BASIC DESIGN STUDY
ON
THE PROJECT FOR EXPANSION
OF
ELECTRONIC ENGINEERING
POLYTECHNIC INSTITUTE
OF
SURABAYA
IN
THE REPUBLIC OF INDONESIA

NOVEMBER 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
PACIFIC CONSULTANTS INTERNATIONAL
INTEM CONSULTING, INC.

PREFACE

In response to a request from the Government of the Republic of Indonesia, the Government of Japan decided to conduct a basic design study on the Project for Expansion of Electronic Engineering Polytechnic Institute of Surabaya, and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Indonesia a study team from 17 May, to 15 June, 2001. The team held discussions with the officials concerned of the Government of Indonesia, 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 Indonesia 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 Indonesia for their close cooperation extended to the teams.

November, 2001

Takao Kawakami
President
Japan International Cooperation Agency

November 2001

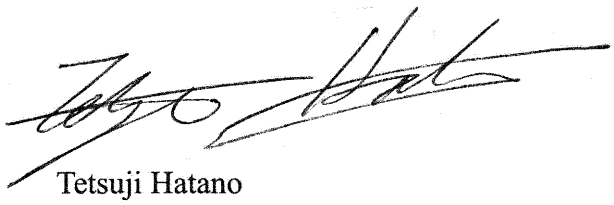
LETTER OF TRANSMITTAL

We are pleased to submit to you the basic design study report on the Project for Expansion of Electronic Engineering Polytechnic Institute of Surabaya in the Republic of Indonesia.

This study was conducted by Consortium of Pacific Consultants International and INTEM Consulting, Inc. under a contract to JICA, during the period from 14 May, 2001 to 16 November, 2001. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Indonesia and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

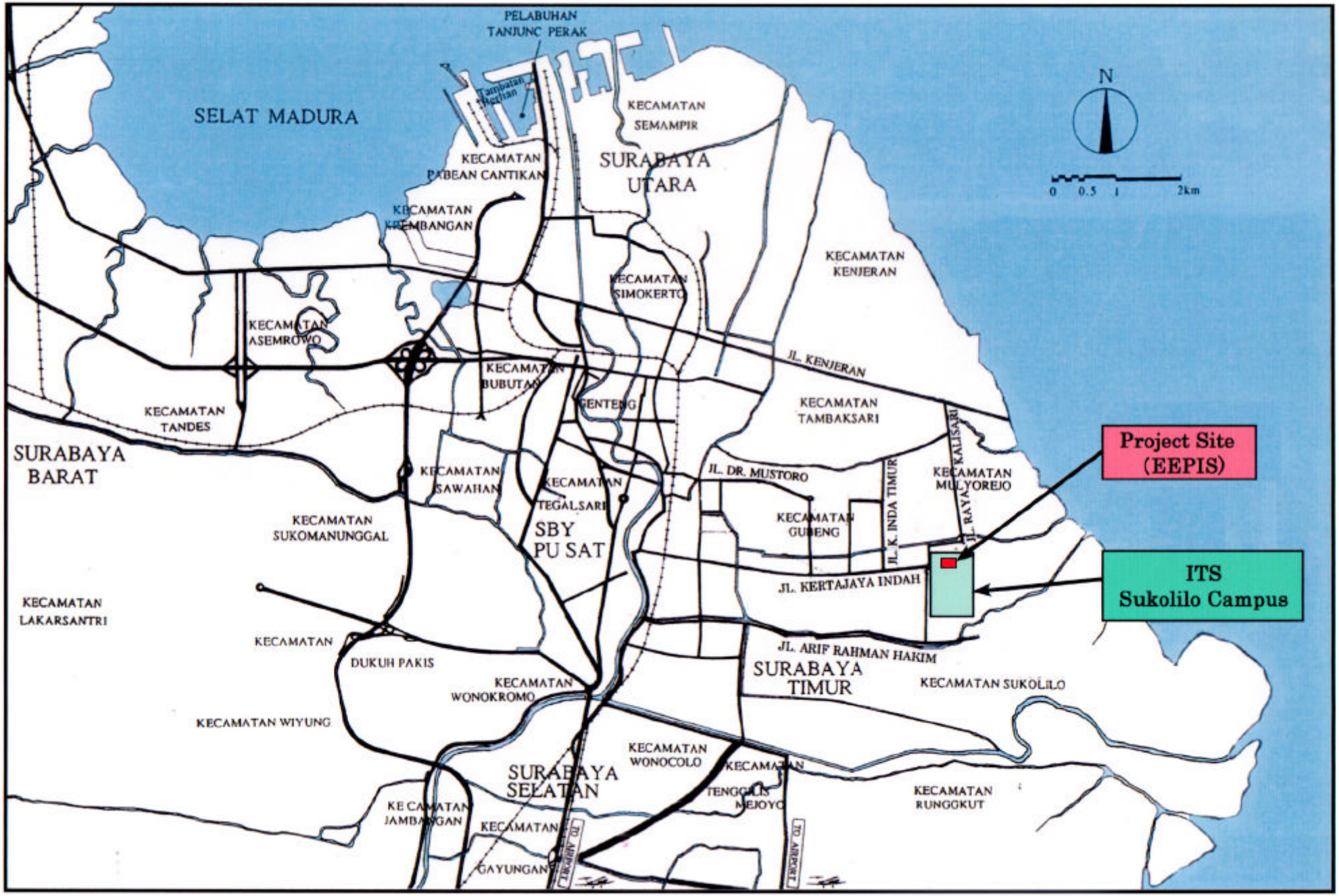
Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

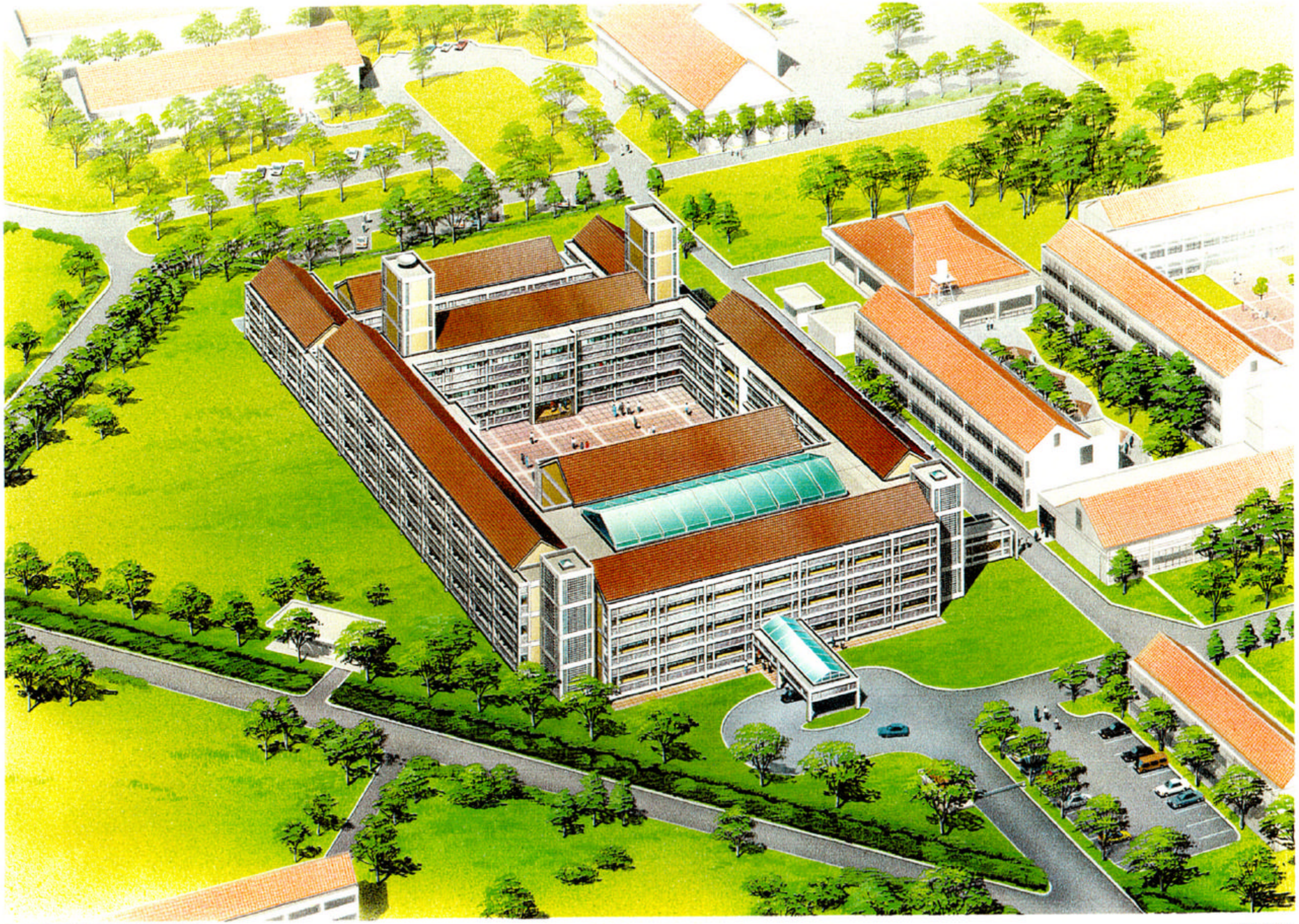


Tetsuji Hatano
Project Manager,
Basic Design Study Team on
The Project for Expansion of
Electronic Engineering Polytechnic Institute
of Surabaya, in the Republic of Indonesia
Pacific Consultants International
INTEM Consulting, Inc.

Location Map of the Project Site-1



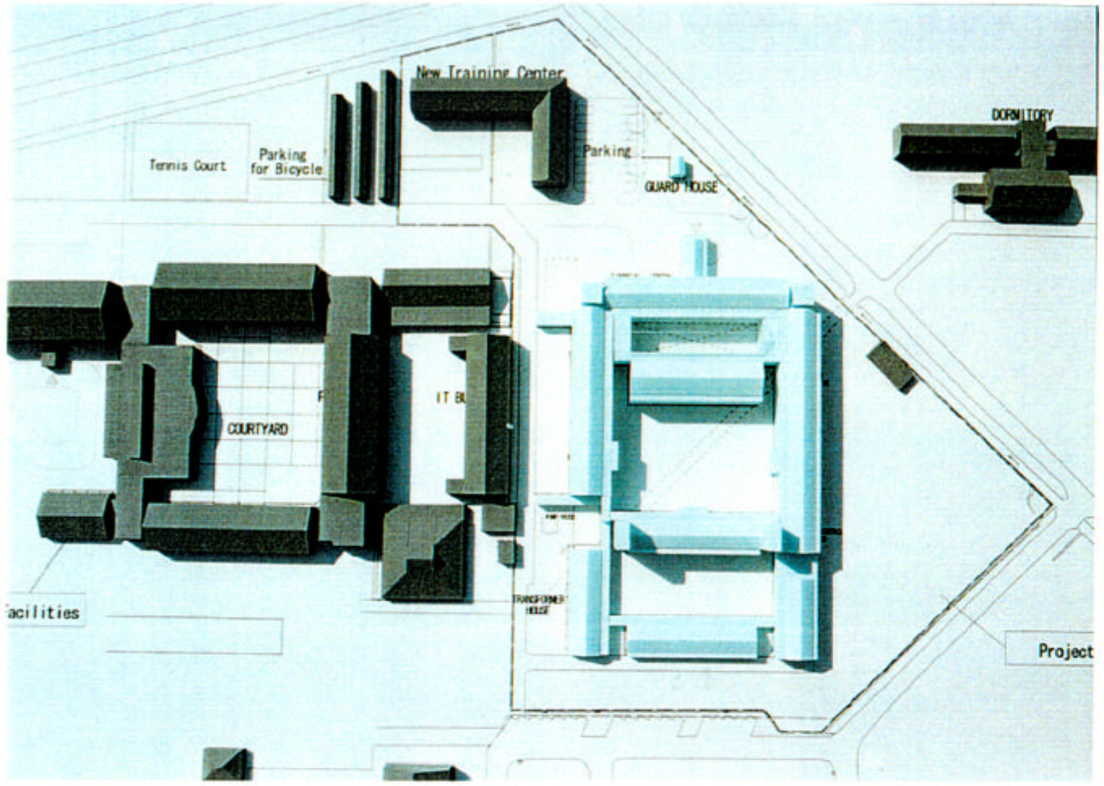
Location Map of the Project Site-2

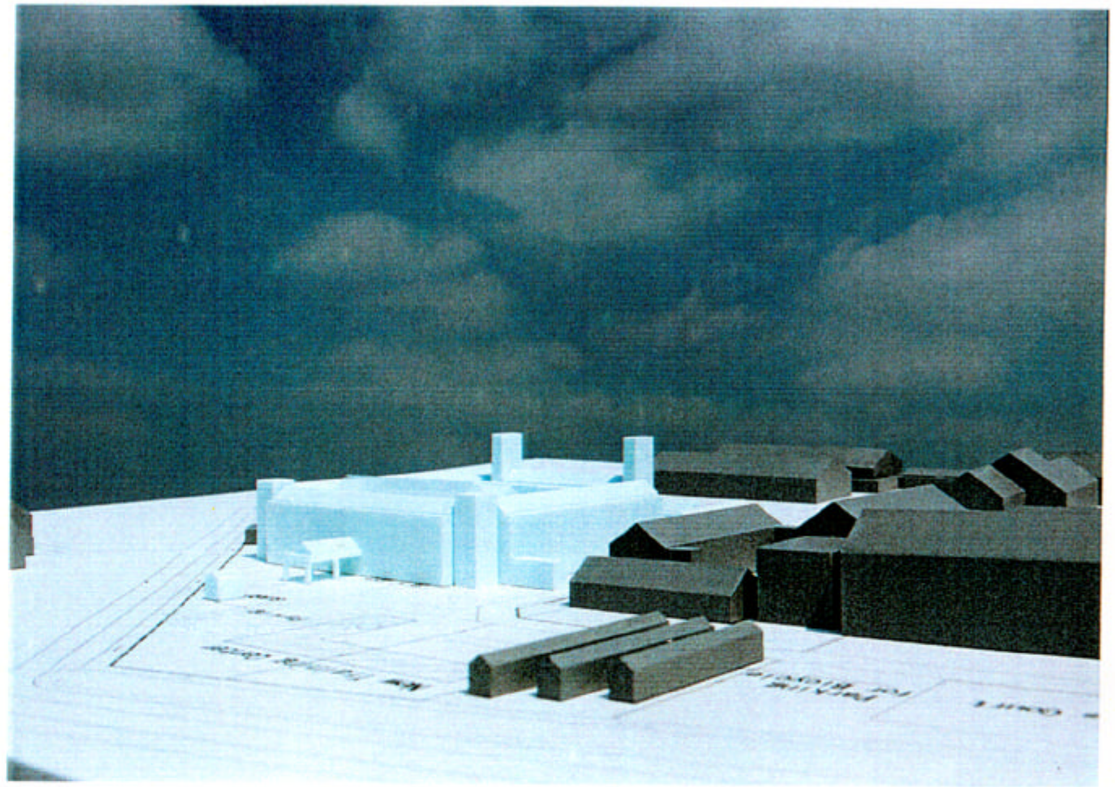


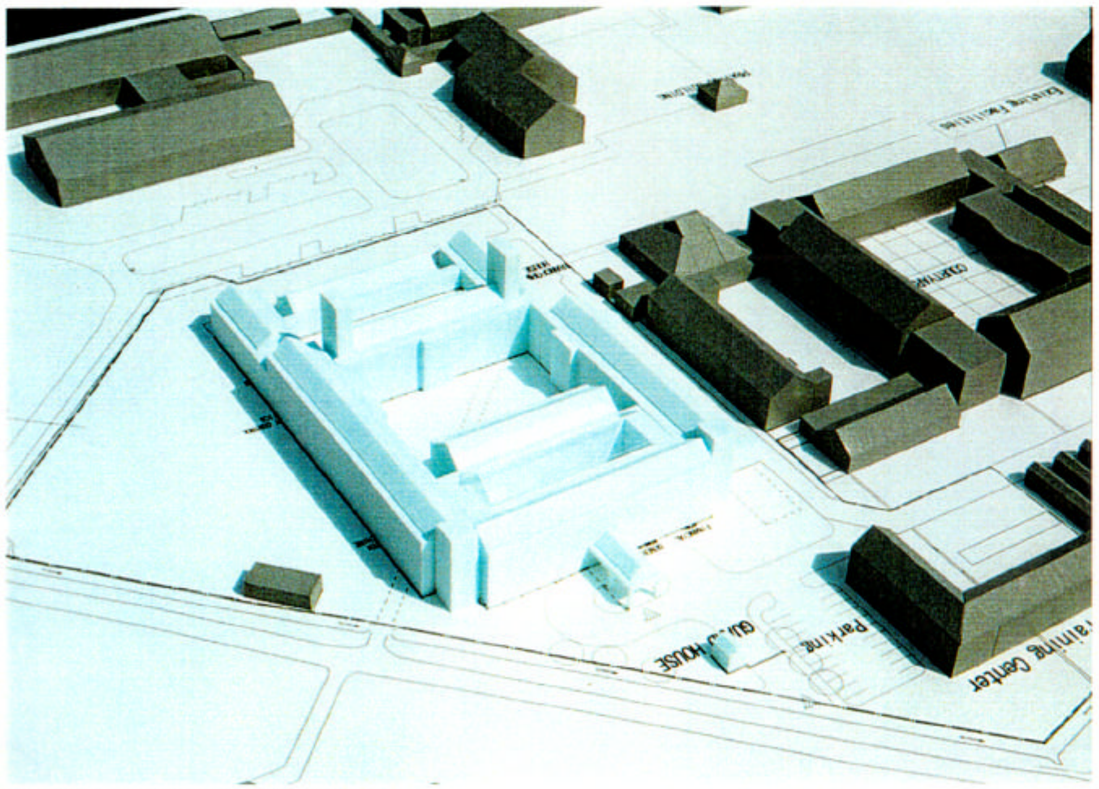
THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,
IN THE REPUBLIC OF INDONESIA

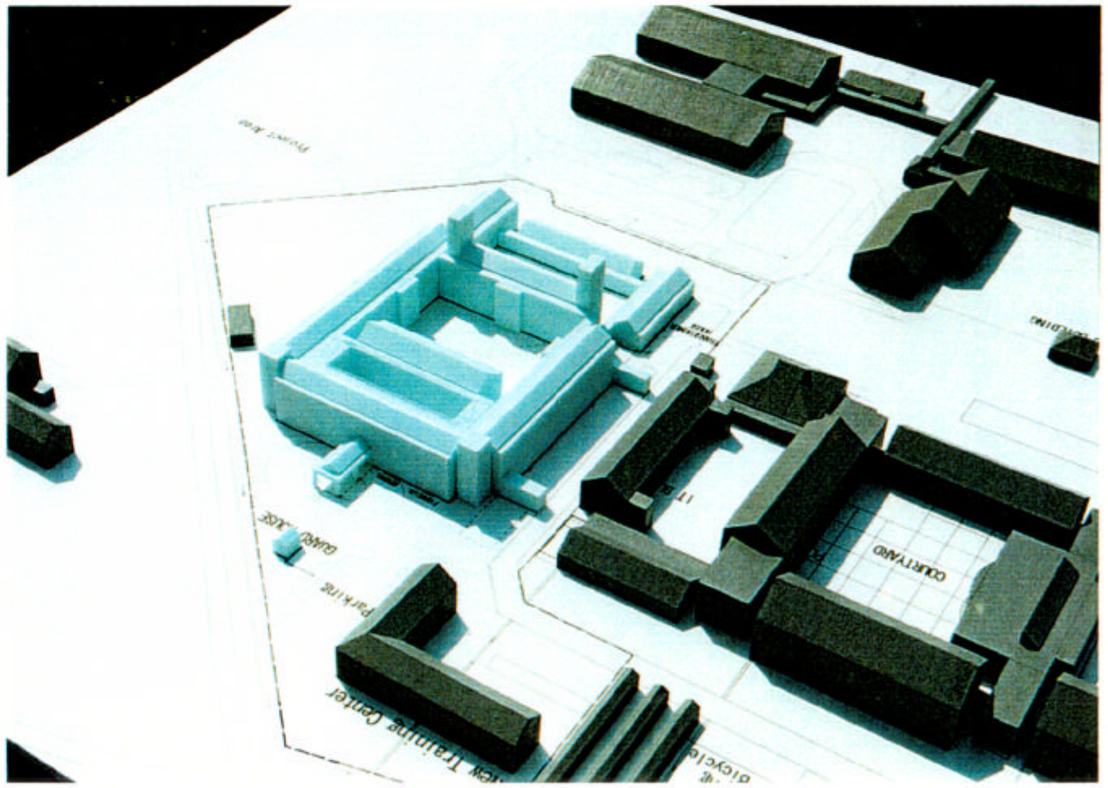
PACIFIC CONSULTANTS INTERNATIONAL

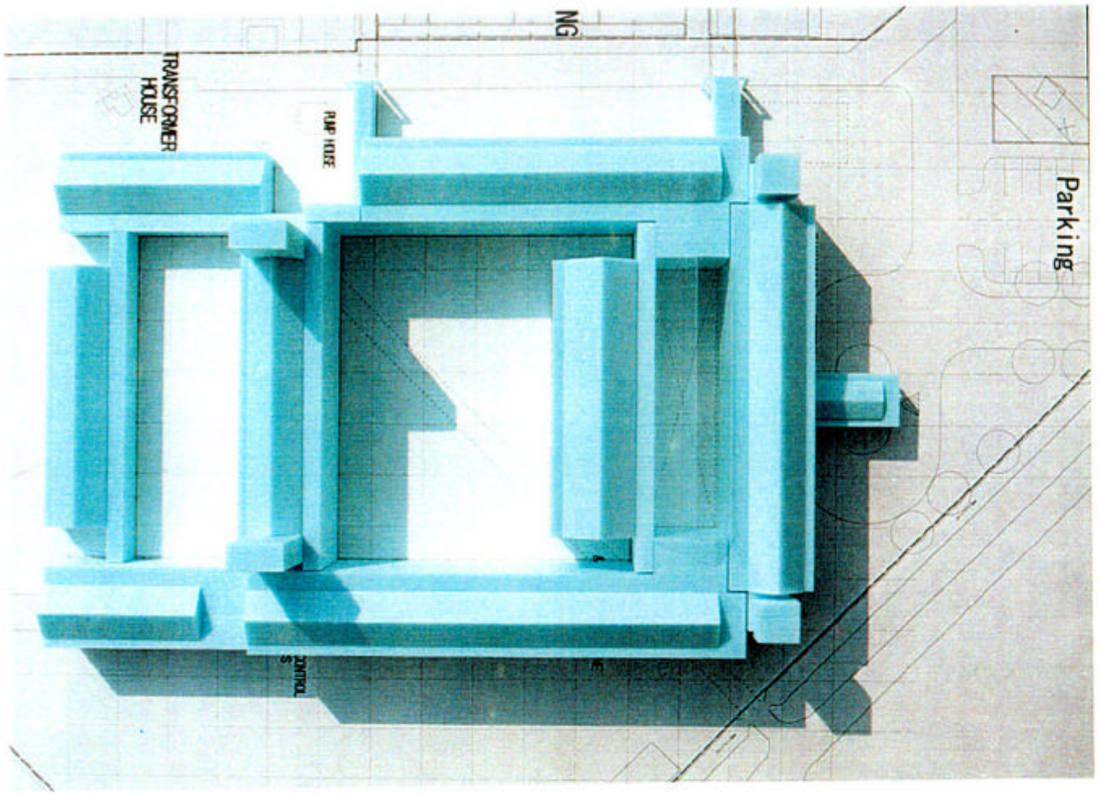
Perspective

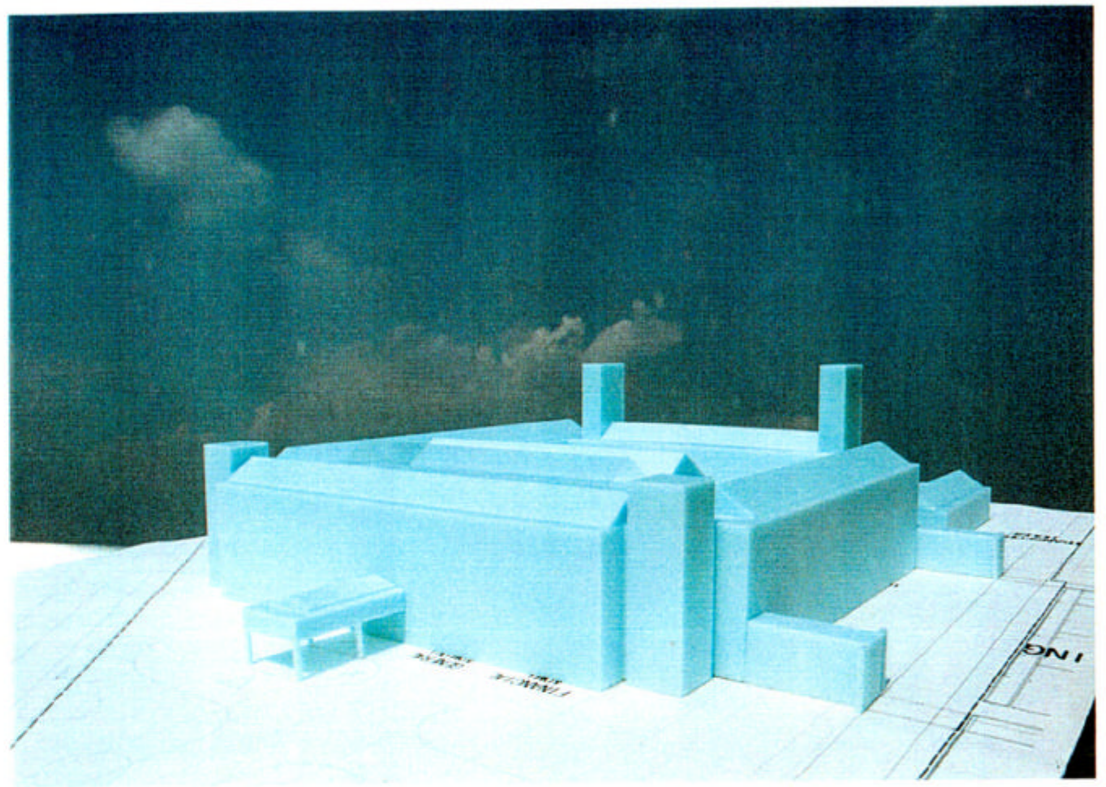

New Training Center
DORMITORY
Tennis Court
Parking for Bicycle
Parking
GUARD HOUSE
COURTYARD
Project

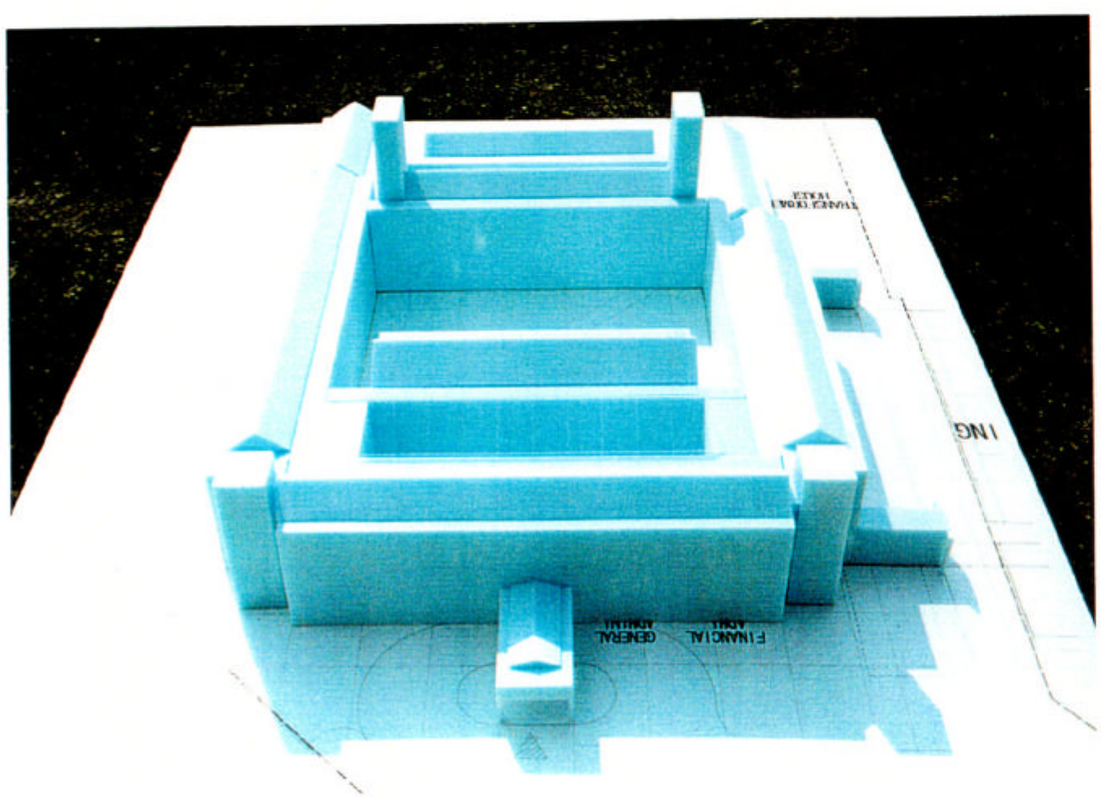


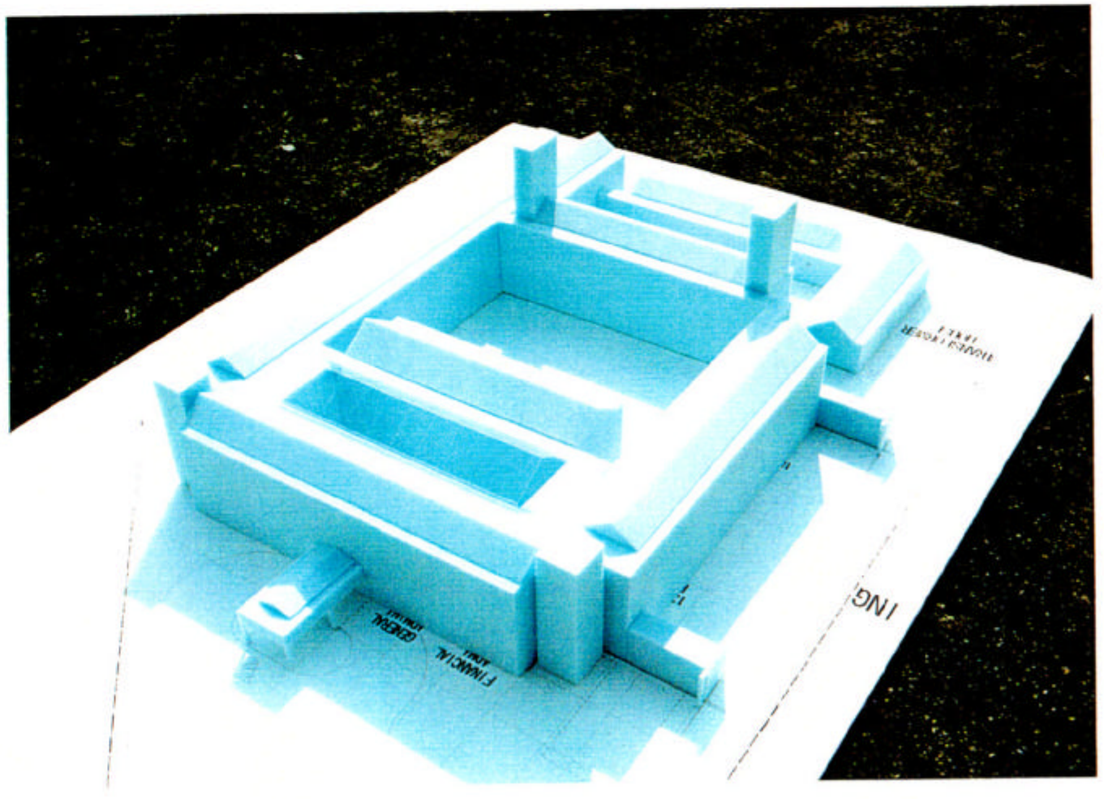












THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,

PACIFIC CONSULTANTS INTERNATIONAL

Model Photos - 2

List of Figures

List of Tables

ABBREVIATION

ADB	Asia Development Bank
BLK	Balai Latihan Kerja (Indonesian Language)
D	Diploma
DGHE	Directorate General of Higher Education
EEPIS	Electronic Engineering Polytechnic Institute of Surabaya
GDP	Gross Domestic Product
IKIP	Institute Kegurun dan Ilmu Pendidikan (Indonesian Language)
ITS	Institut Teknologi Sepuluh Nopember (Indonesian Language)
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
LAN	Local Area Network
MONE	Ministry Of National Education
NAB	National Accreditation Board
NRP	National Resource Polytechnic
ODA	Official Development Assistance
PES	Polytechnic Education System
POLBAN	Politeknik Negeri Bandung (Indonesian Language)
POLMAN	Politeknik Manufaktur Bandung (Indonesian Language)
PTTC	Project Type Technical Cooperation
S1	Sarajana 1 (Indonesian Language)
S2	Sarajana 2 (Indonesian Language)
S3	Sarajana 3 (Indonesian Language)
SAPROF	Special Assistance for Project Formation
SP	Specialis (Indonesian Language)
SPEET	Strengthening of Polytechnic Education in Electronic-related Technology
TPSDP	Technical and Professional Skill Development Project
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNS	University of Sebelas Maret
USAID	The U.S. Agency for International Development
WB	World Bank

TABLE OF CONTENTS

APPENDICES

CHAPTER 1
BACKGROUND OF THE PROJECT

CHAPTER 1 BACKGROUND OF THE PROJECT

1.1 Background of the Request

In recent years, the industrialization progress in Indonesia has been a serious problem due to lack of middle-class engineers who were able to deal with technical problems. In consequence of this shortage, progress has been impaired. Therefore, the development of polytechnic education that will nurture middle-class engineers have become the important issue for Indonesia. Director General for Higher Education (DGHE), under the Ministry of National Education (MONE), has planned to establish 155 polytechnic institutions by 2020, in addition to the existing 26 polytechnics institutions, however, the actual number of institution is 25 due to closing of East Timor polytechnic. The Overseas Economic Cooperation Fund (OECF) of Japan, presently called Japan Bank for International Cooperation (JBIC), carried out the Special Assistance for Project Formation (SAPROF) to define details of the Polytechnic Development in Indonesia from November 1997 to March 1998. OECF planned to establish D4 level polytechnic teacher training course in Electronic Engineering Polytechnic Institute of Surabaya (EEPIS), Politeknik Negeri Bandung (POLBAN) and Politeknik Manufaktur Bandung (POLMAN) as model polytechnics institute and D3 training courses in polytechnics attached to Surabaya Institute Teknologi Sepuluh Nopember (ITS) and Solo University of Sebelas Maret (UNS). DGHE already approved the Implementation Program based on the SAPROF study. However, the economic crisis postponed the implementation of the project by Japanese Official Development Assistance (ODA) Loan since the summer of 1997.

Meanwhile, the restoration of the industry is indispensable for recovery after a economic crisis. Therefore, the continuation in the development of Polytechnic Education System (PES) is made the most important priority for DGHE, the development planning of the above 155 polytechnic institutions is indispensable, and even the need of teacher training in this regard has become inevitable. On the basis of this policy, DGHE proposed the expanded development plan of 220 polytechnic institutes including private polytechnic institutions and extension of existing universities by 2020.

Under these circumstances, DGHE decided to designate EEPIS as the National Resource Polytechnic (NRP) and to establish the D4 level polytechnic teacher training course (equal to S1 level) for teacher training in the Electronics, Electricity and Telecommunication Departments. Additionally, it has planned to establish the D3 level polytechnic training course of Information Technology for training of middle-class engineers due to their shortage in the industrial world.

The Government of Japan, through Japan International Cooperation Agency (JICA), granted the establishment of EEPIS attached to ITS in 1988, a Technical Cooperation for EEPIS from 1987 to 1994 and implementation of the Third Country Training Program one month a year for five years, for the reason that Surabaya city is considered the center of the electronic industry in Indonesia.

JICA has implemented a second Technical Cooperation for EEPIS called the “Strengthening Polytechnic Education in Electric-related Technology” (SPEET) project from 1999 and to

continue to the year 2004.

In this context, the Government of Indonesia has made a request to the Government of Japan for the establishment of D4 level polytechnic teacher training course for subjects in electronic engineering, electrical engineering and telecommunication engineering and also of D3 level Polytechnic training course in Information Technology in accordance with SPEET.

In regard to the establishment of D3 level Polytechnic training course in Information Technology, the request was changed to the establishment of D4 level polytechnic teacher training course on account of strong request by Indonesian side as it has already been decided earlier during the design study stage.

CHAPTER 2
CONTENTS OF THE PROJECT

CHAPTER 2 CONTENTS OF THE PROJECT

2-1 Basic Concept of the Project

2-1-1 Outline of Project

(1) Project Objective

One of the main objectives of this Project is to provide assistance to the activities of Strengthening of Polytechnic Education in Electronic-related Technology (SPEET) Project implemented through JICA's Project Type Technical Cooperation (PTTC). Thus, the Project should be implemented in close cooperation with the SPEET Project and finally contribute to PTTC.

Therefore, based on the request from the Indonesian side and the results of the Basic Design Study, the specific objectives of the Project are as follows:

The provision of the necessary facility and equipment for the establishment of;

1) the D4 Course, 4-year teacher training (Pre-service), and;
2) the 1.5-year Teacher Retraining (in-service) Course that allows teachers on active duty with D3 qualification to upgrade it to the D4 level in Electrical Engineering, Electronic Engineering, Telecommunication Engineering and Information Technology Departments.

In reference to the Information Technology Department, the establishment of the D3 courses has altered to assist the D4 course based on the Basic Design Study, which the Indonesian side had initially requested in the establishment of the D3 course.

(2) Outline of the Project (Basic Concept)

The points to be confirmed through the Basic Design Study are presented in the following 'Outline of the Project'.

〔Outline of the Project〕

Final Objective:		To promote and develop human resources in the fields of Electrical Engineering, Electronic Engineering, Telecommunication Engineering and Information Technology in Indonesia. (be relevant to Overall Goal in SPEET by PTTC)
1)	Overall Goal:	To promote training in the fields of Electrical Engineering, Electronic Engineering, Telecommunication Engineering and Information Technology in Indonesia. (be relevant to Project Purpose in SPEET by PTTC)
2)	Project Purpose:	To improve the educational environment in the following courses: Electrical Engineering, Electronic Engineering, Telecommunication Engineering and Information Technology of Electronic Engineering Polytechnic in Surabaya (EEPIS) Polytechnic.
3)	Expected Outputs (Based on the Basic Design of the Project)	
	The contribution to teacher training for EEPIS in which technical education to train skilled technicians with specific expertise in the fields of electrical and electronics engineering is provided, and to support SPEET Project are expected through the implementation of the Project.	

4) Activities and Inputs
   a) Contents of request to Japanese side
      Facility and equipment needed for the D4 courses of EEPIS in:
      i) Electrical Engineering,
      ii) Electronic Engineering,
      iii) Telecommunication Engineering and
      iv) Information Technology.
   b) Execution plan by Indonesian side
      Conducting the courses applying planned facility and equipment, deploying necessary teachers, and developing operation and maintenance system.
5) Target area (site): Surabaya, Indonesia. Nationwide in long term.
6) Direct/Indirect Beneficiaries:
   Direct beneficiary : 480 students and 60 teachers per year on active duty to be retrained in EEPIS
   Indirect beneficiary: All the polytechnics in the country and enterprises that EEPIS brings positive effects on technology

(3) Result of Examination of the Contents of the Request

1) Facility Construction

a) Contents of the Request

The contents of the request on facility, which the Basic Design Study covered, were agreed with the Indonesian side after the discussion and examination. Table 2-1 shows the confirmed contents of the request on facility.

Table 2-1 Required Rooms of Indonesian Side (facilities)

Facility Name					
1.	**Laboratories**		**2.**	**Classrooms**	
	Electrical Engineering Department		**3.**	**Library**	
	1.1	Electromechanical Workshop		3.1	Reading Room
	1.2	Electric Circuits and Measurements		3.2	Head of Library Room
	1.3	Factory Automation		3.3	Book Storage Room
	1.4	Power System and Electric Machine		3.4	e-Library Room
	Electronics Engineering Department			3.5	Server Room
	1.5	Electronic Fundamental		3.6	Audiio Visual Room
	1.6	Digital Electronics		3.7	Lobby
	1.7	Computer and Interface			
	1.8	Automatic Control	**4.**	**Administration Office**	
	1.9	Intelligent Control and Robotics		4.1	Director Room
	Telecommunication Engineering Department			4.2	Vice Director Ⅰand Ⅱ (2p×1)Room
	1.10	Radio Wave Propagation		4.3	General Administration
	1.11	Optical Communications and Electro-Physics		4.4	Head of Department and Adm. Room
	1.12	Digital Communications		4.5	Meeting Room
	Information Technology Department			4.6	Academic Affair Administration
	1.13	Computer Programming Ⅰ		4.7	Financial Administration
	1.14	Computer Programming Ⅱ		4.8	JICA Expert
	1.15	Computer Programming Ⅲ		4.9	JICA Administration Room
	1.16	Advance Programming		4.10	Public Relation
	1.17	Computer Aided Design and Simulation		4.11	Employee Administaration
	1.18	Computer Network	**5.**	**Canteen**	

b) Examination of the Contents of the request

For each facility, dedicated discussions were exchanged with EEPIS in terms of the necessary number and scale of each room, and they have been examined. The results are presented as follows:

i) Laboratory

The Electrical Engineering Department (4 Laboratories), the Electronics Engineering Department (5 Laboratories), the Telecommunication Engineering Department (3 laboratories), and the Information Technology Department (6 laboratories), 18 laboratories in total were requested by the Indonesian side. After the examination of the curriculum and the experimental form of each laboratory, 18 laboratories are recognized in necessity, and the contents, the form, and the size of each laboratory have been planned through comprehensive discussions with the EEPIS.

ii) Classrooms

Having considered the regular lectures are given in regular classrooms, the necessary and least numbers of classrooms were planned. On the process of evaluation, the maximum operation degree, which gives no negative effects on time-table-management, was set as 75% based on the examination of the curriculum.

iii) Library

The existing library was planned with the floor area of 253.33m^2 for 360 students and 36 teachers. However, 657 students and 117 teachers, about two times the planned amount, are on the register in EEPIS.

The number of students and teachers will become 1197 and 211 respectively, after the establishment of D4 course. The absolute shortage in the space of the existing library is obvious.

The rooms, having relation with the e-library, are not covered in the Project for its unclear management plan or the increase of running and maintenance costs undertaken by Indonesian side.

iv) Administration Office

The main rooms shall be moved to the new building and is least necessary and should have no duplication on their function between the new and existing buildings based on the concept that the management system for both facilities, D3 and D4 courses, are going to be unified.

v) Canteen

The Project does not cover the expansion of existing space for canteen under the evaluation that existing space still have capacity to accommodate more students

and drawing a distinct line, in terms of costs undertaken between the Indonesian side and Japanese side, is difficult although the request was presented.

2) Equipment

a) Activity and needed equipment in EEPIS

Through the discussion with Indonesian side during the field survey, it was agreed that the required equipment would be limited to experimental and educational equipment for the newly established D4 course. Based on this agreement, the consistency between the agreed request and the activities in 18 laboratories were examined to clarify the necessity of equipment.

The outline of activities and main equipment needed are referred to in Table 2-2.

Table 2-2 The outline of activities and main equipment needed

No.	Laboratory/Workshop	Activity/Contents	Needed Equipment
1	Electromechanical Workshop	Production training work related to all departments	CNC lathe and Drilling machine etc.
2	Electrical Circuit and Measurements	Teaching basic electric circuit and utilization of measuring instrument	Frequency counter, DC Potentiometer, Electronic Voltmeter and Q meter etc.
3	Factory Automation	Teaching control technology related to factory automation	Motor control training apparatus, Temperature controller training apparatus and factory instrumentation training apparatus etc.
4	Power System and Electric Machine	Teaching electrical power system (delivery and distribution) and machinery	Synchronous generator parallel operational panel, Taco meter and Transformer experimental apparatus, etc.
5	Electronic Fundamental	Teaching basic electronic circuit	Function generator, FFT analyzer and Volt meter etc.
6	Digital Electronics	Teaching digital circuit	Logic probe and Advanced logic circuit etc.
7	Computer and Interface	Teaching computer and input/out devices	Microprocessor training kit, PC and Universal programmer etc.
8	Automatic Control	Teaching automatic control technology	Process trainer, Mechatro laboratory, and Pneumatic trainer etc.
9	Intelligent Control and Robotics	Teaching artificial intelligence, robot and medical electronic engineering	Arm robot and Bio pack student labo stimulator etc.
10	Radio Wave Propagation	Teaching radio communication	Spectrum analyzer, Antenna and Mobile communication trainer etc.
11	Optical Communications and Electro-Physics	Teaching optical communication and electrical physics	Laser source and Optical communication trainer etc.
12	Digital Communications	Teaching digital communication	Telephone training system, PBAX etc.
13	Computer Programming I	Teaching computer programming (based on Windows)	PC and File Server etc.
14	Computer Programming II	Teaching computer programming (based on Linux)	PC and File Server etc.
15	Computer Programming III	Teaching computer programming (based on Mac OS)	PC and File Server etc.
16	Advanced Programming	Teaching upper class programming	PC and File Server etc.
17	Computer Aided Design and Simulation	Teaching simulation technology using CAD and computer	PC and File Server etc.
18	Computer Network	Teaching computer network technology	PC, File Server and sound proof chamber etc.

b) Examination of contents of request (the details and outline of detailed discussion)

The subject D4 course is to be newly established and the final curricula and syllabi plan have been formulated. Therefore, the examination and discussion on the curricula, experiment subjects and their themes were conducted through the interviews with the main lecturers in each department. Then, the final list of equipment was completed followed by the preparation of the list for comparison between experiment themes and necessary equipment.

The list prepared after survey and discussion are as follows:

i) A list for comparison between requested laboratories and teaching subjects
   - Name of laboratory
   - List of departments which requires laboratories concerned
   - Contents of experiments implemented in each laboratory (by regular lectures and final project (research))
   - Experiment time (hours) implemented in each laboratory
   - Name of departments corresponding to each laboratory

   The laboratories and workshops requested by 4 departments consist of 18 rooms as follows:

   - Electrical Engineering Department: 4 rooms
     The electrical workshop will be for common use among 4 departments and not for final project (research).
   - Electronic Engineering Department: 5 rooms
     Electronic engineering basic laboratory and digital circuit laboratory are used for the common basic themes among 4 departments and not for final project (research).
   - Telecommunication Engineering Department: 3 rooms
     All of the telecommunication-engineering workshop will be used for special subjects of the Telecommunication Engineering Department course.
   - Information Technology Department: 6 rooms
     Computer programming laboratories I, II and III are used for the common basic practice themes among 4 departments and not for final project (research).

   Thus, the requested laboratories and workshops consist of 6 common basic laboratories shared by departments, and 12 laboratories for distinct fields in each department. 3 rooms for each department were agreed to be allocated.

   The scale of the common basic laboratories and workshops are appropriate for this project, as the contents of experiment among each department are different

from each other and the experimental hours in each laboratory or workshop will reach its limits.

The specialized laboratories and workshops are related to lectures in each department. The needed equipment is different in each laboratory and workshop in order to conduct specialized experiments in each field. Each laboratory will be used by maximum of 15 undergraduate research students in each specialized laboratory on a yearly basis. Thus, the specialized laboratories and workshops mentioned are admitted on their necessity and relevance for the Project.

ii) The table of laboratories and workshops corresponding to each department
- Experiment subjects implemented in each laboratory and workshop
- Purpose of use in each laboratory and workshop

Using the above table, the use of each laboratory and workshop and the experimental subjects were classified. It was confirmed that all the experimental subjects corresponded to specific usage through careful consideration.

iii) The list of comparisons between requested laboratories and workshops and teaching subjects
- Experiment subjects in each laboratory and workshop
- Name of departments, school term and teaching hours in each experimental subject

Using the above table, the validity of experiment hours of each subject was evaluated. Some minor adjustments are made such as re-allocation to the more appropriate laboratories after the discussion with Indonesian side, since some inconsistencies are found between the contents of experiments and the purposes of usage for those laboratories and workshops.

iv) Tables of experiment subjects, themes and equipment needed
- Experiment subjects
- No. of students in a group to implement each experiment theme
- No. of groups to implement each experiment theme
- Equipment needed
- Outline of specifications
- No. of equipments needed in a group to implement each experiment theme
- Total number of equipment needed to implement each experiment theme

After careful examination of the relation among each experiment theme, contents of experiment and experimental method based on above table, the consistency between each theme and equipment was recognized.

It was confirmed that the needed equipment was proper for the Project.

v) Lists of requested equipment in each laboratory and workshop
   - Name of equipment
   - Total quantity of each equipment needed
   - Evaluation of necessity of the quantity for each equipment needed

   The list mentioned above reflects the maximum quantity for each equipment evaluated by the Table of experiment subjects, themes and equipment needed. Basically, the validity of contents for each equipment is admitted. However, some inconsistencies on their contents or quantities remain unsolved. Thus, final equipment plan will be adjusted along with the basic policy after the examination of both tables.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Contents of Project and Basic Policy

The Project is going to cover the construction of facilities and procurement of the equipment for supporting the establishment of the D4 course of Electricity, Electronics, Telecommunication Engineering and Information Technology Department.

1) Facilities Plan

The necessary and least number of facilities required are covered in the Project. Laboratories, classrooms, a library, and administration offices are main parts of the facility construction plan. Furthermore, in regard to the IT-infrastructure, the interconnection by fiber optic cables for the campus backbone construction is considered.

2) Equipment Plan

The planned equipment will be limited to laboratory equipment and educational support equipment for 4 departments in D4 course. After a dedicated and comprehensive study of the consistency among experiment themes and methods etc., the scale should be the necessary and least required contents.

(2) Notes to be considered for the Basic Design:

1) The facility and equipment plan should be considered based on the functions and activities required to EEPIS, and on the exchange of opinions with persons concerned with PTTC.

2) The rational plan will be made with the consideration of realizing the functional collaboration between existing and newly constructed facilities and the integrated administrative management system.

3) Keep in mind the idea to minimize expenses for management and maintenance, the total concept in the design of the facility and equipment is to allow for easy maintenance and to reduce utility costs.

4) The schedule that follow in practicing the Grant Aid Project should be collaborated with the schedule of PTTC.

5) The equipment needed to specify a brand will be examined with the possibility of corresponding to the PTTC side.

6) The result of cost estimation for the portions to be taken by Indonesian side such as site preparation, infrastructure preparation (water, power, telephone, etc) has been confirmed and

requested to the Indonesian Side for their budgetary preparation. And it will be confirmed that Indonesian Side prepare these necessary budgets and keep their implementation schedule to complete those portions by Indonesian side before the start of the project.

(3) Design Policy

The basic design of the facilities and equipment in this project is based on the following design policies with due consideration of the results from the field survey, the environmental and social conditions of Indonesia, the construction and procurement conditions, the maintenance and management capability of the Implementation Agency and construction schedule under Japan's Grant Aid assistance.

1) Having examined the functions and the activity plan required by EEPIS, the total plan for the contents and level of functions of new facilities and equipment will be designed to satisfy its purpose as the National Resource Polytechnic (NRP) facility, the national center for teacher training related to electrical Polytechnic.

2) The new facilities and equipment should be planned in smooth harmony and coordination with PTTC. On the stage of evaluating or selecting planned equipment, full coordination and collaboration with equipment supplied by PTTC will be promoted.

3) The Circulation flow line and external plan should meet the functional concept of the existing facilities based on the field survey and analysis result of the existing EEPIS facilities.

4) Having compared/examined relevant and similar facilities of Indonesia and by Japanese Grant Aid, the advantages that we could apply for the Project will be referred. On the other hand, the current problems are supposed to be improved as much as possible in the Project.

5) The local climate (a rain, a sunshine and a wind) and social customs (security, life style) should be taken into consideration.

6) The design for the facilities and equipment plan should allow low-cost and easy maintenance based on the technical level and maintenance/management system of the Indonesian side.

7) Rationalizing the construction and lowering the cost are promoted through the maximized-use of local construction methods and materials.

2-2-1-1 Facility Planning

(1) Basic Concept for Determination of Contents and Scale of Facilities

The selection of the contents and scale of the facilities is based on the study of the number of rooms and the scale of each room. The design concept and determination of the facilities' scale may have an important impact not only on the function for the facilities, but it will have an important effect on the construction and project cost of EEPIS. The determination of the facility scale is based on the following policies.

1) The contents of the facilities and their assumed scale is based on the contents of the Minutes of Discussions signed by the Indonesian side and the Basic Design Study Survey Team, therefore, a rational number and scale of facilities should be designed and established from the data of the basic study.

2) The appropriate floor areas of room per person for educational purposes various in size. Therefore, the size of major rooms is to be confirmed through discussions with the Indonesian side considering the layout plan of the required minimum space for equipment and usage of the rooms show on the drawings. The number of necessary rooms should be minimized by employing multiple usage as much as possible. An optimum facility design is to be formulated through studies of existing facilities in Indonesia and other similar facilities as a reference for the project.

3) The computation for scale of each room should be planned giving consideration to the basic unit of each room based on the education and the practice activity for D4 course of EEPIS. Space design for utilities and equipment is to be planned by taking into consideration the safety and functions of educational facility.

4) The flow line plan, zoning plan and facilities plan should be planned giving consideration to the internal circulation of students, teachers and staffs etc. and external flow lines of guest and equipment, etc. Especially, the flow line connection with existing EEPIS facilities should carefully be studied.

5) The scale of facilities should be calculated based on the educational plan (curriculum and number of students) confirmed during the Basic Design Study.

6) The facilities' scale, in terms of operation and maintenance, should be formulated rationally based on the number of staff and the organization of EEPIS prepared by Indonesian side.

(2) Study for the number of rooms

The scale and number of each room have been determined in accordance with a series of discussions and examinations with the Indonesian side.

The detailed study of each room is noted as follows:

1) Laboratory

EEPIS prepared the curricula table to be implemented by each department of Electrical Engineering, Electronic Engineering, Telecommunication Engineering and Information Technology in the D4 course and planned the teaching hours for each subject. In the curricula, total teaching hours spent in the laboratories are 338 hours per week in odd school terms and 389 hours per week in even school terms, respectively. Total teaching hours per week per room is calculated at 42 hours. Total calculated teaching hours of the 18 rooms in a week is 727 hours. In addition, some Final Project (8 school terms: 18 hours/week) and the preparation of it (7 school terms: 3 hours/week) are carried out in the laboratories. Accordingly, the occupation rate of laboratories and workshops average 47.5% in odd school terms and 68.1% in even school terms. The appropriate occupation rate of laboratories and workshop is generally 60% at the maximum. Thus, the occupation rate on this project will be proper.

Table 2-3 shows the corresponding teaching hours and occupation rate of each department and laboratory or workshop. 20% of lecturing hours in the Information Technology Department at 18 hours will have to be implemented in the laboratories and workshops.

Table 2-3 Teaching Hours and Occupation Rate in Laboratories and Workshops

No	Department	Laboratory/Workshop	Teaching Hours			
			Odd School Term		Even School Term	
			Teaching Hours/Week	Occupation Rate	Teaching Hours/Week	Occupation Rate
1	Electric Engineering	Electromechanical Workshop	29	69.0%	27	64.3%
2		Electric Circuit and Measurements	22	52.4%	27	64.3%
3		Factory Automation	25	59.5%	21	50.0%
4		Power System and Electric Machine	13	31.0%	32	76.2%
5	Electronic Engineering	Electronic Fundamental	16	38.1%	33	78.6%
6		Digital Electronics	13	31.0%	24	57.1%
7		Computer and Interface	22	52.4%	39	92.9%
8		Automatic Control	13	31.0%	33	78.6%
9		Intelligent Control and Robotics	19	45.2%	18	42.9%
10	Telecommuni-cation Engineering	Radio Wave Propagation	11	26.2%	24	57.1%
11		Optical Communications and Electro Physics	17	40.5%	27	64.3%
12		Digital Communications	23	54.8%	21	50.0%
13	Information Technology	Computer Programming I	27	64.3%	36	85.7%
14		Computer Programming II	27	64.3%	36	85.7%
15		Computer Programming III	16	38.1%	32	76.2%
16		Advanced Programming	18	42.9%	26	61.9%
17		Computer Aided Design and Simulation	25	59.5%	30	71.4%
18		Computer Network	23	54.8%	29	69.0%
Total			359	47.5%	515	68.1%

Study of number of general classroom

All the lectures in the Department of Electrical Engineering, Electronic Engineering and Telecommunication Engineering will be given in the general classrooms but some lectures in the Department of Information Technology will be given in the laboratories and workshops. Table 2-4 shows the lecturing hours of each department in the general classrooms. When the occupation rate of 75% is applied on the estimation of number of classrooms, 14 general classrooms will be planned for the plan.

Table 2-4 Teaching Hours in General Classrooms

Department	Item	Semester Teaching Hours		
	School Term	Odd Terms	Even Terms	Total
Electrical Engineering		110	91	201
Electronic Engineering		104	86	190
Telecommunication Engineering		108	96	204
Information Technology		93	90	183
Sub Total		415	363	778

Table 2-5 Calculation of Needed General Classrooms

Lecturing Hours	Odd Semester School Terms	:	415	Hours	①
	Even Semester School Terms	:	363	Hours	②
Lecturing Hours in General Classroom		:	42	Hours/Week	③
Occupation Rate Applied		:	75	%	④
Occupation Rate in General Classroom					
	Odd Semester School Terms (①÷③)÷④ =		13.17 ⇒	14	
	Even Semester School Terms (②÷③)÷④ =		11.52 ⇒	12	
Required General Classrooms				**14**	

(3) Computation of Room Size

The floor area have been calculated from the required room numbers of the new facility by item "(2) Study of the Number of Rooms". The facility size will be formulated based on the existing EEPIS facilities, similar existing educational facilities of Indonesia, and the standards of the Ministry of National Education (MONE) of Indonesia, and other similar projects undertaken with Japan's Grant Aid Assistance.

While the Basic Design Study Team carried out their survey, EEPIS proposed the number, size and function for each room. Based on the proposal, each room area has been calculated with consideration of planned activities such as the style of lectures and number of students.

1) Laboratory

The laboratory, with 18 rooms in all, is classified into five types (1-A, 1-B, 2-A, 2-B, 2-A') from the combination of the Practice Room, and the dependent rooms which consists of: (a. Head of Laboratory Room, b. Lecturer's Room, c. Final Project Room, d. storage, e. Server Room), basically. Each room type has been explained as follows:

a) Type 1-A

1. Electronic Fundamental
2. Digital Electronics
3. Computer Programming I
4. Computer Programming II
5. Computer Programming III

The Laboratory consists of the Practice Room (103.68m^2) and the Head of Laboratory Room (25.92m^2) and its total area is 129.6m^2.

The standard number of students accommodated in the Practice Room is 30 (students). The room for teachers in the Practice room has been planned to encourage the communication between the teachers and students, and for the maintenance and security of the experimental equipment in the Practice Room.

The floor area of the existing laboratory (for 30 students) is 172.8m^2, however, the floor area in actual practice is essentially about 103 - 115m^2. The existing laboratories are divided by partitions or cabinets in the laboratory, and they are used to divide space such as the Lecturer Room and the Final Project Room. The Practice Room has been planned as 7.2m x 14.4m = 103.68m^2 where 3.4m^2/person is planned in consideration of the arrangement and the layout plan of the experimental equipment and through discussions with teachers.
The unit area, 3.5m^2/person, of the Practice Room is approximately equal to a laboratory in the Science and Mathematics Teaching for Primary and Secondary Education facility under Japanese Grant Aid assistance project.

A counter table for practice matters has been arranged on the window side, and a steel cabinet for storing experimental instruments will be located on the corridor side in the Electronics Fundamental Laboratory and the Digital Circuit Laboratory. The floor area of the Head of Laboratory Room has been planned as 25.92m^2 (for 3 teachers), 8.64m^2/person, in consideration of the arrangement of the existing facilities, the layout of equipment and tools and discussion with teachers in charge. The standard office floor area for teachers is based on 18 - 21m^2/person for a senior class, 9 - 11m^2/person for assistant senior class, and 6 - 7m^2/person for junior class in MONE. The plan is about average for the assistant senior class.

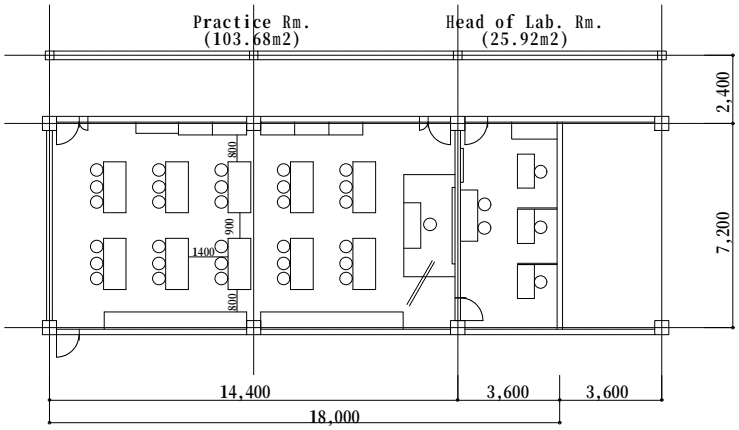


Fig. 2-1 Laboratory (Type 1-A type)

b) Type 1-B

1. Electromechanical Workshop

Electromechanical Workshop consists of the Mechanical Workshop (77.76m^2), the Electrical Workshop (77.76m^2), the Head of Laboratory Room (25.92m^2) and the warehouse (25.92m^2), 207.36m^2 in all. Although the floor area of the existing workshop is 172.8m^2, the floor area for the project is planned as 155.52m^2, should be rational by dividing the Mechanical Workshop and the Electrical Workshop in

consideration of the present condition. The layout plan of machinery and tools have been planned by discussions with teachers in charge.

The floor area of the Head of Laboratory Room is planned the same as a) type 1-A. The custody for tools, parts and any products are considered in the storage. The floor area for the storage is 25.92m^2 in consideration of existing conditions and discussion with teachers in charge.

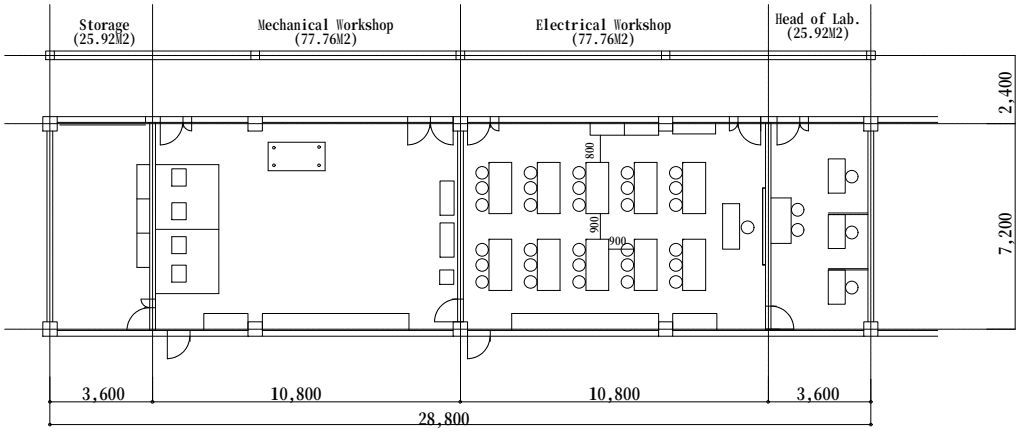


Fig. 2-2 Laboratory (1-B type)

c) Type 2-A

1.	Electric Circuits and Measurements
2.	Computer and Interface
3.	Radio Wave Propagation
4.	Optical Communications and Electro-Physics
5.	Digital Communications
6.	Advance Programming
7.	Computer Aided Design and Simulation

The type 2-A consists of the Practice Room (103.68m^2), the Head of Laboratory Room & Lecturer's Room (51.84 m^2) and the Final Project Room (51.84m^2), and has been planned as 207.36m^2 in total. The floor area of the Practice Room has been planned the same a) Type 1-A. The Head of Laboratory Room & Lecturer's Room has been planned as 51.84m^2 (7.4m^2/person) including the room for 7 teachers, in consideration of the existing facilities, the layout plan of machinery and equipment, and discussion with teachers in charge. The Final Project Room is planned as a place where 15 students of D4 perform their graduation research for one year. The floor area of the Final Project Room has been planned as 51.84m^2, 3.4m^2/person, in consideration of the layout plan of experimental equipment and discussions with teachers. This is the same as the unit area of the Practice Room in the project.

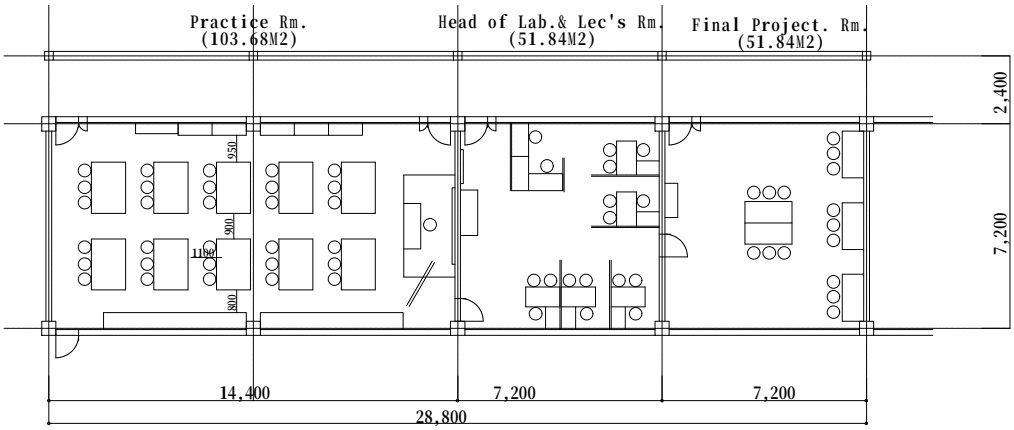


Fig. 2-3 Laboratory (Type 2-A)

d) Type 2-B

1.	Factory Automation
2.	Power System and Electric Machine
3.	Automatic Control
4.	Intelligent Control and Robotics

Type 2-B consists of the Practice Room (155.52m^2), the Head of Laboratory Room & Lecturer's Room (51,84m^2) and the Final Project Room (51.84m^2), and is planned as 259.20m^2 in total. The Practice Room has been planned as 155.52 m^2 including the space (51.84m^2) for equipment and computer in consideration of the layout plan of equipment and discussion with teachers in charge.

The Head of Laboratory Room & Lecturer's Room has been planned as 51.84 m^2 for 6 teachers - 8.64m^2/person. This is the same unit area as a) Type 1-A. The floor area of the Final Project Room has been planned under the same condition as c) Type 2-A.

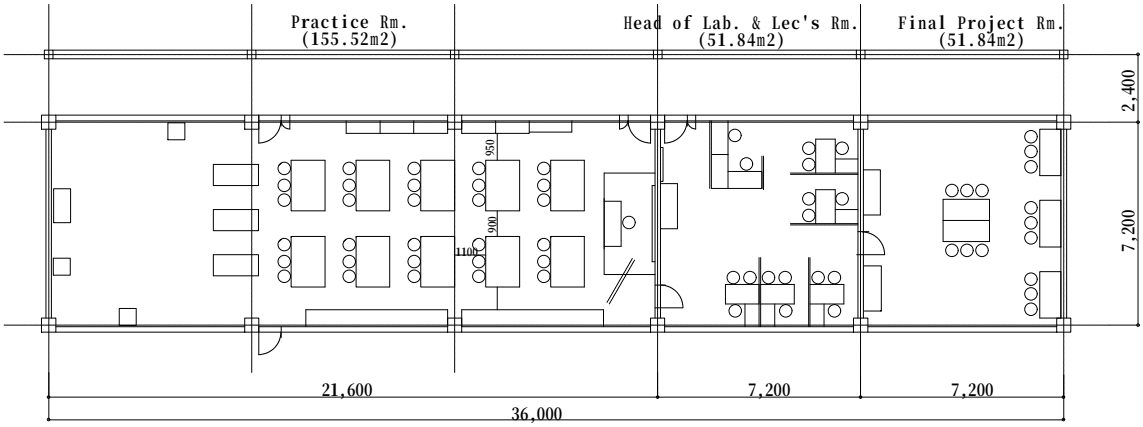


Fig. 2-4 Laboratory (Type 2-B)

e) Type 2-A’

1. Computer Network

Type 2-A’ consists of the Practice Room (86.4m^2), the Head of Laboratory Room (43.2m^2), the Server Room (25.92m^2) and the Final Project Room (51.8m^2), and is planned as 207.36m^2 in all. The Practice Room has been planned as 86.4 m^2 (2.88m^2/person), although the plan condition is the same as the Practice Room (103.68m^2) of a) Type 1-A, consideration has been given to have practice with only computer and the layout was planned under discussion with teachers in charge.

The Sound Proof Chamber room (9.0m^2) and the room for 4 teachers (8.55m^2/person) have been planned in the Head of Laboratory Room. The Final Project Room has been the same plan as c) Type 2-A.

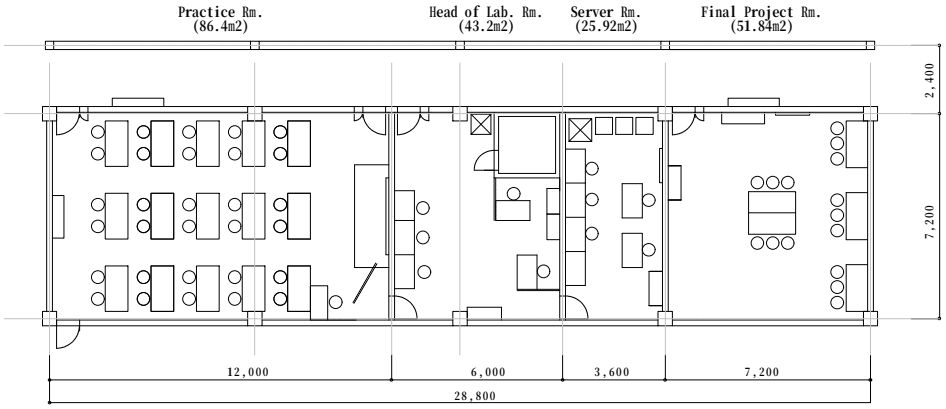


Fig. 2-5 Laboratory (Type 2-A’)

Table 2-6 Laboratory Outline

Unit: (m^2)

	Type	Practice Room	Head of Lab.	Head of Lab & Lecture's Room	Final Project Room	Storage	Server Room	Total
Electric Engineering Department								
1.1 Electromechanical Workshop	1-B	155.52	25.92	-	-	25.92	-	207.36
1.2 Electric Circuit and Measurements	2-A	103.68	-	-	51.84	-	-	207.36
1.3 Factory Automation	2-B	155.52	-	51.84	51.84	-	-	259.2
1.4 Power System and Electric Machine	2-B	155.52	-	51.84	51.84	-	-	259.2
Electronics Engineering Department								
1.5 Electronic Fundamental	1-A	103.68	-	25.92	-	-	-	129.6
1.6 Digital Electronics	1-A	103.68	-	25.92	-	-	-	129.6
1.7 Computer and Interface	2-A	103.68	-	51.84	51.84	-	-	207.36
1.8 Automatic Control	2-B	155.52	-	51.84	51.84	-	-	259.2
1.9 Intelligent Control & Robotics	2-B	155.52	-	51.84	51.84	-	-	259.2
Telecommunication Engineering Department								
1.10 Radio Wave Propagation	2-A	103.68	-	51.84	51.84	-	-	207.36
1.11 Optical Communications and Electro-Physics	2-A	103.68	-	51.84	51.84	-	-	207.36
1.12 Digital Communications	2-A	103.68	-	51.84	51.84	-	-	207.36
Information Technology Department								
1.13 Computer Programming I	1-A	103.68	25.92	-	-	-	-	129.6
1.14 Computer Programming II	1-A	103.68	25.92	-	-	-	-	129.6
1.15 Computer Programming III	1-A	103.68	25.92	-	-	-	-	129.6
1.16 Advance Programming	2-A	103.68	-	51.84	51.84	-	-	207.36
1.17 Computer Aided Design and Simulation	2-A	103.68	-	51.84	51.84	-	-	207.36
1.18 Computer Network	2-A'	86.4	43.2	-	51.84	-	25.92	207.36

2) Classroom

The standard number of students in a classroom is regarded us 30 (students). It has been planned as 64.8m^2 (10 rooms) and 77.76m^2 (4 rooms) in consideration of the existing classrooms, the layout plan of furniture and discussion with teacher.

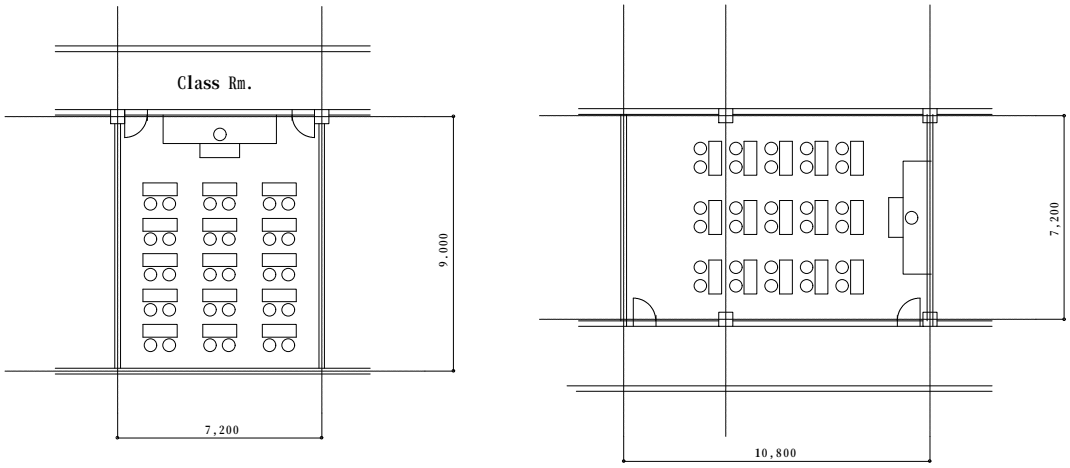


Fig. 2-6 Class Room

3) Library

The Library is planned on the assumption indicated below.

a) Numbers of personnel: 1197 students, the numbers of teachers: 117 teachers with total floor area: 311.04m^2
b) Operational time of the Library: 7:30～20:30 (13 hours)
c) Numbers of book stock: 10,000 books
d) Number of seats: 60 seats

EEPIS has the e-Library plan, however, that is not covered in the project with reason explained on page of 2-3.
The proposed plan for e-library by EEPIS was as follows.

a) To construct a digital net work library possible to peruse digitized teaching materials and treatise of the teachers and for graduation thesis made up by students for final projects on the network

b) To install the application of GDL (Ganesha Digital Library) developed by ITB for digital library (e-library) on linking to IDLN (Indonesian Digital Library Networks) established by ITB to the Knowledge Sharing with the outside educational facilities.

In addition to the above, the EEPIS-ISLN server of the Web base would be introduced all together.

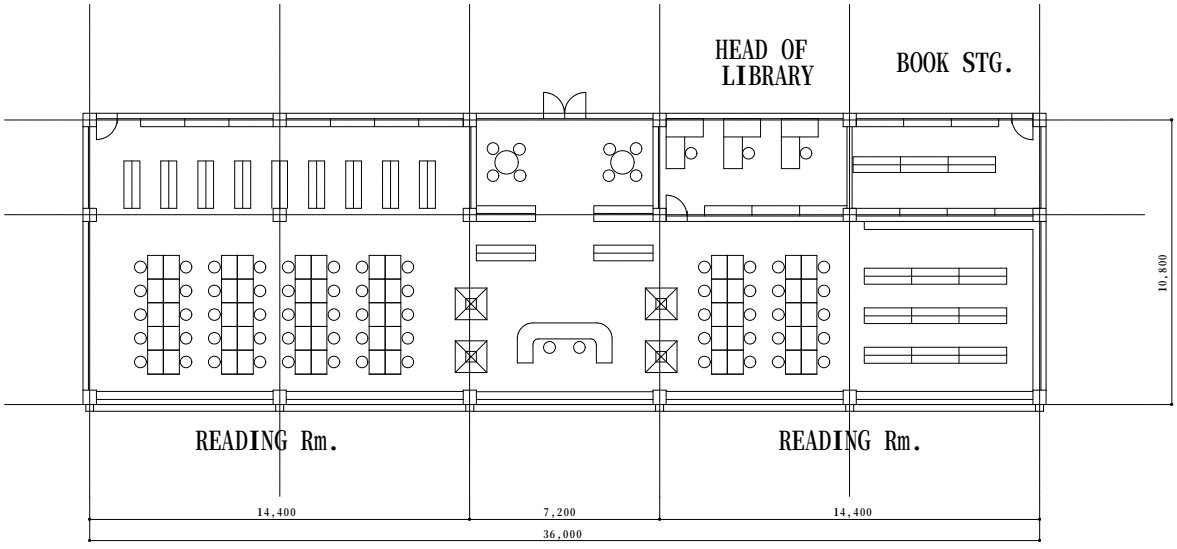


Fig. 2-7 Library Room

4) Administration Office

Having based the plan (idea) that the integrated management system for both D3 and D4 facilities are carried out, the requested floor area of Administration Office by EEPIS was 1297.4m^2 (including new and existing facility, in all) for 1197 students, 211 teachers and 110 administration staffs. The new building has provided 414.72m^2 under the condition of no redundancy of rooms in the existing and new building and the necessity of minimum functional space.

a) Director Room

The floor area of existing Directors' Room is 32.4m^2 including the meeting space for 6 persons. As a result of present conditions and discussion with the Director, it has been planned as 32.4m^2, approximately the same as the existing room.

b) Vice Director Rooms I and II

There are 4 vice directors in EEPIS. Vice Director I and II will move into the new building. The floor area of the Vice Director's I and II have been planned as 32.4m^2 (16.2m^2/person) same as the floor area of the senior class in the standard office floor area for MONE.

c) Head of Department and Adm. Room

There are heads of department for Electrical, Electronic, Telecommunication and Information Technology engineering department in EEPIS. The Head of Department holds the dual post of D3 and D4, although the D3 and D4 are under separate organizations. All Heads of Department will move to the new facility. The Head of Department and Adm. Room has been planned as 77.76m^2 (9.27m^2/person) including secretaries of each Head of Department. This is an expansion of the standard size for teacher's (lecturer's), office issued by the Ministry of National Education, 9~11m^2/person.

d) General Administration Room

25 staffs, including 9 staffs for General Administration, 9 staffs for Academic Affair, and 7 staffs for Financial Administration, will be accommodated in the General Administration Room in the new building. In the original request from EEPIS, each administration room is classified as independent, however, after the examination along with the 'Design Policy' (the necessary and the least contents and space), the General Administration Room has been finalized as 129.6m^2 (5.2m^2/person) since the rational use of space is feasible.

e) Meeting Room

Two meeting rooms have been planned. One meeting room for 30 persons including Director, the vice Director, all Department Heads and also for the D4 Laboratory Chief who can hold meetings, and the other for the individual meetings.

f) Storage

As a result of the discussion with administrative staff, two storages, each 25.92 m^2, are planned for storage of administrative documents.

g) Guard House

The guard house for security personnel is planned at the main gate for security, which is a similar system as used at the existing facility.

5) Others

a) Electrical Room

Electrical room is equipped with a transformer and a main switch-gear that will distribute low voltage power to all D4 facilities.

b) Generator Room

Generator room is equipped with a stand-by generator that can maintain power supply for minimum activity of the D4 facilities during power outage.

c) Pump Room

Pump room is equipped with indoor and outdoor hydrant pump unit and potable water supply pumps.

(4) Necessary Rooms and Floor Areas

As a result of the field survey and information gathered during the discussion with the EEPIS, minimum area requirements for necessary rooms have been established. The area of necessary rooms based on the above mentioned examination is shown on Table 2-7.

Table 2-7 Required Rooms and Their Floor Areas

No.	Room Name	*Unit Area (m2)	Unit No.	Total Area (m2)	Remarks
1.	**Laboratories**				
	Electrical Engineering Department				
1.1	Electromechanical Workshop	77.76	2	207.36	1-B
1.2	Electric Circuits and Measurements	103.68	1	207.36	2-A
1.3	Factory Automation	155.52	1	259.20	2-B
1.4	Power System and Electric Machine	155.52	1	259.20	2-B
	Electronics Engineering Department				
1.5	Electronic Fundamental	103.68	1	129.60	1-A
1.6	Digital Electronics	103.68	1	129.60	1-A
1.7	Computer and Interface	103.68	1	207.36	2-A
1.8	Automatic Control	155.52	1	259.20	2-B
1.9	Intelligent Control and Robotics	155.52	1	259.20	2-B
	Telecommunication Engineering Department				
1.10	Radio Wave Propagation	103.68	1	207.36	2-A
1.11	Optical Communications and Electro-Physics	103.68	1	207.36	2-A
1.12	Digital Communications	103.68	1	207.36	2-A
	Information Technology Department				
1.13	Computer Programming Ⅰ	103.68	1	129.60	1-A
1.14	Computer Programming Ⅱ	103.68	1	129.60	1-A
1.15	Computer Programming Ⅲ	103.68	1	129.60	1-A
1.16	Advance Programming	103.68	1	207.36	2-A
1.17	Computer Aided Design and Simulation	103.68	1	207.36	2-A
1.18	Computer Network	86.40	1	207.36	2-A'
	Sub - Total			3,551.04	
2.	**Classrooms**				
2.1	Classroom 1 for 30 persons	64.80	10	648.00	
2.2	Classroom 2 for 30 persons	77.76	4	311.04	
	Sub - Total			959.04	
3.	**Library**			388.80	
3.1	Reading Room	259.20	1		
3.2	Head of Library Room	25.92	1		
3.3	Book Storage Room	25.92	1		
3.4	Lobby	77.76	1		
	Sub-Total			388.80	
4.	**Administration Office**				
4.1	Director Room	32.40	1	32.40	
4.2	Vice Director Ⅰand Ⅱ (2p×1)Room	32.40	1	32.40	
4.3	General Administration Room	129.60	1	129.60	
4.4	Head of Department and Adm. Room	77.76	1	77.76	
4.5	Meeting Room 1	64.80	1	64.80	
4.6	Meeting Room 2	77.76	1	77.76	
	Sub-Total			414.72	
5.	**Common**				
5.1	Generator Room	51.84	1	51.84	
5.2	Electric Room	51.84	1	51.84	
5.3	Pump Room	51.84	1	51.84	
5.4	Toilet	51.84	7	362.88	
5.5	Storage	25.92	2	51.84	
5.6	Guard House	12.00	1	12.00	
5.7	Corridor			3,629.04	
	Sub-Total			4,211.28	
	Ground Total			9,524.88	

* Unit Area shows the Floor Area of Practice Room.

2-2-1-2 Equipment Plan

(1) Policy for equipment planning

Equipment planning will be conducted carefully covering all the equipment in the requested equipment list based on the following basic policy.
All 18 laboratories and workshops requested will be considered on equipment planning. As shown in "Study of Request", the appropriateness to cover these lab & workshops are provided. Therefore, 18 laboratories and workshops requests are studied.

1) The contents of equipment will be limited to minimum size and items necessary for the experiment themes implemented in each laboratory or workshop.
2) The contents of equipment and quantities is supposed to be consistent with the experimental methods.
3) The duplicated items in a laboratory or workshop will be deleted.
4) The contents of equipment will be limited to experimental items that will be used directly by students.

(2) Scale

The scale of equipment will be estimated based on the following policy.

1) The number of equipment will be based on the number of groups. The groups of 2, 5, 6 and 10 for the laboratory work are verified as to its consistency in correlation with its particular course of study.

2) Experimental themes in a teaching hour will be experimented through group rotation. It will be reasonable that all students in a class will implement the same experiment at one time. In that case, the quantity of equipment should be synchronized with the number of groups or the number of the students. Thus, the quantity of equipment to be planned will be huge. Moreover, several large-sized equipment may be required in some experimental themes. It is noted that the limited space will not allow to install such quantity or several large-sized equipment in a room. For the effective utilization of equipment in a limited space, rotational experiment periods will be recommendable.

3) Basically, equipment for graduate thesis will not be considered. Therefore, the number of equipments will be planned with the fewest that are necessary.

4) In general, the quantity of equipment at a laboratory will be planned with the fewest that are necessary.

2-2-2 Basic Design

2-2-2-1 Site Layout Plan

The site layout plan for this project was planned based on the following points giving full consideration to site conditions (the natural condition, the site condition, the condition of site the peripheral), in order to improve the previously mentioned problems. The zoning and flow line plan of the facilities are also explained in the following Basic Policy:

(1) Basic Policy

1) The site layout plan of D4 facilities shall be considered to ensure its functions as independent institute of Polytechnic. And a rational plan in terms of flow lines and functions shall be established considering incorporation with the zoning and building layout at the existing campus of D3.
2) It is necessary to examine integration of the external space for the new facility and the existing facility of EEPIS. Layout of the facilities should be determined not to interfere with their functions, but should be integrated in the architectural, structural and utility design.
3) It is important to consider spaces between buildings and their orientation in order to incorporate good ventilation and natural lighting without using mechanical devices throughout the year with consideration of the climate of Indonesia.
4) Safety, accessibility to the facilities from the main gate and security check points should be considered in order to provide an effective security system in the site of new facilities.
5) Louvers should be considered to provide protection from rainfall and strong sunlight.
6) A good environment suitable to facilitate high educational atmosphere would be achieved with effective use of the open space (the court yard). The flow lines between new buildings and the existing buildings shall be carefully considered based on the each functional relationship. The harmony with the surrounding landscape shall also be considered.

2-2-2-2 Architectural Designs

(1) Floor Plan

In terms of floor planning, the calculated areas and the layout plan as mentioned above, were used and each facility was planned on the basis of the following criteria:

1) The floor plan should be coordinated considering the relationship between each facility. Contents and function of each facility shall be considered in the floor plan so that the facility can be integrated effectively.
2) Considering the zoning and flow lines of the existing buildings of EEPIS, the layout plan for the new buildings and the collaboration between the new buildings and the existing buildings should be established.

3) It is important to integrate required rooms and equipment effectively so as to create flexibility in planning. Structure Grid layout should be standard module, in particular, for laboratory and classroom units. Building should be planned with most economical and common module used in Indonesia considering layout plans of computers, equipment, furniture, etc. for economical construction. The basic structural frame spans shall be examined and considered as the same spans used at existing EEPIS facilities which is 7.2 meters..
4) Considering local climatic conditions at the construction site, connection method of each building should be planned in order to provide protection from rainfall and strong sunlight.
5) In principle, natural ventilation and lighting should be applied as much as possible, and mechanical ventilation and artificial lighting is to be minimized to reduce maintenance costs. In this case, consideration should be given to keep good interior environment by effective air-conditioning and appropriate natural ventilation.
6) The size and layout of equipment and furniture in each room should be considered in the design.

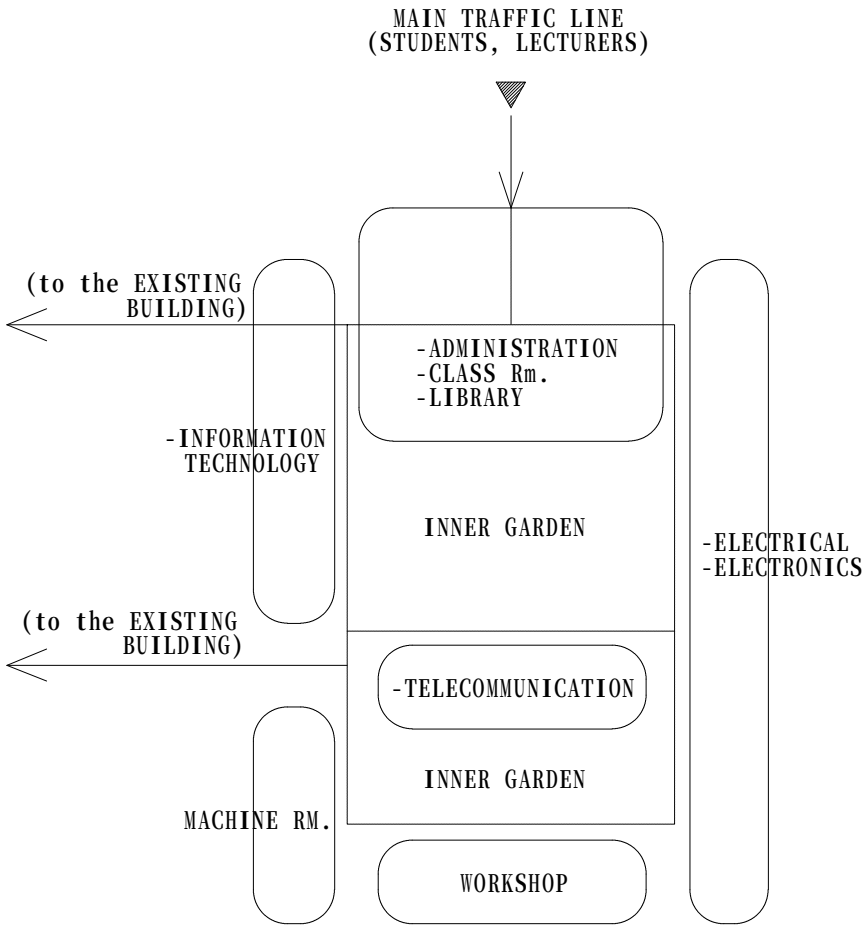


Fig. 2-8 Zoning Plan

(2) Elevation and Cross-Section Plan

For planning of elevation and cross-section of the building, local building styles, local construction methods and the existing building styles should be considered for references on the basis of the following policies:

1) The analysis of the site ground level and floor height of the existing buildings shall be taken into consideration in order to determine the floor level and cross section. In particular, relationship between the ground level and the floor level of the existing buildings should be given careful consideration.
2) The level of the ground floor will be raised above the existing 1st floor level in order to prevent water infiltration caused by flood conditions.
3) The roof should be sloped in order to provide protection from sun radiation and from direct sunlight and to have positive protection from rain water.
4) Deep eaves, louvers and balconies can help to protect the rooms from direct sunlight and rainfall.
5) Louvers and hollow bricks, which can control natural light penetration and air flow shall be installed in order to enhance the space environment as well as to provide protection from strong sun rays and rainfall.
6) Wall surfaces should have openings, as large as possible, to facilitate room ventilation and provide a balanced natural lighting, and also to reduce the running cost of electrical lighting and equipment.

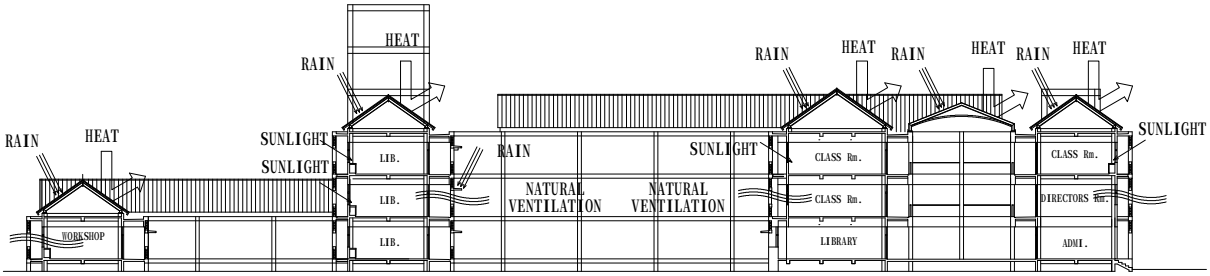


Fig. 2-9 Cross-Section Plan

(3) Cost Reducing Measures

Various cost reduction factors have to be considered in the course of design works for the new facilities The following cost performance and the maintenance costs must be taken into account for building design:

1) The overall size of the facility is rationalized so as to enhance the utilization rate of the rooms and to promote the effective use of rooms, utilities and equipment.
2) The standardization of space is necessary to give flexibility in the design of the buildings. The basic module should be determined by considering how it will be combined to form the overall buildings. Through extensive investigations, the economical span and standard module of Indonesia has been successfully determined for incorporation into the Basic Design.

3) In principal, natural ventilation and lighting is to be applied as much as possible and mechanical ventilation and artificial lighting is to be minimized to reduce maintenance costs. However, some of the rooms in the building will need mechanical systems. In this case, independent systems will be used in place of a central system.
4) Local construction materials should be effectively used so as to reduce the costs for construction and maintenance. Also, in the long-term view of the project, together with the consideration of the maintenance costs of the facilities, the finishing materials will be selected considering the building life-span and maintenance characteristics of the materials.
5) The positive consideration shall be given to the installation of high energy-efficient equipment and insulation material in order to reduce operational costs.
6) As mentioned above, cost reduction measures shall be considered in the course of the design work. The reduction of the initial cost shall be considered carefully so as not to cause any cost increase in operations and maintenance and deterioration in quality.

2-2-2-3 Structural Plan

(1) Basic Policy

The structural plan for the project should be formulated after a full review of the existing site conditions and with consideration of the result of the soil investigation.

The structure shall be designed to prevent serious defects such as deflection and settlement, etc. In addition, the building shall have sufficient safety and durability against earthquakes, strong winds, etc. Consideration should also be given to local construction and maintenance conditions

(2) Standard for Structural Design.

Structural design shall basically conform to the relevant codes, regulations and standards of Indonesia. However, other relevant codes and or AIJ (Architectural Institute of Japan) are to be referred to secure safety and rationality in structure design and for cost reduction.

(3) Method and Material.

The superstructure is to be made of reinforced concrete and the walls are to be made of brick which are economical and widely used materials in Indonesia. A steel structural frame is to be provided in some portions of the building, such as roof trusses, to achieve the required strength and be cost effective. Reinforcing steel bars, concrete and structural steel are locally available, however, appropriate quality control management is required while in the factory and the site in order to insure quality control.

Concrete : Design strength Fc=24N/mm^2 (28-days compressive strength of cylinder test piece).

(4) Soil Condition and Foundation.

The results of the soil investigations indicate that the layers from ground level to a depth of 6.0 meters are surface soil (N value 0) and the layers from 6.0m to the neighborhood of 30.0 meters are distributed in silt clay (N value is 3 - 24) . Although soil investigation have been done to GL-45.0m, good bearing subsoil could not be confirmed. In order to design a three story building, the use of pile foundations is recommended. The foundation of this building should be friction pile of prestressed concrete, size L=27.0m ϕ350 - ϕ600, the N value will be 30.

(5) Design Load.

1) Wind load : The wind load is calculated in accordance with the Architectural Standards of Indonesia. Heavy winds which cause significant impact on the building are not recorded around the project site.

2) Seismic Force : Seismic force shall be based on the 'REGULAION OF INDONESIAN LOAD1970(N. I-18). Zone coefficient in Surabaya is Ⅳ and base shear coefficient is 0.05.

3) Dead load : Dead load includes the weight of the structure itself and any permanent fixtures, partition, finishes, etc. thereon.

4) Live load : Live loads shall be referred to the standards of Indonesia. Load conditions are to be determined considering the equipment layout and use. Location should be considered for rooms such as Workshop, Mechanical Room and Electrical Room where live loads are relatively higher, should be at first floor level for a more economical slab design.

2-2-2-4 Utility and Building Facility Plan

(1) Plumbing Work

1) Water Supply System

a) Source of potable water

Within the existing EEPIS compound, Potable water is fed from city water main running under the north road surrounding the EEPIS. Perusahaan Daerah Mium, (PDAM) is responsible for the operation and management of potable water supply within Surabaya city. The feeding potable water supply is distributed to the existing water reserve tanks in EEPIS and in its student dormitory.

Size of City water main	150mm ϕ
Size of supply water pipe	100mm ϕ

According to the latest data of water consumption of the existing EEPIS facilities in the past year, the average monthly water consumption is around 1,900 m^3/month. At present, the occupants of the existing EEPIS facilities are 750 people including students and staff.

Therefore, the water consumption of the new D4 facilities is estimated to be about 2,000 m^3/month since the targeted population of the new D4 facilities is about 700 people, this is almost the same as for the D3.

It is planned to split the existing potable water supply pipe of 100mm-diameter, and extending it to the new D4 facilities since it has enough capacity to supply water to both the D3 and the new D4 facilities.

A water receiver tank which is an elevated tank and with lift pumps, will be provided to serve constant water supply to the new D4 facilities.

b) Estimated water demand per day

Occupants	Staff:	130 persons
	Students	540 persons
	Total	670 persons

According to the data of the existing EEPIS facilities, unit water consumption rate is as follows,

Students, Staff; 90 liter/capita/day

Water demand is calculated based on the population and the above unit water consumption rate as follows:

Day Water Demand 670persons x 90liter/capita/day = 61,300 liters/day
= 62m^3/day

c) Capacity of water storage tanks

In order to assure the quality of supply water and low maintenance, the water receiver tank and elevated tank will be made of F.R.P. (Fiber Reinforced Plastic) and will have inner compartments. The water supply pressure of city water main is not reliable in that the capacity of the water receiver tank may not have water equivalent to accommodate one day's water consumption. The elevated tank will contain the average water consumption per hour.

Water receiver tank:	Capacity	62m^3/day x 1.0 = 62m^3
	Dimensions	4m x 6m x 3mHeight
Elevated water tank:	Capacity	62m^3/day x 1/8 = 7.75 $\rightarrow$ 8m^3
	Dimensions	2m x 3m x 2mhigh

2) Sewerage System

The wastewater generated from the existing EEPIS facilities has been treated by four septic tanks located within the EEPIS compound and is soaked into underground soil through perforated pipeline laid underground. However, since the site is located in wetland and the ground water level is relatively high, rainwater frequently have run into the septic tanks in the past years. In this regard, the maintenance staff discharged both rainwater and wastewater in the septic tanks into the adjacent open ditch by using a portable submersible pump.

It is planned to equip the new D4 facilities with a sewerage water treatment plant (STP) to avoid the influence of the high ground water level and rainwater. The wastewater generated from the new D4 facilities will be treated by the STP and then be discharged to the existing open channel running along the site boundary.

The project is not obliged to comply with the Environmental Impact Assessment (EIA) of the Indonesia because the classification and scale of the project does not apply to the requirements. However, the design quality of effluent water from the STP is set to be less than BOD 50ppm based on the guideline of the EIA so as to prevent the adjacent environment from population possibly caused by the discharge of wastewater into the outside.

The design flow-rate for the STP is calculated based on the return rate of 100%for consumed potable water.

Capacity of the STP	Quality of treated water; Less than BOD50ppm
	Design flow rate; $62m^3$/day

Rainwater from the facilities and pavement of the site is drained to the existing open channel separately from wastewater.

Through the discussion with the Indonesian side, it was confirmed that Indonesian side should prepare the manholes to finally connect to the existing open channel.

3) Plumbing Fixtures

Most of the water closets equipped in the existing EEPIS facilities were Asian type. Meanwhile, we found that most water closets became western type, according to the site survey on the buildings currently constructed. Both western type and Asian type water closets will be provided. Urinals with water tap will be wall hung type.

4) Fire Fighting Facility

Fire fighting facility should be equipped in accordance with the Fire Code of Indonesia, 「Dinas Pemadam Kebakaran」. The new D4 facilities will be fully provided with outdoor fire hydrant system, indoor hydrant system and fire extinguishers.

(2) Air conditioning and Ventilation Work

1) Air conditioning System

Surabaya is located near the equator at south latitude of 13 degrees on an altitude of approximately 3meters above sea level. The climate is extensively hot and humid throughout the year.

According to the air conditioning design standard of ASHRAE (American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc.), the outdoor design condition is as follows,

Outdoor: Dry Bulb 33ºC, Wet Bulb 27ºC Daily Range 10 degrees
(ASHRAE Fundamentals 1997: at Surabaya)

In light of using the existing D3 facilities and the above mentioned outdoor conditions, air conditioning system (A/C system) should be in every laboratory of Electrical, Electronics, Telecommunication engineering and Information technology departments that will be provided with large number of equipment sensitive to heat, humidity and dust. Server room, lecturer's rooms and administration offices will be also installed with A/C system to maintain appropriate indoor condition.
Split type air conditioners will be used as individual type air conditioning system for every air conditioned area..

The electrical mechanical workshop will be equipped with mechanical ventilation system in spite of A/C system.

On the other hand, class rooms and final project rooms will be provided with natural ventilation.

2) Ventilation System

It is planned to provide lavatory, pantry, electrical rooms and mechanical rooms with mechanical ventilation system so as to discharge odor, heat and humidity into outside.

According to the Japanese standard of the Ministry of construction and the ASHRAE standard, the standard of mechanical ventilation is shown in the following table.

Design standard of mechanical ventilation

Room	Method of Ventilation	Unit Air Flow Rate	Remarks
Lavatory	Exhaust only	10 Round/min.	To eliminate odor
Storage	Exhaust only	5 Round/min.	
Pantry	Exhaust only	10 Round/min.	To eliminate combustion gas
Pump room,	Exhaust only	5 Round/min.	
Electrical room	Supply and Exhaust	10 Round/min.	To eliminate heat
Generator room	Supply and Exhaust	25 ~30 Round/min.	To intake fresh air and eliminate heat

(3) Electrical Works

1) Power Supply System

In the existing EEPIS facilities, medium voltage power supply (3ϕ 3W,20KV) of PLN is led-in through aerial wiring to the existing electrical room. The medium voltage power is stepped down to low voltage power (3ϕ 4W, 380/220V) by the existing transformer (500KVA) and then is distributed to the whole facilities.

Based on the site survey, the existing substation has not enough capacity to supply an additional power to the new D4 facilities. Therefore, a new substation equipped with a 630KVA transformer should be provided. The existing substation for the D3 facilities will be supplied by medium voltage power from the new substation in spite of the PLN.

The estimated power load is calculated as shown in the following table.

Description	Load Density (VA/m^2)	Floor Area (m^2)	Total Load (KVA)	Remarks
Lighting and Small Appliance	30	9,000	270	
Laboratory Equipment	20	9,000	180	
Air conditioning Equipment	40	9,000	360	
Plumbing Equipment			60	
Total			870	

Thus, the estimated power load is approximately 870 KVA.
Assuming that demand factor is 50%, the estimated power demand is calculated as follows,

870KVA x 0.5 = 435KVA

Based on the results of discussion with the engineers in the PLN and the EEPIS, the condition of power supply from the Sukolilo power plant of PLN has been greatly improved. However, a couple of power outrage still took place yearly especially in rainy season. Therefore, a stand-by generator should be provided for the new D4 facilities.

Computers should be provided with UPS: Uninterrupted Power Supply units (UPS) or Automatic Voltage Regulator (AVR) by the scope of the Equipment Plan.

2) Stand-by Generator

A stand-by generator should be equipped to maintain power supply for the minimum activity of the D4 in the case of power outrage. This generator will also back-up emergency power supply to the hydrant pumps in accordance with requirement of the Fire Code of the Indonesia. We will prepare change-over circuits, from duty to emergency drive, of the generator to effectively utilize stand-by power.

The capacity of the generator is estimated to be equivalent to 40% of peak demand (435KVA).

a) Type: Indoor Packaged diesel driven generator
Low noise and radiator cooling type
b) Capacity: 3 Phase 3 Wire 380V 50Hz 180KVA
c) Operational Time: 10 hours
d) Fuel: Diesel oil
e) Quantity: 1 (one) number

3) Main Feeder Wiring System

a) Wiring Method: Cable ladder, Conduit piping
b) Power Distribution: Main Feeder; 3ϕ4W 220V/380V
For Lighting and small appliance 1ϕ2W 220V
For power 3ϕ3W 380V

4) Lighting System

Every room, entrance hall and corridor will be equipped with fluorescent lamps since it will result in a good energy saving and easy maintenance.

The lighting intensity level to be adopted is based on the one of the existing EEPIS facilities and JIS (Japanese Industrial Standards).

Standard of Lighting Intensity level

Room	Lighting Intensity (Lux)	Remarks
Entrance hall	200	
Class room, Final project room	300	
Library, Computer lab.	400	
Laboratory	400	
Administration office	300	
Corridor, Toilet	100	
Storage	50	

Exit lights with batteries should be installed at every staircase and exit for emergency escape.

5) Telephone System

The existing EEPIS facilities and the new D4 facilities will be under the unified Operation & Management after the completion of the D4 facilities. However, the existing telephone private automatic branch exchanger (PABX) has no additional capacity to accommodate the new D4 facilities. In order to make the telephone system cover both the existing EEPIS facilities and the new D4 facilities, we are planning to provide a new PABX that has a networking function with the existing PABX by using tie-line cards.

Through the discussion with the Indonesian side, it was confirmed that the Indonesian side should be responsible for the following items,

a) Application and subscription fee for additional telephone trunk lines by TELEKOM
b) Expenses for replacing or restoring the existing PABX to link to the new PABX
c) Expense for the installation of tie-line cabling within the existing EEPIS

The specification of the telephone system for the new D4 facilities will be as follows,

Private automatic branch exchanger (PABX) with UPS
Quantity; 1 (One)
Trunk lines; more than 3 lines
Extension lines; more than 90 lines

6) Public Address System

Public address system should be provided in common areas and classrooms in the new D4 facilities. Every classroom and corridor will be equipped with speakers so as to page students and staff.

7) LAN (Local Area Network) System

LAN system should be provided to fully equip the new D4 facilities with scalable network system as an IT infrastructure. The LAN system will consist of a backbone switch (L3 Switch), department switches, horizontal cabling and fiber optic backbone that link from the backbone switch to every department switch. We are planning to adopt an effective network switching technology such as L3 routing and an appropriate network segmentation so as to minimize the congestion of network traffic and to improve network through out. Through the discussion with the Indonesian side, it has been confirmed that the backbone switch and fiber backbone should be duplicated so as to secure the LAN system redundancy.

a) Adopted LAN Standard: 100BASE-FXT
b) Data Transfer Speed 100 Mbps

PTTC is currently planning an expansion of the existing LAN system to establish IT Infrastructure within EEPIS in a year. The planned LAN system will be fast ether-net (100Base-FXT). Therefore, the LAN system within the new D4 to be prepared by Japanese

side should be consistent with the one of SPEET Project to function as an integrated Campus Area Network.

8) Fire Alarm System

Manual fire alarm system should be provided in accordance with the fire code of the Indonesia. A combination panel that consists of an alarm bell, an indicate lamp and a push button should be provided in each alarm area. Fire control panel is to be installed in the administrative office on the ground floor.

Furthermore, it should be made possible to transmit a fire signal between the existing D3 and D4 facilities.

9) Lightning Protection System

Lightning protection system should be provided to prevent serious damage to the building structure and electrical facilities.

(4) Garbage and Waste Disposal

The staff belonging to the general administration periodically collects all garbage and waste generated in the existing EEPIS facilities. The collected waste is segregated into recyclable waste and other waste to be collected by the municipal workers. The existing incinerator was broken and hasn't been working for these years. The amount of generated waste is little.

Consequently, an incinerator is not planned to be provided that would possibly generate hazardous gas. The amount of waste could be reduced by means of complete segregation and recycling and the rest of waste will be collected by the municipality.

2-2-2-5 Building Material Plan

(1) Basic Policy

The building material plan shall be formulated based on the climatic conditions, the location of the site, the local construction situation, construction period, construction cost, and maintenance and operation costs. The following matters shall be Basic Policy:

1) The local procurement of construction materials shall be considered to reduce construction costs and shorten the construction period.
2) The maintenance and operational costs shall be reduced by considering the adaptation to the local climate, resistance against climate and the selection of materials that are easy to maintain.
3) It is important to note that the selection of material should be made to satisfy the essential functions of EEPIS and must be considered along with the utility and equipment plans.
4) Selection and determination of the building materials shall be based on the studies on local procurement or application of local construction methods.

(2) Building Material Plan

The local construction situation and construction schedule as well as method for minimizing operation and maintenance costs should be taken into consideration for the prominent building material plan, referring to the analysis of materials of the existing EEPIS buildings.

The existing EEPIS buildings have been designed by a Japanese consultant and constructed by a Japanese contractor as Japan's Grant Aid assistance in 1988.

The materials of the existing buildings are as follows: the roof materials are tile roofing . Exterior wall materials are trowelled mortar with paint on brick masonry or reinforced concrete; Interior wall materials are trowelled mortar with paint on brick masonry; Ceiling materials are non-combustible plaster board or asbestos mill board; Windows are aluminum sash; Floor materials are cement tile.

The policy of selection of materials for this Project is to adopt local materials as much as possible, considering harmony with the existing buildings.

The selection of materials for this Project will aim at maximizing the adoption of local construction methods and selection of local materials, mainly under the supervision of a Japanese Contractor. This policy intends to reduce the construction cost. In reference to the surveys and studies of materials of existing buildings, it is considered that this policy will enable proper selection and procurement of building materials under the scheme of Japan's Grant Aid assistance. The results of these considerations are as follows:

1) Structural Materials

In principle, the typical local construction method and materials which are reinforced concrete for main frames with bricks walls will be adopted for this Project. However, for the oblique roof structure, lightweight steel frame on reinforced concrete roof slab will be adopted considering ceiling insulation and water leaks from the roof.

2) Exterior Finishing

a) Exterior Wall

Exterior wall finishing will be in mainly long-lasting weatherproof paint such as sprayed epoxy painting. It is necessary to consider the adoption of material quality and local construction methods. Especially the degeneration of paint agent, mold and crack will not only increase the maintenance expense after completion of construction, but will also affect the degradation of concrete frames from water leak. While ensuring that the quality of plastering work is maintained, the use of local available epoxy paint is adopted for external use for its performance and durability. As such, quality of plaster works and paint works shall be controlled together.

b) Roofs

The local tile roofing will be adopted for the new building which is supported by ridged light weight steel frame roof structure taking into consideration the durability and to avoid sound transmission from heavy rain and heat absorption from strong sunlight and also maintenance. The appearance of the local roof tile will also match the surrounding landscape.

c) Windows and Doors

Provision of better durability and air tightness for external openings, such as windows and doors, in order to plan the air conditioner in most of the rooms, local available aluminum sash will be adopted for this Project. Also, steel sash will be used for the some openings facing outside. These similar materials have been used for openings of external walls of the existing buildings.
The security grill on the front or back face of the windows will be adopted to provide protection against theft.

d) Floors

The floor finish materials for the outside corridor in the existing buildings are cement tile. Ceramic tile, which is popularly used in Indonesia, will be adopted for the project. External floors will be wet when it rains and non slip type tiles are to be considered.

3) Interior Finishing

a) Floors

The floor finish materials in the existing buildings are cement tile. The ceramic tile will be adopted in the new buildings, which are generally used in Indonesia, considering the quality and durability. PVC tile will be adopted for the rooms equipped with free-access floors in order to facilitate maintenance of computer and electrical wiring. Hardener coat will be adopted for the workshop. Epoxy paint on mortar base will be adopted for mechanical room and storage.

b) Walls

Paint on mortar base will be used as the finishing materials for interior walls which are generally used in Indonesia. As such, quality of plaster works and paint works shall be controlled together, the same as exterior wall.

c) Ceilings

Suspended ceilings using rock-wool absorption board and paint on mortar will be used in the new buildings. Noise absorption material will be adopted for the rooms which house noise producing equipment or noise from people talking.

(3) Proposed Main Materials

The criteria for building materials have been analyzed and studied in Table 2-8. Based on the analysis, main materials proposed are as follows;

Table 2-8 Main Materials Proposed

Structure	Reinforced Concrete, partially steel structure					
Floor Height	4,000 mm					
External Finish						
Roof	Clay Tile, water proof coating for flat roof					
Eaves	Paint on Cement Board					
External Wall	Paint on Plastered Wall / Paint on Louver					
Doors & Windows 1) Windows 2) Doors	 Aluminum Aluminum (Anodized) and Steel					
External Floor	Non-Slip Ceramic Tile on mortar base					
External Corridor Ceiling	Paint on Cement Board					
Internal Finish						
	General Facilities	Laboratory	Computer Room	Workshop	Corridors	Staircase
Floor	Ceramic Tile on Mortar Base	Ceramic Tile on Mortar Base	Free-access Floor & PVC Tile	Hardner Coat	Ceramic Tile on Mortar Base	Ceramic Tile on Mortar Base
Base Board	Ceramic Tile	Ceramic Tile	Hard Wood		Ceramic Tile	Ceramic Tile
Wall	Paint on Plastered Wall	Paint on Plastered Wall	Paint on Plastered Wall	Paint on Plastered Wall	Paint on Plastered Wall	Paint on Plastered Wall/Glass Block
Ceiling	Plaster Board (System ceiling)	Rockwool Board (System ceiling)	Rockwool Board (System ceiling)	Rockwool Board (System ceiling)	Plaster Board with EP	Cement Board with EP
Toilet Floor Wall Ceiling	 Ceramic Tile Ceramic Tile Plaster Board (VP)					

Legend EP Enamel Paint
VP Vinyl Paint
PVC Polyvinyl Chloride

2-2-2-6 Equipment Plan

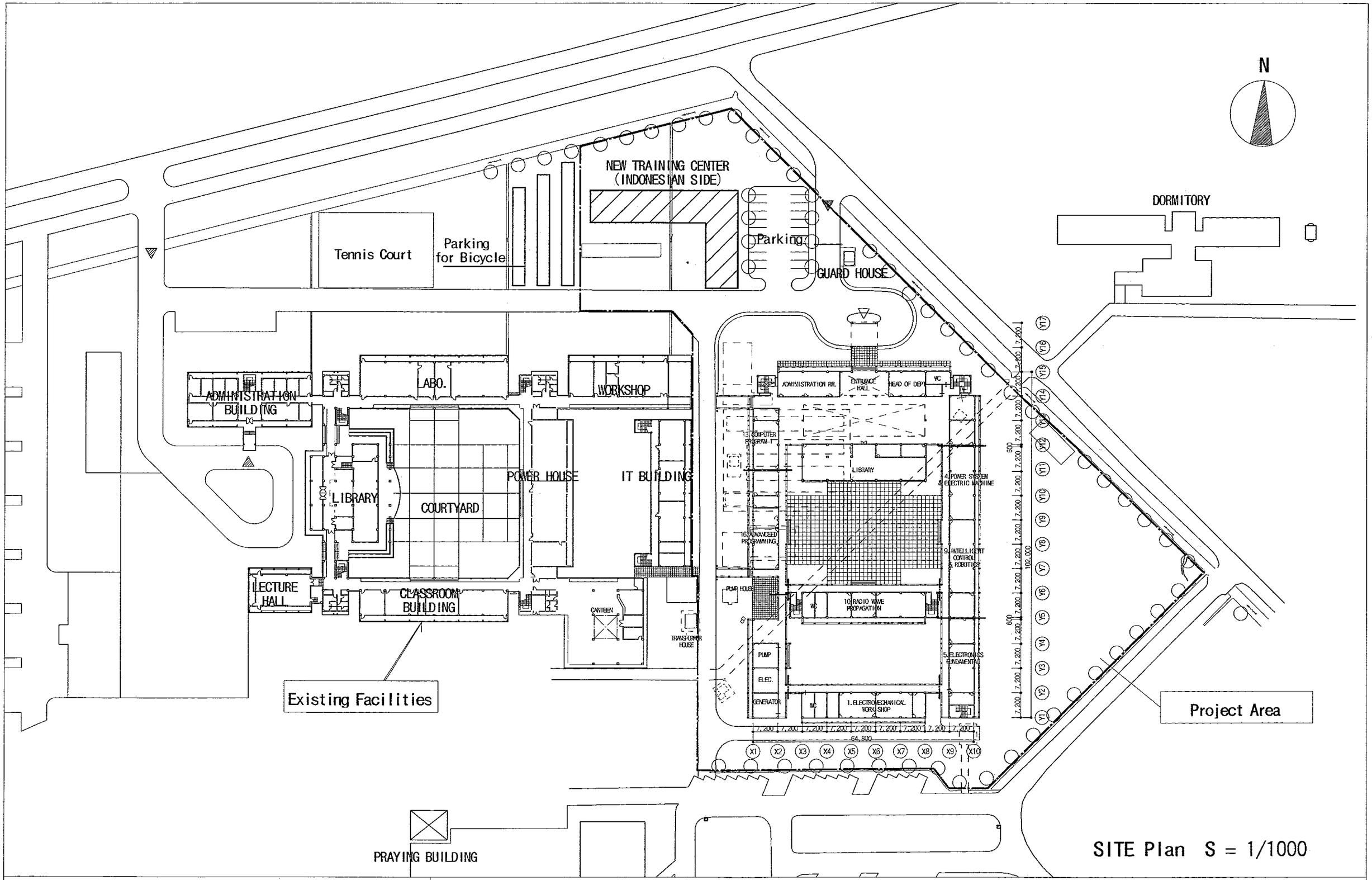
The main planned equipment is as follows;

1. Electromechanical Workshop: (43 items) such as CNC lathe, CNC Milling, Drilling machine etc.,
2. Electric Circuits and Measurements: (36 items) such as Frequency counter, DC Potentiometer, Electronic Voltmeter and Q meter etc.,
3. Factory Automation: (85 items) such as Motor control training apparatus, Temperature controller training apparatus and factory instrumentation training apparatus etc.,
4. Power System and Electric Machine: (43 items) such as Synchronous generator parallel operational panel, Taco meter and Transformer experimental apparatus, etc.,
5. Electronic Fundamental: (23 items) such as Function generator, FFT analyzer and Voltmeter etc.,
6. Digital Electronics: (13 items) such as Logic probe and Advanced logic circuit etc.,
7. Computer and Interface: (30 items) such as Microprocessor training kit, PC and Universal programmer etc.,
8. Automatic Control: (35 items such as Process trainer, Mechatro labe, and Pneumatic trainer etc.,
9. Intelligent Control and Robotics: (50 items) such as Arm robot and Bio pack student laboratory stimulator etc.,
10. Radio Wave Propagation: (45 items) such as Spectrum analyzer, Antenna and Mobile communication trainer etc.,
11. Optical Communications and Electrical-Physics: (41 items) such as Laser source and Optical communication trainer etc.,
12. Digital Communications: (37 items) such as Telephone training system, PBAX etc.,
13. Computer Programming I Laboratory I: (16 items) such as PC and File Server etc.,
14. Computer Programming II: (14 items) such as PC and File Server etc.,
15. Computer Programming III: (20 items) such as PC and File Server etc.,
16. Advanced Programming: (17 items) such as PC and File Server etc.,
17. Computer Aided Design and Simulation: (20 items) such as PC and File Server etc.,
18. Computer Network: (62 items) PC, File Server and soundproof chamber etc.,
19. General Furniture: (3 items) Desk and Chair for Student, and Desk for Teacher

Detailed planned equipment will be followed by attachment.

2-2-3 Basic Design Drawing & Equipment List

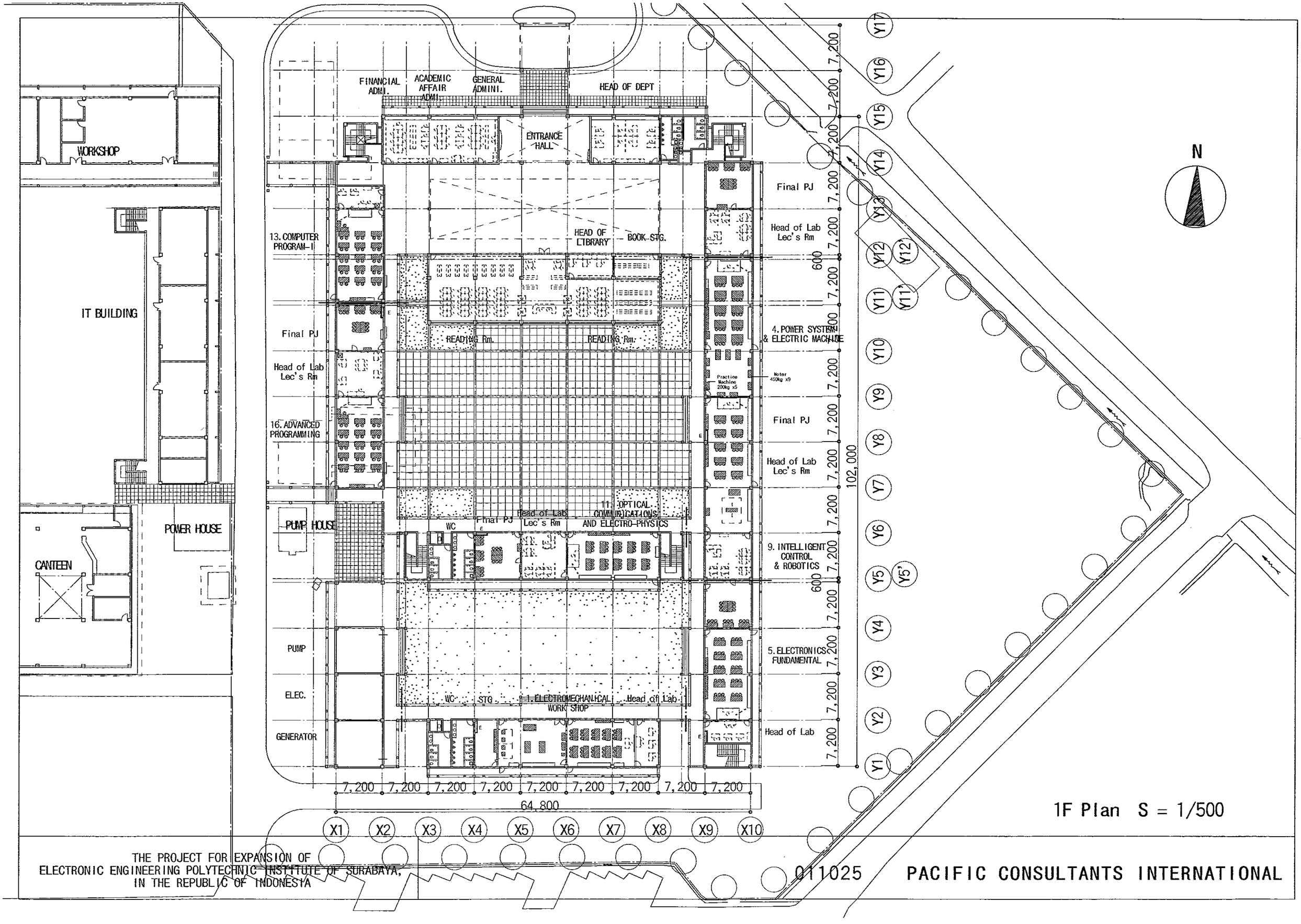
BASIC DESIGN DRAWING



SITE Plan S = 1/1000

THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,
IN THE REPUBLIC OF INDONESIA

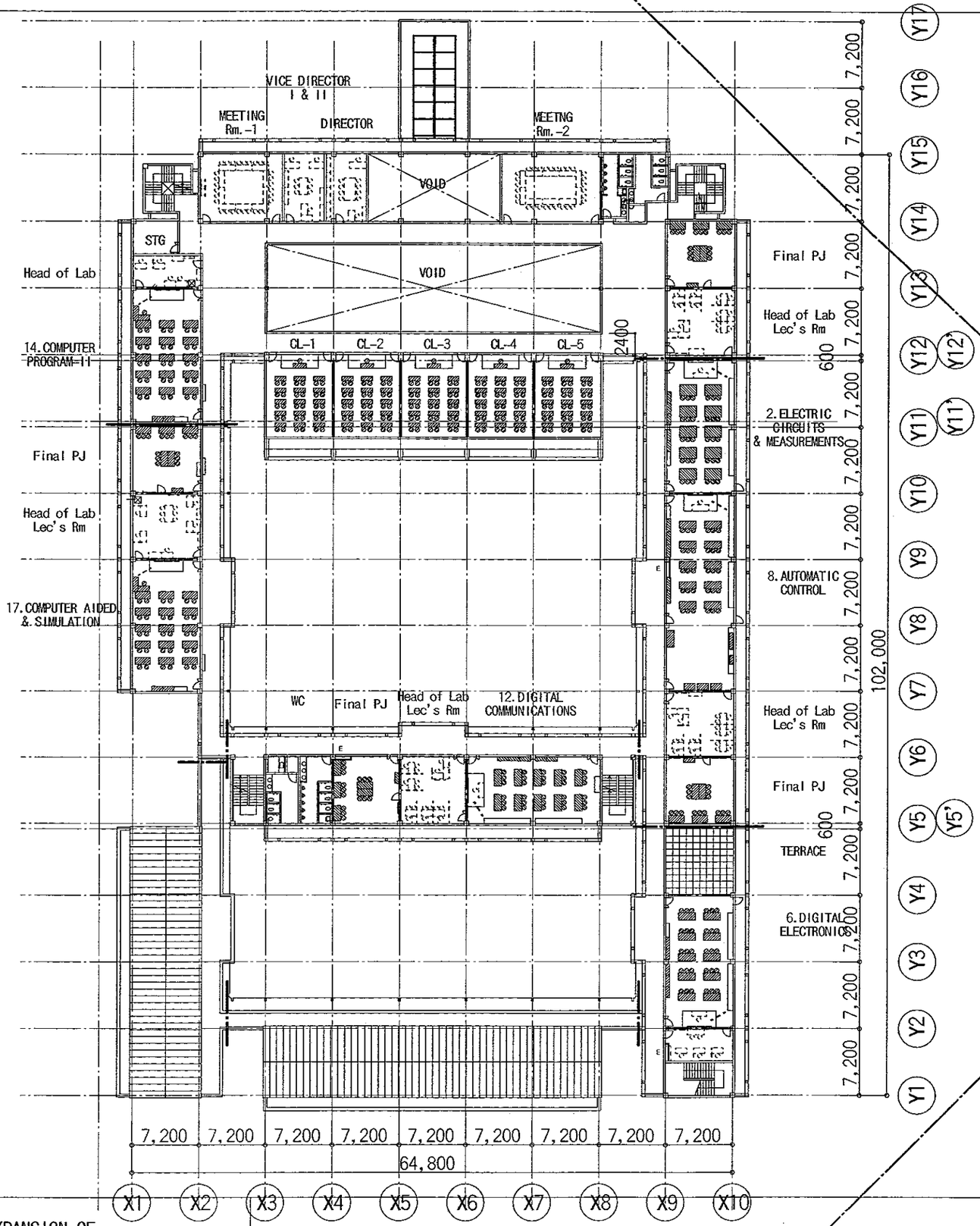
011025 PACIFIC CONSULTANTS INTERNATIONAL



1F Plan S = 1/500

THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,
IN THE REPUBLIC OF INDONESIA

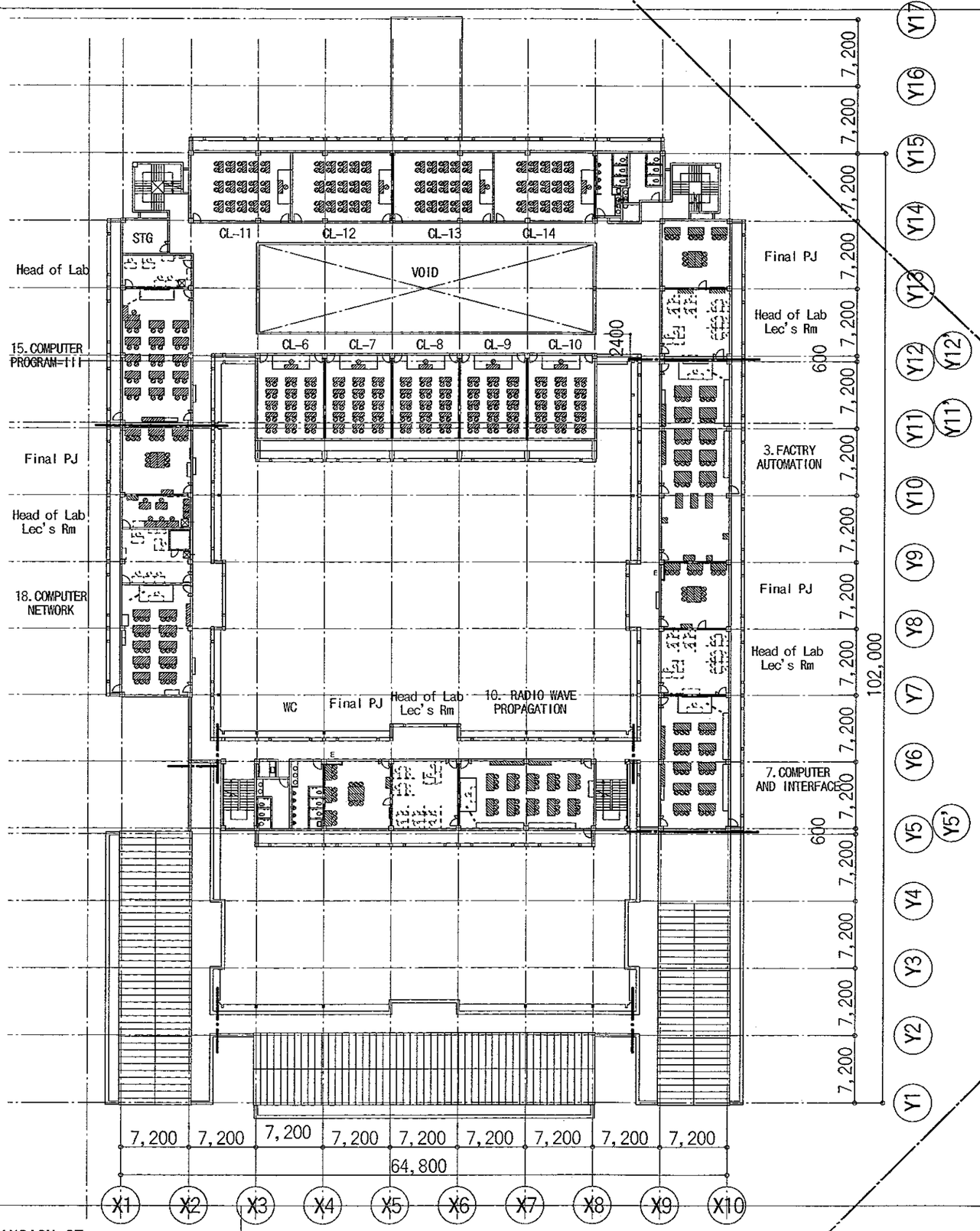
011025 PACIFIC CONSULTANTS INTERNATIONAL



2F Plan S = 1/500

THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,
IN THE REPUBLIC OF INDONESIA

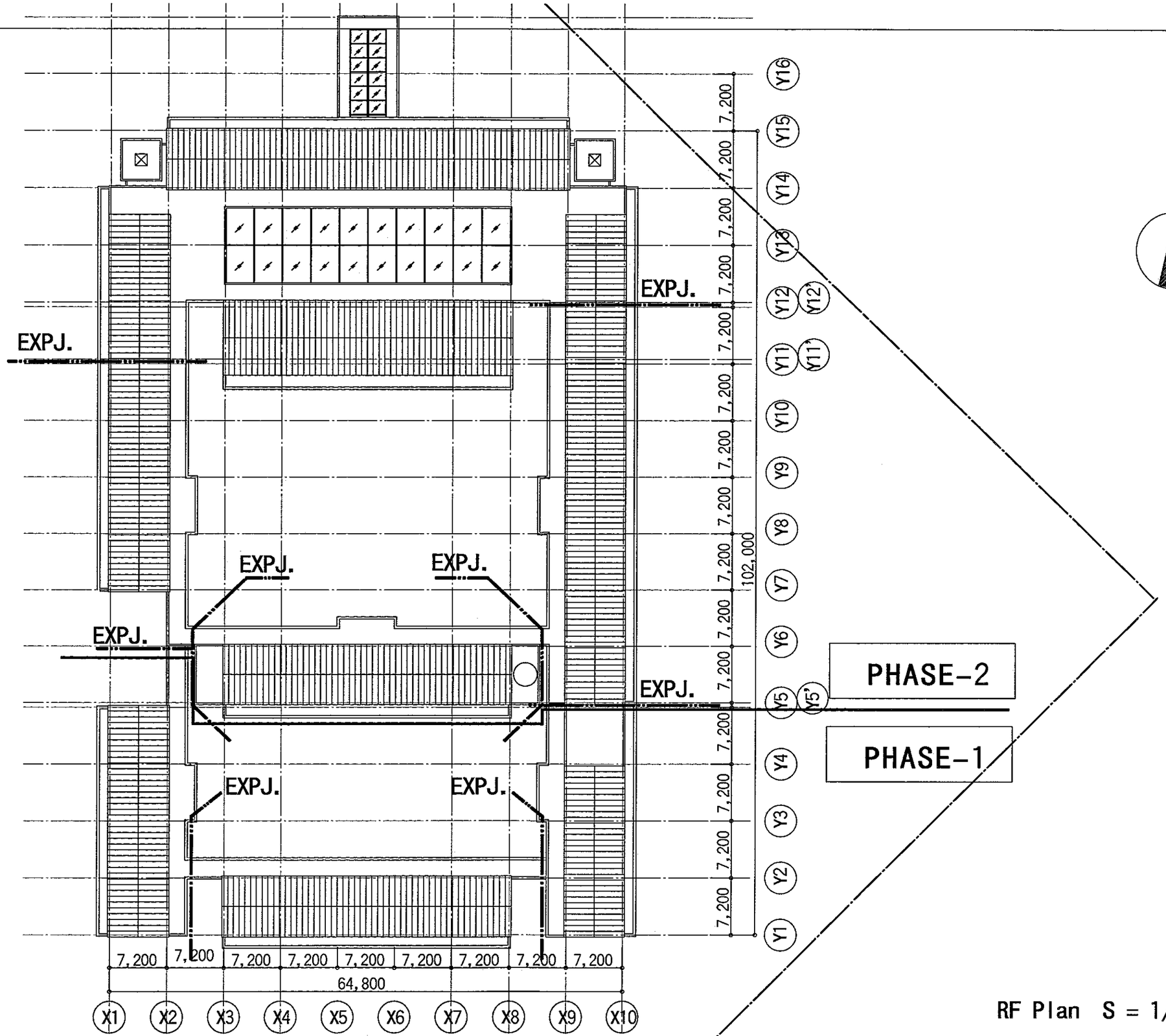
011025 PACIFIC CONSULTANTS INTERNATIONAL



3F Plan S = 1/500

THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,
IN THE REPUBLIC OF INDONESIA

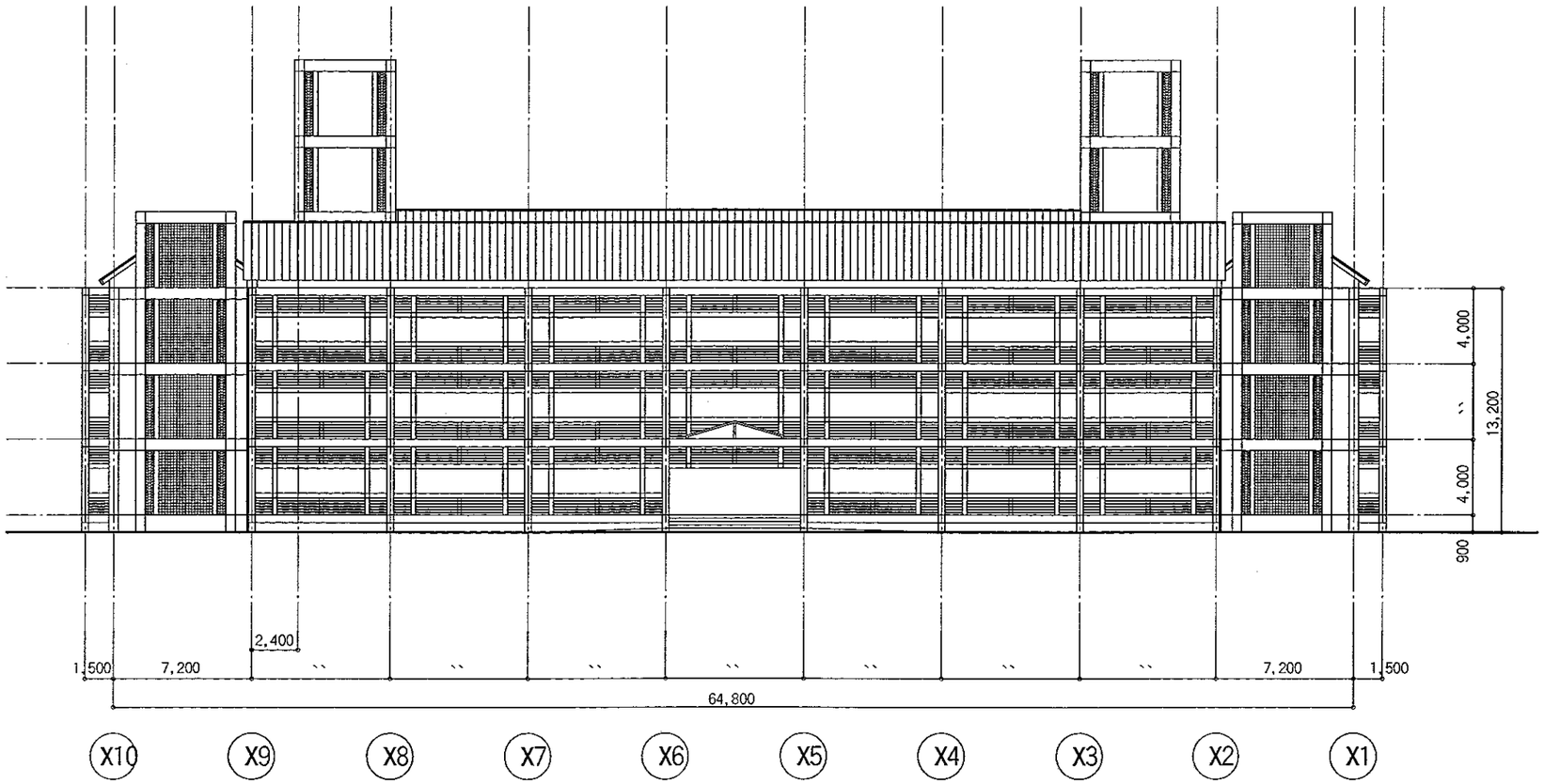
011025 PACIFIC CONSULTANTS INTERNATIONAL



RF Plan S = 1/500

THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,
IN THE REPUBLIC OF INDONESIA

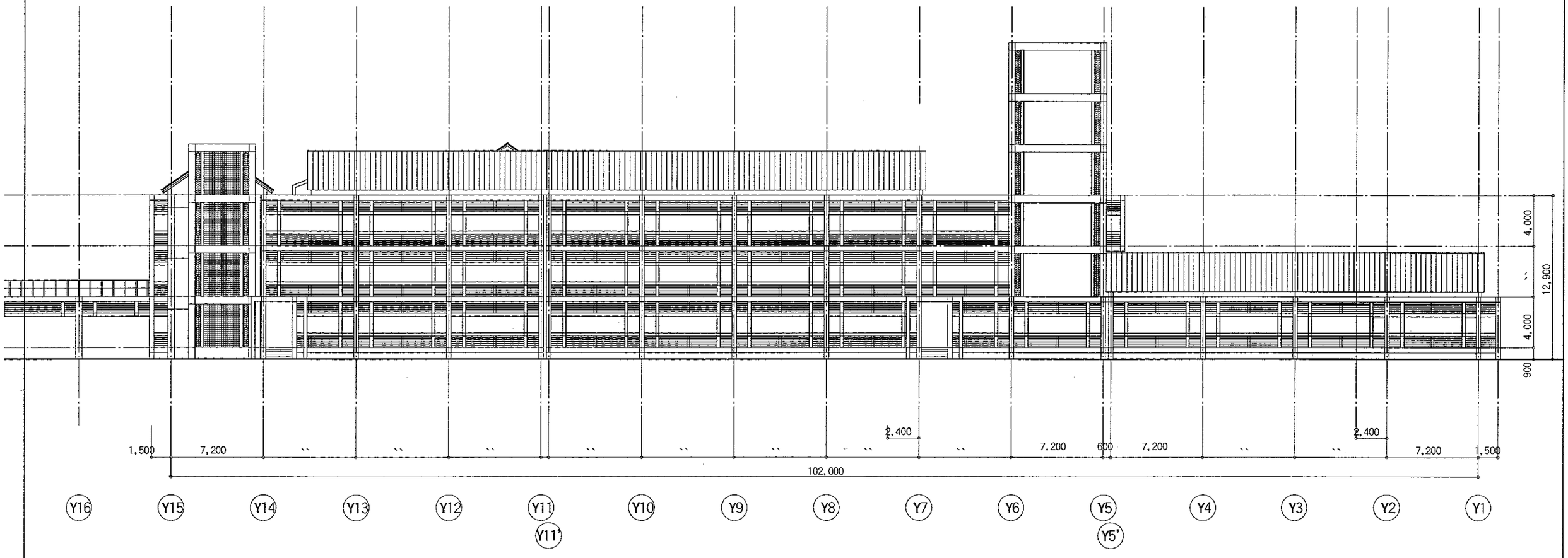
011025 PACIFIC CONSULTANTS INTERNATIONAL



North Side Elevation S = 1/300

THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,
IN THE REPUBLIC OF INDONESIA

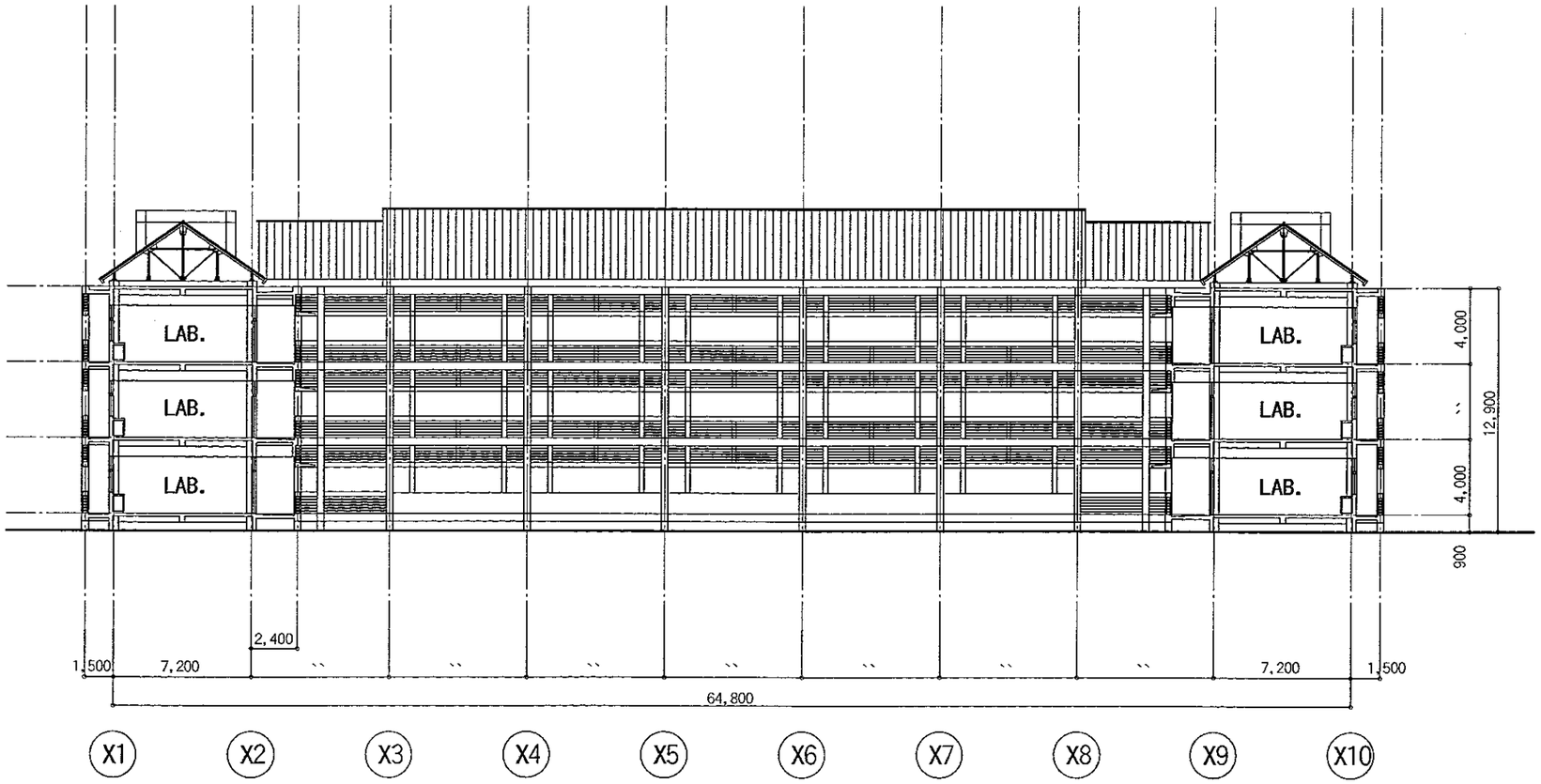
011025 PACIFIC CONSULTANTS INTERNATIONAL



West Side Elevation S = 1/300

THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,
IN THE REPUBLIC OF INDONESIA

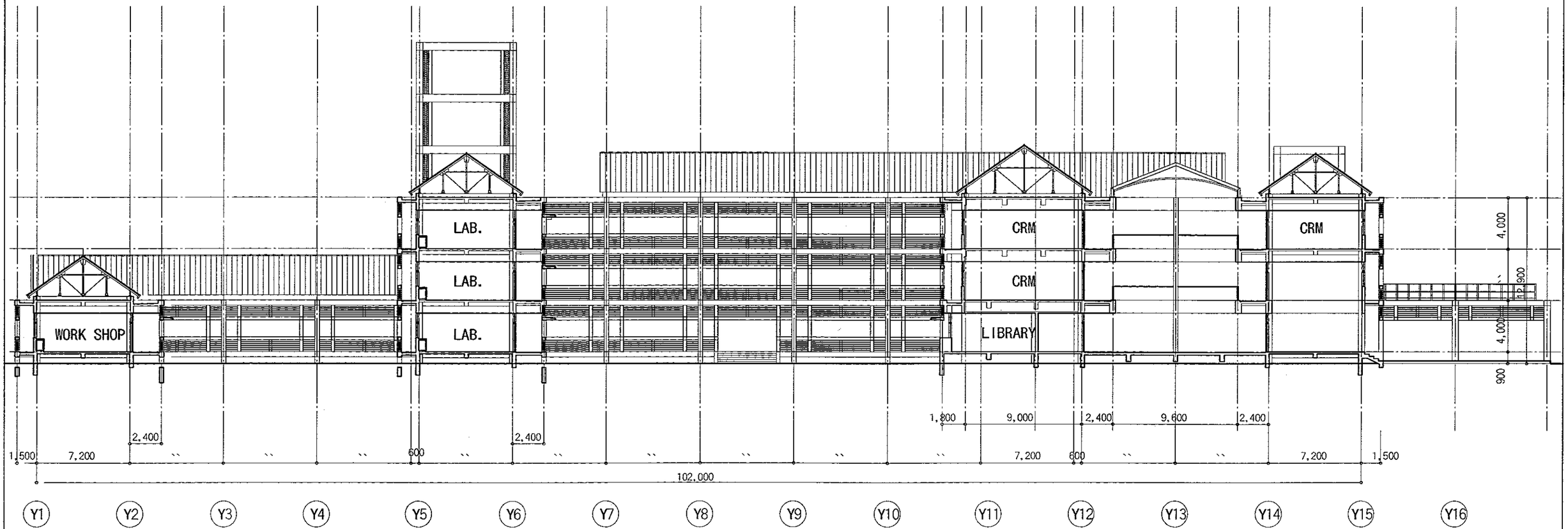
011025 PACIFIC CONSULTANTS INTERNATIONAL



A–Section S = 1/300

THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,
IN THE REPUBLIC OF INDONESIA

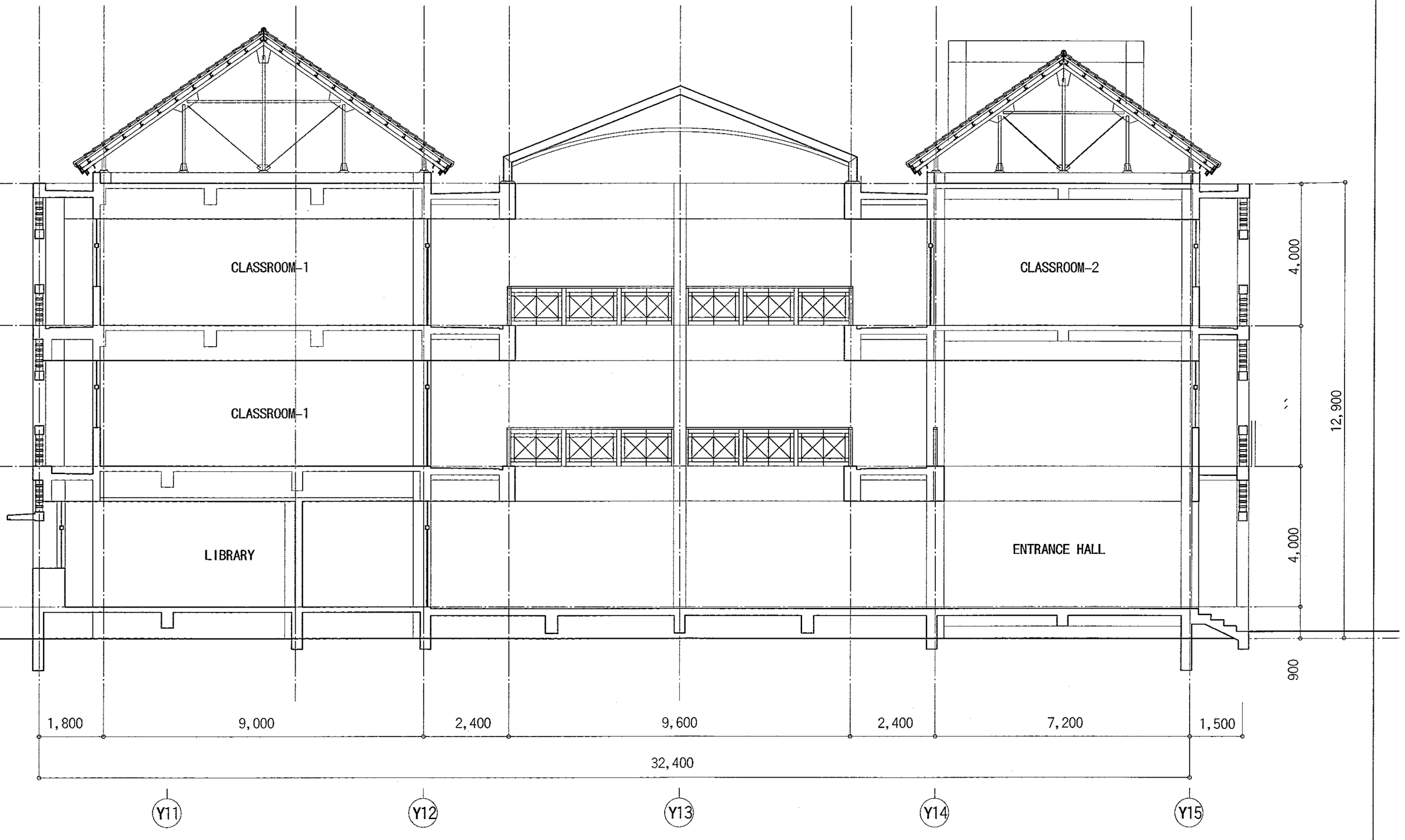
011025 PACIFIC CONSULTANTS INTERNATIONAL



B-Section S = 1/300

THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,
IN THE REPUBLIC OF INDONESIA

011025 PACIFIC CONSULTANTS INTERNATIONAL



B-Section S = 1/100

THE PROJECT FOR EXPANSION OF
ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE OF SURABAYA,
IN THE REPUBLIC OF INDONESIA

011025 PACIFIC CONSULTANTS INTERNATIONAL

EQUIPMENT LIST

Requested Equipment List

CODE	Description	Q'ty
WS1-2	Sockets Set	3
WS1-3	Reamer Sets	3
WS1-4	Air Compressor	1
WS1-5	Angle Grinder	3
WS1-6	Arc Welder	3
WS1-9	Circular Saw	2
WS1-11	CNC Lathe Machine	1
WS1-12	CNC Milling Machine	1
WS1-15	Cordless Metal Cutter	2
WS1-16	Deburring Kit	3
WS1-19	Drill Press	1
WS1-22	Engineering Tool Set	10
WS1-23	Engineer's Vice	3
WS1-24	Folding Machine	1
WS1-25	Hand Hole Punch Set	3
WS1-26	Hand Lever Press	1
WS1-28	Hand Spot Welder	1
WS1-37	Micro-tech Tool Sets	3
WS1-39	Mini Pipe Bender	1
WS1-42	Outside Micrometer	3
WS1-43	Pipe Bender	1
WS1-44	Power Saw (Reciprocating Type)	1
WS1-46	Tap & Die Sets	6
WS1-47	Spray Gun for Painting	2
WS1-54	AC Ammeter	5
WS1-55	AC Voltmeter	5
WS1-57	DC Ammeter	5
WS1-58	DC Voltmeter	5
WS1-59	Frequency Counter	5
WS1-60	Harmonic Analyzer	5
WS1-61	Hi Tester	5
WS1-62	Logic Probe	5
WS1-63	Analog Multimeter	10
WS1-64	Digital Storage Oscilloscope	5
WS1-66	DC Power Supply	10
WS1-67	Standard Signal Generator	5
WS1-68	DC Motor	6
WS1-69	Induction motor (3 phase)	3
WS1-70	Induction motor (1 phase)	3
WS1-72	Sliding Load Resistor	5
WS1-75	Pulse Generator	5
WS2-1	Laboratory Table & Chair Set	10
WS2-2	Cabinet for Workshop	5
EM1-1	Analog Multimeter	6
EM1-2	AC Ammeter	9
EM1-3	AC Voltmeter	9
EM1-5	Analog Frequency Meter	3

Requested Equipment List

CODE	Description	Q'ty
EM1-6	LCR Meter (S)	5
EM1-8	DC Ammeter	9
EM1-9	DC Ammeter	3
EM1-10	DC Potentiometer	1
EM1-11	DC Power Supply	6
EM1-12	DC Voltmeter	9
EM1-13	DC Voltmeter	6
EM1-14	Decaded Capacitor	3
EM1-15	Decaded Inductor	3
EM1-18	Decaded Resistance	6
EM1-19	Frequency Counter	6
EM1-20	Digital Multimeter	6
EM1-21	Electronic Voltmeter	6
EM1-23	Function Generator	6
EM1-24	Galvanometer	3
EM1-26	LCR Meter (L)	5
EM1-27	Power Factor Meter	3
EM1-28	Q Meter	1
EM1-29	Shunt Box	3
EM1-30	Single Phase Wattmeter	3
EM1-31	Slide Rheostats	3
EM1-34	Thermometer	6
EM1-35	Three Phase Wattmeter	3
EM1-37	Volt Slider	6
EM1-38	Wheatstone Bridge	5
EM1-43	Induction Voltage Regulator	1
EM1-47	Digital Storage Oscilloscope	6
EM2-1	Personal Computer with OS for Final Project Room	1
EM4-1	Laboratory Table & Chair Set	10
EM4-2	Cabinet	5
EM4-3	Laboratory Table & Chair Set for Final Project Room	5
EM4-4	Cabinet for Final Project Room	1
FA1-2	Temperature Transducers Training Apparatus	1
FA1-5	Thermometer	1
FA1-6	Optical Bench Training Apparatus	1
FA1-15	Limit Switch Training Apparatus	1
FA1-21	Magnetic Amplifier training apparatus	1
FA1-26	Linear displacement, Rotation position training apparatus	1
FA1-29	Sequence Control Timer & Counter training Apparatus	1
FA1-30	Motor Control Training Apparatus	1
FA1-31	Temperature Controller Training Apparatus	1
FA1-32	Thermometer	1
FA1-34	Water Level Controller Training Apparatus	1
FA1-36	DC Servo Motor	1
FA1-37	AC Servo Motor + Drives	1
FA1-38	Shaded Pole Motor	1
FA1-39	Tachometer (Optical)	5

Requested Equipment List

CODE	Description	Q'ty
FA1-40	PLC for Installation	5
FA1-51	PLC for Factory Automation	5
FA1-59	Digital Multimeter	5
FA1-60	Torque meter	1
FA1-61	Over Current Relays Training Apparatus	1
FA1-62	Over / Under Voltage Relays Training Apparatus	1
FA1-63	Reverse Power Relays Training Apparatus	1
FA1-64	Frequency Relays Training Apparatus	1
FA1-65	Programmable Relays Training Apparatus	1
FA1-70	Relay Testing / calibration	1
FA1-71	Moveable Regulated autotransformer	5
FA1-72	High inductive load	5
FA1-73	AC Ammeter	10
FA1-74	AC Voltmeter	10
FA1-76	Lighting Installation Module	1
FA1-77	Motor Control Training Apparatus	3
FA1-91	Fire Alarm System Taining Apparatus	3
FA1-96	Tool Set for Installation	6
FA1-109	MV Panel Training Apparatus	1
FA1-112	Earth tester	1
FA1-113	Insulation tester	1
FA1-115	Experiment Apparatus for ATM&AMF	1
FA1-118	Power Meter	1
FA1-120	Power Meter	3
FA1-121	Power High Tester	1
FA1-122	Electronic Circuit Tester	5
FA1-123	Computer simulation Software	1
FA1-126	Power Quality Analyze	1
FA1-127	FFT Analyzer	5
FA1-129	AC/DC Converter	2
FA1-130	UPS	1
FA1-131	Power Inverter	2
FA1-132	Harmonic Filter	1
FA1-134	Automatic Capacitor Bank Panel	1
FA1-136	Tele-measuring support equipment	1
FA1-137	Industrial Bus training module	5
FA1-138	Micro Controller training kit	1
FA1-139	Data Acquisition and Control Module	5
FA1-140	Embedded PC	5
FA1-141	Industrial PC	5
FA1-143	Panel PC with OS	5
FA1-146	Digital Storage Oscilloscope	5
FA1-147	Logic Analyzer	2
FA1-148	Universal Programmable	1
FA1-149	Universal Gang Programmer	1
FA1-150	EPROM Eraser	1
FA1-153	Industrial Software	1

Requested Equipment List

CODE	Description	Q'ty
FA1-155	Personal Computer with OS	5
FA2-1	Personal Computer with OS for Final Project Room	1
FA2-2	Multitester	1
FA2-3	Frequency Counter	1
FA2-4	Function generator	1
FA2-5	Digital Storage Oscilloscope	1
FA2-6	Power supply	1
FA2-7	Signal Conditioning	1
FA2-9	Tele-measuring support equipment	1
FA2-10	Data Acquisition and Control Module	1
FA2-11	Embedded PC	1
FA2-12	Industrial PC	1
FA2-13	Panel PC with OS	1
FA2-14	Data entry equipment	1
FA2-15	Universal Programmable	1
FA2-16	Universal Gang Programmer	1
FA2-17	EPROM Eraser	1
FA2-18	Industrial Software	1
FA2-19	Programmable Logic Controller	1
FA4-1	Laboratory Table & Chair Set	10
FA4-2	Cabinet	5
FA4-3	Laboratory Table & Chair Set for Final Project Room	5
FA4-4	Cabinet for Final Project Room	1
PE1-1	AC Ammeter	10
PE1-3	AC Ammeter	5
PE1-4	AC Mili Ammeter	2
PE1-7	AC Voltmeter	5
PE1-8	AC Voltmeter	10
PE1-14	DC Ammeter	10
PE1-17	DC Ammeter	10
PE1-20	DC Mili Ammeter	10
PE1-22	DC Voltmeter	10
PE1-24	DC Voltmeter	10
PE1-26	Digital Counter	6
PE1-34	Function Generator	6
PE1-40	Digital Storage Oscilloscope	6
PE1-48	Automatic Voltage Regulator	5
PE1-53	Wattmeter	5
PE1-54	Wattmeter	5
PE1-57	Power Factor Meter	5
PE1-58	Tachometer	5
PE1-59	Load Resistor	10
PE1-61	Inverter	10
PE1-63	Synchronous Generator Parallel Operational Panel	1
PE1-64	DC Motor -DC Generator Panel	1
PE1-65	Experiment Apparatus for Three Phase Induction Motor Panel	1
PE1-66	Experiment Apparatus for Static Converter-fed DC Machine Panel	1

Requested Equipment List

CODE	Description	Q'ty
PE1-67	Experiment Apparatus for Static Converter-fed Asynchronous Machine Panel	1
PE1-68	Experiment Apparatus for Transformer Panel	1
PE1-70	Experiment Apparatus for Asynchronous Machine Panel	1
PE1-71	Experiment Apparatus for Synchronous Generator Panel	1
PE1-76	Personal Computer with OS	6
PE1-77	ADAM Series	6
PE1-79	Current Transformer Sensor	6
PE1-80	Voltage Sensor	6
PE1-81	Experiment Apparatus for Power Electronics Panel	3
PE1-85	Transformer 1 phase	5
PE1-86	Transformer 3 phase	6
PE1-87	Volt Slider 1 phase	3
PE1-88	Volt Slider 3 phase	3
PE1-89	DC Power Source	3
PE2-1	Personal Computer with OS	1
PE3-2	Laboratory Table & Chair Set	10
PE3-3	Cabinet	5
PE3-4	Laboratory Table & Chair Set for Final Project Room	5
PE3-5	Cabinet for Final Project Room	1
EF1-1	Function Generator	5
EF1-2	Digital Storage Oscilloscope	5
EF1-3	Programmable DC Source	1
EF1-4	DC Power Supply	10
EF1-5	Electronic Voltmeter	5
EF1-6	Lux Meter	5
EF1-7	Digital Multimeter	5
EF1-8	Analog Multimeter	5
EF1-9	Thermometer	5
EF1-10	FFT Analyzer	5
EF1-11	Universal Counter	5
EF1-12	DC Ammeter	10
EF1-13	DC Ammeter	10
EF1-14	DC micro Ammeter	10
EF1-15	DC micro Ammeter	10
EF1-16	DC Voltmeter	10
EF1-17	Audio Analyzer	1
EF1-18	Random Noise Generator	1
EF1-19	Tachometer	1
EF1-20	Slid Voltage Regulator	5
EF1-21	Curve Tracer	1
EF2-1	Laboratory Table & Chair Set	10
EF2-2	Cabinet	5
DE1-1	Function Generators	5
DE1-2	Frequency Counter	5
DE1-3	Digital Storage Oscilloscope	5
DE1-4	Digital Multimeter	5
DE1-5	Logic Probe	5

Requested Equipment List

CODE	Description	Q'ty
DE1-6	Logic Pulser	5
DE1-7	Basic Logic Circuits Trainer	5
DE1-8	Advanced Logic Circuits Trainer	5
DE1-9	Logic Analyser	5
DE1-10	A/D D/A Conversion Module	5
DE1-11	DC Power Supply	5
DE2-1	Laboratory Table & Chair Set	10
DE2-2	Cabinet	5
CI1-1	Microprocessor Trainer	10
CI1-2	Embedded PC w/Controller Board	10
CI1-4	Micro Controller In-circuit Emulator	5
CI1-5	C Cross Compiler	5
CI1-6	Universal Programmer	3
CI1-7	Universal Emulator	10
CI1-8	PIC Micro Development Tools	10
CI1-9	Personal Computer with OS	10
CI2-1	Embedded PC	1
CI2-2	Micro Controller In-circuit Emulator	1
CI2-3	C Cross Compiler	1
CI2-4	PIC Micro Development Tools	1
CI2-5	Universal Programmer and Tester	1
CI2-6	Personal Computer with OS for Final Project Room	1
CI2-7	Printer (Color)	1
CI2-8	Scanner	1
CI2-9	Digital Camera	1
CI2-10	Logic Probe	1
CI2-12	Function Generator	1
CI2-13	Analog Multimeter	1
CI2-14	Frequency Counter	1
CI2-15	Pulse Generator	1
CI2-16	Logic Analyzer	1
CI2-17	Digital Storage Oscilloscope	1
CI2-18	UV EPROM Eraser	1
CI2-19	DC Power Supply	1
CI3-1	Laboratory Table & Chair Set	10
CI3-2	Cabinet	5
CI3-3	Laboratory Table & Chair Set for Final Project Room	5
CI3-4	Cabinet for Final Project Room	1
AC1-1	DC Power Supply	5
AC1-2	Digital Storage Oscilloscope	5
AC1-3	Frequency Counter	5
AC1-4	X-Y Recorder	2
AC1-5	Digital Multimeter	5
AC1-6	Process Trainer	1
AC1-7	Personal Computer with OS	5
AC1-8	PLC Trainer	3
AC1-9	Sensor & Transducer Interfacing Trainer	2

Requested Equipment List

CODE	Description	Q'ty
AC1-10	Mechatro Lab	2
AC1-11	Digital Servo Board	1
AC1-13	Analogue & Digital Servo Fundamental Trainer	1
AC1-14	Fundamental Pneumatic Trainer	1
AC1-15	Pneumatic Application Trainer	1
AC1-16	Fundamental Hydraulic Trainer	1
AC1-17	Hydraulic Application Trainer	1
AC1-18	Arm Robot Trainer	1
AC1-19	Relay Sequence Controller Trainer	2
AC1-23	Software(HDL Development Tool), package	1
	Software(HDL Development Tool), license	4
AC1-24	FPGA Module Design Kit	5
AC1-26	Software(for Training Kit), package	1
	Software(for Training Kit), license	4
AC1-28	Function Generator	5
AC2-1	DC Power Supply	1
AC2-2	Digital Storage Oscilloscope	1
AC2-3	Function Generator	1
AC2-4	Frequency Counter	1
AC2-5	Digital Multimeter	1
AC2-6	Personal Computer with OS	1
AC2-7	Printer (Color)	1
AC2-8	Scanner	1
AC2-9	Simulation Software for Control Automation	1
AC4-1	Laboratory Table & Chair Set	10
AC4-2	Cabinet	5
AC4-3	Laboratory Table & Chair Set for Final Project Room	5
AC4-4	Cabinet for Final Project Room	1
IC1-1	Function Generator	2
IC1-2	Digital Storage Oscilloscope	3
IC1-3	Complete DSP La Kit	1
IC1-4	Digital Multimeter	6
IC1-5	ECG Standard Function Generator	1
IC1-6	Remote Monitoring Modul Set	1
IC1-7	Biopac Student Lab Stimulator	1
IC1-8	MP 150 Starter System	1
IC1-9	BSL ULTIMATE SYSTEM	3
IC1-10	DC Power Supply	6
IC1-11	Optical Encoder	3
IC1-12	AD/DA Converter	2
IC1-13	Simulation Software for Fuzzy and Digital Control with Tool box	2
IC1-17	Indoor Robot Line	1
IC1-18	Single-boad Computer	6
IC1-19	Inverted Pendulum Trainer	1
IC1-20	Magnetic Levitation Trainer	1
IC1-21	RS-232C Break Box	1
IC1-22	Arm Robot	1

Requested Equipment List

CODE	Description	Q'ty
IC1-23	Ball and Beam Demonstrator	1
IC1-25	DC Motor w/Driver	2
IC1-26	Servo Motor w/Driver	2
IC1-27	Digital Camera	1
IC1-28	Electrical Safties Demonstrator	1
IC1-29-1	Personal Computer with OS	2
IC1-29-2	Panel PC with OS	2
IC1-30	Data Acquisition Module	2
IC1-31	Radio Modem	4
IC1-32	PLC Module	6
IC1-33	DCS Training Module	1
IC1-34	Mechatronic System Trainer	2
IC1-35	Graphic Recorder	3
IC1-37	Frequency Counter	1
IC1-38	Experimental Apparatus for Pneumatic Control	1
IC1-39	Tachometer	1
IC2-1	Function Generator	1
IC2-2	DC Power Supply	1
IC2-3	Digital Storage Oscilloscope	1
IC2-4	Personal Computer with OS for Final Project Room	1
IC2-5	DSP Board and Softoware	1
IC2-6	Digital Multimeter	1
IC2-7	AD/DA Converter	1
IC2-8	Simulation Software for Fuzzy and Digital Control with Tool box	1
IC2-12	Single-boad Computer	1
IC2-13	Printer	1
IC2-14	Scanner	1
IC4-1	Laboratory Table & Chair Set	10
IC4-2	Cabinet	5
IC4-3	Laboratory Table & Chair Set for Final Project Room	5
IC4-4	Cabinet for Final Project Room	1
RW1-1	DC Power Supply	3
RW1-2	DC Micro Ammeter	3
RW1-3	Personal Computer with OS	3
RW1-4	Set of Transmission Line Demonstrator	1
RW1-5	Set of Microwave Trainer	4
RW1-6	Microwave Counter	1
RW1-7	Function Generator	3
RW1-8	DC Mili Ammeter	3
RW1-9	Standard Dipole Antenna	1
RW1-11	Standard Log Periodic Antenna	2
RW1-12	Standard Signal Generator	1
RW1-13	Spectrum Analyzer	2
RW1-14	Tripod for Antenna	1
RW1-15	Micro Strip Antenna Trainer Set	1
RW1-16	DC-Current Measurement	6
RW1-17	AC Voltage Measurement	6

Requested Equipment List

CODE	Description	Q'ty
RW1-18	Standard Horn Antenna	1
RW1-19	Phase Shifter	3
RW1-20	Parabolic Antenna w/Digital Satellite Receiver	1
RW1-21	Cellular Telephony Trainer	2
RW1-22	Trainer for Interactive Multipurpose Electronics	2
RW1-23	Mobile Communication Trainer	2
RW1-24	Digital Storage Oscilloscope	3
RW1-25	Logic Analyzer	1
RW1-34	Termination Type Wattmeter	2
RW1-35	VHF Transmitter Receiver	2
RW1-36	Attenuator (10dB)	2
RW1-37	Attenuator (50dB)	2
RW1-38	Through Line Type Wattmeter	2
RW1-40	Frequency Counter	2
RW1-41	Universal Counter	1
RW1-43	Variable Standard Capacitance	1
RW1-44	Variable Standard Resistance	1
RW1-45	Electronic Voltmeter	3
RW2-2	Function Generator	1
RW2-3	Personal Computer with OS for Final Project Room	1
RW2-4	Digital Multimeter	1
RW2-5	Analog Multimeter	1
RW2-6	Tool Set	1
RW2-8	Oscilloscope	1
RW2-10	DC Power Supply	1
RW4-1	Laboratory Table & Chair Set	10
RW4-2	Cabinet	5
RW4-3	Laboratory Table & Chair Set for Final Project Room	5
RW4-4	Cabinet for Final Project Room	1
OP1-1	AC Mili Ammeter	3
OP1-2	AC Voltmeter	3
OP1-4	Beam Splitter	3
OP1-5	Capacity Meter	2
OP1-8	Connector Polisher	3
OP1-10	DC Ammeter	3
OP1-11	DC Micro Ammeter	3
OP1-12	DC Power Supply	3
OP1-13	DC Voltmeter	3
OP1-14	Digital Multimeter	3
OP1-17	Equipotential Lines Module	3
OP1-18	Fault Locator Tool Kits	3
OP1-19	Fiber Attenuator	3
OP1-20	Fiber Connector Equipment	6
OP1-21	Fiber Optic Clip-on Coupler	6
OP1-22	Function Generator	3
OP1-23	Galvanometer	3
OP1-34	Optical Fiber Connector	12

Requested Equipment List

CODE	Description	Q'ty
OP1-35	Optical Power Meter	3
OP1-36	Digital Storage Oscilloscope	3
OP1-45	Set of Grating	3
OP1-49	Set of Prism	3
OP1-53	Variable Pinhole	3
OP1-56	Volt-Stat	3
OP1-58	Optical Communication Trainer	3
OP1-59	Optoelectronic Trainer	3
OP1-60	Optical Fiber (Plastics)	3
OP1-61	Optical Fiber (multi-mode type, with connector)	3
OP1-62	Optical Fiber (multi-mode type, without connector)	3
OP2-1	Standard Signal Generator	1
OP2-2	Function Generator	1
OP2-3	Personal Computer with OS	1
OP2-4	Digital Multimeter	1
OP2-5	Analog Multimeter	1
OP2-6	Tool Set	1
OP2-8	Digital Storage Oscilloscope	1
OP2-10	DC Power Supply	1
OP4-1	Laboratory Table & Chair Set	10
OP4-2	Cabinet	5
OP4-3	Laboratory Table & Chair Set for Final Project Room	5
OP4-4	Cabinet for Final Project Room	1
DC1-1	Standard Signal Generator	3
DC1-3	Digital Storage Oscilloscope	3
DC1-5	Spectrum Analyzer	3
DC1-6	Function Generator	3
DC1-7	PAL Pattern Generator	1
DC1-8	AM/FM Radio Receiver	1
DC1-9	FSK Modem	3
DC1-10	Decaded Capacitor	3
DC1-11	Decaded Resistor	6
DC1-12	Electronic Voltmeter	3
DC1-14	Frequency Counter	3
DC1-15	Analog Multimeter	2
DC1-16	Digital Multimeter	3
DC1-18	DC Power Supply	3
DC1-19	Color TV Trainer	2
DC1-20	AM/FM Radio Trainer	2
DC1-21	Digital Modulation Apparatus	1
DC1-25	Digital Telephony Training Apparatus	1
DC1-34	PBX	1
DC1-35	Transmission System Training Apparatus	1
DC1-43	HT VHF	2
DC1-44	HT UHF	2
DC1-45	VSWR Meter	2
DC2-1	Standard Signal Generator	1

Requested Equipment List

CODE	Description	Q'ty
DC2-2	Function Generator	1
DC2-4	Digital Storage Oscilloscope	1
DC2-5	Analog Multimeter	1
DC2-6	Digital Multimeter	1
DC2-7	Tool Set	1
DC2-10	Personal Computer with OS for Final Project Room	1
DC2-12	Logic Probe	1
DC2-13	Electronic Voltmeter	1
DC2-14	Frequency Counter	1
DC4-1	Laboratory Table & Chair Set	10
DC4-2	Cabinet	5
DC4-3	Laboratory Table & Chair Set for Final Project Room	5
DC4-4	Cabinet for Final Project Room	1
PC1-1	Personal Computer	31
PC1-2	File Server	1
PC1-3	Printer (Monochrome)	1
PC1-4	Printer (Color)	1
PC1-5	Printer Server	1
PC1-6	Router	1
PC1-7	Switching Hub	2
PC1-8	UPS for Server、Router、Switching Hub	1
PC1-9	AVR for all PCs	1
PC1-10-1	Software (OS for Server), package	1
PC1-10-2	Software (OS for PC), package	1
	Software (OS for PC), license	31
PC1-10-3	Software (Programing Language), package	1
	Software (Programing Language), license	30
PC1-10-4	Software (Office Suite), package	1
PC1-10-5	Software (Anti Virus), package	1
	Software (Anti Virus), license	32
PC1-11	LCD Projector	1
PC1-13	Cabinet	2
PC2-1	Personal Computer	31
PC2-2	File Server	1
PC2-3	Printer (Monochrome)	1
PC2-4	Printer (Color)	1
PC2-5	Printer Server	1
PC2-6	Router	1
PC2-7	Switching Hub	2
PC2-8	UPS for Server, Router, Switching Hub	1
PC2-9	AVR for all PCs	1
PC2-10-1	Software (OS for Server), package	1
PC2-10-2	Software (OS for PC:Linux), package	1
PC2-10-3	Software (Office Suite for Linux), package	1
PC2-11	LCD Projector	1
PC2-13	Cabinet	2
PC3-1	Personal Computer	31

Requested Equipment List

CODE	Description	Q'ty
PC3-2	File Server	1
PC3-3	Printer (Monochrome)	1
PC3-4	Printer (Color)	1
PC3-5	Printer Server	1
PC3-6	Router	1
PC3-7	Switching Hub	2
PC3-8	UPS for Server, Router, Switching Hub	1
PC3-9	AVR for all PCs	1
PC3-10-3	Software (for Graphics), package	1
	Software (for Graphics), license	15
PC3-10-4	Software(Anti Virus for MAC), package	1
	Software(Anti Virus for MAC), license	32
PC3-11	LCD Projector	1
PC3-13	Digital Still Camera	1
PC3-14	Scanner	1
PC3-15	Matrix Routing Switcher	1
PC3-16	Image Processing Card	1
PC3-17	TV	1
PC3-18	Digital Video Camera	1
PC3-19	Sound System Set	1
PC3-20	Cabinet	2
PC4-1	Personal Computer	36
PC4-2	File Server	1
PC4-3	Printer (Monochrome)	1
PC4-4	Printer (Color)	1
PC4-5	Printer Server	1
PC4-6	Router	1
PC4-7	Switching Hub	2
PC4-8	UPS for Server, Router, Switching Hub	1
PC4-9	AVR for all PCs	1
PC4-10-1	Software (OS for Server), package	1
PC4-10-2	Software (OS for PC), package	1
	Software (OS for PC), license	36
PC4-10-3	Software (Programing Language), package	1
	Software (Programing Language), license	35
PC4-10-5	Software (Word Processor), package	1
	Software (Word Processor), license	30
PC4-10-6	Software (Anti Virus), package	1
	Software (Anti Virus), license	37
PC4-10-9	Software (GIS), package	1
	Software (GIS), license	15
PC4-11	LCD Projector	1
PC4-13	Cabinet	2
PC5-1	Personal Computer	36
PC5-2	File Server	1
PC5-3	Printer (Monochrome)	1
PC5-4	Printer (Color)	1

Requested Equipment List

CODE	Description	Q'ty
PC5-5	Printer Server	1
PC5-6	Router	1
PC5-7	Switching Hub	2
PC5-8	UPS for Server, Router, Switching Hub	1
PC5-9	AVR for all PCs	1
PC5-10-1	Software (OS for Server), package	1
PC5-10-2	Software (OS for PC), package	1
	Software (OS for PC), license	36
PC5-10-3	Software (Office Suite), package	1
PC5-10-4	Software (CAD), package	1
	Software (CAD), license	30
PC5-10-5	Software (For Simulation), package	1
	Software (For Simulation), license	30
PC5-10-6	Software (for Power Electronics Simulation), package	1
	Software (for Power Electronics Simulation), license	10
PC5-10-7	Software (Anti Virus), package	1
	Software (Anti Virus), license	37
PC5-10-9	Software (for Power System Simulation), package	1
	Software (for Power System Simulation), license	10
PC5-11	LCD Projector	1
PC5-13	PC/DSP Board	2
PC5-14	Cabinet	2
PC6-1	Personal Computer	21
PC6-2	File Server	1
PC6-3	Note Book PC	1
PC6-4	Unix Server	1
PC6-5	Thin Client	10
PC6-6	Printer (Monochrome)	1
PC6-7	Printer Server	1
PC6-8	Router	1
PC6-9	Switching Hub	4
PC6-10	UPS for Server, Router, Switching Hub	1
PC6-11	AVR for all PCs	1
PC6-12-1	Software (OS for Server), package	1
PC6-12-2	Software (OS for PC), package	1
	Software (OS for PC), license	21
PC6-12-3	Software (Office Suite), package	1
PC6-12-4	Software (Anti Virus), package	1
	Software (Anti Virus), license	22
PC6-13	LCD Projector	1
PC6-15	Cabinet	2
PC6-16	Sound Proof Chamber	1
PC6-17	Digital Audio Tape Recorder	1
PC6-18	Electric Condenser Microphone	1
PC6-19	Headphone	1
PC6-20	Digital Audio Processor	1
PC6-21	Precision Sound Level Meter	1

Requested Equipment List

CODE	Description	Q'ty
PC6-22	Audio Signal Generator	1
PC6-23	HIFI Sound System	1
PC6-24	Audio Mixer	1
PC6-25	Digital Storage Oscilloscope	1
PC6-26	Ethernet Cables	3
PC6-27	RJ-45 Connector	6
PC6-28	LAN Cable Tester	1
PC6-29	Ethernet Connector	70
PC6-30	Tool set for Networking	3
PC6-31	Communication Rack	2
PC6-32	LAN HUB	4
PC6-33	Protocol Analyzer	1
PC6-34	LAN Analyzer	1
PC6-35	Equipment for xDSL	6
PC6-36	CTI Card	6
PC6-37-1	Internet Router (S)	2
PC6-37-2	Internet Router (L)	2
PC6-38-2	Cable for Internet Router (with male-connector)	4
PC6-38-3	Cable for Internet Router (with female-connector)	4
PC6-38-5	Switching Hub (24 ports)	4
PC6-38-6	Switching Hub (12 ports)	4
PC6-39	Ethernet Tranceiver	6
PC6-41	Wave LAN Card	6
PC6-42	Indoor Antenna for Wave LAN	6
PC6-43	Outdoor Antenna for Wave LAN	3
PC6-44	Wave LAN Booster	3
PC6-45	Wave LAN Remote Outdoor Router	2
PC6-46	Ethernet Card	15
PC6-47	Ethernet Cables	70
PC6-48	Modem	10
PC6-49	PBX	1
PC6-50	VoIP Blaster Card	4
PC6-51	ISDN Emulator	2
PC6-52	A/D Converter	4
PC6-53	D/A Converter	4
PC6-54	Programmable Peripheral Interface Card	4
PC6-55	PC Interface Trainer	4
PC6-56	ADAMS Series	4
PC6-57	Cabinet	2
GN1-1	Table for General Class Room (for Student)	420
GN1-2	Chair for General Class Room (for Student)	420
GN1-3	Table for General Class Room (for Lecturer)	14

2-2-4 Implementation Plan

2-2-4-1 Implementation Concept

(1) Basic Items

The Project shall be implemented in the budget of two phases.

1) The Exchange of Notes (E/N) for the Grant Aid Project shall be concluded between the Japanese Government and the Government of Indonesia after the cabinet meeting and decision by the Japanese Government.

2) With the E/N, Japan shall commit itself officially to assist and initiate specific action.

3) After the above-mentioned conclusion, a consultant contract shall be signed between a consultant of Japanese nationality and the Government of Indonesia and detailed design and supervision services shall be started immediately.

(2) Detailed Design Stage

1) For the Detailed Design, full details of facilities and equipment in the Basic Design should be carefully confirmed and discussed with the implementation agency.

2) The consultant shall discuss the technical issues through meetings with the relevant authorities in Japan and Indonesia during the detailed design stage.

3) The detailed design will probably require approximately 2 months to complete after the agreement of the E/N.

(3) Tender

1) The tender for the construction of the facility and procurement and installation of equipment shall be conducted in accordance with JICA guidelines.

2) The tender shall be conducted either as one package with a Contractor of Japan or classified in two packages with a Contractor of Japan to carry out the construction work and a supplier of Japan for the procurement and installation of the equipment necessary for the facility.

3) The Consultant will assist the implementation agency for the construction contract in accordance with the guidelines of JICA.

(4) Construction, Supply and Installation of Equipment

1) According to past Grant Aid projects and other similar projects in Indonesia, most of the building materials are locally available and considered to be acceptable in quality and

supply. Therefore, use of local building materials and equipment are preconditions for cost reduction and easy maintenance. As such, locally procured materials are planned to be used for this project as much as possible. However, ensuring and improving quality are the most important items to be noted..

2) Also, for the planning of labour supply, the capability of local contractor and level of skilled and semiskilled labourers are considered to be acceptable. Since a Japanese contractor will be the prime contractor who will supervise and manage the local contractor and his labourers, the quality required for the project should be maintained.

3) Schedule between facility construction and supply and installation of equipment should be well and technically coordinated. In particular, since most equipment will be supplied from Japan or third countries, orders shall be made considering the overall schedule. Also transportation shall be well studied and planned in order that the equipment can be delivered to site on a timely basis.

(5) Implementation Organization

The organizations involved in this project are as shown below:

The responsible organization for the Project is the Directorate General of Higher Education (DGHE) under the Ministry of National Education (MONE) and the executing organization is the EEPIS.

The following diagram shows the relationship between the Government of Indonesia, the Japanese Consultant and Contractor.

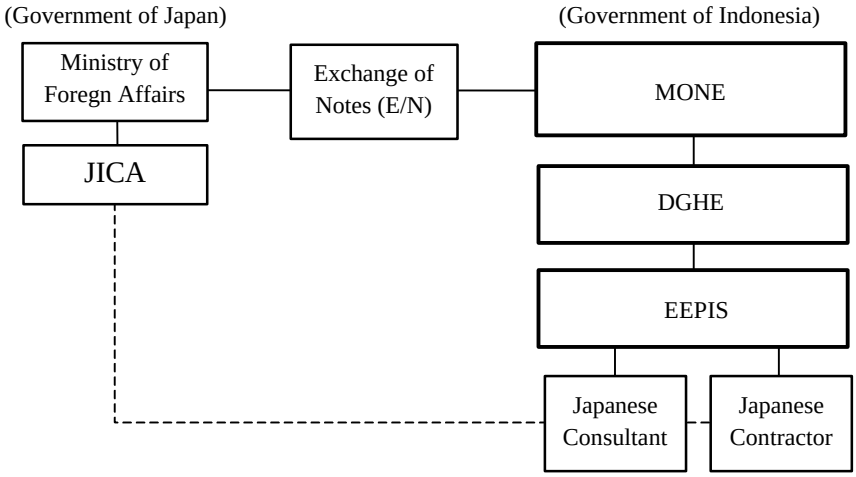


Fig. 2-10 Implementation Organization

2-2-4-2 Implementation Conditions

Surabaya City is the second largest city in Indonesia, therefore, the local contractors with high capability and skilled labourers congregate as compared with other districts in Indonesia. In the local investigation, no problem is considered for the procurement of building machinery and materials. The local technology power, construction administration capability sharply advances, for the construction technology is surely transferred form Japanese consultants and contractors to local contractors and their labourers, at present. However, confirmation must be made in regard to the skill of the subcontractors, the engineers and the workers.

The following points must be especially noted on construction, based on the construction circumstances in Indonesia above mentioned.

(1) Japanese contractor will be the prime contractor in accordance with the Grant Aid program and they will undertake the construction by subletting the works to the local sub-contractor. Local workers would normally be employed by the sub-contractor and supervised. Therefore, it is necessary to employ efficient supervisors, provide suitable labor control and site supervision in order to achieve effective construction and to minimize losses. On the above condition, schedule control should be done most carefully considering the effective arrangement of workers.

(2) For construction planning in particular, problems of the rainy season and effect on existing facilities must be considered. The earthworks, substructure and superstructure works should be scheduled and completed during the dry season, not in the rainy season.

(3) As the building is constructed in a part of EEPIS campus, its construction plan must be planned so that countermeasures could be taken against the traffic of construction vehicles and noise from the construction work.

(4) A temporary yard and temporary buildings for the construction work will be planned in the EEPIS campus. Therefore, a safety measures must be taken not to expose the students to any danger during the construction.

(5) Indonesian laws, codes and standards, should be followed. However, Japanese standard is also to be applied considering the local situation.

(6) Regarding the construction schedule, it is necessary for the Indonesian side to submit documents with an approved signature by local consultant’s who have an Indonesian architectural license. Building permit application should be considered in the overall schedule.

The application procedures and necessary documents are as follows:

Staged Application Procedures	Necessary Documents	Term for Approval
(1) Administrative Instructions for Planning	1) Confirmation on usage of area concerned, 2) ratios of total floor area with site area and building area with site area, 3) building height limit, 4) designated wall lines, 5) amount of parking required, etc.	
(2) Approval of Site Layout	1) Site layout plan, 2) outlined sections, 3) floor area schedule, etc.	Approximately 1 month
(3) Approval of Drawing for Construction	1) Plans, 2) elevations, 3) sections, 4) finishing schedule, 5) documents, models and pictures showing harmonization with the surroundings, 6) landscaping plans, 7) waste and drainage plans, etc.	Approximately 2 months
(4) Various Approvals		
a. Substructure Approval	1) Piling and foundation plans, 2) calculation sheets, 3) soil investigation report, etc.	Approximately 2 months
b. Superstructure Approval	1) Outlines of superstructure, 2) drawings, 3) structural calculation sheets, etc.	Approximately 2 months
c. Electric, A/C, Plumbing and Utilities	1) Related drawings for electric, A/C, plumbing and utility, calculation for water consumption, detailed chemical waste and disposal plan, etc.	Approximately 2 months
(5) Final Building Permit		
(6) Building Use Permission	Issued after final inspection of the building completion	

2-2-4-3 Scope of Works

The responsibilities by the Japanese side and by the Government of Indonesia for the implementation of Japan's Grant Aid Program are shown in Table 2-9.

Table 2-9 Extent of Works

Portions by the Japanese Side	Portions by the Indonesian Side
(1) Building Works Structural works, finishing works (2) Electrical Works Power trunk facilities, lighting, power outlets, P/A systems (3) Utilities and Facilities a) Water Supply Providing water tanks, pumps and related internal piping work b) Sewerage system including piping works up to the connection manhole c) Sewage treatment plant d) Fire-hydrant and extinguishing facilities e) Electrical supply and transformer system, Cabling work from main switchgear panel to the facilities. f) Telecommunication system Providing a new PABX, MDF, telephones and wiring work g) Lightning Protection System h) Lightning system in the site i) Air conditioning system j) Mechanical ventilation system (4) Exterior Work Road, path and parking lots within the site (5) Equipment Equipment for education training (6) Electric Room, Electric Generator Room, Pump Room	(1) Site Preparation a) Ground preparation works: (Demolish the guard-house, parking lot, warehouse etc.) b) Temporary power and water supply for the construction c) Access road (2) External Works Landscaping, planting, fence, etc within the Site (3) Utilities and Facilities a) Water Supply Providing potable water supply Relocating the existing piping to the student's house b) Waste and Storm Drainage Providing connecting point to the existing open canal c) Electrical Work Providing medium voltage power supply Relocating the existing primary power supply Relocating the existing power supply to the student's house Relocating the existing power supply to the shipbuilding Polytechnic. d) Telecommunication Work Connecting between the existing system and new system e) Local Area Network Connecting between the existing system and new system f) Fire alarm system Connecting between the existing system and new system g) Relocating the existing electrical wiring to the student's house (4) General Furniture (5) Other Procedures a) Procedures of the permission and approval to Indonesian Government b) Building permission application procedures, every service line connecting application procedures, duty free procedures and customs clearance procedures c) Commission to A/P (6) Expenses for the maintenance, administration, and the management (7) Tax exemption and necessary preferential treatment for the construction staff from Japan or a third country (8) Smooth entry, re-entry and departure from Indonesia for the Japanese technical staff (9) All the expenses, other than those to be borne by Japan's Grant Aid within the scope of the Project

2-2-4-4 Supervisory Plan for Construction and Procurement

(1) Basic Policy

The project will be implemented over 20 months, divided into 2 phases, Phase 1 for 10 months and Phase 2 for 16 months, with an overlap between Phase 1 and Phase 2 of 6 months. A consultant supervisor (a professional in the field of architecture) is dispatched during both construction phases and technical engineers are dispatched to supervise the important stages of electrical and mechanical works and installation works for equipment, etc. A project manager is dispatched to supervise and inspect during important stages such as beginning of construction, the structure works, the completion and final inspection.

Plan of Personnel necessary for Supervision

Supervisor	Period
Supervisor (Architecture)	20months
Project Manager	Approximately 1.5months
Building construction (Architectural, structural, electrical and mechanical engineers)	Approximately 10months
Procurement・and installation work for equipment	Approximately 6.5months

The supervision works are to control the construction schedule considering construction method, the number of labor and procurement of construction materials and equipment. At the same time, quality of materials and construction work, control of construction cost and security for workers is considered. If the construction work being carried out by the Indonesian side is found to be delayed, the consultant may urge acceleration of the construction work. Furthermore, a suitable construction schedule will be planned in consideration of the construction and procurement circumstances as mentioned in 2-2-4-2.

(2) Contents of consultant assignment in Indonesia and Japan

The scope of the works for the supervisor in the project site is to check and approve the construction plans and drawings, management of the construction schedule regarding building construction and procurement and installation for equipment.
The scope of the works for the supervisor in Japan is quality control for building construction and design through reports by the supervisor in the project site, reporting of progress of the construction work to JICA, and inspection of equipment procured from Japan in factories before shipping.

(3) Issuance of Certificates

The certificates on export of construction materials and equipment, the payment for construction, practical completion and completion, etc. are issued.

(4) Submission of Reports, etc.

Checking and approving monthly progress report, completion documents and photos of works from the contractor and submitting to the Government of Indonesia and JICA.
The completion report in accordance with the Grant Aid program guidelines shall be prepared and submitted to JICA.

(5) Others

Managing and coordinating the schedule and works in order to achieve smooth operation with works executed by the Government of Indonesia, if necessary.

2-2-4-5 Quality Control Plan

(1) Basic Policy

The Detailed Design Drawings shall be developed based on the studies analyzing actual circumstances in Indonesia, maintenance cost, use of local materials and local construction methods. The specification should comply with the Indonesian standards and codes to ensure the quality of buildings, utilities and equipment complies with Indonesia's construction standards, and supplemented by Japanese Regulations such as Japanese Architectural Standard Specification (JASS).

The construction plan, implementation schedule and shop-drawings which are to be submitted by the contractor during the construction period shall be examined and approved by the consultant.

(2) Quality Examination

The Consultant shall examine the implementation plan submitted by the Contractor prior to the commencement of each stage of the works, and approve it if the construction materials and the execution methods conform to the Specification. The Consultant should inspect necessary portions of work based on the implementation plan and Specification.

Surprise inspections of the materials or the execution of work are essential, because most of the construction materials are locally made. The manufacturers' warranty on the products are not sufficient to keep the quality required in the specifications which comply to Codes and Regulations related to developed nations mentioned above.

1) Earthwork

According to the soil investigation report which was made in the basic design study, the ground condition of the project site are poor. A friction pile foundation system is planned.

The progress schedule should be planned to consider the rainy season in order to assure safety and time schedule.

2) Reinforcing Bar Work

The Mill-Sheet showing rebar content submitted by the Contractor should be confirmed by the Consultant. Also bar strength should be inspected to match yield strength in the specification.

3) Concrete Work

The ready mixed concrete plant is at a distance of one hour by car from the project site, the production capacity is 60m^3/hour, and also the storage condition and the quality control are acceptable, and therefore ready mixed concrete shall be adopted.

2-2-4-6 Procurement Plan

(1) Procurement Plan for Building Construction

The division of procurement of construction materials is as shown in the following Table. As can be seen, most of the materials can be obtained in Surabaya. Also, it is understood that there is no problem with respect to the quality and production quantity. For this reason, local materials shall be used as much as possible, and the basic policy shall be the reduction of costs and the selection of materials that will have the best quality and lowest maintenance costs.

Table 2-10 Procurement Situation of Construction Materials

Name of material	Locally Produced	From Japan	From Third Country	Remarks
Sand/Gravel	○			
Cement	○			
Bricks	○			
Timber	○			
Re-bar	○			
Concrete Blocks	○			
Tiles	○			
Wood Fittings	○			
Metal Fittings	○			
Glass	○			
Waterproof Agent	○			
Plywood Sheeting	○			
Roof Tile	○			
Roofing Material	○			
Plastic Tiles	○			
Ceiling Board	○			
Paint	○			
Miscellaneous Hardware	○			
Distribution Panel Board	○			
Lighting Appliances	○			
Electric Cable/Conduit	○			
Wiring Equipment	○			
Control Panel	○			
PABX		○		

Name of material	Locally Produced	From Japan	From Third Country	Remarks
Emergency Generator		○		
Transformer	○			
Communication Appliance	○			
PVC pipes	○			
Sanitary Fixtures	○			
Elevated Reservoir Tank	○			
Pumps	○			
Air conditioner	○			
Fan	○			
IT Fittings	○	○	○	

Table 2-11 Procurement Situation of Construction Equipment

Name of material	Locally Produced	From Japan	From Third Country	Remarks
Back hoe ($0.6m^3$)	○			with breaker
Shovel loader	○			
Dump truck (4t)	○			
Truck (4t)	○			with boom
Vibrating roller	○			
Rammer	○			
Compactor	○			
Concrete mixer ($0.3m^3$)	○			tilting mixer
Re-bar cutter	○			
Re-bar bender	○			
Mortar mixer ($0.3m^3$)	○			
Concrete Block making machine	○			
Water pump	○			
Generator (35kVA)	○			
Generator (2.2 kVA)	○			
Engine welding machine	○			
Crusher	○			
Tank lorry	○			
Temporary scaffolding	○			
Concrete Dumper	○			for transporting on site
Batcher plant	○			

(2) Procurement plan for Equipment

Source countries of procured equipment are expected, as follows:

1) Measuring instrument: Japan
2) Machine tools: Japan and third countries
3) Computer: Site area in recipient country
4) Experimental system: Japan and third countries
5) Furniture and other small items: Site area in recipient country

(3) Transportation Plan

As stated above, most of equipment and consumables are available in Indonesia. As for the procurement from Japan or third counties, approximately three weeks for custom clearance (from document submission to finalizing) is anticipated and such durations should be considered in the overall schedule.

1) Ocean Freight

The route of Surabaya Port (Indonesia) from Yokohama Port (Japan) for the ocean freight should be considered with regard to the procurement goods from Japan.

Freight Days from Japan to Surabaya

Yokohama Port <approximately two times per month/customs clearance - three days> → (navigation fifteen days) → Surabaya Port (approximately eighteen days in all)

The procurement goods from third countries shall be as follows, when procured from Singapore.

Freight Days from Singapore to Surabaya

Singapore <one time/week> → (navigation approximately seven days) → Surabaya Port (approximately one week in all)

2) Land Transportation

It takes about thirty minutes by car from Surabaya Port to the project site. The equipment and materials could be directly transported to the project site by truck.

3) Time required for transportation of the imports

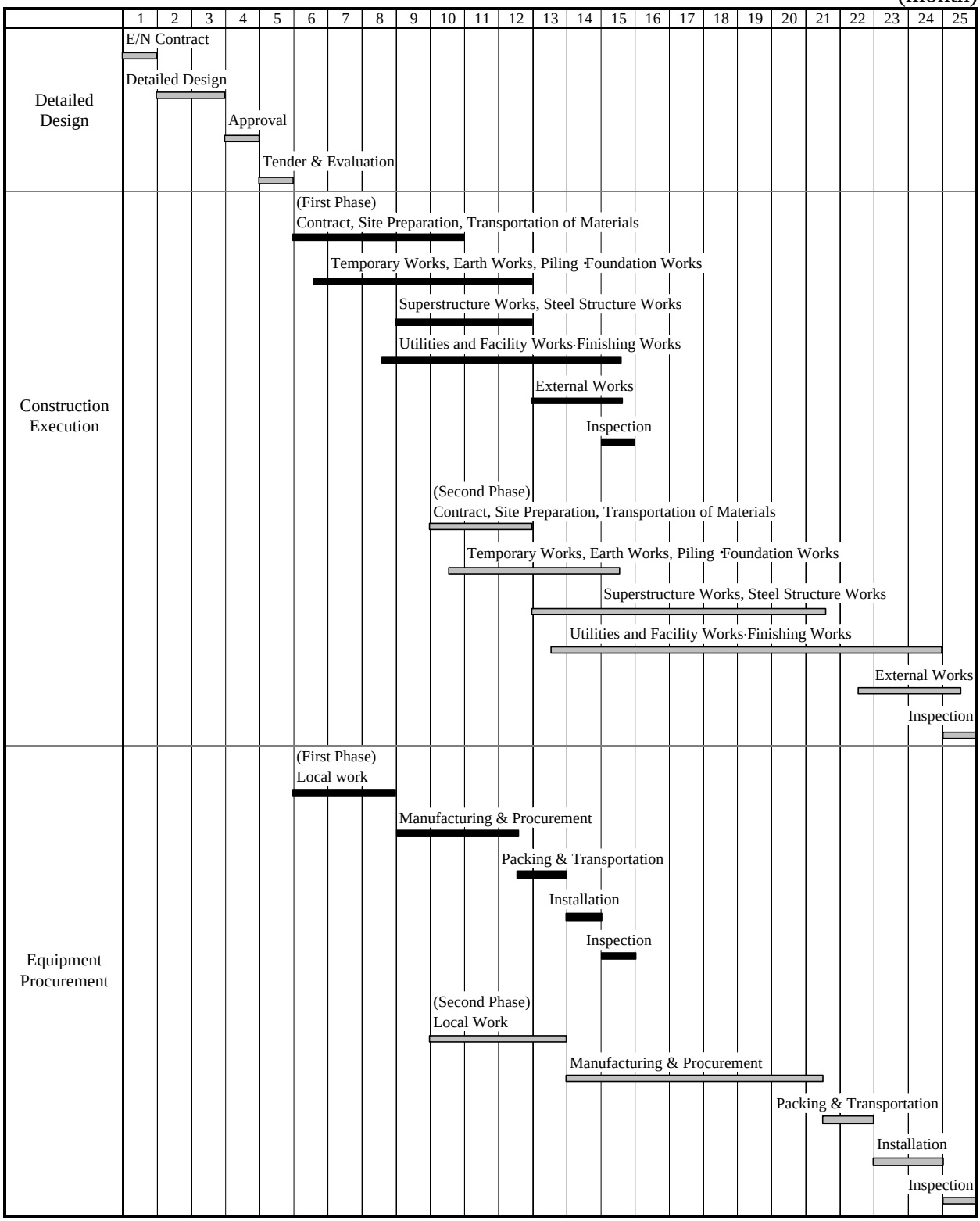
The time required for transportation of the imports to the project site shall be the sum of the time required for the ocean freight, the procedure of an imported duty, the procedure of the customs clearance and the transportation from the ports to the project site. The master list system that imports are judged and approved in advance for an import duty is adopted in Indonesia. It takes approximately three weeks for the procedure of an imported duty. Compared with the time required for above-mentioned procedure and transportation, practically, this is the time required for transportation for the imports.

2-2-4-7 Implementation Schedule

The tentative implementation schedule for the Project is expected to be as shown in Table 2-12.

Table 2-12 General Project Schedule

(month)



2-3 Obligations of Recipient Country

In case the project is implemented, Indonesian side will carry out the following scope of works, and it has been confirmed that Indonesian side has agreed to execute their scope of works during the Basic Design Study.

(1) Procedure Items of Indonesian side

1) Tax Exemption
   - Under the Grant Aid Scheme, the equipment and materials purchased for this project shall be tax free.
   - Based on the contract that was certified, the provided equipment and service, and the Japanese who are involved in this project shall be exempt from custom tariff, domestic tax and other financial taxes

2) Convenience Provision
   - Based on the certified contract, the convenience for entry and stay permit in Indonesia in regard to the Japanese staff who will be involved in this project shall be provided.

3) Obtain Building Permits:
   - As EEPIS is recognized as the institution under the direct control of DGHE, the building planning shall be applied to the authority concerned so as to be approved as a public facility.
   - An application to receive fire fighting permission to submit necessary application documents to fire station Headquarter in Surabaya City for fire fighting approval
   - An application to receive electric power shall be submitted to PLN(an electric power company) with necessary documents which indicates an estimated demand for approval.
   - An application to receive water supply shall be submitted to PDAM (a water supply enterprise) with necessary documents for approval.
   - An application to receive sewage disposal shall be submitted to Environment Bureau in Surabaya City with necessary documents for approval.

(2) Portions by Indonesian Side

The portions, except ‘Table 2-9 Extent of works’ by Indonesian side are as follows:

1) Before Implementation
   - Construct water supply pipe for construction work use
   - Remove the existing warehouses, the existing bicycle parking, and all other existing facilities inside of the project site
   - Construct an access road for the construction of new buildings, if necessary.

- Remove the existing electric power service line and the existing water supply pipe, main feeder wiring, telephone line, Public Address Line under the ground in the project site.

2) During Implementation
   - Landscaping and gardening of EEPIS site.
   - To purchase and install office furniture, curtain, and carpet, etc. of EEPIS
   - Construct cabling or piping work for main feeder wiring, water supply, telephone line and LAN, etc. to the project site.
   - To issue permissions and the licenses, etc., necessary for the implementation of the project, without delay
   - Commission on "Authorization to Pay"
   - Tax exemptions for construction staff from Japan and a third country
   - Smooth entry, re-entry and departure from Indonesia for the Japanese technical staff

3) After Implementation

For the portions by Indonesian Side, as EEPIS have enough experiences in regard to the Grant Aid Project, and knowledge of the content and schedule of their portions to ensure it is expected that they will be during the implementation.

A budget for the portions by Indonesian side was supposed to be prepared with a special budget by DGHE by fiscal year 2002. However, in order to advance to the construction stage according to a process schedule, expectations are that work by Indonesian Side shall be carried out in accordance with the original schedule. The Basic Design Study Team has also explained its importance. It is necessary to monitor the progress regarding this matter by the Japanese side.

2-4 Project Operation Plan

2-4-1 Project Operation Plan

(1) Maintenance and Operation Plan for Facilities

At this time, there are twenty personnel in the general administration who are mainly in charge of maintenance and operation of the utilities at the existing EEPIS facilities. The twenty personnel are comprised of the following:

4 persons in charge of maintenance and operation for utilities,
2 persons in charge of maintenance for furniture,
6 persons in charge of cleaning for facilities,
8 persons in charge of driving car

On the other hand, the EEPIS is outsourcing the maintenance and operation of Air conditioning system. The technicians belonging to the electrical engineering department conduct electrical utilities, that is, the main switchgear and the stand-by generator.

The fact is that the amount of human and financial resources being allocated for the Maintenance and Operation have been too modest to properly operate and maintain the existing utilities, and that the documents system like maintenance and operation manuals, operation records, etc. has not been established properly to maintain up-dated manuals.

After completion of the new D4 facilities, the EEPIS is planning to increase the personnel in charge of Maintenance and Operation in regard to the utilities from 20 persons to 26 persons. In order to establish the proper organization for maintenance and operation, the EEPIS is aiming to allocate capable technicians and to outsource most of the maintenance and operation work.

(2) Maintenance and Management Plan for Campus Network

Through the discussion with the Indonesian side, it has been clarified that EEPIS will plan to establish the maintenance and management system and to establish the maintenance and management system for Campus Network with progress of the implementation schedule of the project. The Maintenance and Management system for Campus Network will mainly comprise Computer Network Management and Information System Management as follows:

A. Computer network management
   - Senior network administrator will be assigned by 2 lecturers of IT Department
   - Assistant network administration will be assigned by 2 lecturers and an assistant in IT Department

B. Information system management
   - Database server administrator or will be assigned by 2 lecturers and an assistant in IT Department
   - Information system development will be assigned by 5 lecturers

(3) Equipment/Operation, Maintenance and Management Plan

The planned equipment will belong to the related laboratory or workshop that will be responsible for equipment operation, maintenance and management. From the storage condition of existing equipment in D3, it is expected that there will be no technical or management problem. In the existing facility, a specialized repair and maintenance section is available with tools and spare parts, in case of equipment trouble. It was confirmed that this maintenance system will be made available for this Project, thus minor repair works will be possible in this workshop. Local agents for all the planned equipment in this project are established near the site area and any specialized repair will be made available by them.

2-4-2 Administration and Operation & Management (O&M) Cost

(1) Expenses Required for EEPIS Facilities

The running cost (expenses for water, power and fuel) for the EEPIS facilities are calculated as follows:

1) Electricity Charge

a) Assumption

Peak Demand	555 kw
Load Factor	0.25

b) Tariff by PLN（Power Company）

Fixed Charge	6,000 Rp/Month	
Demand Charge	15,500 Rp/kw	
Energy Charge: (18:00~22:00)	123 Rp/kwh	WBP
Energy Charge: (22:00~18:00)	123 Rp/kwh	LBP

c) Estimate of monthly power consumption

WBP	555	kw	×	120	H/Month	×	0.25	×	1.2	=	19,980
LBP	555	kw	×	600	H/Month	×	0.25	×	1.2	=	99,900
KVARH	555	kw	×	720	H/Month	×	0.25	×	0.4	=	34,970

d) Monthly Electricity Cost

Fixed Charge									6,000
Demand Charge	555	kw	×	15,500	Rp/kw			=	8,602,500
WBP				19,980	Kwh/Month	×	123 Rp/kwh	=	2,457,540
LBP				99,900	Kwh/Month	×	123 Rp/kwh	=	12,287,700
KVARH				34,970	Kwh/Month	×	249 Rp/kwh	=	8,707,530
					Total				23,452,770
									(Rp/Month)

e) Annual Electricity Cost

23,452,770 Rp/Month	×	12	Month/Year	=	281,433,240	(Rp/Year)

2) Telephone Cost

a) Assumption

Direct Line: 1 Line
Trunk Line: 3 Lines

b) Tariff by TELKOM

Local call charge (0-30km)	85 Rp/min	
Long distance charge (over 30km)	2,000 Rp/min	
International call charge	9,400 Rp/min	(To Japan)

c) Assumption of calling time

Local call (0-30km)	2,400 Min/Month/Line
Long distance call (over 30km)	120 Min/Month/Line
International call	50 Min/Month/Line

d) Monthly Telephone Cost

Local call	2,400.0	×	85 Rp/min	×	4	Lines	=	816,000
Long distance call	120.0	×	2,000 Rp/min	×	4	Lines	=	960,000
International call	50.0	×	9,400 Rp/min	×	1	Lines	=	470,000
			Total					2,246,000
Tax (VAT 12.5%)								280750
			Total					2,526,750

e) Annual Telephone Cost

2,526,750 Rp/Month	×	12	Month/Year	=	30,321,000	(Rp/Year)

3) Fuel Cost

a) Assumption

Emergency Generator	200 KVA 3ö415V 50Hz	One set
Fuel consumption		47L／Hour

Assuming one (1) hour test drive a week

b) Fuel price

Diesel Fuel	900 Rp/L

c) Annual Fuel Cost

47 L/Hour	×	1 Hour/week	×	52 Week/year	=	2,440	(L/year)
2,440 L/year	×	900 Rp/L			=	2,196,000	(Rp/year)

4) Data Communication Cost

*According to the Tariff by Global Net

a) Inter-net Access Charge (128kbs) 7,200,000 Rp/month

b) Microwave Access Charge Included in above charge

	7,200,000
Tax (VAT 12.5%)	90,0000
Total	8,100,000 Rp/month

c) Annual Data Communication Cost

8,100,000 Rp/month × 12 Month/year = 97,200,000 (Rp/year)

5) Water Supply Cost

a) Average consumption per day of water 63 m^3/day

b) Average consumption per month of water

63 m^3/day × 30 Day/month = 1,890 m^3/month

c) Tariff by PDAM

Fixed charge:		4,0000 Rp/month
Demand charge	~15m^3	270 Rp/m^3
	~30m^3	390 Rp/m^3
	~50m^3	610 Rp/m^3
	50m^3~	950 Rp/m^3

d) Monthly Water Cost

Fixed charge:							
Demand charge	~15m^3	15 m^3/month	×	270	Rp/m^3	=	4,050
	~30m^3	15 m^3/month	×	390	Rp/m^3	=	5,850
	~50m^3	20 m^3/month	×	610	Rp/m^3	=	12,200
	50m^3~	1,840 m^3/month	×	950	Rp/m^3	=	1,748,000
		Sub-Total					1,810,100
Stamp fee							11,000
		Grand Total					1,781,100

e) Annual Water Cost

1,781,100	Rp/month	×	12	Month/year	=	21,373,200
						(Rp/Year)

6) Annual Running Cost

Electricity Cost	281,433,240
Telephone Cost	30,321,000
Fuel Cost	2,196,000
Data Communication Cost	97,200,000
Water Supply Cost	21,372,200
Grand Total	432,523,440
	432,500,000
	(Rp/year)

7) Comparative Cost to existing facilities（For reference）

Total floor area of the new D4 facilities is estimated to be smaller by 10% as compared to the existing D3. Meanwhile, the number of students and staff of D4 will be the same as D3. The number of laboratories and classes of D4 is expected to be more than D3. Consequently, the running cost of new EEPIS will be doubled after the project.

	Existing EEPIS Fiscal year 2000 (Rp./year)	New EEPIS (Rp./year)	Remarks
Electricity cost	180,000,000	461,000,000	
Water supply cost	21,000,000	42,000,000	
Telephone cost	32,000,000	62,000,000	
Data communication cost	52,000,000	92,000,000	64Kbps→128Kbps
Total	285,000,000	657,000,000	

CHAPTER 3
PROJECT EVALUATION AND RECOMMENDATIONS

CHAPTER 3 PROJECT EVALUATION AND RECOMMENDATIONS

3-1 Project Effect

(1) Direct Impacts

The Project will bear the outputs needed to achieve the objectives of the Project Type Technical Cooperation, 'The Project for Strengthening of Polytechnic Education in Electric-related Technology (SPEET)'(1999-2004), through appropriate design and planning of the facility and educational equipment of the Project. Expectations of direct impacts and benefits are summarized as follows:

<Direct impact/benefits of the Project>

1) D4 programs which include Electronic Engineering, Electrical Engineering, Telecommunications Engineering and Information Technology will aim to train new polytechnic teachers where (Pre-service training) are conducted.
2) D4 programs with 18 months of In-service training which include Electronic Engineering, Electrical Engineering, Telecommunications Engineering will aim to train polytechnic teachers where active service are conducted.
3) Systematic educational training will be provided by giving sufficient practice conducted through adequate construction of the facility and procurement of equipment in order to supply Engineers and technicians needed by the socio-industrial demand.

Beneficiaries who will have direct impact from the Project are summarized as follows:

<Direct Beneficiaries of the Project (direct impact)>

1) 480 students of EEPIS (Graduates of the D4 program which number 120 persons per year)
2) Teachers with D3 degree on active service (Teachers on active service for year and a half program account for 60 persons per year)
3) Polytechnics and enterprises where students, graduates and teachers are trained in the EEPIS will contribute to their own needs and satisfaction.

(2) Indirect Impacts

The graduates of the EEPIS will be expected to participate actively in the industry as advanced engineers or technicians as well as in the polytechnics institutions practicing as teachers over the entire country. The Project will also develop electronics related engineering teachers who will serve in the existing and new polytechnics industry. The Project, therefore, will contribute to the enhancement of polytechnic educational training and alleviate the existing Teacher/Student ratio so as to achieve the end goal of the DGHE, which is 1:10 Teacher/Student ratio. Furthermore, the Project will be able to serve the aims of the DGHE which is to expand and enhance the practice of engineering related students and technicians. Concrete indirect impacts are summarized as follows:

<Indirect impact/benefits of the Project>

1) Teachers who are needed, in response to the '*Polytechnic expansion plan (through the program for Polytechnic Education System)',* will be developed and supplied.
2) Teacher/Student ratio will be alleviated so as to offer high-grade educational training.
3) Technicians and engineering related students will increase in numbers and contribute to industries.
4) Industries in terms of electronic engineering, electrical engineering, telecommunication engineering, and information technology will be developed and improved in Surabaya.
5) Human resource development will be promoted in the industry in terms of electronic engineering, electrical engineering, telecommunication engineering, and information technology nation wide in the whole of Indonesia.

Indirect beneficiaries for the long-term projections will be expected as follows:

<Indirect Beneficiaries of the Project>

1) Students of Electronic Engineering Polytechnics in Surabaya
2) Industries and enterprises in Surabaya
3) Electronic Engineering polytechnics over the whole nation
4) Students of Electronic Engineering polytechnics in the whole country.
5) Industries in the whole country in reference to electronic, electric, telecommunications, and information technology.

Graduates of the EEPIS will actively participate in the industries not only in Surabaya but also in the whole of Indonesia. The project will extend impact and benefits effectively throughout Indonesia, and '*Human resources in reference to electronic engineering, electrical engineering, telecommunication engineering and information technology are developed and promoted'* and eventually attain (The project purpose of the SPEET) in the long-term. Moreover, the project will contribute to recovery and development of economy, therefore, will benefit all citizens in Indonesia.

Table 3-1 Summary of impact and improvement through the Project

	Current situation and existing problems	Activities of the Project	Impact and improvement
1	**Insufficient human resource in reference to engineering (in terms of quality and quantity)** Human resource development that serves industrial needs in terms of technicians in electronics, electrical, telecommunication and information technology is a demand needed to promote strategy for economic reconstruction in Indonesia. However, budget reduction for higher education due to economic recession do not permit expediting the measures in terms of facility and equipment. There is a pressing demand recently in terms of human resource development for information technology, which is perceived to be the requirement to foster competitive atmosphere and involvement in the Asian market.	Facility construction and equipment procurement needed for 4 year's pre-service in the D4 programs of electronic, electrical, telecommunication engineering and information technology. * Facility of 9,524.88m^2 * 18 laboratories * 14 classrooms * 1 library * 7 offices for administrative facility * Equipment (675 items)	Systematic education including sufficient practiced training will be conducted with adequate equipment procured according to curriculum developed by the SPEET project. Graduates of the EEPIS will participate actively in both polytechnics and industries as technicians as well as teachers. * 120 qualified teachers through D4 programs * 480 students of the EEPIS
2	**Insufficient polytechnic teachers in reference to engineering (in regard to quality and quantity)** Reduction of the budget for higher education has made strategy implementation in the sector of higher education to be difficult. Lack of research and development budget have negative effects on the allocation of the recurrent budget, which has been reduced for these years. The technology and teacher development is experiencing difficulty. Improvement of technology level of teachers in active service in terms of engineering is urgently required.	Facility construction and equipment procurement needed for year and a half in-service D4 programs of electronic, electrical, telecommunication engineering and information technology. (* ditto as above)	Systematic education including sufficient practiced training will be conducted with equipment procured based on the curriculum developed. Teachers in active service trained in the EEPIS will contribute to education with advanced techniques. * In-service training of 60 persons per year * Teachers with D3 degree. * Reduction of Teacher/ Student ratio (present 1:27.7)
3	**Equity and fairness in terms of higher education opportunity** Indonesia regards the expansion of education facilities as one of the strategies needed for the purpose of equity and fairness in the higher education sector. For poverty reduction policy, the government takes priority in the engineering related field in terms of human resource development and improvement of access to education, especially for poor families. However, economic recession makes the poverty reduction more difficult in the educational field.	Facility construction and equipment procurement needed for 4 year's pre-service D4 programs of electronic, electrical, telecommunication engineering and information technology. (* ditto as above)	The EEPIS offers the opportunity of giving scholarships for students from poor families for the purpose of educational equity and fairness. The scholarship assistance will improve the employment rate of poor families and contribute to poverty reduction in the long-term * 300 scholarship students are expected for assistance.

3-2 Recommendations

There are several considerations proposed, which the EEPIS should take into consideration to maintain sustainable development in order to keep benefits generated through the Project, summarized as follows:

(1) Recruitment of new teachers

The facility and equipment will be prepared for D4 programs that are clearly setup apart from existing D3 programs. The adequate recruitment plan shall be needed in response to student expansions of the new D4 courses. The EEPIS has a future plan for the teacher expansion. Teacher/Student ratio will be alleviated as well when the teacher expansion plan is conducted, which will eventually contribute to the end goal of the DGHE, namely Teacher/Student ratio is expected to be 1:10.

(2) Clear demarcation of each sections/divisions in the administrative and maintenance organizational set-up

In terms of facility, including laboratories and workshops/classrooms and equipment, clear demarcation will be set up between the existing D3 program and the new D4. Meanwhile, since existing staff will work together with newly recruited staff in the administrative divisions, maintenance staff and system for new facility and equipment (of D4) by the Project will be organized independently.

(3) Coordination with the Project-Type Technical Cooperation, i.e., SPEET Project

As mentioned above, the foremost purpose of the Project is to contribute to the SPEET project and generate outputs needed for SPEET purpose, as part of the activities of SPEET. The technical support by the SPEET team is required, in terms of use of equipment procured through the Project, especially in reference to curriculum developed by the SPEET project.

3-3 Relevance of the Project Implementation

Relevance of the Project implementation, which will be grant aid project, has been examined and identified because of these following reasons:

(1) The Project will be implemented as a part of the activities needed for the SPEET project, the foremost aim of the Project is to serve the expectations in the achievement of the SPEET project.

(2) The project beneficiaries expected to be Indonesian civilians including poor families.

(3) The purpose of the Project is required urgently in the field of human resource and technology development, as well as educational equity and fairness in the field of higher education.

(4) The EEPIS possess the autonomy of a higher educational institution in terms of budget planning, personnel planning, and management and organizational set-up with the approval of the DGHE.

(5) The Project has consistency in regard to national programs such as national development program, long-term guideline of the DGHE, and strategies for higher education. Therefore, the implementation is needed to serve and to achieve effectively these national level programs.

3-4 Conclusion

The Project will bear considerable benefits and impacts expected and mentioned herein above to facilitate the livelihood of the people of the Indonesia, and as a grant aid project, give relevance and appropriateness to the Project which are clearly identified.

In reference to management and maintenance of the Project, as previously mentioned, the organizational set-up of the Indonesian side is sufficient in terms of staff and budget plan, while special income, such as income from enterprises, are estimated in the future planning apart from the budget allocation from MONE. Further sustainable development shall require adequate budget planning incorporating the special income in order for the EEPIS to continue the supply of sufficient numbers of engineers and polytechnic teachers after the completion of the Project.

APPENDICES

APPENDICES

Member List of Basic Design Study
on
the Project for Expansion of Electronic Engineering Polytechnic Institute of Surabaya
in
the Republic of Indonesia
(May 17 – June 15, 2001)

1.	Mr. Tomoyuki TADA Team Leader	Deputy Director Social Development Cooperation Dep. Japan International Cooperation Agency (JICA)
2.	Dr. Nobuhiko SUGINO Technical Advisor	Associate Professor, Department of Advanced Applied Electronics, Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology
3.	Mr. Yoshihito NAKAYAMA Project Coordinator	First Project Management Div. Grant Aid Management Dep. Japan International Cooperation Agency (JICA)
4.	Mr. Tetsuji HATANO Project Manager/Architectural Planner	PACIFIC CONSULTANTS INTERNATIONAL
5.	Mr. Soichi TAKAI Higher Technical Education Specialist	INTEM CONSULTING, INC.
6.	Mr. Ado KAMAGATA Facilities and Utilities Specialist	PACIFIC CONSULTANTS INTERNATIONAL
7.	Mr. Atsushi KAMEDA Equipment Planner I	INTEM CONSULTING, INC.
8.	Mr. Yasumichi DOI Equipment Planner II	INTEM CONSULTING, INC.
9.	Mr. Hirotsugu KATO Cost Estimator/Procurement Planner	PACIFIC CONSULTANTS INTERNATIONAL
10.	Mr. Tatsuo KOIKE Coordinator/Architect	PACIFIC CONSULTANTS INTERNATIONAL

Member List of Draft Report Explanation Study

on

the Project for Expansion of Electronic Engineering Polytechnic Institute of Surabaya

in

the Republic of Indonesia

(October3 – October 12, 2001)

1.	Mr. Eiji INUI Team Leader	Director Social Development Cooperation Dep. Japan International Cooperation Agency (JICA)
2.	Dr. Nobuhiko SUGINO Technical Advisor	Associate Professor, Department of Advanced Applied Electronics, Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology
3.	Mr. Yoshihito NAKAYAMA Project Coordinator	First Project Management Div. Grant Aid Management Dep. Japan International Cooperation Agency (JICA)
4.	Mr. Tetsuji HATANO Project Manager/Architectural Planner	PACIFIC CONSULTANTS INTERNATIONAL
5.	Mr. Ado KAMAGATA Facilities and Utilities Specialist	PACIFIC CONSULTANTS INTERNATIONAL
6.	Mr. Atsushi KAMEDA Equipment Planner I	INTEM CONSULTING, INC.
7.	Mr. Hirotsugu KATO Cost Estimator/Procurement Planner	PACIFIC CONSULTANTS INTERNATIONAL
8.	Mr. Tatsuo KOIKE Coordinator/Architect	PACIFIC CONSULTANTS INTERNATIONAL

SURVEY SCHEDULE / BASIC DESIGN (May. / 17 / 2001 ～ Jun. / 15 / 2001)

No	Date	Place	Activity
1.	May.17 (Thu)	NRT 11:00→16:30 JKT (GA881) (A,B) NRT 10:50→16:05 JKT (JL725) (C,D,F,G,I,J)	Team Meeting
2.	May.18 (Fri)	(A,B,C,D,F,G,I,J) JKT 18:00→19:20 SUB (All Members)	Couetesty calls and meeting with the officials from: 8:50~10:55 DGHE 11:30~12:20 Embassy of Japan 15:15~15:30 JICA Jakarta office
3.	May.19 (Sat)	(All Members)	9:30~12:30 Meeting with EEPIS 13:30~18:30 Meeting with EEPIS
4.	May.20 (Sun)	(All Members)	10:30~12:10 Meeting with EEPIS 13:00~14:30 Lunch with EEPIS Team meeting and analysis of collected data and information
5.	May.21 (Mon)	(All Members)	9:00~12:00 Meeting with EEPIS 13:40~14:30 Couetesty calls and meeting with ITS 15:10~16:00 Meeting with EEPIS
6.	May.22 (Tue)	SUB 10:00→11:20 JKT (A,B,C,D,E,I) (F,G,H,J)	15:40~17:30 Team Meeting 18:15~19:00 Meeting with JICA Jakarta office 9:40~12:10 Meeting with EEPIS 14:30~16:10 Meeting with EEPIS
7.	May.23 (Wed)	(A,B,C,D,E,I) (F,G,H,J)	9:15~10:00 Meeting with DGHE 14:30~15:00 Signing of Minutes 15:45~16:00 Report to Embassy of Japan 21:00~21:40 Team Meeting 9:00~19:00 Meeting with EEPIS
8.	May.24 (Thu)	JKT 22:50→8:15 NRT (GA880) JKT 23:45→8:35 NRT (JL726) (A,B,C) (D,E,I) (F,G,H,J)	Team meeting and analysis of collected data and information
9.	May.25 (Fri)	(D,E,H) (F,G,H,J)	9:00~11:40 Meeting with DGHE 13:00~ Inspection of Relevant Facilities 9:00~19:00 Meeting with EEPIS
10.	May.26 (Sat)	JKT 17:00→18:20 SUB (D,E,H) (F,G,H,J)	9:30~ Inspection of Relevant Facilities 9:30~17:30 Meeting with EEPIS 20:00~21:20 Team Meeting
11.	May.27 (Sun)	(D,F,G,H,I,J) (E)	Team meeting and analysis of collected data and information
12.	May.28 (Mon)	(D,F,G,H,I,J) JKT 14:00→15:20 SUB (E)	9:00~18:30 Meeting with EEPIS 9:00~12:00 Meeting with DGHE
13.	May.29 (Tue)	(D,E,F,G,H,I,J)	9:00~19:00 Meeting with EEPIS
14.	May.30 (Wed)	(D,E,F,G,H,I,J)	13:30~18:30 Meeting with EEPIS (in NOVOTEL)
15.	May.31 (Thu)	(D,E,F,G,H,I,J)	10:15~18:00 Meeting with EEPIS (in NOVOTEL)

No	Date	Place	Activity
16.	Jun.1 (Fri)	(D,E,F,G,H,I,J) SUB 16:00→17:20 JKT→BDG (D,F,I,J)	9:00~12:00 Meeting with ITS and survey of facilities 13:30~14:00 Meeting with EEPIS
17.	Jun.2 (Sat)	(D,F,I,J) (E,G,H)	9:00~12:00 Meeting with POLBAN and survey of facilities 12:30~14:00 Meeting with POLMAN and survey of facilities 9:00~19:00 Meeting with EEPIS
18.	Jun.3 (Sun)	(E,G,H) (D,F,I,J)	Team meeting and analysis of collected data and information
19.	Jun.4 (Mon)	(E,G,H) (D,F,I,J)	9:00~ Inspection of Relevant Facilities
20.	Jun.5 (Tue)	BDG 6:30→7:40 SUB (D,E,F,G,H,I,J)	 9:00~18:30 Meeting with EEPIS
21.	Jun.6 (Wed)	(D,E,F,G,H,I,J) SUB 18:00→19:20JKT (E)	10:00~12:15 Meeting with ITS and survey of facilities 13:30~18:30 Meeting with EEPIS 9:00~12:00 Meeting with EEPIS (Education Plan)
22.	Jun.7 (Thu)	(E,F,G,H,I,J) SUB 20:00→21:20JKT (E)	9:00~ Meeting with DGHE 14:30~ Meeting with JBIC 17:00~ Meeting with 9:00~18:30 Meeting with EEPIS
23.	Jun.8 (Fri)	(D,F,G,H,I,J) (E)	9:00~18:30 Meeting with EEPIS 9:00~ Meeting with related organizations
24.	Jun.9 (Sat)	(D,F,G,H,I,J) (E)	9:00~18:30 Meeting with EEPIS 9:00~ Meeting with related organizations
25.	Jun.10 (Sun)	SUB 19:00→20:20JKT (D) JKT 23:45→8:35 NRT (JL726) (E) (F,G,H,I,J)	Team meeting and analysis of collected data and information Research
26.	Jun.11 (Mon)	JKT 23:45→8:35 NRT (JL726) (D) (F,G,H,I,J)	 9:00~19:00 DGHE, Embassy of Japan, JICA Jakarta office 9:00~19:00 Meeting with EEPIS
27	Jun.12 (Mon)	(F,G,H,I,J)	9:00~19:00 Meeting with EEPIS
28	Jun.13 (Mon)	SUB 18:00→19:20JKT (F,G,H,I,J)	9:00~14:00 Meeting with EEPIS
29	Jun.14 (Mon)	JKT 23:45→8:35 NRT (JL726) (F,G,H,I,J)	10:00~10:30 Report to JICA Jakarta office 11:00~ analysis of collected data and information
30	Jun.15 (Mon)	(F,G,H,I,J)	8:35

Note)

(JICA) A: Mr. Tada, C: Mr. Nakayama

(Adviser) B: Mr. Sugino

(Consultant) D: Mr. Hatano, E: Mr.Takai, F: Mr. Kamagata, G: Mr. Kameda, H: Mr. Doi, I: Mr. Kato, J: Mr. Koike

SURVEY SCHEDULE / DRAFT FINAL SURVEY (Oct. / 3 / 2001 ～ Oct. / 12 / 2001)

No	Date	Place	Activity
1.	Oct.3 (Wed)	NRT 10:25→16:05 JKT (JL725) (B,C,D,E,F,G,H)	 18:30~19:50 Team Meeting
2.	Oct.4 (Thu)	(B,C,D,E,F,G,H) (C,D,G) JKT→SUB (B,E,F,H)	Couetesty calls and meeting with the officials from: 9:15~10:00 Ministry of Foreign Affairs 10:10~10:15 JICA Jakarta office 13:10~14:30 DGHE 15:00~15:20 Ministry of Finance 18:00~19:00 Team Meeting
3.	Oct.5 (Fri)	(C,D,G) (B,E,F,H) JKT→SUB (C,D,G)	8:30~ 9:45 Meeting with DGHE 8:30~18:00 Meeting with EEPIS
4.	Oct.6 (Sat)	(B,C,D,E,F,G,H) (C,D,G) (B,C,D,E,F,G,H)	9:00~18:00 Meeting with EEPIS (Explanation of Draft Report) 11:30~12:00 Couetesty calls and meeting with ITS 19:00~20:00 Team Meeting
5.	Oct.7 (Sun)	NRT 10:25→16:05 JKT (JL725) (A) (B,C,D,E,F,G,H,I,J) SUB→JKT (B,C,D,G,)	 8:00~18:00 Meeting with EEPIS 20:00~21:00 Team Meeting
6.	Oct.8 (Mon)	(A,B,C,D,G) (E,F,H)	11:15~12:30 Meeting with DGHE 8:30~19:00 Meeting with EEPIS, Survey of facilities
7.	Oct.9 (Tue)	(A,B,C,D,G) (A,B,C,D,G) JKT23:20→ (JL726) (B,C) JKT→SUB (D,G) (E,F,H)	10:00~11:00 Signing of Minutes Report to Embassy of Japan and JICA Jakarta office 8:30~18:30 Meeting with EEPIS ・additional Research
8.	Oct.10 (Wed)	→8:35NRT(JL726) (B,C) (D,E,F,G,H)	 8:30~18:30 Meeting with EEPIS・additional Research
9.	Oct.11 (Thu)	(A,D,E,F,G,H) SUB→JKT JKT23:20→ (JL726) (D,E,F,G)	8:30~14:30 Meeting with EEPIS・additional Research
10.	Oct.12 (Fri)	→8:35NRT(JL726) (D,E,F,G)	

Note）
(JICA) A: Mr. Inui, C: Mr. Nakayama
(Adviser) B: Mr. Sugino
(Consultant) D: Mr. Hatano, E: Mr. Kamagata, F: Mr. Kameda, G: Mr. Kato, H: Mr. Koike

LIST OF PERSONS CONCERNED IN THE RECIPIENT COUNTRY

〔1〕 Basic Design Survey (May. 1～Jun. 15, 2001)

Embassy of Japan

Mr. Kazuhiro Hasegawa	(First Secretary)

Japan International Cooperation Agency Indonesia Office (JICA)

Mr. Hiroyoshi Ihara	(Resident Representative)
Mr. Makoto Inaba	(Deputy Resident Representative)
Mr. Takusaburo Kimura	(Assistant Resident Representative)

Directorate General of Higher Education, Ministry of National Education (DGHE)

Dr. Satryo Soemantri	(Director General)
Mr. Suprodjo Pusposutardjo	(Director of Academic and Student Affairs)
Ir. Oetomo Djajanegara	(Expert-National Accreditation Board for Higher Education)

Electronic Engineering Polytechnic Institute of Surabaya (EEPIS)

Dr. Mhozmmad Nuh	(Director)
Mr. Era.P	(Assistant Director for Academic Affair)
Ir. Nonot Harsono, MT	(Assistant Director for Administration Affair)
Mr. GigiH P	(Assistant Director for Student Affair)
Mr. Sigit Wasista	(Head of Electronic Dept.)
Ms. Prima K.	(Head of Telecommunication Dept.)
Mr. Titon Dutono	(Head of Information Technology)
Mr. Sangar	(Electrical Dept.)
Mr. Ayub	(Electrical Dept.)
Mr. A. Nasir	(Electrical Dept.)
Mr. M.Syafrudin	(Electronic Dept.)
Mr. Alrijadjis	(Electronic Dept.)
Ms. Arna Fariza	(IT Dept.)
Mr. Ferry Astika S	(IT Dept.)

SPEET PROJECT-Strengthening of Polytechnic Education in Electric-related Technology（JICA）

Mr. Osamu Makino	(JICA Chief Advisor)
Mr. Toru Muso	(JICA Expert Information Technology)
Mr. Kazuchika Sato	(JICA Short-term expert)
Mr. Takashi Inoue	(Project Coordinator)

Institut Teknologi Sepuluh Nopember（ITS）

Prof. Soegiono	(Rector)
Dr. Daniel Mohammad Rosyid, Ph.D	(Vice Rector)
Ir. Sugeng Gunadi, MLA	(Head of Landscape Architecture)
Mr. Shigemaro Aoki	(JICA Short-term expert, Information Technology)

Politeknik Negeri Bandung (POLBAN)

Dr Ir. Bambang Budiono, M.E. (Director, POLBAN, Vice Rector, Polytechnic Education Development Center)

Politeknik Manufaktur Bandung (POLMAN)

Ir. Mohammad Nurdin	(Head of Industrial Service Center)

LIST OF PERSONS CONCERNED IN THE RECIPIENT COUNTRY

〔2〕 Draft Final Survey (Oct. 3～Oct. 12, 2001)

Embassy of Japan

Mr. Kazuhiro Hasegawa	(First Secretary)

Japan International Cooperation Agency Indonesia Office (JICA)

Mr. Michio Kanda	(Resident Representative)
Mr. Yuji Ohtake	(Deputy Resident Representative)
Mr. Takusaburo Kimura	(Assistant Resident Representative)

Directorate General of Higher Education, Ministry of National Education (DGHE)

Dr. Satryo Soemantri	(Director General)
Mr. Suprodjo Pusposutardjo	(Director of Academic and Student Affairs)
Ir. Oetomo Djajanegara	(Expert-National Accreditation Board for Higher Education)
Mr. Norihiro Kuroda	(JICA Expert)

Electronic Engineering Polytechnic Institute of Surabaya (EEPIS)

Dr. Mhozmmad Nuh	(Director)
Mr. Era.P	(Assistant Director for Academic Affair)
Mr. Gigih P	(Assistant Director for Student Affair)
Mr. Sigit Wasista	(Head of Electronic Dept.)
Ms. Prima K.	(Head of Telecommunication Dept.)
Mr. Titon Dutono	(Head of Information Technology)
Mr. Sangar	(Electrical Dept.)
Mr. Ayub	(Electrical Dept.)
Mr. A. Nasir	(Electrical Dept.)
Mr. M.Syafrudin	(Electronic Dept.)
Mr. Alrijadjis	(Electronic Dept.)
Ms. Arna Fariza	(IT Dept.)
Mr. Ferry Astika S	(IT Dept.)

SPEET PROJECT-Strengthening of Polytechnic Education in Electric-related Technology（JICA）

Mr. Osamu Makino	(JICA Chief Advisor)
Mr. Toru Muso	(JICA Expert Information Technology)
Mr. Kazuchika Sato	(JICA Short-term expert)
Mr.Takashi Inoue	(Project Coordinator)

Institut Teknologi Sepuluh Nopember（ITS）

Prof. Soegiono	(Rector)
Dr. Daniel Mohammad Rosyid, Ph.D	(Vice Rector)
Ir. Sugeng Gunadi, MLA	(Head of Landscape Architecture)

Minutes of Discussions
on
the Basic Design Study on
the Project for Expansion of Electronic Engineering Polytechnic Institute of Surabaya
in the Republic of Indonesia

In response to a request from the Government of the Republic of Indonesia (hereinafter referred to as "Indonesia"), the Government of Japan has decided to conduct a Basic Design Study on the Project for Expansion of Electronic Engineering Polytechnic Institute of Surabaya in the Republic of Indonesia (hereinafter referred to as "the Project"), and entrusted the study to Japan International Cooperation Agency (JICA).

JICA sent to Indonesia the Basic Design Study Team (hereafter referred to as "the Team"), which is headed by Mr. Tomoyuki Tada, Deputy Director, First Management Division, Social Development Cooperation Department, JICA, with a field survey period between the 17th of May and the 14th of June, 2001.

The Team held a series of discussions on the Project with the officials concerned with the Ministry of National Education (MONE) and Electronic Engineering Polytechnic Institute of Surabaya (EEPIS). The discussions were followed up with a field survey of the study area.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets.

The Team will proceed to further work and prepare the Basic Design Study Report.

Jakarta, 23rd May, 2001

Mr. Tomoyuki Tada
Leader,
Basic Design Study Team,
Japan International Cooperation Agency
Japan

Prof. Dr. Ir. Satryo Soemantri Brodjonegoro
Director General,
Directorate General of Higher Education
Ministry of National Education
The Republic of Indonesia

with the Witness of

Dr. Mohammad Nuh
Director,
Electronic Engineering Polytechnic
Institute of Surabaya
The Republic of Indonesia

ATTACHMENT

1. Objective of the Project

The objective of the Project is to contribute EEPIS with the ability to educate professional skilled polytechnic teachers in electronic-related field and they will educate skilled technicians needed for industrial development. This project is also expected to support the JICA project of technical cooperation "Strengthening of Polytechnic Education in Electric-related Technology (SPEET)".

2. Project Site

The Project site is located at EEPIS in Surabaya, East Java, the Republic of Indonesia as shown in Annex-1.

3. Responsible and Implementing Organization

3-1. The responsible organization for the Project is the Directorate General of Higher Education (herein after referred as DGHE), MONE.

3-2. The implementing organization of the Project is EEPIS under the supervision of DGHE.

4.Items requested by the Republic of Indonesia

Regarding the Department of Information Technology (IT), the Indonesian side presented the practical plan for the establishment of D4 course (polytechnic teacher training course) and requested to replace the initial request for expansion of facilities and procurement of equipment which is related to D3 level (polytechnic technician training course) with D4 level.

The Team admitted the capability or potentiality of the implementing organization, EEPIS, and recognized the relevance to support D4 level of IT course rather than D3 level in this Project.

After discussions with the Team, the items described below are finally requested by the Indonesian side.

JICA will assess the appropriateness of the request and will recommend to the Government of Japan for the approval. Final components for the implementation of the Project will be decided based on the further analysis in Japan.

4-1. The project supports D4 courses in the following departments;

1) Electronics Engineering,

2) Electrical Engineering,

3) Telecommunication Engineering, and

4) Information Technology

4-2. The construction for the expansion of EEPIS facilities are as shown in Annex-2.

4-3. The procurement of equipment for EEPIS activities.

The criteria for the selection of the equipment are shown in Annex-3.

5. Japan's Grant Aid Scheme

5-1. The Indonesian side understood the Japan's Grant Aid Scheme explained by the Team, as described in Annex-4.

5-2. The Indonesian side will take the necessary measures, described in Annex-5, for the smooth implementation of the Project on condition that the Japan's grant aid is extended to the Project.

6. Schedule of the Study

6-1. The Consultant Team will proceed to further studies in Indonesia until the 14th of June 2001.

6-2. Based on the result of the field survey and analysis, JICA will prepare the Draft Report in English and dispatch a team in order to explain the outline of the Basic Design approximately around early September 2001.

6-3. In the event of the Draft Report being acceptable in principle by the Government of Indonesia, JICA will complete the Final Report and forward it to the Government of Indonesia approximately by the end of November 2001.

7.Other Relevant Items

7-1.The Indonesian side explained that EEPIS is an integrated part of Institut Teknologi Sepuluh Nopember (ITS), therefore, the policy and authority of its development are under the ITS.

However, its operational management and budget are autonomous.

7-2. The Indonesian side explained the Japan's Grant Aid of this Project will be allocated fully to the expansion of EEPIS.

7-3.The Indonesian side shall complete the replacement of existing facilities, clearance and leveling of the land in the proposed site for construction, before the commencement of the construction of the facilities by the Project.

7-4. The Indonesian side shall ensure enough budget and personnel for the smooth operation and maintenance of the facilities and equipment after the completion of the Project. The Indonesian side confirmed that the necessary staff and budget would be arranged by

January 2002, the beginning of the fiscal year of Indonesia.

7-5. Both sides agreed the importance of the administrative support for the appropriate allocation of Polytechnic teachers who would be going to graduate from D4 course of EEPIS and the Indonesian side promised to undertake necessary measures from the policy aspect.

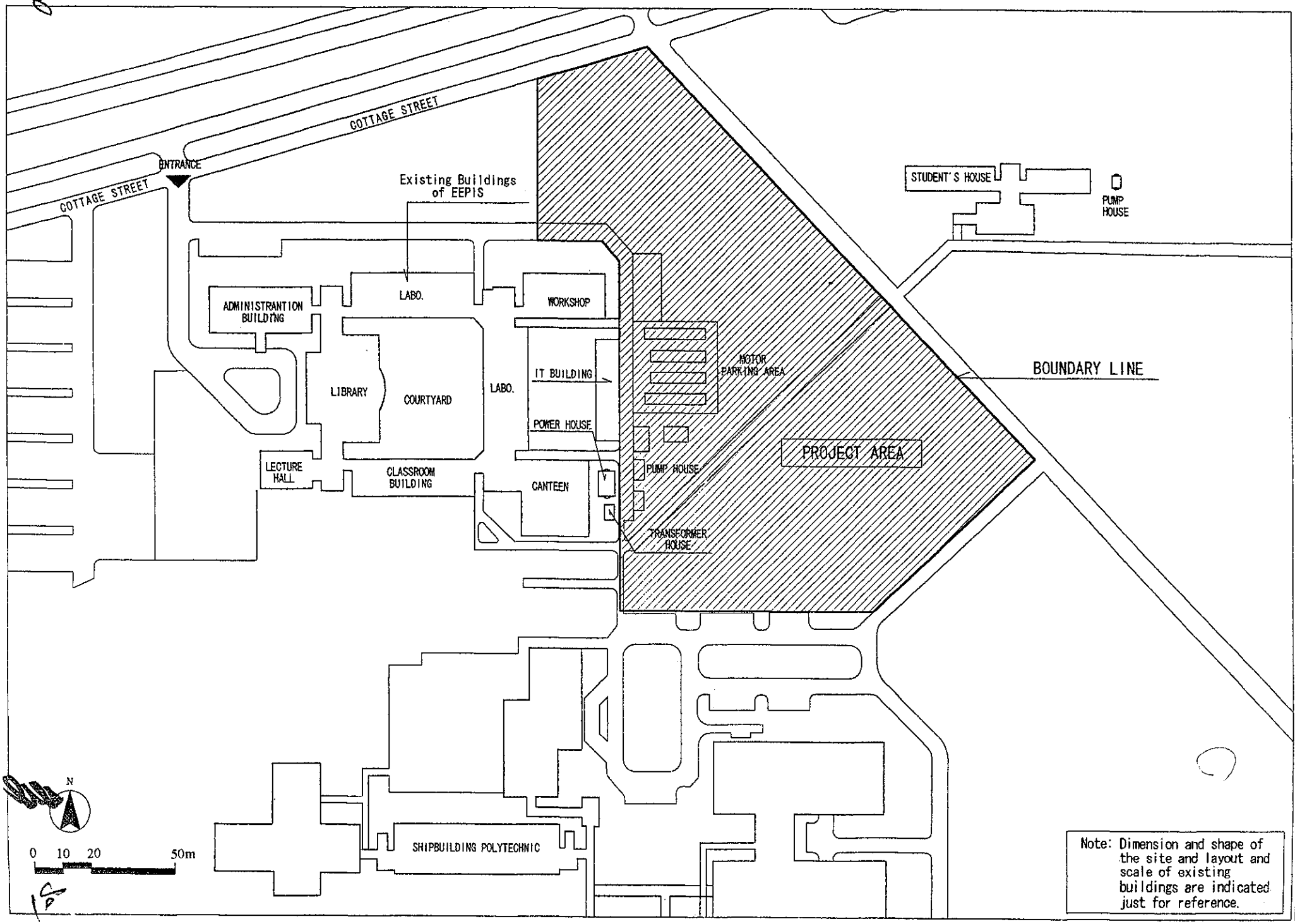
7-6. The Indonesian side agreed that the Questionnaire, which the Team handed over is replied with sufficient information for the analysis of this Basic Design Study by the 7th of June 2001.

7-7. Both sides agreed to change the name of the Project from;

"The Project for Teacher Training for Electronic Engineering Polytechnic Education Center in the Republic of Indonesia" to

"The Project for Expansion of Electronic Engineering Polytechnic Institute of Surabaya in the Republic of Indonesia"

for declaring its feature more clearly.



Note: Dimension and shape of the site and layout and scale of existing buildings are indicated just for reference.

ANNEX-1

ANNEX-2

Items Requested by EEPIS (Facilities)

Priority	Facilities
1.	**Laboratories** — Electromechanical Workshop — Electric Circuits and Measurements — Factory Automation — Power System and Electric Machine — Electronic Fundamental — Digital Electronics — Computer and Interface — Automatic Control — Intelligent Control and Robotics — Radio Wave Propagation — Optical Communications and Electro-Physics — Digital Communications — Computer Programming I — Computer Programming II — Computer Programming III — Advance Programming — Computer Aided Design and Simulation — Computer Network
2.	**Classrooms**
3.	**Library**
4.	**Administration Office**
5.	**Canteen**

Note 1. Both sides confirm that each facility mentioned above includes the related common spaces (corridors, storage, machine room, etc.) and the necessary utilities (electricity, water supply, sewage, telecommunication, campus LAN, etc.). Details of such common spaces and utilities will be discussed furthermore between the both sides.

2. Size and capacity of the facilities will be studied furthermore in the process of the Basic Design.

ANNEX-3

Criteria for Selection of Equipment

The following criteria shall be considered for selection of equipment

1. Basic criteria for equipment planning
   1) Planned equipment shall be limited for the purposes of experiment and educational support for the courses targeted in this project.
   2) Necessity of experimental equipment must be justified by curriculum, syllabus and items/methods of experiment of each course.
   3) Equipment required an excessively high operational cost should be excluded.
   4) Equipment required an excessively advanced operational technique should be excluded.
   5) Equipment in extremely low frequency of usage should be excluded.
   6) Equipment required an excessively expensive installation cost should be excluded.
   7) Equipment mainly for personal use should be excluded.
   8) Equipment for office use should be excluded.
   9) Fixtures for buildings/facilities should be excluded.
   10) Equipment for only research purpose should be excluded.
   11) Equipment, which has no local maintenance service systems, should be excluded.
   12) Equipment which could be purchased with self-effort , should be excluded

2. Equipment specifications
   1) Equipment specification must meet the technical level of staff of EEPIS for operation and maintenance.
   2) Equipment specification basically must meet the level of local agencies for maintenance services.
   3) Equipment specification must meet the same level as other similar institutes.

3. Equipment quantity
   1) Equipment quantity under the project should not duplicate with newly procured equipment under the technical cooperation.
   2) Equipment of same purpose of usage among the courses/experiments should be planned as common use.
   3) Equipment quantity should be minimized in necessity for each experiment.
   4) Equipment quantity should be minimized in necessity of student number of each course.

The Japan's Grant Aid Scheme

1. Japan's Grant Aid System

(1) Grant Aid Procedure

1) Japan's Grant Aid Program is executed through the following procedures.

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

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request. If necessary, JICA send a Preliminary Study Mission to the recipient country to confirm the contents of the request.

Secondly, JICA conducts the study (Basic Design Study), using Japanese consulting firms.

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

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

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

(2) Basic Design Study

1) Contents of the Study

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

a) confirmation of the background, objectives and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation;
b) evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from the technical, social and economic points of view;
c) confirmation of items agreed on by both parties concerning the basic concept of the Project;
d) preparation of a basic design of the Project; and
e) 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 are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even through 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 the smooth implementation of the Study, JICA uses a consulting firm selected through its own procedure (competitive proposal). The selected firm participates in the Study and prepares for a report based upon the terms of reference set by JICA.

At the beginning of implementation after the Exchange of Notes, for the services of the Detailed Design and Construction Supervision of the Project, JICA recommends the same consulting firm which participated in the Study to the recipient country in order to maintain the technical consistency between the Basic Design and Detailed Design.

(3) Japan's Grant Aid Scheme

1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of

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

2) Exchange of Notes (E/N)

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

3) "The period of the Grant" means the one fiscal year which the Cabinet approves the project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with consulting firms and contractors and final payment to them must be completed.

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

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

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

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

5) Necessity of "Verification"

The Government of the 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 of Japanese taxpayers.

6) Undertakings required to the Government of the recipient country

a) to secure a lot of land necessary for the construction of the Project and to clear the site;

b) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities outside the site;

c) to ensure prompt unloading and customs clearance at ports of disembarkation in the

recipient country and internal transportation therein of the products purchased under the Grant Aid;

d) to exempt Japanese nationals from customs duties, internal taxes and fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts;

e) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts such as facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work;

f) to ensure that the facilities constructed and products purchased under the Grant Aid be maintained and used properly and effectively for the Project; and

g) to bear all the expenses, other than those covered by the Grant Aid, necessary for the Project.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for operation and maintenance of them 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 shall not be re-exported from the recipient country.

9) Banking Arrangement (B/A)

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

c) Commission of payment will be arranged and covered by the Government of the recipient country.

2. Necessary measures undertakings by each government

Major undertakings to be taken by each government is shown in the ANNEX-5.

ANNEX-5

Necessary measures undertakings by each government

No	Items	To be covered by Grant Aid	To be covered by Recipient side
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To construct the parking lot	●	
5	To construct roads		
	1) Within the site	●	
	2) Outside the site		●
6	To construct the building	●	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a. The distributing line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and/or elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for storm, sewer and others) to the site		●
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	●	
	4) Gas Supply		
	a. The city gas main to the site		●
	b. The gas supply system within the 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	●	
8	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		●
9	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
	1) Marine(Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and customs clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
10	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		●
11	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		●
12	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant		●
13	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for transportation and installation of the equipment		●

Minutes of Discussions
on
the Project for Expansion of Electronic Engineering Polytechnic Institute of Surabaya
in the Republic of Indonesia
(EXPLANATION ON DRAFT REPORT)

In May 2001, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study Team on the Project for Expansion of Electronic Engineering Polytechnic Institute of Surabaya (hereinafter referred to as "the Project") to the Republic of Indonesia (hereinafter referred to as "Indonesia"), and through discussions, site surveys, and technical examination of the results in Japan, JICA prepared the draft report of the study.

In order to explain and to consult the Indonesia side on the components of the draft report, JICA sent to Indonesia the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Eiji Inui, Director, First Technical Cooperation Division, Social Development Cooperation Department, JICA, from 3rd October to 11th October, 2001.

As a result of discussions, both sides have confirmed the main items described on the attached sheet.

Jakarta, 9th October 2001

Mr. Eiji Inui
Leader,
Basic Design Study Team,
Japan International Cooperation Agency
Japan

Mr. Satryo Soemantri Brodjonegoro
Director General,
Directorate General of Higher Education
Ministry of National Education
The Republic of Indonesia

with the Witness of

Mr. Mohammad Nuh
Director,
Electronic Engineering Polytechnic Institute of Surabaya
The Republic of Indonesia

Mr. Abdul Mukmin Siregar,
Director for Investment and Financial Cooperation,
Ministry of Foreign Affairs
The Republic of Indonesia

Mr. Agus Rahardjo.
Director of Religious Affairs and Education,
BAPPENAS
The Republic of Indonesia

Mr. Edi Karsanto
Director for Foreign Funds,
Ministry of Finance
The Republic of Indonesia

Mr. Soegiono
Rector,
Sepuluh November Institute of Technology
The Republic of Indonesia

ATTACHMENT

1. Components of the Draft Report

The Government of Indonesia agreed and accepted in principle the components of the draft report explained by the Team. After the discussions with the Team, the Indonesian side finally confirmed the items described in Annex-1 and Annex-2.
(Annex-1: Facilities, Annex-2: Equipment)

2. Japan's Grant Aid Scheme

The Indonesian side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Indonesian side as explained by the Team and described in Annex-4 of the Minutes of Discussions signed by both parties on 23rd May 2001.

3. Schedule of the Study

JICA will complete a final report in accordance with the result of discussions and forward it to the Government of Indonesia around January 2002.

4. Other Relevant Issues

4-1. Changes of the layout plan for laboratories

The Indonesian side requested to change the layout plan for laboratories in the department of telecommunication and information technology to realize more effective class management. After the discussions, both sides agreed to change the plan shown as below:

a) The Department of Telecommunication Technology

Name of Laboratories	Layout changes
Radio Wave Propagation	1F→3F
Optical Communication	2F→1F
Digital Communication	3F→2F

b) The Department of Information Technology

Name of Laboratories	Layout changes
Computer Network	1F→3F
Advanced Programming	3F→1F

4-2. Necessary Measures to be taken by the Indonesian Side

On condition that the Grant Aid Scheme by the Government of Japan is extended to the Project, the Indonesian side will take necessary measures described in the Annex-3 for the smooth implementation of the Project.

4-3. Budgetary Arrangements

Both sides confirmed that the Indonesian side shall allocate sufficient budget necessary for:

(1) the completion of the replacement of existing facilities, clearance, leveling of the land in the proposed site by April 2002, before the commencement of construction;

(2) the recruitment of administrative staff and lectures for the smooth and effective operation of the Project.

4-4. Allocation of Personals

The Indonesian side confirmed that appropriate allocation of administrative staff and lecturers to the implementing organization, Electronic Engineering Polytechnic Institute of Surabaya (EEPIS) shall be secured for the Project.

Requested Facilities for the Project

No.	Room Name
1.	**Laboratories**
	Electrical Engineering Department
	1.1 Electromechanical Workshop
	1.2 Electric Circuits & Measurements
	1.3 Factory Automation
	1.4 Power System & Electric Machine
	Electronics Engineering Department
	1.5 Electronic Fundamental
	1.6 Digital Electronics
	1.7 Computer and Interface
	1.8 Automatic Control
	1.9 Intelligent Control & Robotics
	Telecommunication Engineering Department
	1.10 Radio Wave Propagation
	1.11 Optical Communications and Electro-Physics
	1.12 Digital Communications
	Information Technology Department
	1.13 Computer Programming I
	1.14 Computer Programming II
	1.15 Computer Programming III
	1.16 Advance Programming
	1.17 Computer Aided Design and Simulation
	1.18 Computer Network
2.	**Classrooms**
	2.1 Classroom 1 for 30 persons
	2.2 Classroom 2 for 30 persons
3.	**Library**
	3.1 Reading Room
	3.2 Head of Library Room
	3.3 Book Storage Room
	3.4 Lobby
4.	**Administration Office**
	4.1 Director Room
	4.2 Vice Director I and II (2p×1)Room
	4.3 General Administration Room
	4.4 Head of Department and Adm. Room
	4.5 Meeting Room 1
	4.6 Meeting Room 2
5.	**Common**
	5.1 Mechinical Room
	5.2 Electronic Room
	5.3 Pump Room
	5.4 Toilet
	5.5 Storage
	5.6 Guard House
	5.7 Corridor
	5.8 Others

ANNEX-2

Requested Equipment for the Project

Code No.	Description	Q'ty
WS1-2	Sockets Set	3
WS1-3	Reamer Sets	3
WS1-4	Air Compressor	1
WS1-5	Angle Grinder	3
WS1-6	Arc Welder	3
WS1-9	Circular Saw	2
WS1-11	CNC Lathe Machine	1
WS1-12	CNC Milling Machine	1
WS1-15	Cordless Metal Cutter	2
WS1-16	Deburring Kit	3
WS1-19	Drill Press	1
WS1-22	Engineering Tool Set	10
WS1-23	Engineer's Vice	3
WS1-24	Folding Machine	1
WS1-25	Hand Hole Punch Set	3
WS1-26	Hand Lever Press	1
WS1-28	Hand Spot Welder	1
WS1-37	Micro-tech Tool Sets	3
WS1-39	Mini Pipe Bender	1
WS1-42	Outside Micrometer	3
WS1-43	Pipe Bender	1
WS1-44	Power Saw (Reciprocating Type)	1
WS1-46	Tap & Die Sets	6
WS1-47	Spray Gun for Painting	2
WS1-54	AC Ammeter	5
WS1-55	AC Voltmeter	5
WS1-57	DC Ammeter	5
WS1-58	DC Voltmeter	5
WS1-59	Frequency Counter	5
WS1-60	Harmonic Analyzer	5
WS1-61	Hi Tester	5
WS1-62	Logic Probe	5
WS1-63	Analog Multimeter	10
WS1-64	Digital Storage Oscilloscope	5
WS1-66	DC Power Supply	10
WS1-67	Standard Signal Generator	5
WS1-68	DC Motor	6
WS1-69	Induction motor (3 phase)	3
WS1-70	Induction motor (1 phase)	3
WS1-72	Sliding Load Resistor	5
WS1-75	Pulse Generator	5
WS2-1	Laboratory Table & Chair Set	10
WS2-2	Cabinet for Workshop	5
EM1-1	Analog Multimeter	6
EM1-2	AC Ammeter	9
EM1-3	AC Voltmeter	9
EM1-5	Analog Frequency Meter	3
EM1-6	LCR Meter (S)	5
EM1-8	DC Ammeter	9
EM1-9	DC Ammeter	3
EM1-10	DC Potentiometer	1
EM1-11	DC Power Supply	6
EM1-12	DC Voltmeter	9
EM1-13	DC Voltmeter	6
EM1-14	Decaded Capacitor	3
EM1-15	Decaded Inductor	3
EM1-18	Decaded Resistance	6
EM1-19	Frequency Counter	6
EM1-20	Digital Multimeter	6
EM1-21	Electronic Voltmeter	6
EM1-23	Function Generator	6

Code No.	Description	Q'ty
EM1-24	Galvanometer	3
EM1-26	LCR Meter (L)	5
EM1-27	Power Factor Meter	3
EM1-28	Q Meter	1
EM1-29	Shunt Box	3
EM1-30	Single Phase Wattmeter	3
EM1-31	Slide Rheostats	3
EM1-34	Thermometer	6
EM1-35	Three Phase Wattmeter	3
EM1-37	Volt Slider	6
EM1-38	Wheatstone Bridge	5
EM1-43	Induction Voltage Regulator	1
EM1-47	Digital Storage Oscilloscope	6
EM2-1	Personal Computer with OS for Final Project Room	1
EM4-1	Laboratory Table & Chair Set	10
EM4-2	Cabinet	5
EM4-3	Laboratory Table & Chair Set for Final Project Room	5
EM4-4	Cabinet for Final Project Room	1
FA1-2	Temperature Transducers Training Apparatus	1
FA1-5	Thermometer	1
FA1-6	Optical Bench Training Apparatus	1
FA1-15	Limit Switch Training Apparatus	1
FA1-21	Magnetic Amplifier training apparatus	1
FA1-26	Linear displacement, Rotation position training apparatus	1
FA1-29	Sequence Control Timer & Counter training Apparatus	1
FA1-30	Motor Control Training Apparatus	1
FA1-31	Temperature Controller Training Apparatus	1
FA1-32	Thermometer	1
FA1-34	Water Level Controller Training Apparatus	1
FA1-36	DC Servo Motor	1
FA1-37	AC Servo Motor + Drives	1
FA1-38	Shaded Pole Motor	1
FA1-39	Tachometer (Optical)	5
FA1-40	PLC for Installation	5
FA1-51	PLC for Factory Automation	5
FA1-59	Digital Multimeter	5
FA1-60	Torque meter	1
FA1-61	Over Current Relays Training Apparatus	1
FA1-62	Over / Under Voltage Relays Training Apparatus	1
FA1-63	Reverse Power Relays Training Apparatus	1
FA1-64	Frequency Relays Training Apparatus	1
FA1-65	Programmable Relays Training Apparatus	1
FA1-70	Relay Testing / calibration	1
FA1-71	Moveable Regulated autotransformer	5
FA1-72	High inductive load	5
FA1-73	AC Ammeter	10
FA1-74	AC Voltmeter	10
FA1-76	Lighting Installation Module	1
FA1-77	Motor Control Training Apparatus	3
FA1-91	Fire Alarm System Taining Apparatus	3
FA1-96	Tool Set for Installation	6
FA1-109	MV Panel Training Apparatus	1
FA1-112	Earth tester	1
FA1-113	Insulation tester	1
FA1-115	Experiment Apparatus for ATM&AMF	1
FA1-118	Power Meter	1
FA1-120	Power Meter	3
FA1-121	Power High Tester	1
FA1-122	Electronic Circuit Tester	5
FA1-123	Computer simulation Software	1
FA1-126	Power Quality Analyze	1
FA1-127	FFT Analyzer	5

Code No.	Description	Q'ty
FA1-129	AC/DC Converter	2
FA1-130	UPS	1
FA1-131	Power Inverter	2
FA1-132	Harmonic Filter	1
FA1-134	Automatic Capacitor Bank Panel	1
FA1-136	Tele-measuring support equipment	1
FA1-137	Industrial Bus training module	5
FA1-138	Micro Controller training kit	1
FA1-139	Data Acquisition and Control Module	5
FA1-140	Embedded PC	5
FA1-141	Industrial PC	5
FA1-143	Panel PC with OS	5
FA1-146	Digital Storage Oscilloscope	5
FA1-147	Logic Analyzer	2
FA1-148	Universal Programmable	1
FA1-149	Universal Gang Programmer	1
FA1-150	EPROM Eraser	1
FA1-153	Industrial Software	1
FA1-155	Personal Computer with OS	5
FA2-1	Personal Computer with OS for Final Project Room	1
FA2-2	Multitester	1
FA2-3	Frequency Counter	1
FA2-4	Function generator	1
FA2-5	Digital Storage Oscilloscope	1
FA2-6	Power supply	1
FA2-7	Signal Conditioning	1
FA2-9	Tele-measuring support equipment	1
FA2-10	Data Acquisition and Control Module	1
FA2-11	Embedded PC	1
FA2-12	Industrial PC	1
FA2-13	Panel PC with OS	1
FA2-14	Data entry equipment	1
FA2-15	Universal Programmable	1
FA2-16	Universal Gang Programmer	1
FA2-17	EPROM Eraser	1
FA2-18	Industrial Software	1
FA2-19	Programmable Logic Controller	1
FA4-1	Laboratory Table & Chair Set	10
FA4-2	Cabinet	5
FA4-3	Laboratory Table & Chair Set for Final Project Room	5
FA4-4	Cabinet for Final Project Room	1
PE1-1	AC Ammeter	10
PE1-3	AC Ammeter	5
PE1-4	AC Mili Ammeter	2
PE1-7	AC Voltmeter	5
PE1-8	AC Voltmeter	10
PE1-14	DC Ammeter	10
PE1-17	DC Ammeter	10
PE1-20	DC Mili Ammeter	10
PE1-22	DC Voltmeter	10
PE1-24	DC Voltmeter	10
PE1-26	Digital Counter	6
PE1-34	Function Generator	6
PE1-40	Digital Storage Oscilloscope	6
PE1-48	Automatic Voltage Regulator	5
PE1-53	Wattmeter	5
PE1-54	Wattmeter	5
PE1-57	Power Factor Meter	5
PE1-58	Tachometer	5
PE1-59	Load Resistor	10
PE1-61	Inverter	10
PE1-63	Synchronous Generator Parallel Operational Panel	1

Code No.	Description	Q'ty
PE1-64	DC Motor -DC Generator Panel	1
PE1-65	Experiment Apparatus for Three Phase Induction Motor Panel	1
PE1-66	Experiment Apparatus for Static Converter-fed DC Machine Panel	1
PE1-67	Experiment Apparatus for Static Converter-fed Asynchronous Machine Panel	1
PE1-68	Experiment Apparatus for Transformer Panel	1
PE1-70	Experiment Apparatus for Asynchronous Machine Panel	1
PE1-71	Experiment Apparatus for Synchronous Generator Panel	1
PE1-76	Personal Computer with OS	6
PE1-77	ADAM Series	6
PE1-79	Current Transformer Sensor	6
PE1-80	Voltage Sensor	6
PE1-81	Experiment Apparatus for Power Electronics Panel	3
PE1-85	Transformer 1 phase	5
PE1-86	Transformer 3 phase	6
PE1-87	Volt Slider 1 phase	3
PE1-88	Volt Slider 3 phase	3
PE1-89	DC Power Source	3
PE2-1	Personal Computer with OS	1
PE3-2	Laboratory Table & Chair Set	10
PE3-3	Cabinet	5
PE3-4	Laboratory Table & Chair Set for Final Project Room	5
PE3-5	Cabinet for Final Project Room	1
EF1-1	Function Generator	5
EF1-2	Digital Storage Oscilloscope	5
EF1-3	Programmable DC Source	1
EF1-4	DC Power Supply	10
EF1-5	Electronic Voltmeter	5
EF1-6	Lux Meter	5
EF1-7	Digital Multimeter	5
EF1-8	Analog Multimeter	5
EF1-9	Thermometer	5
EF1-10	FFT Analyzer	5
EF1-11	Universal Counter	5
EF1-12	DC Ammeter	10
EF1-13	DC Ammeter	10
EF1-14	DC micro Ammeter	10
EF1-15	DC micro Ammeter	10
EF1-16	DC Voltmeter	10
EF1-17	Audio Analyzer	1
EF1-18	Random Noise Generator	1
EF1-19	Tachometer	1
EF1-20	Slid Voltage Regulator	5
EF1-21	Curve Tracer	1
EF2-1	Laboratory Table & Chair Set	10
EF2-2	Cabinet	5
DE1-1	Function Generators	5
DE1-2	Frequency Counter	5
DE1-3	Digital Storage Oscilloscope	5
DE1-4	Digital Multimeter	5
DE1-5	Logic Probe	5
DE1-6	Logic Pulser	5
DE1-7	Basic Logic Circuits Trainer	5
DE1-8	Advanced Logic Circuits Trainer	5
DE1-9	Logic Analyser	5
DE1-10	A/D D/A Conversion Module	5
DE1-11	DC Power Supply	5
DE2-1	Laboratory Table & Chair Set	10
DE2-2	Cabinet	5
CI1-1	Microprocessor Trainer	10
CI1-2	Embedded PC w/Controller Board	10
CI1-4	Micro Controller In-circuit Emulator	5
CI1-5	C Cross Compiler	5

Code No.	Description	Q'ty
CI1-6	Universal Programmer	3
CI1-7	Universal Emulator	10
CI1-8	PIC Micro Development Tools	10
CI1-9	Personal Computer with OS	10
CI2-1	Embedded PC	1
CI2-2	Micro Controller In-circuit Emulator	1
CI2-3	C Cross Compiler	1
CI2-4	PIC Micro Development Tools	1
CI2-5	Universal Programmer and Tester	1
CI2-6	Personal Computer with OS for Final Project Room	1
CI2-7	Printer (Color)	1
CI2-8	Scanner	1
CI2-9	Digital Camera	1
CI2-10	Logic Probe	1
CI2-12	Function Generator	1
CI2-13	Analog Multimeter	1
CI2-14	Frequency Counter	1
CI2-15	Pulse Generator	1
CI2-16	Logic Analyzer	1
CI2-17	Digital Storage Oscilloscope	1
CI2-18	UV EPROM Eraser	1
CI2-19	DC Power Supply	1
CI3-1	Laboratory Table & Chair Set	10
CI3-2	Cabinet	5
CI3-3	Laboratory Table & Chair Set for Final Project Room	5
CI3-4	Cabinet for Final Project Room	1
AC1-1	DC Power Supply	5
AC1-2	Digital Storage Oscilloscope	5
AC1-3	Frequency Counter	5
AC1-4	X-Y Recorder	2
AC1-5	Digital Multimeter	5
AC1-6	Process Trainer	1
AC1-7	Personal Computer with OS	5
AC1-8	PLC Trainer	3
AC1-9	Sensor & Transducer Interfacing Trainer	2
AC1-10	Mechatro Lab	2
AC1-11	Digital Servo Board	1
AC1-13	Analogue & Digital Servo Fundamental Trainer	1
AC1-14	Fundamental Pneumatic Trainer	1
AC1-15	Pneumatic Application Trainer	1
AC1-16	Fundamental Hydraulic Trainer	1
AC1-17	Hydraulic Application Trainer	1
AC1-18	Arm Robot Trainer	1
AC1-19	Relay Sequence Controller Trainer	2
AC1-23	Software(HDL Development Tool), package	1
	Software(HDL Development Tool), license	4
AC1-24	FPGA Module Design Kit	5
AC1-26	Software(for Training Kit), package	1
	Software(for Training Kit), license	4
AC1-28	Function Generator	5
AC2-1	DC Power Supply	1
AC2-2	Digital Storage Oscilloscope	1
AC2-3	Function Generator	1
AC2-4	Frequency Counter	1
AC2-5	Digital Multimeter	1
AC2-6	Personal Computer with OS	1
AC2-7	Printer (Color)	1
AC2-8	Scanner	1
AC2-9	Simulation Software for Control Automation	1
AC4-1	Laboratory Table & Chair Set	10
AC4-2	Cabinet	5
AC4-3	Laboratory Table & Chair Set for Final Project Room	5

Code No.	Description	Q'ty
AC4-4	Cabinet for Final Project Room	1
IC1-1	Function Generator	2
IC1-2	Digital Storage Oscilloscope	3
IC1-3	Complete DSP La Kit	1
IC1-4	Digital Multimeter	6
IC1-5	ECG Standard Function Generator	1
IC1-6	Remote Monitoring Modul Set	1
IC1-7	Biopac Student Lab Stimulator	1
IC1-8	MP 150 Starter System	1
IC1-9	BSL ULTIMATE SYSTEM	3
IC1-10	DC Power Supply	6
IC1-11	Optical Encoder	3
IC1-12	AD/DA Converter	2
IC1-13	Simulation Software for Fuzzy and Digital Control with Tool box	2
IC1-17	Indoor Robot Line	1
IC1-18	Single-boad Computer	6
IC1-19	Inverted Pendulum Trainer	1
IC1-20	Magnetic Levitation Trainer	1
IC1-21	RS-232C Break Box	1
IC1-22	Arm Robot	1
IC1-23	Ball and Beam Demonstrator	1
IC1-25	DC Motor w/Driver	2
IC1-26	Servo Motor w/Driver	2
IC1-27	Digital Camera	1
IC1-28	Electrical Safties Demonstrator	1
IC1-29-1	Personal Computer with OS	2
IC1-29-2	Panel PC with OS	2
IC1-30	Data Acquisition Module	2
IC1-31	Radio Modem	4
IC1-32	PLC Module	6
IC1-33	DCS Training Module	1
IC1-34	Mechatronic System Trainer	2
IC1-35	Graphic Recorder	3
IC1-37	Frequency Counter	1
IC1-38	Experimental Apparatus for Pneumatic Control	1
IC1-39	Tachometer	1
IC2-1	Function Generator	1
IC2-2	DC Power Supply	1
IC2-3	Digital Storage Oscilloscope	1
IC2-4	Personal Computer with OS for Final Project Room	1
IC2-5	DSP Board and Software	1
IC2-6	Digital Multimeter	1
IC2-7	AD/DA Converter	1
IC2-8	Simulation Software for Fuzzy and Digital Control with Tool box	1
IC2-12	Single-boad Computer	1
IC2-13	Printer	1
IC2-14	Scanner	1
IC4-1	Laboratory Table & Chair Set	10
IC4-2	Cabinet	5
IC4-3	Laboratory Table & Chair Set for Final Project Room	5
IC4-4	Cabinet for Final Project Room	1
RW1-1	DC Power Supply	3
RW1-2	DC Micro Ammeter	3
RW1-3	Personal Computer with OS	3
RW1-4	Set of Transmission Line Demonstrator	1
RW1-5	Set of Microwave Trainer	4
RW1-6	Microwave Counter	1
RW1-7	Function Generator	3
RW1-8	DC Mili Ammeter	3
RW1-9	Standard Dipole Antenna	1
RW1-11	Standard Log Periodic Antenna	2
RW1-12	Standard Signal Generator	1

Code No.	Description	Q'ty
RW1-13	Spectrum Analyzer	2
RW1-14	Tripod for Antenna	1
RW1-15	Micro Strip Antenna Trainer Set	1
RW1-16	DC-Current Measurement	6
RW1-17	AC Voltage Measurement	6
RW1-18	Standard Horn Antenna	1
RW1-19	Phase Shifter	3
RW1-20	Parabolic Antenna w/Digital Satellite Receiver	1
RW1-21	Cellular Telephony Trainer	2
RW1-22	Trainer for Interactive Multipurpose Electronics	2
RW1-23	Mobile Communication Trainer	2
RW1-24	Digital Storage Oscilloscope	3
RW1-25	Logic Analyzer	1
RW1-34	Termination Type Wattmeter	2
RW1-35	VHF Transmitter Receiver	2
RW1-36	Attenuator	2
RW1-37	Attenuator	2
RW1-38	Through Line Type Wattmeter	2
RW1-40	Frequency Counter	2
RW1-41	Universal Counter	1
RW1-43	Variable Standard Capacitance	1
RW1-44	Variable Standard Resistance	1
RW1-45	Electronic Voltmeter	3
RW2-2	Function Generator	1
RW2-3	Personal Computer with OS for Final Project Room	1
RW2-4	Digital Multimeter	1
RW2-5	Analog Multimeter	1
RW2-6	Tool Set	1
RW2-8	Oscilloscope	1
RW2-10	DC Power Supply	1
RW4-1	Laboratory Table & Chair Set	10
RW4-2	Cabinet	5
RW4-3	Laboratory Table & Chair Set for Final Project Room	5
RW4-4	Cabinet for Final Project Room	1
OP1-1	AC Mili Ammeter	3
OP1-2	AC Voltmeter	3
OP1-4	Beam Splitter	3
OP1-5	Capacity Meter	2
OP1-8	Connector Polisher	3
OP1-10	DC Ammeter	3
OP1-11	DC Micro Ammeter	3
OP1-12	DC Power Supply	3
OP1-13	DC Voltmeter	3
OP1-14	Digital Multimeter	3
OP1-17	Equipotential Lines Module	3
OP1-18	Fault Locator Tool Kits	3
OP1-19	Fiber Attenuator	3
OP1-20	Fiber Connector Equipment	6
OP1-21	Fiber Optic Clip-on Coupler	6
OP1-22	Function Generator	3
OP1-23	Galvanometer	3
OP1-34	Optical Fiber Connector	12
OP1-35	Optical Power Meter	3
OP1-36	Digital Storage Oscilloscope	3
OP1-45	Set of Grating	3
OP1-49	Set of Prism	3
OP1-53	Variable Pinhole	3
OP1-56	Volt-Stat	3
OP1-58	Optical Communication Trainer	3
OP1-59	Optoelectronic Trainer	3
OP1-60	Optical Fiber	3
OP1-61	Optical Fiber	3

Code No.	Description	Q'ty
OP1-62	Optical Fiber	3
OP2-1	Standard Signal Generator	1
OP2-2	Function Generator	1
OP2-3	Personal Computer with OS	1
OP2-4	Digital Multimeter	1
OP2-5	Analog Multimeter	1
OP2-6	Tool Set	1
OP2-8	Digital Storage Oscilloscope	1
OP2-10	DC Power Supply	1
OP4-1	Laboratory Table & Chair Set	10
OP4-2	Cabinet	5
OP4-3	Laboratory Table & Chair Set for Final Project Room	5
OP4-4	Cabinet for Final Project Room	1
DC1-1	Standard Signal Generator	3
DC1-3	Digital Storage Oscilloscope	3
DC1-5	Spectrum Analyzer	3
DC1-6	Function Generator	3
DC1-7	PAL Pattern Generator	1
DC1-8	AM/FM Radio Receiver	1
DC1-9	FSK Modem	3
DC1-10	Decaded Capacitor	3
DC1-11	Decaded Resistor	6
DC1-12	Electronic Voltmeter	3
DC1-14	Frequency Counter	3
DC1-15	Analog Multimeter	2
DC1-16	Digital Multimeter	3
DC1-18	DC Power Supply	3
DC1-19	Color TV Trainer	2
DC1-20	AM/FM Radio Trainer	2
DC1-21	Digital Modulation Apparatus	1
DC1-25	Digital Telephony Training Apparatus	1
DC1-34	PBX	1
DC1-35	Transmission System Training Apparatus	1
DC1-43	HT VHF	2
DC1-44	HT UHF	2
DC1-45	VSWR Meter	2
DC2-1	Standard Signal Generator	1
DC2-2	Function Generator	1
DC2-4	Digital Storage Oscilloscope	1
DC2-5	Analog Multimeter	1
DC2-6	Digital Multimeter	1
DC2-7	Tool Set	1
DC2-10	Personal Computer with OS for Final Project Room	1
DC2-12	Logic Probe	1
DC2-13	Electronic Voltmeter	1
DC2-14	Frequency Counter	1
DC4-1	Laboratory Table & Chair Set	10
DC4-2	Cabinet	5
DC4-3	Laboratory Table & Chair Set for Final Project Room	5
DC4-4	Cabinet for Final Project Room	1
PC1-1	Personal Computer	31
PC1-2	File Server	1
PC1-3	Printer (Monochrome)	1
PC1-4	Printer (Color)	1
PC1-5	Printer Server	1
PC1-6	Router	1
PC1-7	Switching Hub	2
PC1-8	UPS for Server, Router, Switching Hub	1
PC1-9	AVR for all PCs	1
PC1-10-1	Software (OS for Server), package	1
PC1-10-2	Software (OS for PC), package	1
	Software (OS for PC), license	31

Code No.	Description	Q'ty
PC1-10-3	Software (Programing Language), package	1
	Software (Programing Language), license	30
PC1-10-4	Software (Office Suite), package	1
PC1-10-5	Software (Anti Virus), package	1
	Software (Anti Virus), license	32
PC1-10-7	Software (FreeBSD for Router), package	1
PC1-11	LCD Projector	1
PC1-12	Screen	1
PC1-13	Cabinet	2
PC2-1	Personal Computer	31
PC2-2	File Server	1
PC2-3	Printer (Monochrome)	1
PC2-4	Printer (Color)	1
PC2-5	Printer Server	1
PC2-6	Router	1
PC2-7	Switching Hub	2
PC2-8	UPS for Server, Router, Switching Hub	1
PC2-9	AVR for all PCs	1
PC2-10-1	Software (OS for Server), package	1
PC2-10-2	Software (OS for PC:Linux), package	1
PC2-10-3	Software (Office Suite for Linux), package	1
PC2-10-7	Software(FreeBSD for Router), package	1
PC2-11	LCD Projector	1
PC2-12	Screen	1
PC2-13	Cabinet	2
PC3-1	Personal Computer	31
PC3-2	File Server	1
PC3-3	Printer (Monochrome)	1
PC3-4	Printer (Color)	1
PC3-5	Printer Server	1
PC3-6	Router	1
PC3-7	Switching Hub	2
PC3-8	UPS for Server, Router, Switching Hub	1
PC3-9	AVR for all PCs	1
PC3-10-1	Software(FreeBSD for Router), package	1
PC3-10-3	Software (for Graphics), package	1
	Software (for Graphics), license	15
PC3-10-4	Software(Anti Virus for MAC), package	1
	Software(Anti Virus for MAC), license	32
PC3-11	LCD Projector	1
PC3-12	Screen	1
PC3-13	Digital Still Camera	1
PC3-14	Scanner	1
PC3-15	Matrix Routing Switcher	1
PC3-16	Image Processing Card	1
PC3-17	TV	1
PC3-18	Digital Video Camera	1
PC3-19	Sound System Set	1
PC3-20	Cabinet	2
PC4-1	Personal Computer	36
PC4-2	File Server	1
PC4-3	Printer (Monochrome)	1
PC4-4	Printer (Color)	1
PC4-5	Printer Server	1
PC4-6	Router	1
PC4-7	Switching Hub	2
PC4-8	UPS for Server, Router, Switching Hub	1
PC4-9	AVR for all PCs	1
PC4-10-1	Software (OS for Server), package	1
PC4-10-2	Software (OS for PC), package	1
	Software (OS for PC), license	36

Code No.	Description	Q'ty
PC4-10-3	Software (Programing Language), package	1
	Software (Programing Language), license	35
PC4-10-5	Software (Word Processor), package	1
	Software (Word Processor), license	30
PC4-10-6	Software (Anti Virus), package	1
	Software (Anti Virus), license	37
PC4-10-9	Software (GIS), package	1
	Software (GIS), license	15
PC4-10-11	Software(FreeBSD for Router), package	1
PC4-11	LCD Projector	1
PC4-12	Screen	1
PC4-13	Cabinet	2
PC5-1	Personal Computer	36
PC5-2	File Server	1
PC5-3	Printer (Monochrome)	1
PC5-4	Printer (Color)	1
PC5-5	Printer Server	1
PC5-6	Router	1
PC5-7	Switching Hub	2
PC5-8	UPS for Server, Router, Switching Hub	1
PC5-9	AVR for all PCs	1
PC5-10-1	Software (OS for Server), package	1
PC5-10-2	Software (OS for PC), package	1
	Software (OS for PC), license	36
PC5-10-3	Software (Office Suite), package	1
PC5-10-4	Software (CAD), package	1
	Software (CAD), license	30
PC5-10-5	Software (For Simulation), package	1
	Software (For Simulation), license	30
PC5-10-6	Software (for Power Electronics Simulation), package	1
	Software (for Power Electronics Simulation), license	10
PC5-10-7	Software (Anti Virus), package	1
	Software (Anti Virus), license	37
PC5-10-9	Software (for Power System Simulation), package	1
	Software (for Power System Simulation), license	10
PC5-10-10	Software(FreeBSD for Router), package	1
PC5-11	LCD Projector	1
PC5-12	Screen	1
PC5-13	PC/DSP Board	2
PC5-14	Cabinet	2
PC6-1	Personal Computer	21
PC6-2	File Server	1
PC6-3	Note Book PC	1
PC6-4	Unix Server	1
PC6-5	Thin Client	10
PC6-6	Printer (Monochrome)	1
PC6-7	Printer Server	1
PC6-8	Router	1
PC6-9	Switching Hub	4
PC6-10	UPS for Server, Router, Switching Hub	1
PC6-11	AVR for all PCs	1
PC6-12-1	Software (OS for Server), package	1
PC6-12-2	Software (OS for PC), package	1
	Software (OS for PC), license	21
PC6-12-3	Software (Office Suite), package	1
PC6-12-4	Software (Anti Virus), package	1
	Software (Anti Virus), license	22
PC6-12-6	Software(FreeBSD for Router), package	1
PC6-13	LCD Projector	1
PC6-14	Screen	1
PC6-15	Cabinet	2
PC6-16	Sound Proof Chamber	1

Code No.	Description	Q'ty
PC6-17	Digital Audio Tape Recorder	1
PC6-18	Electric Condenser Microphone	1
PC6-19	Headphone	1
PC6-20	Digital Audio Processor	1
PC6-21	Precision Sound Level Meter	1
PC6-22	Audio Signal Generator	1
PC6-23	HIFI Sound System	1
PC6-24	Audio Mixer	1
PC6-25	Digital Storage Oscilloscope	1
PC6-26	Ethernet Cables	3
PC6-27	RJ-45 Connector	6
PC6-28	LAN Cable Tester	1
PC6-29	Ethernet Connector	70
PC6-30	Tool set for Networking	3
PC6-31	Communication Rack	2
PC6-32	LAN HUB	4
PC6-33	Protocol Analyzer	1
PC6-34	LAN Analyzer	1
PC6-35	Equipment for xDSL	6
PC6-36	CTI Card	6
PC6-37-1	Internet Router	2
PC6-37-2	Internet Router	2
PC6-38-2	Cable for Internet Router	4
PC6-38-3	Cable for Internet Router	4
PC6-38-5	Switching Hub	4
PC6-38-6	Switching Hub	4
PC6-39	Ethernet Tranceiver	6
PC6-41	Wave LAN Card	6
PC6-42	Indoor Antenna for Wave LAN	6
PC6-43	Outdoor Antenna for Wave LAN	3
PC6-44	Wave LAN Booster	3
PC6-45	Wave LAN Remote Outdoor Router	2
PC6-46	Ethernet Card	15
PC6-47	Ethernet Cables	70
PC6-48	Modem	10
PC6-49	PBX	1
PC6-50	VoIP Blaster Card	4
PC6-51	ISDN Emulator	2
PC6-52	A/D Converter	4
PC6-53	D/A Converter	4
PC6-54	Programmable Peripheral Interface Card	4
PC6-55	PC Interface Trainer	4
PC6-56	ADAMS Series	4
PC6-57	Cabinet	2
GN-1	Table for General Class Room (for Student)	420
GN-2	Chair for General Class Room (for Student)	420
GN-3	Table for General Class Room (for Lecturer)	14

ANNEX - 3

Necessary Measures to be taken by the Indonesian Side

(1) Procedure Items of the Indonesian Side

1) Tax Exemption

- Under the Japanese Grant Aid scheme, the equipment and materials purchased for this project shall be free of tax.
- Based on the certified contract, the provided equipment and service, and the Japanese who are involved in this project shall be exempt from custom tariff, domestic tax and other financial taxes.

2) Convenience Provision

- Based on the certified contract, the convenience for entry and stay permit in Indonesia to the Japanese who will be involved in this project shall be provided.

3) Obtain Building Permits:

- As EEPIS is recognized as the institution under the direct control of DGHE, the building planning shall be applied to the authority concerned so as to be approved as the public facility.
- An application to receive fire-fighting permission to submit necessary application documents to fire station Headquarter in Surabaya City for fire fighting approval.
- An application to receive electric power shall be submitted to PLN (an electric power company) with necessary documents which indicates an estimated demand for approval.
- An application to receive water supply shall be submitted to PDAM (a water supply enterprise) with necessary documents for approval.
- An application to receive sewage disposal shall be submitted to Environment Bureau in Surabaya City with necessary documents for approval.

(2) Portions by the Indonesian Side

The portions by the Indonesian side except 'Table 2-7' on page 2-38 of the Draft Report are as follows:

1) Before Implementation

- To construct water supply pipe for construction work use;
- To remove the existing warehouses, the existing bicycle parking, and all the existing facilities inside of the project site;
- To construct an access road for the construction of new buildings, if necessary;
- To remove the existing electric power service line and the existing water supply pipe, main feeder wiring, telephone line, Public Address Line under the ground in the project site.

2) During Implementation

- To landscape and to garden of EEPIS site;
- To purchase the install office furniture, curtain, and carpet, etc. of EEPIS;
- planting trees;
- To construct cabling or piping work for main feeder wiring, water supply, telephone line and LAN, etc. to the project site;
- To issue permissions and the licenses, etc., necessary for the implementation of the project, without delay.

The Project for Expansion of Electronic Engineering Polytechnics Institute of Surabaya in the Republic of Indonesia

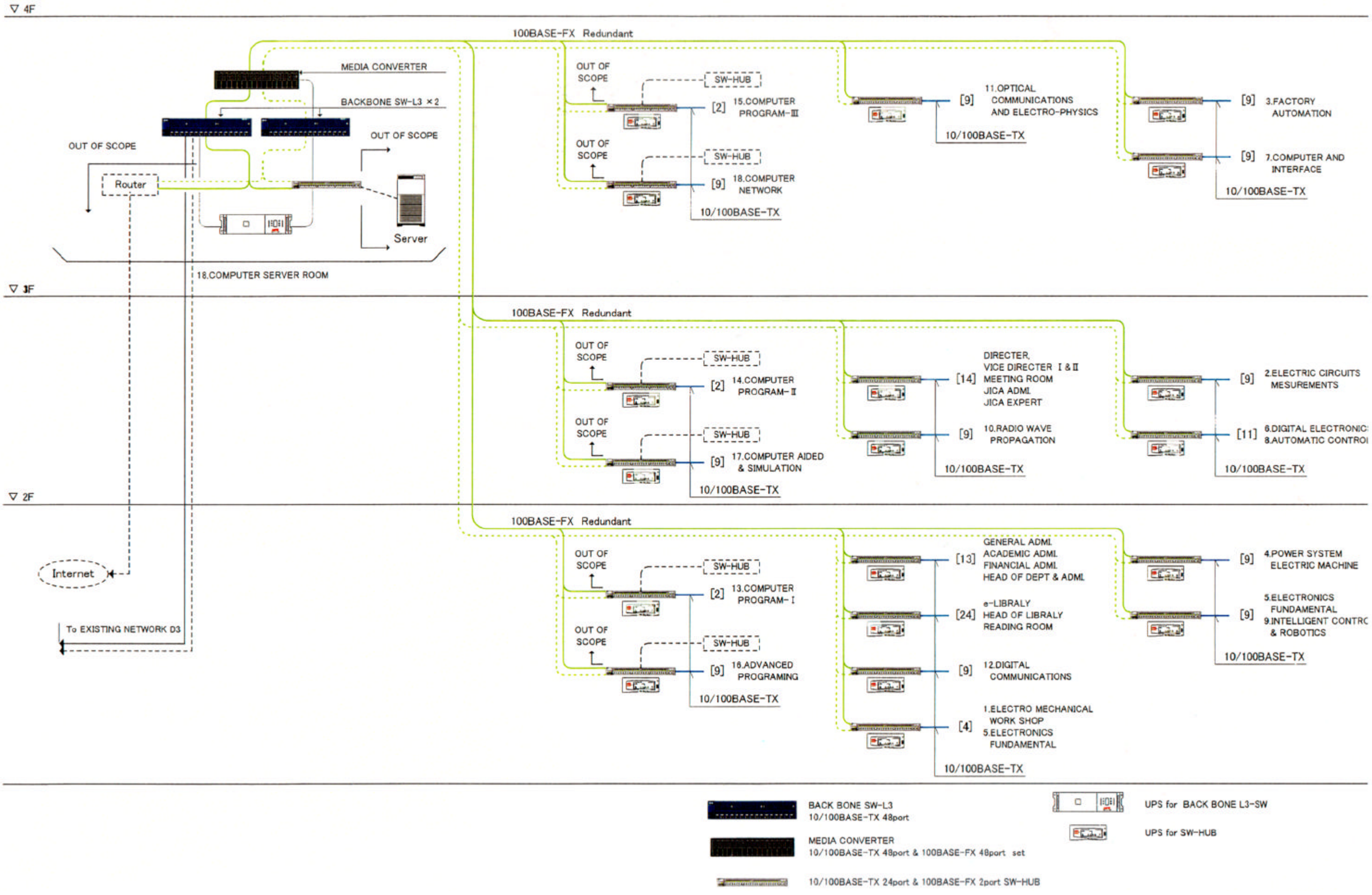
Extent of Works

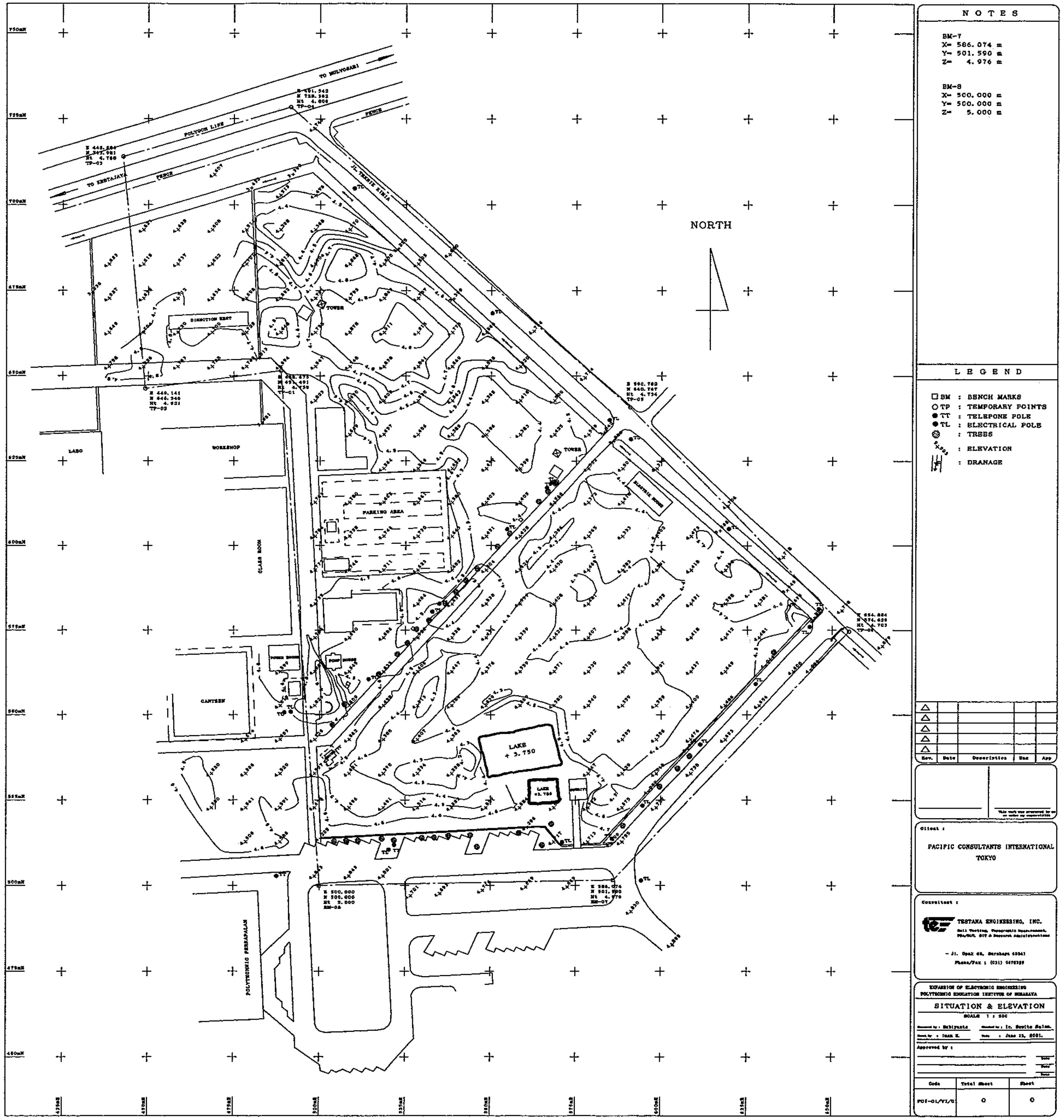
Portions by the Japanese Side	Portions by the Indonesian Side	Budget (Rough Estimation, RP
(1) **Building Works** Structure works, finishing works (2) **Electrical Works** Power • trunk facilities, lighting, power outlets, P/A systems (3) **Utilities and Facilities** a) Water Supply Providing water tanks, pumps and related internal piping work b) Sewerage system including piping works up to the connection manhole c) Sewage treatment plant d) Fire-hydrant and extinguishing facilities e) Electrical supply and transformer system, Cabling work from main switchgear panel to the facilities f) Telecommunication system Providing a new PABX, MDF telephones and wiring work g) Lightning Protection System h) Lighting system in the site i) Air conditioning system j) Mechanical ventilation system (4) Exterior Work Road, path and parking lots within the site (5) Equipment Experimental and educational equipment (6) Electric Room, Electric Generator Room, Pump Room	(1) **Site Preparation** a) Ground preparation woks: (Demolish the guard-house, parking lot, warehouse etc.) b) Temporary power and water supply for the construction c) Access road (2) **External Works** Landscaping, planting, fence, etc within the Site (3) **Utilities and Facilities** a) Water Supply Providing portable water supply Relocating the existing piping to the student's house b) Waste and Storm Drainage Providing connecting point to the existing open canal c) Electrical work Providing medium voltage power supply Relocating the existing primary power supply Relocating the existing power supply to the student's house Relocating the existing power supply to he shipbuilding Polytechnic d) Telecommunication Work Connecting between the existing system and new system e) Local Area Network Connecting between the existing system and new system f) Fire alarm system Connecting between the existing system and new system g) Relocating the existing electrical wiring to the student's house	(1) **Site Preparation** a) 2,227,739,954 b) 27,005,000 c) 28,160,000 (2) **External Works** 297,000,000 (3) **Utilities and Facilities** a) 25,778,600 b) 10,477,500 c) 409,630,946 d) 230,780,000 e) 22,275,000 f) 3,518,350 g) Including in Item(3) c)

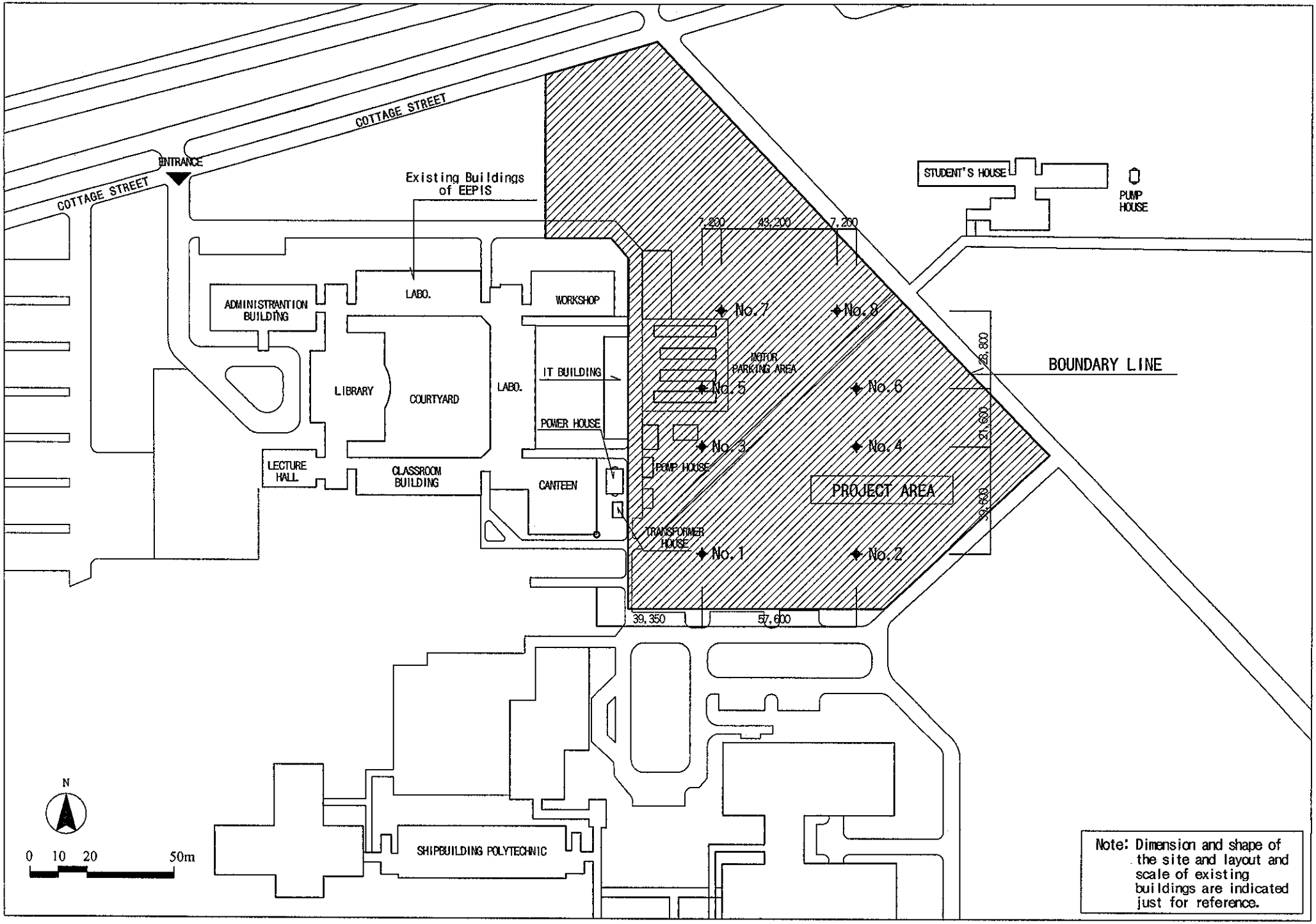
Portions by the Japanese Side	Portions by the Indonesian Side	Budget (Rough Estimation, RP
	(4) **General Furniture**	(4) **General Furniture** 1,015,412,500
	(5) **Others** a) Governmental works including the application for Governmental approvals and permissions b) Smooth custom clearance, tax exemptions and prompt internal transportation for the imported construction materials and equipment c) Commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement namely the advising commission of the "Authorization to Pay" and payment commission (6) Management, operation and maintenance cost for the new building and facilities (7) Tax exemptions and necessary preferential treatment for the construction staff from Japan or a third country (8) Smooth entry , re-entry and departure to/from Indonesia for the Japanese technical staff (9) All the expenses, other than to be born by the Japan's Grant Aid within the scope of the Project	(5) **Others** a) 8,000,000 b) - c) - (6) 1,827,600,890/Year (7) - (8) - (9) -

Total Required Budget 6,133,378,740 RP
(Including management, operation and maintenance cost for the new building and facilities in the first year)

EEPIS D4 NETWORK




NOTES
BM-7
X= 586.074 m
Y= 501.590 m
Z= 4.976 m
BM-8
X= 500.000 m
Y= 500.000 m
Z= 5.000 m
LEGEND
BM : BENCH MARKS
TP : TEMPORARY POINTS
TT : TELEPONE POLE
TL : ELECTRICAL POLE
: TREES
: ELEVATION
: DRANAGE
Rev. Date Description App
Client :
PACIFIC CONSULTANTS INTERNATIONAL
TOKYO
Consultant :
TESTANA ENGINEERING, INC.
SITUATION & ELEVATION
Approved by :
Code Total Sheet Sheet
0 0
NORTH
LAKE
+ 3.750
PARKING AREA
WORKSHOP
CANTEEN
TOWER
TO MULYOSARI
POLYGON LINE
FENCE


COTTAGE STREET
ENTRANCE
COTTAGE STREET
Existing Buildings of EEPIS
STUDENT'S HOUSE
PUMP HOUSE
7,200
43,200
7,200
ADMINISTRANTION BUILDING
LABO.
WORKSHOP
No.7
No.8
MOTOR PARKING AREA
BOUNDARY LINE
28,800
LIBRARY
COURTYARD
LABO.
IT BUILDING
No.5
No.6
POWER HOUSE
21,600
No.3
No.4
LECTURE HALL
CLASSROOM BUILDING
CANTEEN
PUMP HOUSE
PROJECT AREA
TRANSFORMER HOUSE
No.1
No.2
39,350
57,600
N
0 10 20 50m
SHIPBUILDING POLYTECHNIC
Note: Dimension and shape of the site and layout and scale of existing buildings are indicated just for reference.

TESTANA ENGINEERING, Inc.

A.BL.1. BORING LOG

BOREHOLE # : **BH - 1**

PROJECT : **Electronic Engineering Polytechnics ITS**

LOCATION : **Sukolilo, Surabaya**

COORDINATE : -

DEPTH : - 45 m

GROUND WATER LEVEL :

GROUND SURFACE LEVEL :

DEPTH, m.	SOIL DESCRIPTION	STANDARD PENETRATION TEST	TYPE	C	φ	qu	ATTERBERG LIMITS	γ	Gs	eo
0 – 2	Clay, brown, inorganic, some silt, trace sand, very soft to soft.	4, <1, <1								
3 – 5	Sand, grey, little clay, little silt, very loose.	<1, <1, <1	QT	0.07	12	-	22, 55	1.66	2.60	1.43
6 – 11	Clay, grey, inorganic, some silt, trace sand, very soft.	<1, <1, <1, <1, <1	UU	0.09	0	-	29, 59, 93	1.47	2.59	2.40
			UU	0.10	0	-	27, 55, 87	1.48	2.56	2.23
			UU	0.12	0	-	25, 50, 74	1.55	2.61	1.93
12 – 15	Sand, brown, little clay, little silt, loose to medium.	6, 21, 18, 25	QT	0.09	25	-	23, 39, 41	1.77	2.60	1.07
16 – 17	Clay, brown, inorganic, some silt, trace sand, very stiff.	18, 25								
18 – 20	Sand, brown, little silt, little clay, medium.	25, 24, 26, 23								
21 – 24	Clay, brown, inorganic, some silt, trace sand, very stiff.	22, 22, 24, 27								
25 – 27	Clay, reddish brown, inorganic, some silt, little sand, very stiff.	25, 24, 23								
28 – 32	Sand, light brown, little silt, little clay, contains gravel, medium to dense.	26, 34, 50, 36, 39								
33 – 36	Clay, greenish brown, some silt, some sand, very stiff.	22, 23, 24, 23								
37 – 39	Sand, grey, little silt, little clay, dense.	38, 30, 46								
40 – 45	Clay, grey, inorganic, some silt, trace sand, very stiff.	18, 23, 23, 21, 23, 22								
45	End of boring									

NOTE :

0 to 10 % = Trace
10 to 20 % = Little
20 to 35 % = Some
35 to 50 % = And

■ = Thin Walled
▨ = SPT
C = Cohesion intercept, kg/cm²
φ = Internal friction angle, deg

UU = Unconsolidated undrained
CU = Consolidated undrained
CD = Consolidated drained
SPT = Standart penetration test (blows / ft)
qu = Unconfined compression strength, kg/cm²

○ = Wn = Moisture content, %
● = Wp = Plastic limit, %
Δ = Wt = Liquit limit, %
γ = Bulk density, t/m³
Gs = Spesific gravity
eo = Void ratio

TESTANA ENGINEERING, Inc.

A.BL.2. BORING LOG

BOREHOLE # : **BH - 2**

PROJECT : **Electronic Engineering Polytechnics ITS**

LOCATION : **Sukolilo, Surabaya**

COORDINATE : -

DEPTH : **- 45 m**

GROUND WATER LEVEL :

GROUND SURFACE LEVEL :

DEPTH, m,	SOIL DESCRIPTION	STANDARD PENETRATION TEST	TYPE	STRENGTH TEST c	φ	qu	ATTERBERG LIMITS	γ	Gs	eo
0-2	Clay, brown, inorganic, some silt, little sand, very soft.	0 10 20 30 40 ≥50					0 20 40 60 80 100			
3-5	Sand, grey, some clay, little silt, very loose.		QT	0.06	13	-	58	1.64	2.61	1.51
			QT	0.08	12	-	56	1.65	2.60	1.46
6-12	Clay, grey, inorganic, some silt, trace sand, very soft.		UU	0.08	0	-	25 49 83	1.50	2.58	2.15
			UU	0.11	0	-	23 48 80	1.52	2.59	2.07
13-15	Sand, brown, little clay, little silt, medium to dense.	24 28 37	QT	0.14	30	-	25 35 50	1.77	2.60	1.20
16-17	Clay, brown, inorganic, some silt, trace sand, very stiff to hard.	29 38								
18-20	Sand, brown, little clay, little silt, contains gravel, dense.	39 40 37								
21-24	Clay, brown, inorganic, some silt, trace sand, very stiff to hard.	38 28 28 29								
25-26	Clay, reddish brown, inorganic, some silt, little sand, very stiff.	26 28								
27-30	Sand, light brown, little silt, little clay, dense.	28 37 35 50								
31-37	Clay, light brown, inorganic, some silt, trace sand, very stiff.	21 22 23 22 20 23 20								
38-39	Sand, brownish grey, little silt, little clay, medium.	23 25								
40-45	Clay, grey, inorganic, some silt, trace sand, very stiff.	23 22 19 18 20 25								
45	End of Boring									

NOTE :

0 to 10 % = Trace
10 to 20 % = Little
20 to 35 % = Some
35 to 50 % = And

▨ = Thin Walled
▨ = SPT
C = Cohesion intercept, kg/cm²
φ = Internal friction angle, deg

UU = Unconsolidated undrained
CU = Consolidated undrained
CD = Consolidated drained
SPT = Standart penetration test (blows / ft)
qu = Unconfined compression strength, kg/cm²

○ = Wn = Moisture content, %
● = Wp = Plastic limit, %
Δ = Wt = Liquit limit, %
γ = Bulk density, t/m³
Gs = Spesific gravity
eo = Void ratio

TESTANA ENGINEERING, Inc. | **A.BL.3. BORING LOG** | BOREHOLE # : **BH - 3.**

PROJECT : **Electronic Engineering Polytechnics ITS** | COORDINATE : - | GROUND WATER LEVEL :

LOCATION : **Sukolilo, Surabaya** | DEPTH : **- 45 m** | GROUND SURFACE LEVEL :

DEPTH, m,	SOIL DESCRIPTION	STANDARD PENETRATION TEST (0 10 20 30 40)	TYPE	C	φ	qu	ATTERBERG LIMITS (0 20 40 60 80 100)	γ	Gs	eo
0 – 3	Clay, yellowish brown, some silt, trace sand, soft. Sand, grey, trace clay, trace silt, loose.	2, 3, 5	QT	0.07	19	-	53	1.67	2.60	1.38
3 – 12	Clay, grey, inorganic, some silt, trace sand, very soft.	1	UU	0.10	0	-	29, 57, 88	1.49	2.60	2.28
			UU	0.11	0	-	30, 62, 86	1.50	2.61	2.24
12 – 13	Clay and sand, grey, some silt, soft.	3								
13 – 19	Sand, light brown, little silt, little clay, medium.	16, 11, 13, 10, 12, 13	QT	0.14	29	-	23, 38, 48	1.71	2.59	1.24
19 – 27	Clay, yellowish brown, inorganic, some silt, trace to little sand, stiff to very stiff.	12, 11, 16, 19, 21, 22, 23, 22	UU	0.72	0	-	30, 46, 61	1.74	2.63	1.21
27 – 31	Sand, brownish grey, little clay, little silt, medium to dense.	17, 14, 28, 50								
31 – 37	Clay, greyish brown, inorganic, some silt, trace to little sand, very stiff.	15, 16, 18, 19, 22, 21								
37 – 39	Sand, light brown, little clay, little silt, medium.	20, 19								
39 – 45	Clay, grey, inorganic, some silt, trace sand, very stiff.	15, 16, 16, 17, 18, 20								
45	End of Boring									

NOTE :

0 to 10 % = Trace
10 to 20 % = Little
20 to 35 % = Some
35 to 50 % = And

▰ = Thin Walled
▨ = SPT
C = Cohesion intercept, kg/cm²
φ = Internal friction angle, deg

UU = Unconsolidated undrained
CU = Consolidated undrained
CD = Consolidated drained
SPT = Standart penetration test (blows / ft)
qu = Unconfined compression strength, kg/cm²

○ = Wn = Moisture content, %
● = Wp = Plastic limit, %
Δ = Wt = Liquit limit, %
γ = Bulk density, t/m³
Gs = Spesific gravity
eo = Void ratio

TESTANA ENGINEERING, Inc.

A.BL.4. BORING LOG

BOREHOLE # : **BH - 4**

PROJECT : **Electronic Engineering Polytechnics ITS**
LOCATION : **Sukolilo, Surabaya**
COORDINATE : -
DEPTH : - 45 m
GROUND WATER LEVEL :
GROUND SURFACE LEVEL :

DEPTH, m.	SOIL DESCRIPTION	STANDARD PENETRATION TEST	TYPE	c	φ	qu	ATTERBERG LIMITS	γ	Gs	eo
0-1	Clay, brownish grey, some silt, inorganic, little sand, very soft.	<1	UU	0.08	0	-	27 52 91	1.47	2.60	2.38
2-3		<1								
3-4	Sand, grey, little clay, little silt, very soft to soft.	<1	QT	0.09	14	-	55	1.66	2.60	1.43
4-5		1								
5-6		2	QT	0.07	19	-	53	1.67	2.60	1.38
6-7	Clay, grey, inorganic, some silt, trace sand, very soft.	<1								
7-8		<1								
8-9		<1								
9-10		<1	UU	0.09	0	-	28 58 77	1.54	2.65	2.05
10-11		<1								
11-12		<1								
12-13	Silt and sand, light brown, little clay, contains gravel at 15 to 15,5 m, loose to medium.	5								
13-14		7								
14-15		8	QT	0.20	27	-	28 44 48	1.71	2.60	1.25
15-16		14								
16-17		21								
17-18		29								
18-19		27								
19-20	Clay, brown, inorganic, some silt, trace to little sand, very stiff.	25								
20-21		25								
21-22		25								
22-23		23								
23-24		25								
24-25		26								
25-26		24								
26-27		24								
27-28	Sand, brownish grey, little clay, little silt, contains gravel at 29 m depth, medium to very dense.	25								
28-29		27								
29-30		51								
30-31	Clay and silt, greyish brown, trace to little sand, very stiff.	20								
31-32		21								
32-33		22								
33-34		21								
34-35		22								
35-36		23								
36-37		23								
37-38		21								
38-39	Sand, grey, little clay, little silt, medium.	21								
39-40		22								
40-41	Clay, grey, inorganic, some silt, trace sand, very stiff.	21								
41-42		20								
42-43		22								
43-44		22								
44-45		23								
45-46	End of boring.									
46-50										

NOTE :

0 to 10 % = Trace
10 to 20 % = Little
20 to 35 % = Some
35 to 50 % = And

= Thin Walled
= SPT
C = Cohesion intercept, kg/cm²
φ = Internal friction angle, deg

UU = Unconsolidated undrained
CU = Consolidated undrained
CD = Consolidated drained
SPT = Standart penetration test (blows / ft)
qu = Unconfined compression strength, kg/cm²

O = Wn = Moisture content, %
● = Wp = Plastic limit, %
Δ = Wt = Liquit limit, %
γ = Bulk density, t/m³
Gs = Spesific gravity
eo = Void ratio

TESTANA ENGINEERING, Inc.

A.BL.5. BORING LOG

BOREHOLE # : **BH - 5.**

PROJECT : **Electronic Engineering Polytechnics ITS**

LOCATION : **Sukolilo, Surabaya**

COORDINATE : -

DEPTH : - 45 m

GROUND WATER LEVEL :

GROUND SURFACE LEVEL :

DEPTH, m,	SOIL DESCRIPTION	STANDARD PENETRATION TEST (0 10 20 30 40)	TYPE	c	φ	qu	ATTERBERG LIMITS (0 20 40 60 80 100)	γ	Gs	eo
0 – 2	Clay, yellowish brown, inorganic, some silt, little sand, very soft.	1, 1, 1								
2 – 12	Clay, grey, some silt, trace to little sand, contains lime at the upper part, very soft to soft.	2	UU	0.11	0	-	24 47 85	1.52	2.71	2.30
			UU	0.11	0	-	25 48 87	1.50	2.66	2.32
			UU	0.12	0	-	27 52 76	1.55	2.66	2.02
12 – 13	Sand, dark grey,trace silt, loose	6								
13 – 14	Sand, light brown, trace silt, loose	7								
14 – 16		8								
15 – 19	Sand, brown, little silt, little clay, loose to medium.	9, 14, 18, 15	UU	0.12	28	-	21 36 47	1.72	2.61	1.23
			UU	0.07	29	-	22 37 45	1.75	2.65	1.20
19 – 27	Clay, yellowish brown, inorganic, some silt, trace to some sand, stiff to hard.	24, 28, 21, 13, 36, 29, 31, 36								
27 – 31	Sand, light brown, little clay, little silt, medium to dense.	33, 27, 35, 33								
31 – 38	Clay, greyish brown, inorganic, some silt, trace to little sand, very stiff.	18, 19, 17, 18, 22, 21								
38 – 40	Sand, light brown, little silt, little clay, dense.	42, 40								
40 – 45	Clay, grey, inorganic, some silt, trace sand, very stiff.	17, 16, 17, 18, 21, 21								
45	End of Boring									

NOTE :

0 to 10 % = Trace
10 to 20 % = Little
20 to 35 % = Some
35 to 50 % = And

= Thin Walled

= SPT

C = Cohesion intercept, kg/cm²

φ = Internal friction angle, deg

UU = Unconsolidated undrained
CU = Consolidated undrained
CD = Consolidated drained
SPT = Standart penetration test (blows / ft)
qu = Unconfined compression strength, kg/cm²

○ = Wn = Moisture content, %
● = Wp = Plastic limit, %
Δ = Wl = Liquit limit, %
γ = Bulk density, t/m³
Gs = Spesific gravity
eo = Void ratio

TESTANA ENGINEERING, Inc.

A.BL.6. BORING LOG

BOREHOLE # : **BH - 6**

PROJECT : **Electronic Engineering Polytechnics ITS**

LOCATION : **Sukolilo, Surabaya**

COORDINATE : -

DEPTH : - 45 m

GROUND WATER LEVEL :

GROUND SURFACE LEVEL :

DEPTH, m,	SOIL DESCRIPTION	STANDARD PENETRATION TEST	TYPE	c	φ	qu	ATTERBERG LIMITS	γ	Gs	eo
0 - 1	Clay, yellowish brown, inorganic, some silt, little sand, very soft.	<1								
1 - 2		<1								
2 - 3		<1								
3 - 4		<1	UU	0.08	0	-	25 58 90	1.48	2.60	2.34
4 - 5		<1								
5 - 6		<1	UU	0.10	0	-	21 50 88	1.49	2.61	2.29
6 - 7	Clay, grey, inorganic, some silt, trace to little sand, very soft.	<1								
7 - 8		<1								
8 - 9		<1	UU	0.10	0	-	29 60 83	1.51	2.60	2.15
9 - 10		<1								
10 - 11		<1								
11 - 12		<1	UU	0.13	0	-	27 58 73	1.56	2.63	1.92
12 - 13	Clay and sand, greenish grey, some silt, very soft to soft.	<1 3								
13 - 14		4								
14 - 15		6	QT	0.14	29	-	29 42 49	1.71	2.61	1.27
15 - 16	Silt and sand, brown, little clay, loose to medium.	7								
16 - 17		9								
17 - 18		23								
18 - 19	Sand, brown, trace silt.	25								
19 - 20		30								
20 - 21	Silt and sand, brown, little clay, medium to dense.	38								
21 - 22		23								
22 - 23		21								
23 - 24	Clay, light brown, inorganic, some silt, trace sand, very stiff.	20								
24 - 25		21								
25 - 26		24								
26 - 27		25								
27 - 28		24								
28 - 29	Sand, light brown, little clay, little silt, cobble at -30 m depths, medium to very dense.	42								
29 - 30		50/23								
30 - 31		35								
31 - 32		24								
32 - 33		21								
33 - 34	Clay, light brown, inorganic, some silt, trace sand, very stiff.	20								
34 - 35		22								
35 - 36		22								
36 - 37		22								
37 - 38	Sand, grey, little clay, little silt, medium.	22								
38 - 39		23								
39 - 40		19								
40 - 41		21								
41 - 42	Clay, grey, inorganic, some silt, trace sand, very stiff.	22								
42 - 43		21								
43 - 44		21								
44 - 45		23								
45	End of Boring									

NOTE :

0 to 10 % = Trace
10 to 20 % = Little
20 to 35 % = Some
35 to 50 % = And

= Thin Walled

= SPT

C = Cohesion intercept, kg/cm²

φ = Internal friction angle, deg

UU = Unconsolidated undrained
CU = Consolidated undrained
CD = Consolidated drained
SPT = Standart penetration test (blows / ft)
qu = Unconfined compression strength, kg/cm²

O = Wn = Moisture content, %
● = Wp = Plastic limit, %
Δ = Wl = Liquit limit, %
γ = Bulk density, t/m³
Gs = Spesific gravity
eo = Void ratio

TESTANA ENGINEERING, Inc.

A.BL.7. BORING LOG

BOREHOLE # : BH - 7

PROJECT : Electronic Engineering Polytechnics ITS
LOCATION : Sukolilo, Surabaya
COORDINATE : -
DEPTH : - 45 m
GROUND WATER LEVEL :
GROUND SURFACE LEVEL :

DEPTH, m.	SOIL DESCRIPTION	STANDARD PENETRATION TEST (0 10 20 30 40 ≥50)	TYPE	C	φ	qu	ATTERBERG LIMITS (0 20 40 60 80 100)	γ	Gs	eo
0 – 1 – 2 – 3	Clay, yellowish brown, inorganic, some silt, little sand. Clay, brownish grey, inorganic, some silt, little sand, very soft.		UU	0.09	0	-	27 59 89	1.48	2.60	2.32
3 – 4	Clay, grey, some silt, trace sand.									
4 – 5	Sand, grey, little silt, little clay.		QT	0.07	15	-	20 32 56	1.65	2.61	1.47
5 – 12	Clay, grey, inorganic, some silt, trace sand, very soft.		UU	0.09	0	-	29 58 88	1.49	2.61	2.29
			UU	0.10	0	-	24 51 80	1.52	2.60	2.08
12 – 16	Silt and sand, brown, some clay, loose to dense.	6 6 5 7 32 39 28 29 31	QT	0.28	29	-	27 41 47	1.73	2.62	1.23
16 – 26	Clay, brown, inorganic, some silt, trace sand, very stiff to hard.	19 20 23 24 40								
26 – 27	Sand, brown, little clay, little silt.	20								
27 – 30	Clay, light brown, inorganic, some silt, some sand, very stiff.	20 18 21								
30 – 36	Clay, greyish brown, inorganic, some silt, trace sand, very stiff.	26 23 22 22 29 23								
36 – 39	Sand, light brown, little clay, little silt, medium to dense.	23 34 46								
39 – 45	Clay and silt, greyish brown, contains gravel, very stiff. Clay, grey, inorganic, some silt, trace sand, very stiff.	17 21 20 20 21 23								
45 – 50	End of boring									

NOTE :

0 to 10 % = Trace
10 to 20 % = Little
20 to 35 % = Some
35 to 50 % = And

= Thin Walled
= SPT
C = Cohesion intercept, kg/cm²
φ = Internal friction angle, deg

UU = Unconsolidated undrained
CU = Consolidated undrained
CD = Consolidated drained
SPT = Standart penetration test (blows / ft)
qu = Unconfined compression strength, kg/cm²

○ = Wn = Moisture content, %
● = Wp = Plastic limit, %
△ = Wt = Liquit limit, %
γ = Bulk density, t/m³
Gs = Spesific gravity
eo = Void ratio

TESTANA ENGINEERING, Inc.

A.BL.8. BORING LOG

BOREHOLE # : **BH - 8**

PROJECT : **Electronic Engineering Polytechnics ITS**
LOCATION : **Sukolilo, Surabaya**
COORDINATE : -
DEPTH : **- 45 m**
GROUND WATER LEVEL :
GROUND SURFACE LEVEL :

DEPTH, m,	SOIL DESCRIPTION	STANDARD PENETRATION TEST	TYPE	c	φ	qu	ATTERBERG LIMITS	γ	Gs	eo
0	Clay, yellowish brown, some silt, little sand.	A1								
1		A1								
2		A1								
3		A1	UU	0.10	0	-	28 53 87	1.49	2.60	2.26
4		A1								
5		A1								
6	Clay, grey, inorganic, some silt, trace to some sand, very soft.	A1	UU	0.10	0	-	26 51 84	1.50	2.60	2.19
7		A1								
8		A1								
9		A1	UU	0.11	0	-	29 55 83	1.51	2.60	2.15
10		A1								
11		A1								
12		A1	UU	0.13	0	-	30 65 77	1.54	2.63	2.02
13	Clay and sand, brownish grey, some silt, medium.	3								
14		7	QT	0.20	30	-	28 43 45	1.75	2.65	1.20
15		24								
16		21								
17		18								
18	Sand and silt, light brown, little clay, medium.	17								
19		18								
20		20								
21		21								
22		24								
23		20								
24		23								
25	Clay, brown, inorganic, some silt, trace sand, very stiff.	22								
26		22								
27		24								
28	Sand, brown, little clay, little silt, dense.	30								
29		49								
30		50								
31	Clay, greyish brown, inorganic, some silt, little sand, very stiff.	24								
32		22								
33		20								
34		21								
35		20								
36		23								
37		24								
38	Sand, light brown, trace silt, cobble at 37.50 m depths, medium.	24								
39		25								
40	Clay, grey, inorganic, some silt, trace sand, very stiff.	17								
41		18								
42		18								
43		19								
44		20								
45		23								
46	End of boring.									
47										
48										
49										
50										

NOTE :

0 to 10 % = Trace
10 to 20 % = Little
20 to 35 % = Some
35 to 50 % = And

= Thin Walled
= SPT
C = Cohesion intercept, kg/cm²
φ = Internal friction angle, deg

UU = Unconsolidated undrained
CU = Consolidated undrained
CD = Consolidated drained
SPT = Standart penetration test (blows / ft)
qu = Unconfined compression strength, kg/cm²

O = Wn = Moisture content, %
● = Wp = Plastic limit, %
Δ = Wl = Liquit limit, %
γ = Bulk density, t/m³
Gs = Spesific gravity
eo = Void ratio