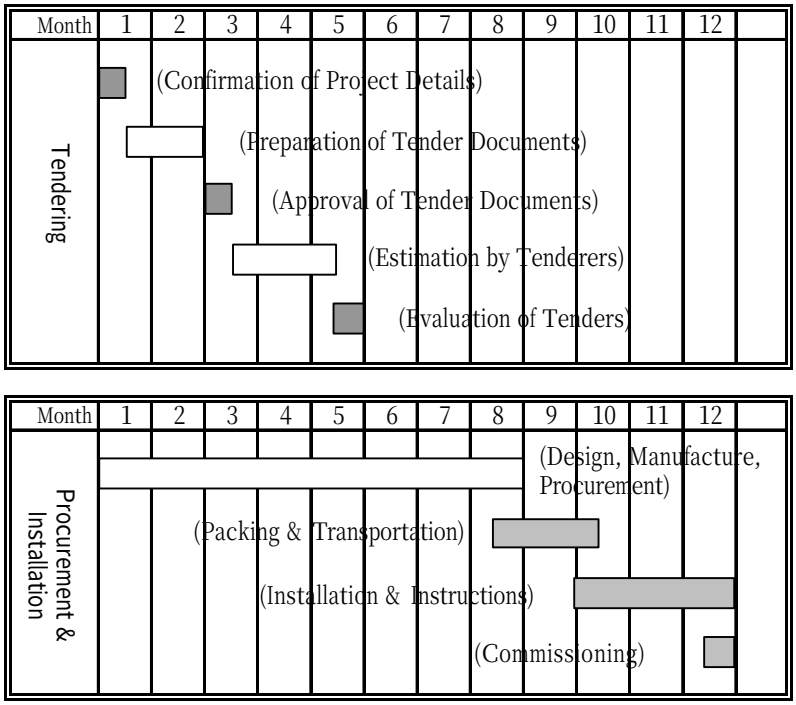


Fig. 3-4 Project Implementation Schedule

The items of equipment that require on-site installation are those shown in Table 3-10. The equipment is classified as follows according to the kind of work needed.

A) Equipment requiring installation or assembly
B) Equipment requiring general instructions on operation (instructions by an engineer)
C) Equipment requiring training (in addition to the above instructions, the equipment is used under the direction of an engineer so that the method of operation is learned)

Table 3-10 On-site Works for the Equipment

(1/2)

Equipment	Site Work			Description of Site Work-C
	A	B	C	
Natural Silk Processing				
Seriplane Winder	O	O	O	To instruct the teaching staff on the method of seriplane testing and evaluation of raw silk actually running the series of equipment.
Seriplane Illumination Apparatus	O	O	O	Ditto
Seriplane Standard Photographs	O	O	O	Ditto
Measuring Meter	O	O	O	Ditto
Denier Scale with Weighing Scale	○	○	○	Ditto
Serigraph	O	O	O	Ditto
Bobbin Winder	O	O		
Conditioning Oven	O	O	O	To instruct the teaching staff on the method of seriplane testing and evaluation of raw silk actually running the series of equipment.
Winding Machine	O	O	O	Ditto
Duplan Cohesion Tester	O	O	O	Ditto
Kett Oven	O	O	O	Ditto
Twist Counter	O	O	O	Ditto
Moisture Meter	O	O	O	Ditto
Doubling Twister	O	O	O	To instruct the teaching staff on how to run doubling and twisting the raw silk and how to evaluate the twisting limit, while actually running the equipment.
Vacuum Heat Setter	O	O		
Sectional Warper	O	O	O	To instruct the teaching staff on how to operate a series of new machines for silk weaving process efficiently using sample raw silks.
Reeling Machine	O	O	O	Ditto
Rapier Loom for Silk	O	O	O	Ditto
Automatic Cone Winder	O	O	O	Ditto
Braiding Machine	O	O		
Cotton Processing				
Optical Hairiness Tester	O	O		
Dynamometer	O	O		
Computer Color Matching System	O	O	O	To instruct the teaching staff on how to prepare dyestuff solution by actually running the equipment with sample dyestuff, and how to check and maintain the equipment.
Tearing Strength Tester	O	O		
Fade Meter	O	O	O	To instruct the teaching staff on how to conduct testing by fade meter using a sample piece of woven fabric, and how to maintain the equipment.
Test Dyeing Machine	O	O		
Cloth Tensile Tester	O	O		
Abrasion Tester	O	O		
Pilling Tester	O	O		
Wrinkle Recovery Tester	O	O		
Slip Resistance Tester	O	O		

Description	Site Work			Description of Site Work C
	A	B	C	
Air Permeability Tester	O	O		
Water Resistance Tester	O	O		
Flammability Tester	O	O		
Color Fastness to Washing Tester	O	O		
Color Fastness to Rubbing Tester	O	O		
Color Fastness to Perspiration Tester	O	O		
Warmth Retaining Tester	O	O		
Yarn Tensile Tester	O	O		
Yarn Tension Meter	O	O		
High Speed Tachometer	O	O		
Thermo Hygrometer	O	O		
Density Meter-Thread Picking Meter	O			
High Magnification Microscope	O	O		
Static Meter	O	O		
Portable Cloth Balance	O			
Rotational Type Viscometer	O	O		
Hardness Tester	O	O		
Air Conditioner	O			
Knitting and Sewing Processing				
Lockstitch Buttonholing Machine	O			
Automatic Embroidery Machine	O	O	O	To instruct teaching staff on how to prepare patterns and design by actually running the equipment.
Side, Reverse & Box Pleating Machine	O	O		
Computer Aided Design System	O	O	O	To instruct teaching staff on how to make designs and their data by actually operating the system, including digitizer and plotter.
Socks Section				
Socks Knitting Machine	O	O	O	To instruct the teaching staff on how to operate the knitting design function actually making a sample by the new machine.
Overlock Machine for Runstitching	O			
Circular Knitting Machine	O	O	O	To instruct the teaching staff on how to operate the design mechanism by actually operating the new machine.
Steam Press	O	O		
Computers & Audio-visual Equipment				
Personal Computers	O	O		
Printers	O			
Scanners	O			
Plotters	O			
Copying Machine	O			
Audio-visual Equipment	O			

3-3 Tasks to be Performed by the Uzbek Side

In the event that this project is implemented under official Japanese regulations and procedures for grant aid the Government of the Republic of Uzbekistan should perform the following tasks.

(1) To provide the documents and information needed for the project

(2) To remove or relocate existing equipment requiring such action so that the procured equipment can be installed, by the time scheduled; and to secure completion of buildings' renovation works prior to the procurement of the equipment

(3) To provide facilities with the distribution of electricity, water supply, telephone and drainage and other incidental facilities in the sites in good order

(4) To provide a suitable budget and personnel for the effective management, operation and maintenance of he equipment procured under this project

(5) To bear the payment of the necessary fees to a Japanese bank based on the Banking Arrangement (B/A)

(6) To ensure prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid

(7) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in Uzbekistan with respect to the supply of the products and services under the Verified contracts

(8) 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 Uzbekistan and stay therein for the performance of their work

(9) To obtain the necessary licenses, permissions etc, needed for this project

(10) To assume responsibility for suitable maintenance and effective use of the equipment procured under this project

(11) To bear all expenses required for this project that are not covered by the grant aid from Japan

3-4 Operations and Maintenance Plan

It is necessary that the Institute adopt an operations and management program for use of the equipment after installation.

① The Institute must prepare its own handling manuals for all of the equipment. These must be particularly thorough with regard to prevention of damage to the equipment, and safety.
② The instructor(s) to be responsible for management of the equipment must be designated.
③ Routine inspections of equipment and parts must be made twice a year, in the presence of the responsible person(s).
④ Records of results of inspections including any problems found must be made and kept, and removed from safekeeping only with the prior approval of the person(s) in charge.
⑤ Small items such as measurement devices and handheld equipment are to be collectively stored in a locker and removed only with prior approval of the person(s) in charge.
⑥ An annual budget must be made each year for maintenance and management of the equipment.

Further, with relation to the silk certification lab and the weaving lab, it is necessary that the Institute increase the number of staff for maintenance. This requirement is as follows.

Lab	Job title	Number
Silk certification	Head of lab	1
	Senior Assistant	2
	Engineer	1
	Technician	1
Weaving	Head of lab	1
	Senior Assistant	1
	Technician	2
Total		9

In addition, in the event that this project is realized, in order to establish a

security system to protect the equipment, the Institute must acquire and install for use supersonic sensors, photoelectric sensors, smoke detectors, fire alarms and the like.

3-5 Project Cost Estimation

3-5-1 Estimated Project Costs

In the event that this project is realized as a grant aid project supported by the Government of Japan, the Government of the Republic of Uzbekistan must bear the following costs.

Works	Amount (mil. Soum)
Building renovation	36.2
Electric work	16.5
Piping work	5.8
Air conditioning work	7.2
Equipment moving, removal	0.2
Total	65.9

It will also be necessary to pay the cost of bank commissions or fees to a Japanese bank when the Authorization to Pay (A/P) is opened and payment is made, and in the event that the A/P is amended at a later stage. If a local bank is involved in opening the A/P, any costs of bank commissions or fees to such bank must also be borne by the Uzbek side.

3-5-2 Operation and Maintenance Costs

In the team's study the annual increment in maintenance and management cost if the equipment is procured according to plan is the sum of the amounts given in Table 3-11. This corresponds to 4% of the Institute's annual 2000 budget, and 15% of its

maintenance related costs.

Table 3-11 The Costs to be increased by Implementation of the Project

Item	Annual Consumption	Unit Rate (yen)	Amount (1,000yen)	Remarks
Electricity	243,772 kWH	3.2	780	
Water Supply	382,596 m^3	1.6	612	
Gas Supply	- m^3	4.0	-	
Consumable	1 lot	-	3,024	Equivalent to 2% of the costs of equipment that need consumable.
Repair of Equipment	1 lot	-	6,367	Equivalent to 2% of equipment costs.
Miscellaneous	1 lot	-	125	Including reagents.

1) Valid only for the equipment to be provided under the project.
2) Based on the assumption of operation rate at 25% of equipment simultaneously, 4 to 7 hours per day, 180 days per year.

CHAPTER 4 Justification and Evaluation of the Project

Chapter 4 Justification and Evaluationof the Project

4-1 Project Effect

It is anticipated that this project for improvement of educational equipment, planned in accordance with Uzbekistan's industrial policy and the National Program for a Human Resources Training System, which is the national plan for the education sector, and specifically on the basis of a detailed study of present conditions in the Tashkent Institute of Textile and Light Industry as well as the needs of industry when hiring graduates of the Institute, will have the following effects.

(1) Direct Effects

1) The direct effects of the project will benefit the students of the Institute. Although there has been some change in enrollment accompanying the larger scale changes in Uzbekistan following attainment of independence, the number of students admitted each year recently has been above 700 and the size of the student body including undergraduates and postgraduates has been nearly 3,000. This project, by replacing and adding specialized equipment and providing up-to-date technology, will improve the educational effects of the students and provide them with the advanced, specialized technology they will need for practical application when employed in industry.

2) The Tashkent Institute of Textile and Light Industry provides applied educational instruction for students of its sister schools (formerly branches of the Institute) and regularly dispatches instructors to teach at those schools. Further, the Institute cooperates with colleges and vocational colleges other than these with regard to applied education, so that students from all these

schools have occasion to use the specialized equipment available at the Institute. It will be possible for the students at the sister and other schools, to the extent of about 2,500 a year, to make use of the lab equipment to be provided to the Institute.

3) At present there are 120 professional colleges and 30 academic lyceums in Uzbekistan. Instruction in textile-related courses is offered at 24 of them. In the National Program for Human Resources Training, plans are set forth for brining the number of professional colleges to 1,611 and the number of academic lyceums to 181 by 2005. An ancillary change will be that textile courses will be offered at 110 of the professional colleges. The Tashkent Institute of Textile and Light Industry has been designated as the institution to train new instructors and provide refresher training for present instructors at these upper middle schools. Plans call for providing training and retraining to about 1,300 instructors by 2005. If this project is implemented, it has the potential of making the effectiveness of that training activity greater.

4) On the basis of an agreement with the Ministry of Public Education and the Ministry of Higher and Secondary Specialized Education in July 1997, an academic lyceum has been established on a site adjacent to the Institute. As of 1999, it had enrolled 220 persons in 10 classes and in the 2000 academic year it has been planned to increase enrollment to 450 and the number of classes to 18. All classes at the academic lyceum study textile subjects for 40 hours a year in the Textile Materials Course. The students make use of the labs at the Institute for practical. Almost all graduates of the academic lyceum advance to the Institute and go on to earn a degree. Therefore if this project is realized, a marked improvement can be expected in the applied aspects of the education of the students, improving their education

substantially.

5) By providing equipment that is on a par with that used in industry, the academic staff (281 persons at present) will be able to bring instruction to a higher level in terms of technology and a more practical level relative to the needs of industry. A better integration of school-to-work at the student level and school-to-industry at the institutional level will be possible. Exchanges with industry and other relevant areas, with regard to production technology, inspection and testing, management techniques and more also will be possible. The equipment will, further, make it possible to contribute to the industry policy goal of raising the domestic processing rate of silk and cotton resources and raising the value added of textile products, through the development and diffusion of technology and improved academia-industry linkage.

(2) Indirect Effects

1) In Uzbekistan, it is planned to increase the number of grades used in certifying and ranking silk yarn -- a major export product -- from the present five to the international standard (in use by Japan and other countries) of seven or more. Uzbek Ipagi together with other relevant institutions is now studying this matter. The Tashkent Institute of Textile and Light Industry is part of the ad hoc organization working on this review of the national standard, and if the testing and measuring equipment expected to be provided through the project are available it will be possible for the Institute, in addition to improving its certification work for silk yarn, to do work in textile metrology, inspection and ratings that is at the world level in terms of technology. It is expected, additionally, that this will promote further review and revision of national standards in general.

2) About half of the Institute students are women. These students are particularly interested in design and downstream work in textiles. The project calls for providing the Institute with equipment for sewing and other downstream work, and this should serve to enhance the appeal of studying at the Tashkent Institute of Textile and Light Industry as well as the motivation of students, while also contributing to expanded employment opportunities for them.

3) Ninety percent of Tashkent Institute of Textile and Light Industry graduates go to work as engineers in textile companies associated with Uzbeklegprom or other bodies, or governmental agencies. Tashkent Institute of Textile and Light Industry graduates who have had the opportunity to do extensive practical lab work using modern equipment and technology will be qualified to diffuse their experience and knowledge to other workers in textile related areas (about 500,000 persons). It is expected that the effect of a transfer and upgrading of technology and standards can be expected to be significant over the long run.

4) By raising the domestic processing rate of textile products made using Uzbek resources, growth of demand in sectors related to textiles will be promoted and it is expected that this will contribute to generate job opportunities for the nation.

4-2 Points Requiring Caution When Implementing the Project

(1) Ensuring a Budget Allocation

Up to this time, the operation and maintenance of equipment (including

utilities) has required about 30% of the Institute's annual operating budget. While showing some variation from year to year, the amount of this budget has been increased every year and it is planned that in 2002 or the year when the equipment to be provided by this project is installed that the budget will be increased about 12% over the preceding year.

The Uzbek Government will have to spend about 66 million soum for improvement of buildings and related work required in connection with the installation of equipment. The Institute is raising funds for this by soliciting contributions from Uzbeklegprom, Uzbek Ipagi, Uzpakhtasanoatsotish and their member companies (for 39 million soum in fiscal 2000), while allocating a portion of own income generated by tuition and research services.

The above-mentioned budget measure is essential and construction (including renovation etc.) must be completed according to the envisioned schedule. An additional assumption of maximum importance is that the new equipment will be properly maintained and managed so as to be usable over a long period of time. No difficulty is expected with regard to the Uzbek Government's providing the necessary budget allocation, but it is recommendable that regular monitoring and reporting regarding the budgeting process and availability of funds is made by the concerned authorities.

(2) Improvements in the System of Operation and Management of Equipment

In the event that this project is realized as presently planned, while the operation and maintenance management of the new equipment will be in the hands of the employees presently doing this sort of work at the Institute, the Institute plans on hiring five and four more persons respectively for the Silk Certification Lab and the

Weaving Lab where new technology is to be introduced. These nine persons will handle operation and maintenance assignments. Also, to establish a suitable security system for the equipment, the Institute plans to install at its own initiative ultrasonic sensors, photoelectronic sensors, smoke detectors and fire alarms. Apart from these plans, as is stated in the preceding chapter need exists for preparation of manuals for operation and maintenance of the equipment, assigning responsibility, and securing annual budgets for periodic inspections of the equipment, keeping of records, the improved storage and security system as well as operation and maintenance costs of the new equipment. It is by such efforts at improving the system and organization for maintenance and management of the equipment that the success of the project in improving education at the Tashkent Institute of Textile and Light Industry can be assured.

4-3 Issues and Recommendations

(1) Technical Cooperation and Assistance

In the past Uzbekistan as a member of the Soviet Union boasted high educational level based on the strength of the economy, and as one of the high points in the field of education, the Tashkent Institute of Textile and Light Industry, with its excellent faculty, provided the nation with 40,000 well-educated graduates, cumulative to the present day. The excellent quality of classroom work in the Institute today not withstanding, almost all of the equipment used in the labs is at least 20 years old, that is, it is outdated and old. The obsolescent and incomplete array of equipment in use is a great handicap to the students, and the academic staff and the Tashkent Institute of Textile and Light Industry, in attempting to obtain and provide, respectively, an education that matches the requirements of the new market economy of Uzbekistan, in terms of the greater accuracy, faster speeds, greater automation and higher quality standards for textile production equipment (including

inspection and analytic equipment) that are demanded by world markets. For this reason, this project provides for guidance on the operation, maintenance and management of the equipment to be provided after installation to the instructors and lab assistants. This service is to be provided by technical staff sent by the makers of the equipment and is intended to ensure that the equipment can be used well over a long period of time.

Moreover, in direct and indirect connection with the new equipment, the Institute has the desire and intention to seek and obtain technical cooperation in the "soft" areas related to textile engineering and textile production, from Japan and other industrial nations, and is looking forward particularly to cooperation concerning the following.

- Metrology, inspection and certification of silk products etc.
- New textile technology and product development
- Textile products marketing
- Textile quality and production control and management

The same desires are held by Uzbeklegprom and Uzbek Ipagi, and if technical cooperation is provided on a broad base, centering on the Institute and targeting Uzbek industry as a whole, it will have a synergetic effect relative to this project and thereby provide substantial benefits to the nation.

(2) Academia-Industry Linkage and Its Strengthening

Because the Tashkent Institute of Textile and Light Industry was founded to provide engineers that would be able to take up posts and be immediately useful in the textile industry in the former Soviet Union, from the outset it was a basic assumption that there will be close cooperation with industry, and so it has been. The Institute has modified its mission somewhat, subsequent to the review of education in

Uzbekistan and planning of reforms, and seeks to give priority to lectures on basic subjects and practical training in specialized applications for undergraduate students, in order to develop their specialized skills but, in addition, the directive of the Ministry of Higher and Secondary Specialized Education, "On Higher Education" calls for practical or lab and shop work to be done at companies, whether the companies are public or private, and in this context a close cooperative relationship between academia and industry is essential.

Because of this, the Institute is considering to start offering technical refresher courses for senior technical personnel at textile companies, utilizing the equipment to be acquired as a result of this project. Further, plans are being prepared for training using large-scale production equipment, a theme not included in the present project, by enlisting the cooperation of nearby companies as has been practiced to the present. If the equipment to be provided is utilized also for activities characterized by such close cooperation between academia and industry in education, research and training, yet greater effects can be expected of the project.

(3) Cooperation of International Agencies and Other Development Assistance Sources

The Tashkent Institute of Textile and Light Industry is receiving assistance from TACIS, the EU organization created to provide assistance to the CIS countries, and during the period 1998-2000 has been provided by TACIS with experts for curriculum development and improvement of pedagogical methods so as to better respond to the requirements of the textile industry. Also, during this period, several faculty members, including Ph.D. candidates, have been given opportunities for short-term study at the following institutions: University of Piraeus (Greece), Ghent University (Belgium), Bergische University (Germany), and the Moscow State University of Printing (Russia).

These foreign study opportunities were intended to give the participating

Uzbek specialists exposure to institutions similar to their own in order to be able to develop new curricula, and to acquire pedagogical methods corresponding to new technology, both of which are to be put to use at Tashkent Institute of Textile and Light Industry. Many of these specialists have participated in the planning of equipment improvement for this project, and have met and cooperated with the basic design study team. The increase in the number of Institute specialists with foreign experience such as obtained by these will contribute further to improving the effectiveness of this project.

Appendices

APPENDIX-1 MEMBER LIST OF THE SURVEY TEAM

1-1 Basic Design Study

Official Member:		
NAKANO Satoshi	Team Leader	Grant Aid Management Department, JICA
Consultant Members:		
SHIGA Wataru	Project Manager & Equipment Planner 1	UNICO International Corporation
KIMURA Teruo	Equipment Planner 2	UNICO International Corporation
UESUGI Yasuo	Equipment Planner 3	UNICO International Corporation
BANDO Chikashi	Facility Planner & Cost Estimator	UNICO International Corporation
YAMAMOTO Yoshio	Interpreter (Russian-Japanese)	UNICO International Corporation

1-2 Explanation of Draft Report

Official Member:		
INAGAKI Tomikazu	Team Leader	Senior Advisor, JICA
Consultant Members:		
SHIGA Wataru	Project Manager & Equipment Planner 1	UNICO International Corporation
KIMURA Teruo	Equipment Planner 2	UNICO International Corporation
YAMAMOTO Yoshio	Interpreter (Russian-Japanese)	UNICO International Corporation

APPENDIX-2 SURVEY SCHEDULE

2-1 Basic Design Study

Sr. No.	Date	Day	Itinerary	
			OFFICIAL MEMBER	CONSULTANT
			A:Nakano	B:Shiga, C:Kimura, D:Uesugi, E:Bando, F:Yamamoto
1	05-Apr-00	Wed	A Leave Japan	BCF Same as "OFFICIAL MEMBER"
2	06-Apr-00	Thu	A Arrival in Tashkent	BCF Ditto
3	07-Apr-00	Fri	A Meeting at JICA, courtesy calls on EOJ	BCF Ditto
4	08-Apr-00	Sat	A Meeting and site visit at TITLI	BCF Ditto
5	09-Apr-00	Sun	A Meeting among Team Members	BCF Ditto E Leave Japan
6	10-Apr-00	Mon	A Courtesy calls on Uzbeklegprom, Uzbek Ipagi, MHSSE	BCF Ditto E Arrival in Tashkent
7	11-Apr-00	Tue	A Discussion at TITLI	BCEF Ditto
8	12-Apr-00	Wed	A Discussions on the Minutes of Meeting at TITLI	BCEF Ditto D Leave Japan
9	13-Apr-00	Thu	A Visit to J/V Kabool Kukcha, Tashkent Textile Combinat, TITLI	BCEF Ditto D Arrival in Tashkent
10	14-Apr-00	Fri	A Discussion at TITLI, Signing of the Minutes of Meeting	BCDEF Same as "OFFICIAL"
11	15-Apr-00	Sat	A Discussion at TITLI, Report to MOFER	BCDEF Discussion at TITLI
12	16-Apr-00	Sun	A Data Analysis	BCDEF Market Survey
13	17-Apr-00	Mon	A Leave for Japan	BCDEF Discussion at TITLI, Interim report to JICA
14	18-Apr-00	Tue	A Arrival in Japan	BCDEF Visit to Uzbeksanoatsotish, Discussion at TITLI
15	19-Apr-00	Wed		BCDEF Discussion at TITLI
16	20-Apr-00	Thu		BCDEF Ditto, Meeting with a Forwarder
17	21-Apr-00	Fri		BCDEF Visit to Uzkhlopkoprom , a ginning factory
18	22-Apr-00	Sat		BCDEF Discussion at TITLI, Meeting with a Local Agent
19	23-Apr-00	Sun		BCDEF Market Survey/Data Analysis
20	24-Apr-00	Mon		BCDEF Visit to "TOLA" Reeling Factory, Pakhtasanoatilm
21	25-Apr-00	Tue		BCDEF Meetings at Uzbeklegprom, Discussion at TITLI, Meeting with a Local Agent
22	26-Apr-00	Wed		BCDEF Discussion at TITLI, Meeting with a Local Agent
23	27-Apr-00	Thu		BCDEF Discussion at TITLI, Meeting with a Forwarder
24	28-Apr-00	Fri		BCDEF Discussion at TITLI, Report to Uzbeklegprom
25	29-Apr-00	Sat		BCDEF Discussion at TITLI, Report to MHSSE
26	30-Apr-00	Sun		BCDEF Market Survey/Data Analysis
27	01-May-00	Mon		BCDEF Report to JICA, EOJ, MOFER
28	02-May-00	Tue		BCDEF Leave for Japan
29	03-May-00	Wed		BCDEF Arrival in Japan

Abbreviations :

JICA	Japan International Cooperation Agency
EOJ	Embassy of Japan
MOFER	Ministry of Foreign Economic Relations
MHSSE	Ministry of Higher and Secondary Specialized Education
TITLI	Tashkent Institute of Textile and Light Industry

2-2 Explanation of Draft Report

Sr. No.	Date	Day	Itinerary		
			OFFICIAL MEMBER		CONSULTANT MEMBERS
			Inagaki	Tanabe	Shiga, Kimura, Yamamoto
1	9-Aug-00	Wed	Leave Japan		Same as "OFFICIAL MEMBER"
2	10-Aug-00	Thu	Arrival in Tashkent (by LH622)		Ditto
3	11-Aug-00	Fri	Meeting at JICA, courtesy calls on EOJ, TITLI		Ditto
4	12-Aug-00	Sat	Discussion at TITLI		Ditto
5	13-Aug-00	Sun	Meeting among Team Members		Ditto
6	14-Aug-00	Mon	Discussion at TITLI		Ditto
7	15-Aug-00	Tue	Discussion at TITLI, meeting at UZBEK IPAGI		Ditto
8	16-Aug-00	Wed	Signing of the Minutes of Meeting at MHSSE, meeting at Uzbeklegprom, discussion at TITLI		Ditto
9	17-Aug-00	Thu	Report to MOFER, JICA, EOJ		Ditto
10	18-Aug-00	Fri	Leave for Japan (LH625)		Discussion at TITLI
11	19-Aug-00	Sat	Arrival in Japan		Discussion at TITLI
12	20-Aug-00	Sun			Market Survey/Data Analysis
13	21-Aug-00	Mon		Seminar at TITLI	Seminar at TITLI, Report to JICA
14	22-Aug-00	Tue			Leave for Japan (LH625)
15	23-Aug-00	Wed			Arrival in Japan

Abbreviations :

JICA	Japan International Cooperation Agency, Tashkent
EOJ	Embassy of Japan, Tashkent
MOFER	Ministry of Foreign Economic Relations, Tashkent
MHSSE	Ministry of Higher and Secondary Specialized Education, Tashkent
TITLI	Tashkent Institute of Textile and Light Industry, Tashkent

APPENDIX-3 LIST OF PARTY CONCERNED IN UZBELISTAN

Tashkent Institute of Textile and Light Industry

Name	Designation
Alimova Khalimahon Alimovna	Rector, Professor, DTS
Abdugaffarov A. Abdujaborovich	1st Vice Rector, Asst. Professor
Akbarov Djamol Nugmonovich	Vice Rector (Scientific Work), Professor
Tolametov A.T.	Vice Rector (Management)
Makhmudova Karima Rustamovna	Head of Department of International Relations
Jumaniyazov Kadam Jumaniyazovich	Head of the Dept. of Marketing & Agreements, Asst. Prof.
Burnashev Idgay Zaripovich	Teacher, Asst. Professor, CTS
Khudoyberdieva Dilfuza Bahramovna	Teacher, Asst. Professor, CTS
Khikmatullaeva Mukaddas	Teacher, Lecturer, Ph.D. Student
Mukimov Mirabzal Mirayubovich	Dean of the Mechanical Technology Faculty, Professor
Majidov Akiliddin Abdurashidovich	Dean of the Eng-Ee on Faculty, Asst. Professor
Ergashev Karim Ergashevich	Head of the Chair of Chemistry, Professor
Gaturov Kabul Gafurovich	Dean of the Eng-Ped Faculty, Asst. Professor
Matismailov Savfulla Lolashbaevich	Head of the Chair of Spinning, Asst. Professor
Bulanov Abdulmamin Kirgizbaevich	Head of the Chair of Printing Technology, Asst. Professor
Kulmetov Mirpulat Kulmetovich	Head of the Chair of Textile Material Science, Asst. Professor
Abdulina Firuza Jamilovna	Teacher of the Chair of Textile Material Science, Asst. Professor
Gulyamov Azamat Eshonkulovich	Teacher of the Chair of Silk Technology, Asst. Professor
Daminov Askarali Davlatovich	Teacher of the Chair of Weaving Technology, Asst. Professor
Zaletdinov Farid Fatihovich	Teacher of the Chair of Shoemaking Technology, Asst. Professor
Almatov Shuhrat	Teacher of the Chair of Shoemaking Technology, Lecture
Isakulov Vohid	Head of the Spinning Laboratory, Lecture
Yunusov Sbirjon	Training Master of Silk Technology, Ph.D.
Laysheva Elmira Talgatovna	Head of the Textile Material Science Laboratory, Engineer
Mirusmonov Baxtiyor Farruhovich	Teacher of the Chair of Knitting Technology, Lecture r
Usmonova Fotima Usmonovna	Head of the Chair of Light Industry, Asst. Professor
Inogomjonov Dovrugbek	Training Master of Weaving Technology, Ph.D.
Haydarov Rahmonqul	Head of the Laboratory of Printing Technology, Technician
Kosimov KH.M.	Chief Engineer
Akhmeddzanov T.A.	Chief Mechanical Engineer
Alimatov T.N.	Chief Electrical Engineer

Ministry of Higher and Secondary Specialized Education

Saidakhror S. Gulyamov	Minister
Alaev K.A.	Vice Minister
Dilmurod Mirzaahmedovich Rasulev	Head of General Department of International Relations

Ministry of Foreign Economic Relations

Dr. Hasan S. Islamkhodjaev	Deputy Minister
Salombek P. Khabibullaev	Head, Asia Pacific Ocean States Department

Uzbeklegprom

Batir Irgashev	Chairman
Fedor N. Kim	Deputy Chairman
Mukhamedova D.M.	Deputy Chairman
Alexsey P. Dogonkin	Chief, Department of Foreign Economic Activity
Kasimov Shabkat D.	Head of Personnel Department

Uzbek Ipagi

Abdumanop A. Akhmadaliev	Chairman
Tsoy Leonid Vladimirovich	1st Deputy Chairman
Abduvakhob K. Irgashev	Deputy Chairman
Anarkulova Ikbol Khakimovna	General Manager

Uzbek Research Institute of Sericulture

Dr. Yuldashev Shavkat	Director
Kholmatov D. Igamatovich	Deputy Director

Tashkent Textile Combine

Valentina F.Shimenova	1st Deputy Chairperson、Chief Engineer
Bakhodir Tupsuhbaev	Deputy Chairman
Ilkhom Faizlev	Deputy Chairman

Uzpakhtasanoatsotish

Tahirov Y.	Chairman
Deyachkov B.B.	Deputy Chairman

Uzbek Center for Certification of Cotton Fiber (SIFAT)

Maksudov I.T.	General Director
Ustutik B.E.	Deputy Director

Scientific Production Center (Pakhtasanoatilm)

Azizkhodiaev Umarkhodia	General Director
Ljk Yakov Khunovich	Deputy Director
Akhmedov Akmal	Chief, Cotton Testing Lab.

Bektemir Cotton Ginning Factory

Khzhidov Boik	Factory Manager
Kuzmina Irina	Deputy Manager
Zhiyahkulov Bakhtier	Chief Engineer

Open Joint Stock Company “TOLA”

Marat S.Akbarov	Chairman
Karabaev R. Karimfonovich	Engineer

JV Kabool Kukcha

Rozjkulov R.	Factory Manager

Embassy of Japan in Uzbekistan

Kyoko Nakayama	Ambassador Extraordinary and Plenipotentiary
Masayuki Makiya	Minister-Counsellor
Hiroyuki Suzuki	Attache
Kazutaka Yoshio	Second Secretary
Tadanori Kumano	Second Secretary
Tetsuya Yamada	Third Secretary

Japan International Cooperation Agency (JICA) Uzbekistan Office

Hiroshi Nino	Resident Representative
Hideki Tanabe	Assistant Resident Representative
Koichi Kuroko	Project Formulation Advisor

MINUTES OF DISCUSSIONS

ON THE BASIC DESIGN STUDY ON THE PROJECT FOR IMPROVEMENT OF EQUIPMENT FOR THE TASHKENT INSTITUTE OF TEXTILE AND LIGHT INDUSTRY IN THE REPUBLIC OF UZBEKISTAN

In response to a request from the Government of the Republic of Uzbekistan, the Government of Japan decided to conduct the Basic Design Study (thereinafter referred to as "the Study") on the project for improvement of equipment for the Tashkent Institute of Textile and Light Industry (thereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Uzbekistan the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Satoshi Nakano, Grant Aid Management Department, JICA, and is scheduled to stay in the country from April 6 to May 2, 2000.

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

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

Tashkent, April 14, 2000

Mr. Satoshi Nakano
Leader,
The Basic Design Study Team,
Japan International Cooperation Agency

Acad. Saidakhror S. Gulyamov
Minister,
The Ministry of Higher and Secondary Specialized Education

Prof. Dr. Khalima Alimovna Alimova
Rector,
The Tashkent Institute of Textile and Light Industry

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve educational equipment of the Tashkent Institute of Textile and Light Industry, so that its quality of higher education for students would be upgraded and the graduates would contribute to the nation as a whole and to the country's light industries sector in particular.

2. Project Site

The site of the Project is the Tashkent Institute of Textile and Light Industry located in the city of Tashkent.

3. Responsible and Implementing Agency

3-1 The Responsible Ministry is the Ministry of Higher and Secondary Specialized Education.

3-2 The Implementing Agency is the Tashkent Institute of Textile and Light Industry.

4. Items requested by the Government of the Republic of Uzbekistan

After discussions with the Team, the items described in Annex I were finally requested by the Uzbek side. However, the final components of the Project may differ from the above listed items whenever it is judged necessary by JICA after further studies to be undertaken by the Team in Japan.

5. Japan's Grant Aid Scheme

5-1 The Uzbekistan side understands the Japan's Grant Aid scheme explained by the Team, as described in Annex II.

5-2 The Uzbek side will take the necessary measures, as described in Annex III, for smooth implementation of the Project, as the conditions for the Japan's Grant Aid to be implemented.

6. Schedule of the Study

6-1 The consultants will proceed to the further studies in Uzbekistan until May 2, 2000.

6-2 JICA will prepare the Draft Final Report in English and its executive summary in Russian, and dispatch the mission in order to explain its contents in or around July 2000.

6-3 In case that the contents of the Report are accepted in principle by the Government of the Republic of Uzbekistan, JICA will complete the Final Report and send it to the Government of the Republic of Uzbekistan by the end of October 2000.

7. Other relevant issues

7-1 The Team explained to the Uzbek side the criteria for selection of equipment as described in Annex IV, which will be taken into account in preparing a draft plan of the equipment.

7-2 The Team emphasized that Tashkent Institute of Textile and Light Industry shall establish an efficient system for operation, maintenance and management of the equipment to be supplied under the Project. In this regard, the Uzbek side confirmed that the Institute undertakes necessary measures as requested by the Japanese side and the Ministry of Higher and Secondary Specialized Education shall supervise and manage its activities.

7-3 The Team requested the Uzbek side to identify the method of securing the sufficient budget for maintenance of the equipment, and the Uzbek side confirmed that the Ministry shall secure the sufficient budget for such maintenance annually.

7-4 The Team repeatedly requested to the Uzbek side that the import duties and other relevant fiscal levies on the goods and services to be provided under the Project shall be exempted and such exemption shall be notified to the authorities concerned of the Government of the Republic of Uzbekistan. The Uzbek side confirmed that such measures shall be taken so that the relevant duties and levies should be duly exempted.

7-5 The Team pointed out that the concrete information on the Project should be kept confidential to the private suppliers in order to secure fair competition in tendering.

7-6 The Uzbek side confirmed that the services of testing or quality certification by Tashkent Institute of Textile and Light Industry to the manufacturers on contract basis by using the equipment to be supplied by the Grant should not hinder those of commercial companies. The Uzbek side also assured that any profit generated from such services should be spent solely for the purpose of educational activities of the Institute or the maintenance of its equipment.

ANNEX I

LIST OF REQUESTED EQUIPMENT (1/2)

Description	Q'ty	Faculty	Remarks
1 Natural Silk Processing			
1-1 Raw Silk Technology			
(1) Seriplane Winder	1 unit	MT	
(2) Seriplane Illumination Apparatus	1 unit	MT	
(3) Standard Photographs	1 unit	MT	
(4) Measuring Meter	1 unit	MT	
(5) Denier Scale	1 set	MT	
(6) Serigraph	1 unit	MT	
(7) Bobbin Winder	1 unit	MT	
(8) Conditioning Oven	1 unit	MT	
(9) Winding Machine	1 unit	MT	
(10) Duplan Cohesion Tester	1 unit	MT	
(11) Kett Oven	1 unit	MT	
Weighing Scale	2 units	MT	**
(12) Braiding Machine	1 unit	MT	Added
(13) Twist Counter	2 units	MT	Added
(14) Moisture Meter	1 unit	MT	Added
1-2 Silk Filature and Weaving			
(1) Doubling Twister	1 unit	MT	
(2) Vacuum Heat Setter	1 unit	MT	
(3) Sectional Warper	1 unit	MT	
(4) Reeling Machine	1 unit	MT	
(5) Rapier Loom for Silk	2 units	MT	
(6) Automatic Cone Winder	1 unit	MT	Added
2 Cotton Processing			
2-1 Spinning Laboratory			
Testing & Analyzing Equipment for Yarn and Intermediate Products	1 set	CT	Deleted
(1) Portable Evenness Testing Instruments	1 set	MT	
(2) Optical Hairiness Tester	1 unit	MT	Added
(3) Dynamometer	1 unit	MT	Added
2-2 Dyeing and Finishing Laboratory			
(1) Computer Color Matching System	1 set	EECT	
(2) Tearing Strength Tester	1 unit	EECT	
Rubbing Tester	1 unit	EECT	**
(3) Fade Meter	1 unit	EECT	
(4) Test Dyeing Equipment	1 unit	EECT	
(5) Tensile Tester	1 unit	MT	Added
(6) Martindale Wear & Abrasion Tester	1 unit	MT	Added
(7) Pilling Tester	1 unit	MT	Added
(8) Monsanto Wrinkle Recovery Tester	1 unit	MT	Added
(9) Slip Resistance Tester	1 unit	MT	Added
(10) Air Permeability Tester	1 unit	MT	Added
(11) Water Resistance Tester	1 unit	MT	Added
(12) Antiflaming Tester	1 unit	MT	Added
(13) Color Fastness to Washing Tester	1 unit	MT	Added
(14) Color Fastness to Rubbing Tester	1 unit	MT	Added
(15) Color Fastness to Chemical Dry Tester	1 unit	MT	Added
(16) KES Hand Evaluation Tester	1 unit	MT	Added
(17) Warmth Retaining Tester	1 unit	MT	Added
(18) Electronic Yarn Tensile Tester	1 unit	MT	Added
(19) Digital Yarn Tensile Tester	1 unit	MT	Added
(20) Digital High Speed Tachometer	1 unit	MT	Added
(21) Digital Thermo Hygrometer	1 unit	MT	Added
(22) Density Meter-Thread Picking Meter	4 units	MT	Added
(23) High Magnification Microscope	1 unit	MT	Added
(24) Static Meter	1 unit	MT	Added
(25) Portable Cloth Balance	1 unit	MT	Added
(26) Rotational Type Viscometer	1 unit	MT	Added
(27) Hardness Tester	1 unit	MT	Added
(28) Air Conditioner	6 units	MT	Added

LIST OF REQUESTED EQUIPMENT (2/2)

Description	Q'ty	Faculty	Remarks
3 Knitting, Sewing & Footwear Processing			
3-1 Garment Section			
(1) Lockstitch Buttonholing Machine	1 unit	LI	
(2) Automatic Embroidery Machine	2 units	LI	
(3) Side, Reverse & Box Pleating Machine	1 unit	LI	
(4) Computer Aided Design System	1 set	LI	***
3-2 Socks Section			
(1) Socks Knitting Machine	2 units	MT	
(2) Overlock Machine for Runstitching	2 units	MT	
3-3 Underwear Section			
(1) Circular Knitting Machine	1 unit	MT	
(2) Steam Press	1 unit	MT	Added
4 Computers for Engineering Education			
Study Class with Multimedia System	1 set	TC	Deleted
(1) Personal Computers	60 units	TC	
(2) Printers	1 set	TC	
(3) Scanners	1 set	TC	
(4) Plotters	1 set	TC	
Lingaphone for Licey	1 set	TC	Deleted
Computers for Licey	1 set	TC	Deleted
(5) Copying Machine	10 units	TC	
Printing Machine	2 units	TC	Deleted
(6) Scanner Color Drum	2 units	TC	Added
(7) Video Display & Video Camera	1 unit	TC	Added
Printing Machine	2 units	TC	Deleted
5 Editorial Design			
(1) Scanner with Slide Module	1 unit	EO	Added
(2) Workstation for Image Processing	2 units	EO	Added
(3) Color monitor	2 units	EO	Added
(4) Color Laser Printer	1 unit	EO	Added
(5) Monochrome Laser Printer	1 unit	EO	Added
(6) Network Equipment	1 set	EO	Added
(7) Internal Drum Image Setter	1 unit	EO	Added
(8) RIP for Image Setter	1 unit	EO	Added
(9) On-line Film Processor	1 unit	EO	Added
(10) Reflection Densitometer	1 unit	EO	Added
(11) Transmission Densitometer	1 unit	EO	Added

* Faculty:
MT: Mechanical-Technological
CT: Cotton Technology
LI: Light Industry
EECT: Engineering Economics & Chemical Technology
TC: Test Center (Computer Center)
EO: Editorial Office

** Included in other item.
*** Moved from other section.

ANNEX II

Japan's Grant Aid

1. Japan's Grant Aid Scheme

1) What is the Grant Aid?

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

2) Exchange of Notes (E/N)

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

3) "The period of the Grant Aid"

"The period of the Grant Aid" means one Japanese fiscal year (that starts in April and ends at the next March) which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.
However in case of delays in delivery, installation or construction, due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one Japanese fiscal year at most by mutual agreement between the two Governments.

4) Purchase of the Products or Services

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

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

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

5) Necessity of the "Verification"

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

6) Undertakings required 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:

(1) To secure completion of buildings' renovation works prior to the procurement of the equipment,

(2) To provide facilities with the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,

(3) To secure buildings prior to the procurement in case of the installation of the equipment,

(4) 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,

(5) 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,

(6) 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 use and maintain the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid,

(8) Re-export

The products purchased under the Grant Aid should not be re-exported from the recipient country,

(9) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the

Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified contracts,

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

(10) To bear an advising commission of an Authorization to Pay (A/P) and payment commissions to the Bank, with which the Government of the recipient country opens an account for the Project.

2. Grant Aid Procedures

The Grant Aid program is executed through the following procedures:

1) Application: The application for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for the Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct the Study on the request.

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

3) Appraisal & Approval: The Government of Japan appraises the Project to see whether or not it is suitable for the Grant Aid scheme, based on the Basic Design Study Report prepared by JICA, and the results are then submitted to the Cabinet for approval.

4) Determination of Implementation: The project, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the recipient country. For the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

3. Basic Design Study

1) Contents of the Study

The aim of the Study, conducted by JICA on a requested Project is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

(1) Confirmation of the background, the objectives, and the benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation,

(2) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid scheme from a technical, social and economic point of view,
(3) Confirmation of items agreed on by both parties concerning the basic concept of the Project,
(4) Preparation of the Basic Design of the Project,
(5) Estimation of costs 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.

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

2) Selection of Consultants

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

The consulting firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes (E/N), in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

ANNEX III

NO.	Items	To be covered by Grant Aid	To be covered by Recipient Side
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 the recipient country		
	1) Marine (Air) transportation of the products from Japan or third countries 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 contact 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 contracts.		●
5	To maintain and use properly and effectively the facilities constructed and/or equipment provided under the Grant.		●
6	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities and/or for the transportation and installation of the equipment, including the operation and maintenance costs		●
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities of the Project site		
	1) Electricity		
	a. The distributing line to the Project site		●
	b. The drop wiring and internal wiring within the Project site		●
	c. The main circuit breaker and transformer		●
	2) Water Supply		
	a. The city water distribution main to the Project site		●
	b. The supply system within the Project site (receiving and elevated tanks)		●
	3) Drainage		
	a. The city drainage main (for storm, sewer and others) to the Project site		●
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the Project site		●
	4) Gas Supply		
	a. The city gas main to the Project site		●
	b. The gas supply system within the Project site		●
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel		●
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	

(B/A: Banking Arrangement, A/P: Authorization to Pay)

ANNEX IV

Proposed Criteria for Selection of the Equipment

A. Principles

1) The equipment shall be used for educational activities pursuant to the current educational curricula and syllabi.

2) The equipment shall be those:
   - to replace the existing outdated and obsolete items,
   - to supplement those that are currently short in quantity, and
   - to add new items that are indispensable but not in use currently.

3) The equipment will be limited to those items that can be installed or stored in the existing buildings of the Institute without major modification of those buildings.

4) The equipment shall be in consonance with the technical needs and level of the industries in Uzbekistan.

5) The equipment shall be those that contribute for efficient utilization of indigenous raw materials of Uzbekistan such as cotton and silk.

6) Sophisticated and costly items of equipment can be included in the Project only if it is justified that they are indispensable and justifiable with regard to educational needs as well as economic and technical capability of the Institute for their operation and maintenance.

7) The equipment shall be those that have sufficient operating life.

B. Priority

The equipment to receive higher priority:

- Those for use in education in the undergraduate/postgraduate courses,
- Those that are indispensable for engineering education,
- Those that are used for larger number of students/graduates,
- Those to be used in the textile related subjects,
- Those that will not require significant building modification works, and
- Those that are in the similar technical level of the ones installed in the industries.

Minutes of Discussions
on
the Basic Design Study
on
the Project for Improvement of Equipment for
the Tashkent Institute of Textile and Light Industry
in
the Republic of Uzbekistan
(EXPLANATION ON DRAFT REPORT)

In April 2000, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the project for improvement of equipment for the Tashkent Institute of Textile and Light Industry (hereinafter referred to as "the Project") to the Republic of Uzbekistan (hereinafter referred to as "Uzbekistan"), 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 and to consult the Uzbekistan on the components of the draft report, JICA sent to Uzbekistan the Draft Report Explanation Team (hereinafter referred to as " the Team "), which is headed by Tomikazu Inagaki, Senior Advisor, JICA, from August 10 to August 22.

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

Tashkent, August 16, 2000

Mr. Tomikazu Inagaki
Leader
Draft Report Consultation Team
Japan International Cooperation Agency

Acad. Saidakhror S. Gulyamov
Minister,
The Ministry of Higher and Secondary
Specialized Education

Prof. Dr. Khalima Alimovna Alimova
Rector,
The Tashkent Institute of Textile
and Light Industry

ATTACHMENT

1. Components of the Draft Report

Uzbek side agreed and accepted in principle the components of the draft report explained by the Team.

After discussions with the Team, the items described in Annex-I were finally confirmed by the Uzbek side.

2. Japan's Grant Aid scheme

Uzbek side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Uzbekistan as explained by the Team and described in Annex-II and Annex-III of the Minutes of Discussions signed by both parties on April 14, 2000.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to Uzbekistan by October 2000.

4. Other relevant issues

(1) The Team handed one copy of the draft detailed specification of the equipment to the Tashkent Institute of Textile and Light Industry. Both sides agreed that this draft specification is confidential and should not be duplicated or released to any outside parties.

(2) The Uzbek side strongly requested that the following modifications on the equipment list would be made;

a) Code No. 4-1-1 "Personal Computers" : Total 60 units will be included.
b) Code No. 4-1-3 "Scanners" : 2 more units will be added.
c) Code No. 4-1-7 "Video Display & Video Camera" : 1 set will be included.

In response to the above, the Team explained to the Uzbek side that this request was duly notified and be conveyed to JICA Head Office for further review, provided that the Uzbek side submits to the Team necessary supporting data for justifying such requests before the Team members leave Uzbekistan.

(3) The Uzbek side confirmed that the following preparatory works for receiving the equipment that are to be undertaken by the Uzbek side should be completed by the end of October 2001.

a) Improvements of existing buildings (floors, ceilings, walls, dividers etc.),
b) Electrical wiring (primary wiring, lighting),
c) Water supply and drainage work,
d) Ventilation and air conditioning work,
e) Telecommunications equipment work,
f) Procurement of furniture, small movable items etc., and

g) Supplies and consumables.

(4) The Team requested to the Uzbek side to secure sufficient budget for running and maintaining the equipment to be supplied under the Project, and the Uzbek side confirmed that the Tashkent Institute of Textile and Light Industry together with the Ministry of Higher and Secondary Specialized Education would suffice such budget.

(5) The Uzbek side confirms that Tashkent Institute of Textile and Light Industry becomes the implementing agency of the Project and should pursue the following roles;

a) To conclude an agreement with a Japanese consulting firm and supply contract(s) with Japanese trading firm(s),

b) To undertake necessary procedures for the Banking Arrangement (B/A) to be concluded between an authorized bank of Uzbekistan and a Japanese bank and to open an Authorization to Pay (A/P) in relation with the verified agreement and the contract(s), and

c) To assure quick customs clearance and exemption of relevant taxes on the goods and services to be provided under the Project.

(6) For the sake of the technology transfer on sustainable operation and maintenance, the Uzbek side pointed out the need for dispatch of Japanese experts as well as technical training of counterpart personnel in Japan. They also understood that another official request on technical cooperation should be submitted through diplomatic channels, i.e. the Embassy of Japan.

Annex-1 List of Equipment to be provided under the Japanese Grant Aid

Code	Sr. No.	Description	Q'ty	Priority			Faculty*
				A	B	C	
1	Natural Silk Processing						
1-1		Raw Silk Certification Technology					
1-1-1	1	Seriplane Winder	1	1			MT
1-1-2	2	Seriplane Illumination Apparatus	1	1			MT
1-1-3	3	Seriplane Standard Photographs	1	1			MT
1-1-4	4	Measuring Meter	1	1			MT
1-1-5	5	Denier Scale with Weighing Scale	1 set	1 set			MT
1-1-6	6	Serigraph	1	1			MT
1-1-7	7	Bobbin Winder	1	1			MT
1-1-8	8	Conditioning Oven	1	1			MT
1-1-9	9	Winding Machine	1	1			MT
1-1-10	10	Duplan Cohesion Tester	1	1			MT
1-1-11	11	Kett Oven	1	1			MT
1-1-12	12	Twist Counter	2	2			MT
1-1-13	13	Moisture Meter	1	1			MT
1-2		Silk Filature and Weaving					
1-2-1	14	Doubling Twister	1	1			MT
1-2-2	15	Vacuum Heat Setter	1	1			MT
1-2-3	16	Sectional Warper	1	1			MT
1-2-4	17	Reeling Machine	1	1			MT
1-2-5	18	Rapier Loom for Silk (Dobby & Jacquard)	2	1	1		MT
1-2-6	19	Automatic Cone Winder	1	1			MT
1-2-7	20	Braiding Machine	1	1			MT
2	Cotton Processing						
2-1		Spinning Laboratory					
2-1-2	1	Optical Hairiness Tester	1	1			MT
2-1-3	2	Dynamometer	1		1		MT
2-2		Dyeing and Finishing Laboratory					
2-2-1	3	Color Matching System	1 set	1 set			EECT
2-2-2	4	Tearing Strength Tester	1	1			EECT
2-2-3	5	Fade Meter	1	1			EECT
2-2-4	6	Test Dyeing Machine	1	1			EECT
2-2-5	7	Cloth Tensile Tester	1	1			MT
2-2-6	8	Abrasion Tester	1	1			MT
2-2-7	9	Pilling Tester	1	1			MT
2-2-8	10	Wrinkle Recovery Tester	1	1			MT
2-2-9	11	Slip Resistance Tester	1	1			MT
2-2-10	12	Air Permeability Tester	1	1			MT
2-2-11	13	Water Resistance Tester	1	1			MT

Code	Sr. No.	Description	Q'ty	Priority			Faculty*
				A	B	C	
2-2-12	14	Flammability Tester	1	1			MT
2-2-13	15	Color Fastness to Washing Tester	1	1			MT
2-2-14	16	Color Fastness to Rubbing Tester	1	1			MT
2-2-15	17	Color Fastness to Perspiration Tester	1	1			MT
2-2-17	18	Warmth Retaining Tester	1	1			MT
2-2-18	19	Yarn Tensile Tester	1	1			MT
2-2-19	20	Yarn Tension Meter	1	1			MT
2-2-20	21	High Speed Tachometer	1	1			MT
2-2-21	22	Thermo Hygrometer	1	1			MT
2-2-22	23	Thread Picking Meter (Density Meter)	4	4			MT
2-2-23	24	High Magnification Microscope	1	1			MT
2-2-24	25	Static Meter	1	1			MT
2-2-25	26	Portable Cloth Balance	1	1			MT
2-2-26	27	Rotational Type Viscometer	1	1			MT
2-2-27	28	Hardness Tester	1	1			MT
2-2-28	29	Air Conditioner	6	6			MT
3		**Knitting and Sewing Processing**					
3-1-1	1	Lockstitch Buttonholing Machine	1	1			LI
3-1-2	2	Automatic Embroidery Machine	1	1			LI
3-1-3	3	Side, Reverse & Box Pleating Machine	1		1		LI
3-1-4	4	Computer Aided Design System	2	2			LI
3-1-5	5	Socks Knitting Machine	1	1			MT
3-1-6	6	Overlock Machine for Runstitching	3	3			MT
3-1-7	7	Circular Knitting Machine	1	1			MT
3-1-8	8	Steam Press	1	1			MT
4		**Computers for Engineering Education**					
4-1-1	1	Personal Computers	60	60			TC
4-1-2	2	Printers	3	3			TC
4-1-3	3	Scanners	3	1		2	TC
4-1-4	4	Plotters	1	1			TC
4-1-5	5	Copying Machine	3	3			TC
4-1-7	6	Video Display & Video Camera	1 set			1 set	TC

*Faculty:
MT: Mechanical-Technological
LI: Light Industry
EECT: Engineering Economics & Chemical Technology
TC: Test Center (Computer Center)

APPENDIX-6 COSTS TO BE BORNE BY THE UZBEK SIDE

Currency: Soum

No.	Cost Item	Silk Filature Machine Room	Weaving Machine Room	Knitting & Sewing Machine Room	Design & Sewing Machine Room	Fiber Products Examination Room #1 & Seriplane Room	Fade Meter Room	CCM Room	Editorial Office	Test Center	Remarks
1	Partition wall with glass	1,500,000	1,710,000	360,000							2m in height
					500,000						Full height
2	Partition wall without glass										2m in height
						600,000		200,000			Full height
3	Flooring work					1,500,000	500,000	200,000	250,000	250,000	
4	Electric Wiring & Facilities	3,000,000	3,000,000	1,000,000	1,500,000	3,900,000	400,000	1,000,000	509,440	1,443,200	
5	Water Facilities	504,950				500,000		510,000	491,297	491,297	
6	Air Piping		1,000,000	1,000,000							
7	Steam Piping	1,000,000									
8	Painting	2,500,000	2,600,000	1,800,000	1,200,000	4,900,000	600,000	1,400,000	2,480,000	2,400,000	
9	Wall Paper					1,200,000		300,000			
10	Ceiling Remodeling					4,000,000	300,000	250,000	1,000,000		
11	Transfer & Setup of Old Machine	30,000	21,160	50,000				50,000			
12	Ventilation			500,000		1,000,000					
						For Seriplane					
13	Air Conditioning				1,000,000	2,000,000	500,000	1,000,000	900,000		
						For Exam Room					
14	Others	426,748	416,558	235,500	210,000	980,000	115,000	245,500	281,537	229,225	
	Sub Total	8,961,698	8,747,718	4,945,500	4,410,000	20,580,000	2,415,000	5,155,500	5,912,274	4,813,722	
		A	B	C	D	E	F	G	H	I	
	Total	A + B + C + D + E + F + G + H + I =						65,941,411			