potable water stored in reservoir will be used as fire extinguish water.

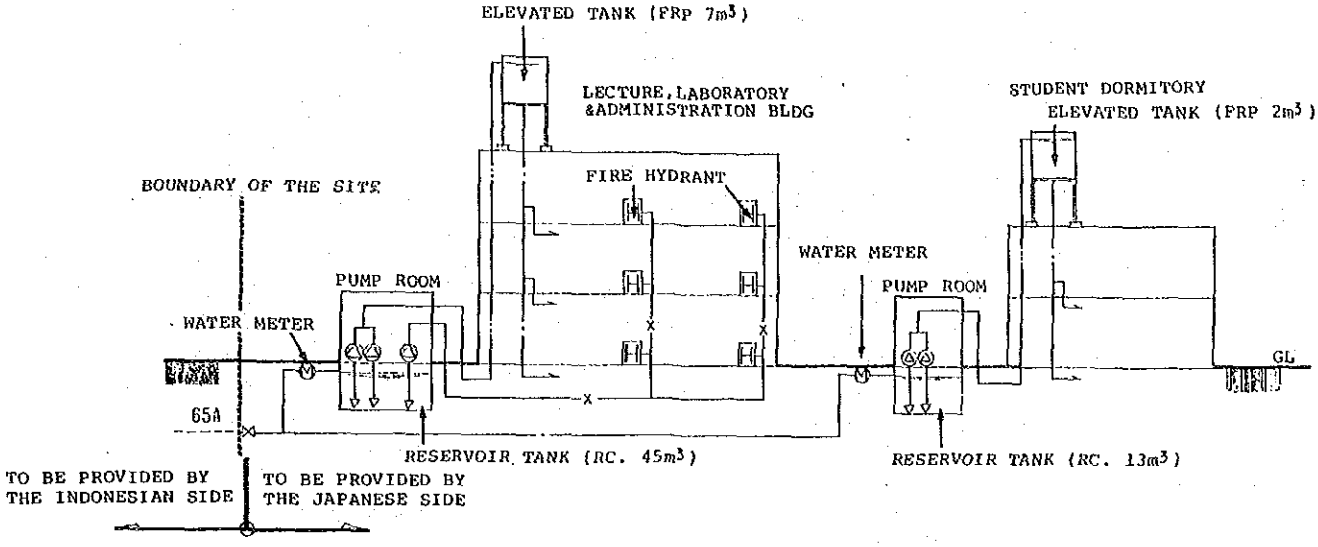


Fig. 4-8 Outline of Water Supply System

4-3-6 Floor Area Plan

The planned floor area for each building and room is shown below.

(1) Lecture, laboratory & Administration Building

1) Academic Block ..... 4,357.8 m^2

Electric Laboratory	162.2 m^2
Preparation Room	45.1
Electronic Laboratory (1)	172.8
Electronic Laboratory (2)	172.8
Preparation Room	69.1
Digital Electronic Laboratory	172.8
Preparation Room	34.6
Darkroom	34.6
Automatic Control Laboratory	172.8

Preparation Room	58.6 m^2
Communication Laboratory (1)	172.8
Preparation Room	69.1
Radio Frequency & Microwave Laboratory	207.4
Preparation Room	34.6
Computer Laboratory	172.8
Electric Power System Laboratory	162.2
Preparation Room	45.1
Communication Laboratory (2)	103.7
Preparation Room	69.1
Physics Laboratory	138.2
Preparation Room	34.6
Electromechanical Workshop	172.8
Technical Drawing Room	138.2
Preparation Room	45.1
Locker Room (360 lockers)	103.7
Large Classroom (150 sets x 1 room)	172.8
Projection Room	25.9
Classroom (60 seats x 2 rooms)	207.4
Classroom (30 seats x 4 rooms)	279.2
Seminar Room (2 rooms)	103.6
Library (including stack room)	285.1
Lecturer's Room	155.7
1 person x 3, 2 person x 3, 5 persons x 2 rooms	
Instructor's Room	224.9
1 person x 4, 2 persons x 5, 5 persons x 2 rooms	
Lecturer's Assistant's Room	69.2
5 persons x 2 rooms	
Instructor's Assistant's Room	69.2
5 persons x 2 rooms	

2) Administration Block 345.9 m2

Director's Room	34.6 m2
Room of Head of Department	34.6
(1 person x 2 rooms)	
Office room (1 person x 6 rooms)	103.8
Administration Office	51.8
(including Reception)	
Meeting Room (18 persons x 3 rooms)	103.8
Medical Room	17.3

3) Cafeteria ..... 447.2 m^2

Cafeteria	376.0 m^2
Kitchen, Staff Room	71.2

4) Common Areas (Entrance Halls, Toilets, Staircases, Corridors, etc.) ..... 3,932.7 m^2

Total	9,083.6 m^2

(2) Student Dormitory

1) Bedrooms (4 beds x 18 rooms) ..... 388.8 m^2
2) Common Areas (Entrance Halls, Toilets, Staircases, Corridors, etc.) 719.9

Total	1,108.7 m^2

(3) Other

1) Electric Building ..... 72.0 m^2
2) Pump House 1 ..... 11.3
3) Pump House 2 ..... 6.0

Total	89.3 m^2

4-4 Equipment Plan

The EEPIS curriculum specifies the practice hours out of the total education hours. The practice hours of the subjects amount to as much as 55-58% of total education hours which cover a wide range of electronic engineering and electronic communication engineering.

Therefore, the curriculum requires many types of experiment equipment related with electricity, electronic, communications, etc. The Equipment Plan is established on the basis of integrated judgement in the following three viewpoints.

1. EEPIS is a facility forming a part of the Polytechnic Education Plan established by the Ministry of Education and Culture, Indonesia.

2. EEPIS is a facility which will be built in the ITS Sukolilo Campus along with other Faculties of ITS.

3. Technical Cooperation to EEPIS from Japan is scheduled

EEPIS requires 13 laboratories, as shown in 4-3-1 Planning, (1)-5 Calculation of the Number of Main Rooms. The experiments on the subjects which are enumerated in Table 4-1 will be carried out in each laboratory. The type, grade, and quantity of the experiment equipment are set on the basis of analysis of the content of the experiments for each subject, with the following points taken into account.

1. Experiment equipment will be selected according to the curriculum. In particular, measuring instruments, etc. are mainly composed of those of basic type so as to meet potential change in the content of practice.

2. Experiment equipment will be mainly composed to minimize troubles for the Indonesian technicians involved in maintenance in consideration of the survey results of electronic parts supply condition in Surabaya.

3. Quantity of equipment is estimated on condition that experiment is basically carried out by a group of 3 students (a class consists of 10 groups.)

The main educational equipment is shown in the following list. The item, Radio Frequency & Microwave Laboratory includes a micro-bus which will be necessary for field measurement practice outside the campus. The grade of the equipment is somewhat higher than that of the existing polytechnics, but the equipment will be successfully utilized by the EEPIS academic staff for the purpose of effective education, when Technical Cooperation from Japan follows.

(1) Equipment list for experiment and practice

G-1 Electric Laboratory

Item	No.
DC Power Supply	12
Multimeter	12
Function Generator	12
AC Ammeter	12
AC Ammeter	12
AC Ammeter	12
DC Voltmeter	12
DC Voltmeter	12
DC Ammeter	12
DC Ammeter	12
DC Ammeter	12
DC Ammeter	12
AC Voltmeter	12
AC Voltmeter	12
AC Voltmeter	12
Slidak	12
Electronic Circuit Training Device	6
L.C.R. Meter	12
Single Phase Wattmeter	12
Digital Multimeter	12
Luxmeter	12

Item	No.
Wheatstone Bridge	12
Galvanometer	12
Digital Thermo Meter	12
Rotary Vacuum Pump	1
Induction Coil	1
OHP	1
Screen for OHP	1
Clamp Meter	2
Electronics Voltmeter	12
DC Potentio Meter	1
Universal Bridge	12
Gauss Meter	12
Set of Tools	1
Set of Parts	1

G-2,3 Electronic Laboratory (1), (2)

Item	No.
DC Power Supply	24
DC Power Supply	2
Multimeter	24
Oscilloscope	24
Function Generator	24
Electronics Voltmeter	24
Frequency Counter	24
CR Oscillator	6
X-Y Recorder	6
Semi-Conductor Circuit Training Device	12
Electronics Circuit Trainer	6
Curve Tracer	2
Transistor Checker	4
Digital Storage Oscilloscope	4
IC Checker	2

Item	No.
Digital Multimeter	24
Q Meter	4
OHP	2
Screen for OHP	2
Copy Machine	1
TP Maker	1
Distortion Meter	6
SSG	6
Analyzer	1
Set of Tools	1
Set of Parts	1

G-4 Digital Electronic Laboratory

Item	No.
DC Power Supply	12
Oscilloscope	12
Multimeter	12
Frequency Counter	12
Digital Circuit Trainer	6
Microprocessor Board	12
Microprocessor Printer	3
Microprocessor Programer Board	3
Microprocessor Eraser	1
Logic Analyzer	2
Digital Storage Oscilloscope	2
Logic Circuit Trainer	6
Digital Multimeter	12
IC Checker	1
DC Power Supply	12
OHP	1
Screen for OHP	1
Micro Computer Training Set	12

Item	No.
Pulse Generator	1
Function Generator	6
Set of Tools	1
Set of Parts	1

G-5 Automatic Control Laboratory

Item	No.
DC Power Supply	2
DC Power Supply	12
Oscilloscope	12
Multimeter	12
Frequency Counter	12
X-Y Recorder	3
DC Motor Control Demonstrator	3
Servo System demonstrator	3
Sequence Control Demonstrator	3
Digital Multimeter	12
Tachometer	12
Step Motor	2
OHP	1
Screen for OHP	1
Move Master Total System	1
Automatic Control Set	12
Analog Computer	1
Set of Tools	1
Set of Parts	1

G-6 Communication Laboratory (1)

Item	No.
DC Power Supply	12
DC Power Supply	2
Oscilloscope	12
RF Generator	3
Spectrum Analyzer	1
Multimeter	12
Electronics Voltmeter	12
Frequency Counter	6
Color Bar Generator	6
Color Television Set	6
B/W Television Set	6
Key Device	32
HF Transmitter Receiver	1
HF Transmitter Receiver	1
Very High Frequency Transmitter-Receiver	6
Ultra High Frequency Transmitter-Receiver	6
Telephone Set	6
Telephone Set	6
Private Automatic Branch Exchange	1
High Tension Meter	2
Sweep Marker Generator	12
Digital Multimeter	12
PCM Training Set	1
Satellite Receiver	1
Noise Generator	1
Marine Radar	1
Transmitting Receiving tester	2
Demagnetizer	2
Signal Injector	2
VTR	2
Camera for VTR	1
Tape Recorder	6
Radio Set	6
OHP	1

Item	No.
Screen for OHP	1
Facsimile	2
Walkie Talkie	4
Power Meter	6
Variable Resistance Attenuator	6
Variable Resistance Attenuator	6
Pulse Generator	1
A-D Training Set	3
D-A Training Set	3
Set of Tools	1
Set of Parts	1

G-7 Radio Frequency & Microwave Laboratory

Item	No.
DC Power Supply	12
Oscilloscope	6
RF Generator	3
Spectrum Analyzer	1
Frequency Counter	2
Field Level Meter	1
Field Level Meter	1
Dipole Antenna	1
Microwave Training Device	2
Portable Engine Generator	2
Digital Multimeter	12
Slidak	12
RF Milivoltmeter	12
OHP	1
Screen for OHP	1
Microwave Absorber	80
Variable Resistance Attenuator	2
Variable Resistance Attenuator	2

Item	No.
Tracking Generator	1
VSW R Bridge	1
Power Distributor	3
Power Distributor	3
Directional Coupler	3
Antenna Rotary Stand	1
Electronic Voltmeter	3
Coaxial Standing Wave Detector	1
Microbus	1
Copy Machine	1
RF Amperemeter	6
Set of Tools	1
Set of Parts	1

G-8 Computer Laboratory

Item	No.
Personal Computer	30
Printer for Computer	10
Personal Computer	7
Printer for Computer	3
OHP	1
Screen for OHP	1
Set of Tools	1
Set of Parts	1

G-9 Electric Power System Laboratory

Item	No.
Battery (PB)	4
DC Power Supply	3
AC Syncro Generator	1
AC Induction Motor	3
DC Motor	3
Transformer	3
Inverter	3
Converter	3
Coil winding Machine	1
SCR Circuit Training Device	6
Portable Wattmeter	6
Portable Wattmeter	6
Insulation Tester	6
Power Factor Meter	6
Multimeter	6
Tachometer	6
Frequency Meter	6
Oscilloscope	6
Torque Meter	2
OHP	1
Screen for OHP	1
Clamp Meter	3
Set of Tools	1
Set of Parts	1

G-10 Communication Laboratory (2)

Item	No.
Neon Helium Laser	2
Optical Tester	2
Laser Diode	10

Item	No.
LD Light Source	2
LED Light Source	2
Optical Converter	2
Optical Converter	2
Optical Converter	2
Optical Bench	2
Optical Compoments	1
Optical Powermeter	2
Spectro Analyzer	1
LED	10
Optical Fiber Cable	1
Optical Fiber Cable	1
Micro Micro Ammeter	2
Lock-in Amplifier	1
X-Y Recorder	1
Fiber Tool Set	1
Micro Scope	1
Pin Photo Diode	10
Set of Tools	1
Set of Parts	1

G-11 Physics Laboratory

Item	No.
Wave Motion Demonstrator	12
Bimetal Demonstrator	12
Luxmeter	12
Solar Battery Demonstrator	12
Lenses and Prisms Kit	12
Convex Lens & Concave Lens	12
Spectrometer	6
OHP	1
Screen for OHP	1

Item	No.
Set of Tools	1
Set of Parts	1

G-12 Electromechanical Workshop

Item	No.
Vise	32
Bench Drill	1
Bench Drill	1
Foot Shear	1
Grinder	1
Bender	1
File	32
Screw Machine	6
Straight Drill	6
Calipers	32
Micrometer	32
Saw	32
Spot Welder (Portable Type)	2
Painting Instruments	1
Precision Lathe	1
Set of Tools	1
Set of Parts	1

G-13 Technical Drawing Room

Item	No.
Drafting Board	30
Computer Aided Drafter	1
Drawing Instruments	32

G-14 Dark Room

Item	No.
PC Board Process Equipment	1
Set of Parts	1

G-15 Large Class Room

Item	No.
Slide Projector	1
Video Projector	1

G-16 Others

Item	No.
Shelf	128
Rack	90
Parts Case	41

(2) Fittings list for lecture, experiment and practice

G-17 Education Fittings

Item	No.
Lecture's Desk (with Double Drawers)	2
Lecture's Desk (with Single Drawers)	102*
Lecture's Chair	90

Item	No.
Student's Chair (1) (Classrooms, Cafeteria, Bedrooms of Student Dormitory etc.)	684
File-cabinet	9
Book Shelves	14
Book Shelves (with Double-swing Door)	40
Lecture's Table (for Lab.)	16
Lecture's Table (for Class Rm)	6
Laboratory Working Table	119
Student's Table (1)	92
Student's Stool (Laboratories etc.)	388
Reading Table	15
Card Catalog Cabinet (Library)	2
Book shelves	43
Book Stack	55
Dining Table	74
Locker (Locker Rm)	60
Student's Table (2)	5
Student's Chair (2)	20
Mobile Chalkboard	2
Student's Desk (Student Dormitory)	72
Student's Bed (Student Dormitory)	73
Locker (Library)	5
Others (Library)	2

* academic staff rooms ; 64
  preparation rooms for laboratoris; 20
  administration offices ; 18

(3) Books

Technical books approx. 400

4-5 Basic Design Drawings

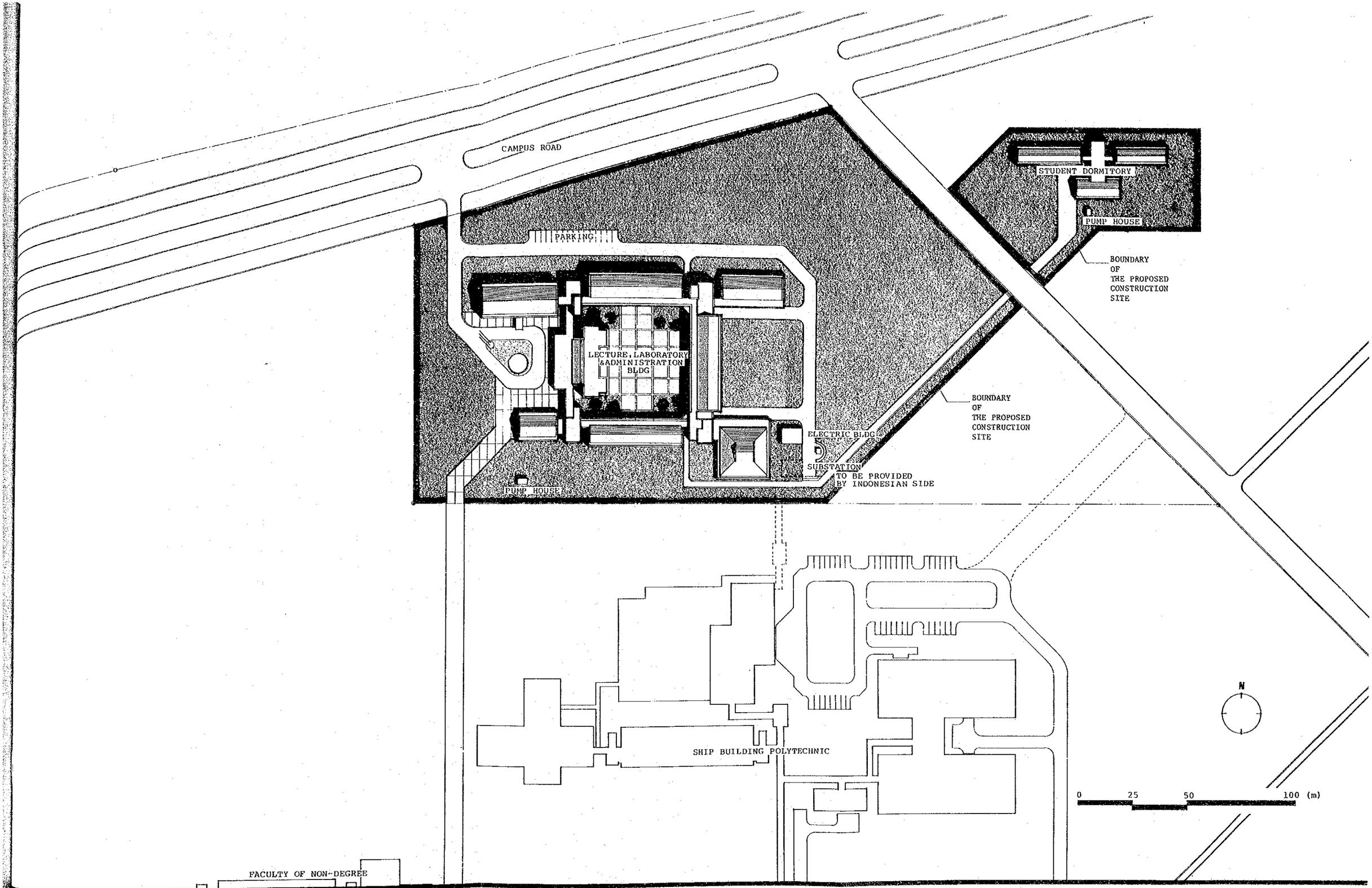
(1) List of Drawings

01 Site Plan
02 Lecture, Laboratory & Administration Building 1st Floor Plan
03 Lecture, Laboratory & Administration Building 2nd Floor Plan
04 Lecture, Laboratory & Administration Building 3rd Floor Plan
05 Lecture, Laboratory & Administration Building Roof Plan
06 Lecture, Laboratory & Administration Building Elev. & section
07 Lecture, Laboratory & Administration Building Elev. & section
08 Student Dormitory 1st Floor Plan, 2nd Floor Plan, Elevation and Section

(2) Floor Area (square meters)

Floor	Lecturer, Laboratory & Administration Bldg.	Student Dormitory	Others
1st Fl.	4,420.6	631.9	89.3
2nd Fl.	2,704.3	476.8	
3rd Fl.	1,920.2		
Penthouse	38.5		
	9,083.6	1,108.7	89.3

Total 10,281.6 m^2



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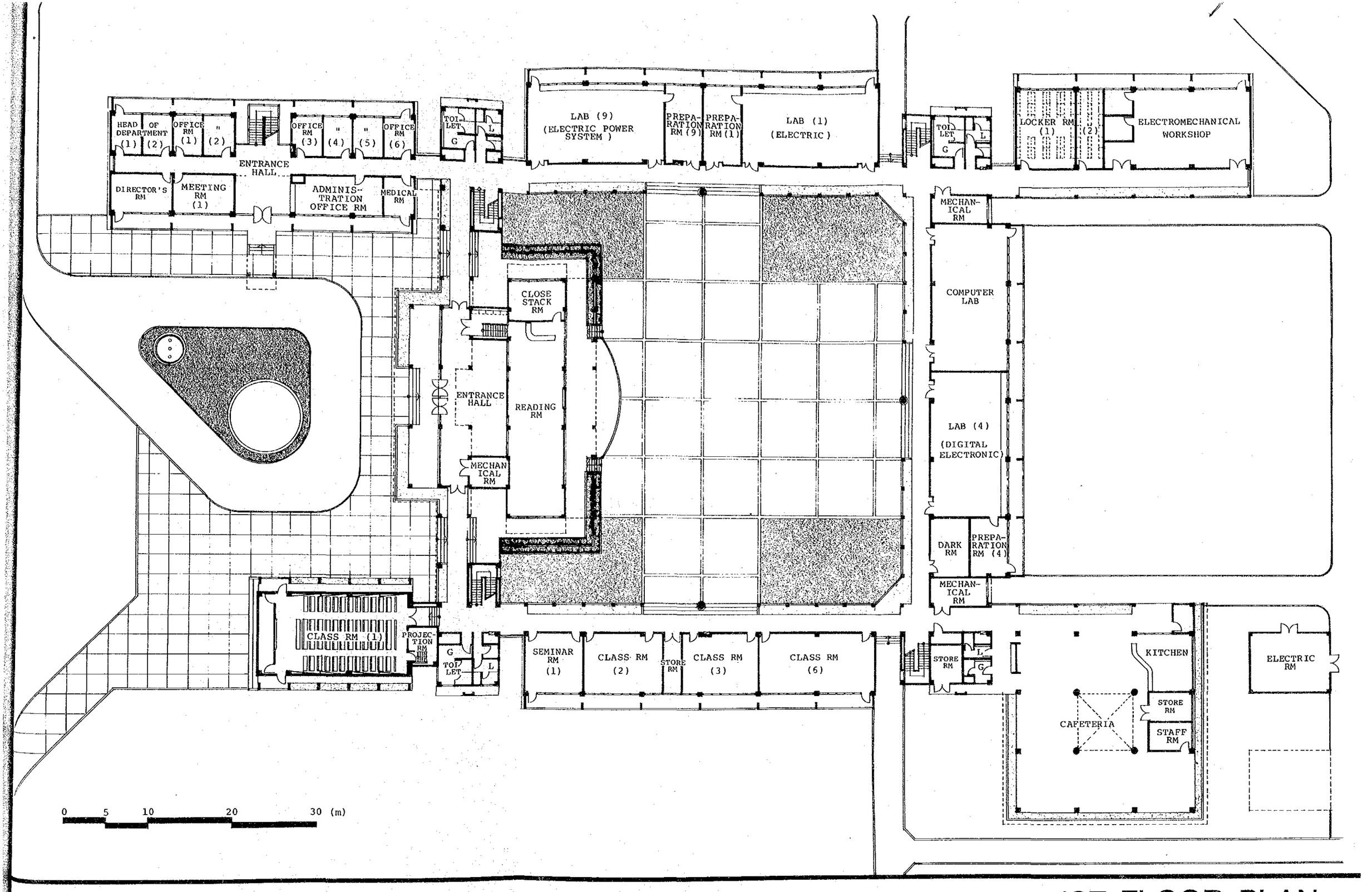
SITE PLAN

01



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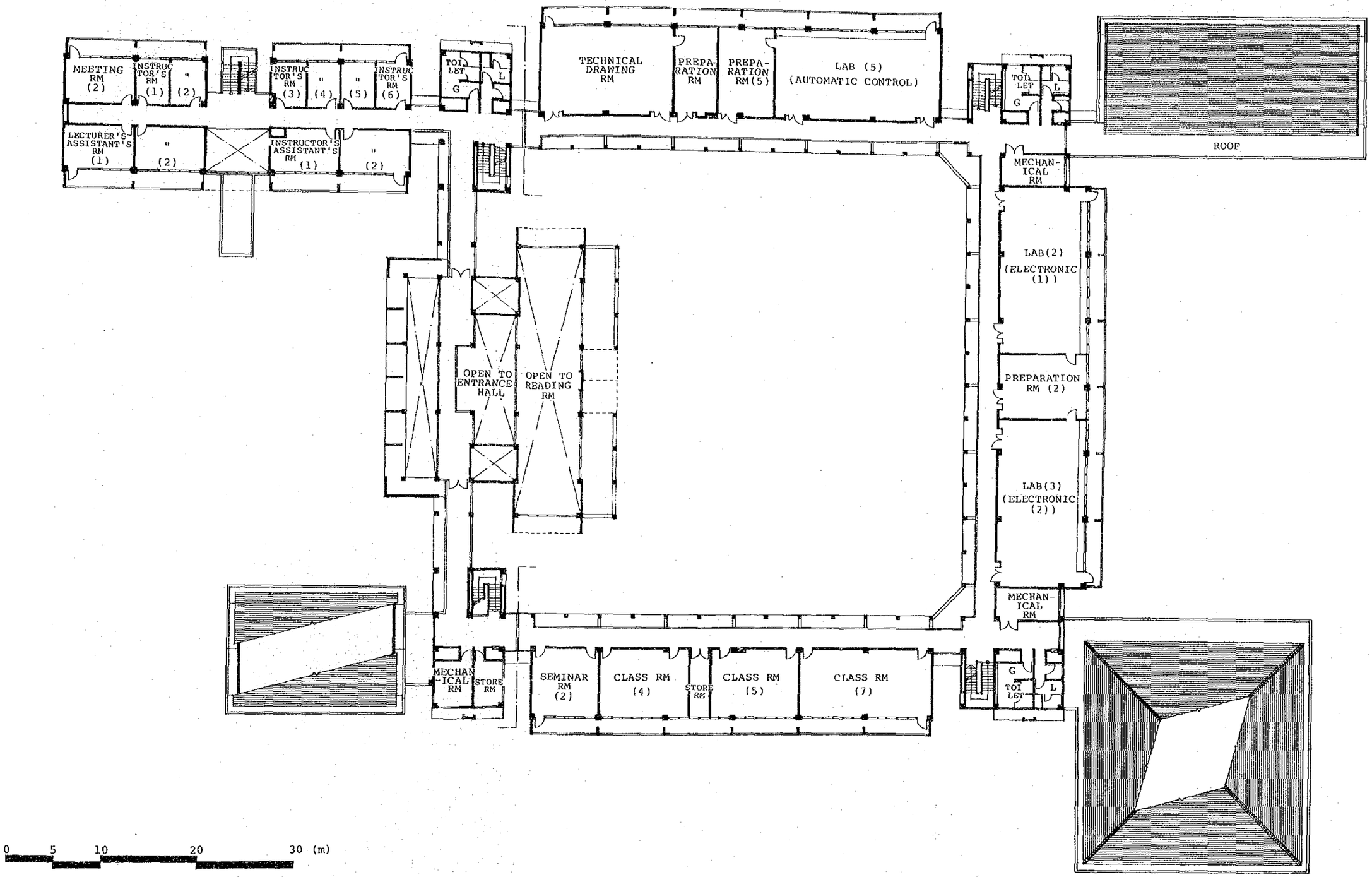
1ST FLOOR PLAN

02



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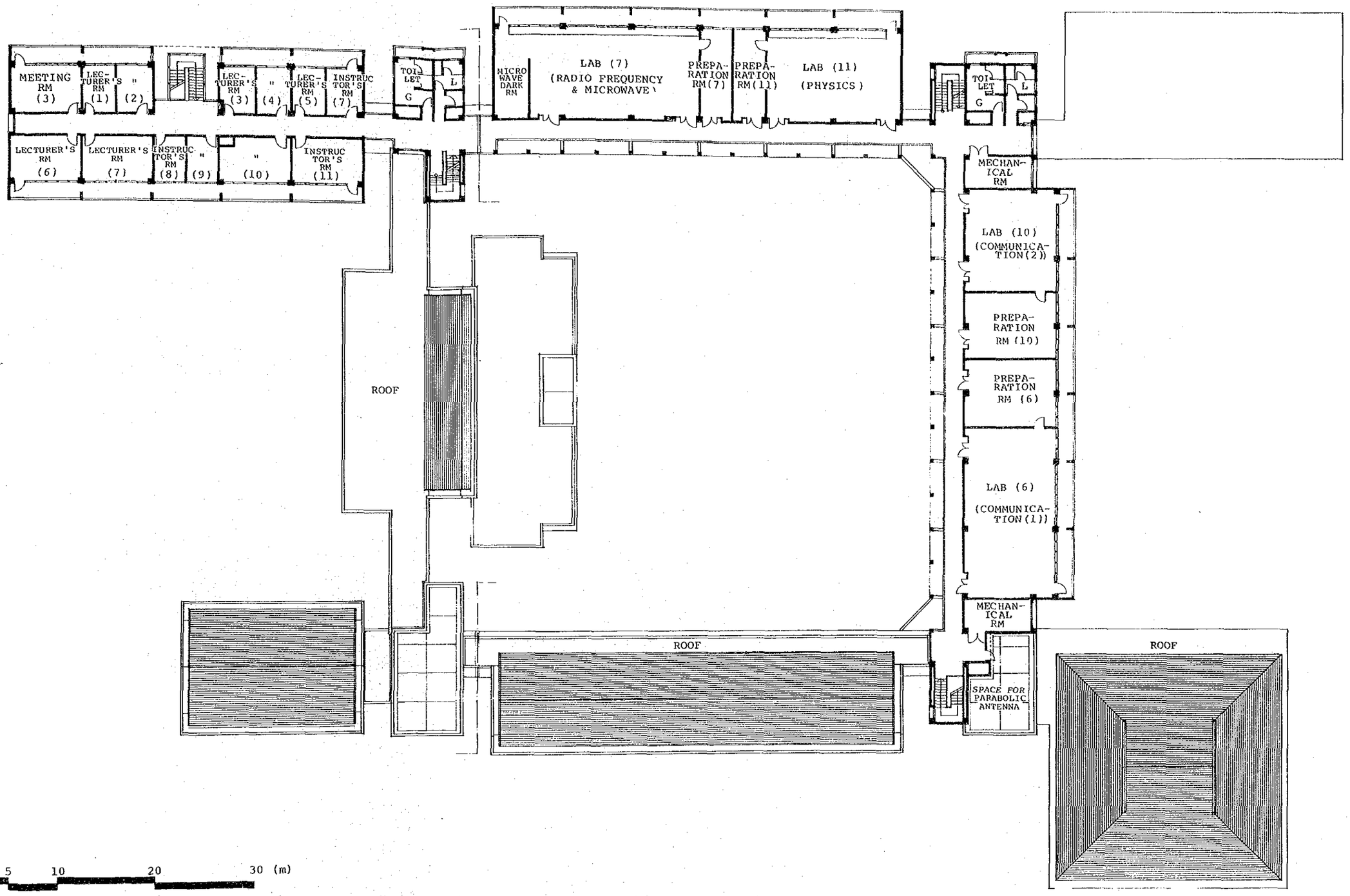
2ND FLOOR PLAN

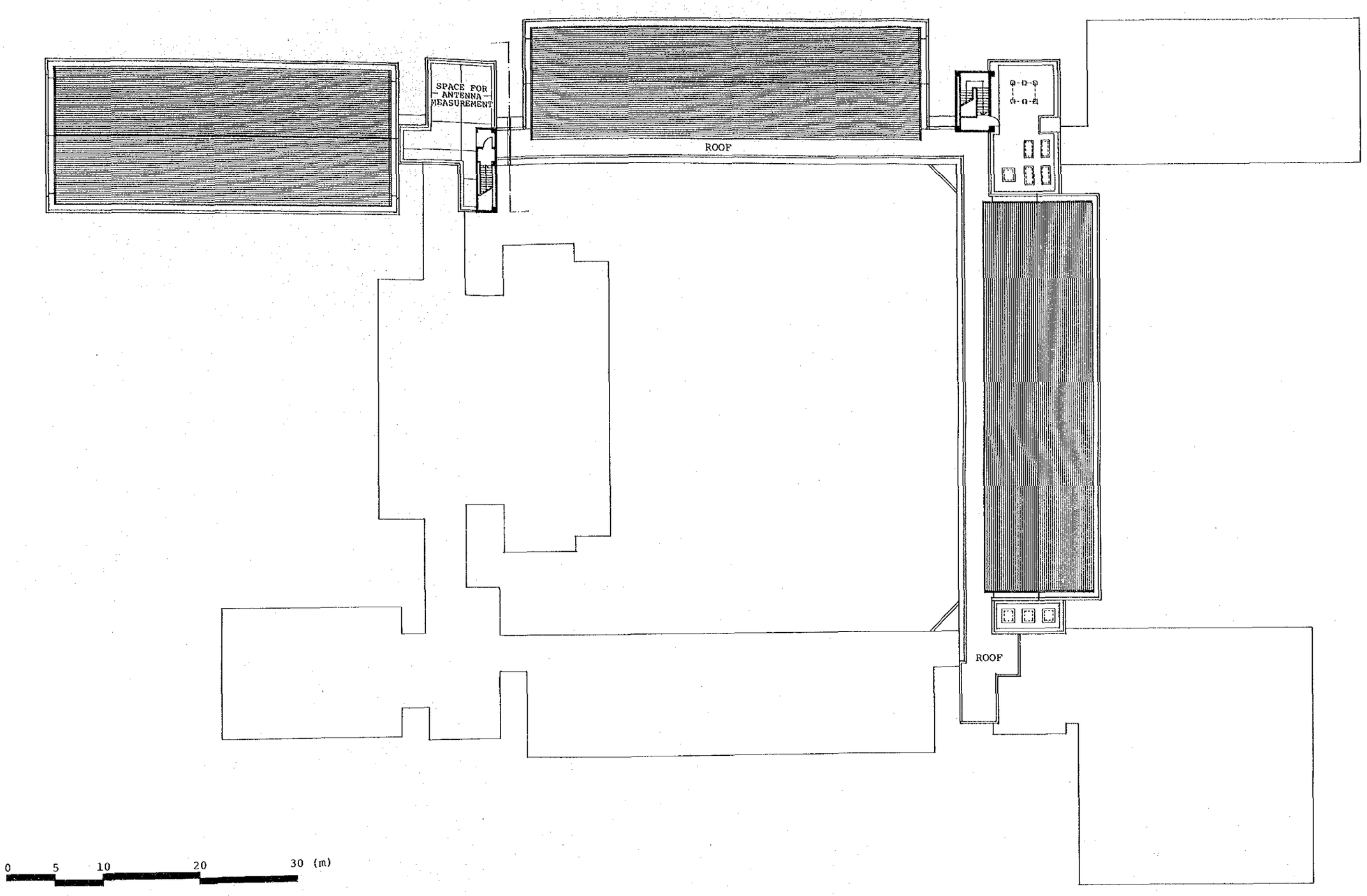
03



Electronic Engineering Polytechnic Institute in Surabaya

3RD FLOOR PLAN

04



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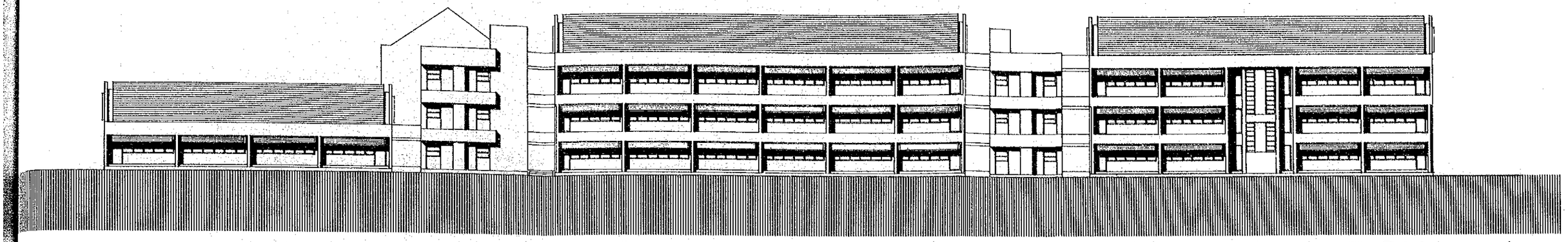
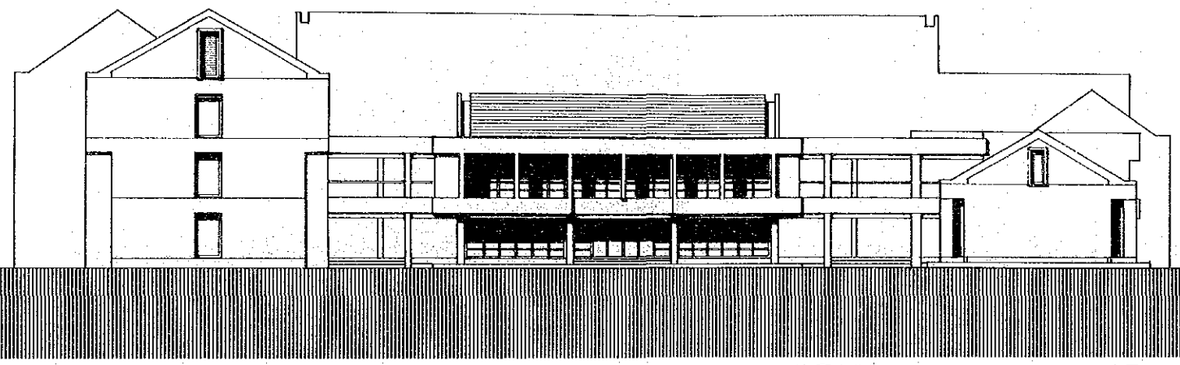
ROOF PLAN

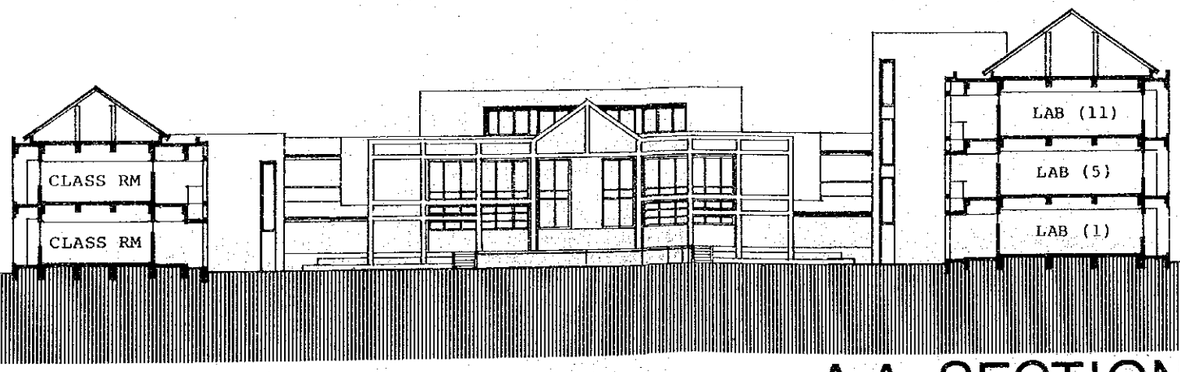
05



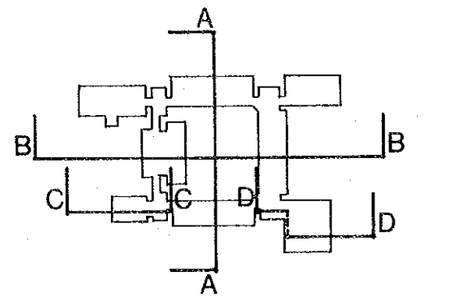
NORTH ELEVATION



WEST ELEVATION



A-A SECTION



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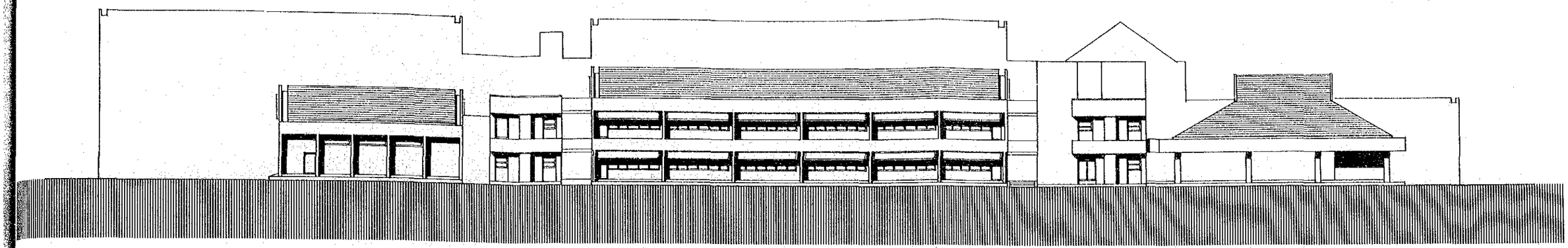
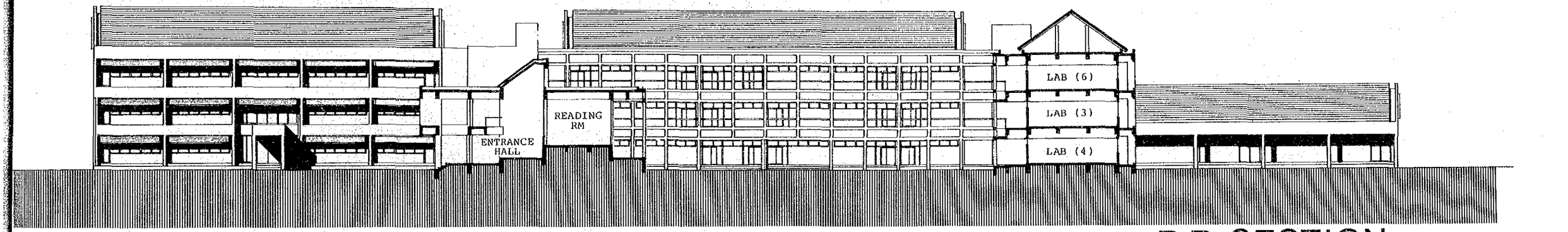
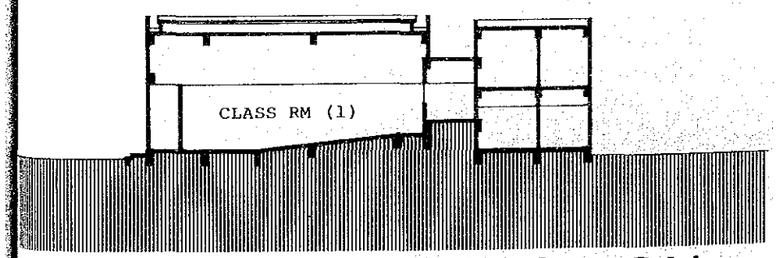


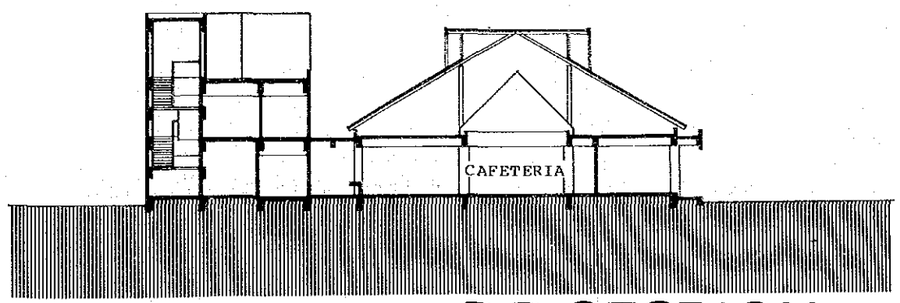
SOUTH ELEVATION



B-B SECTION



C-C SECTION

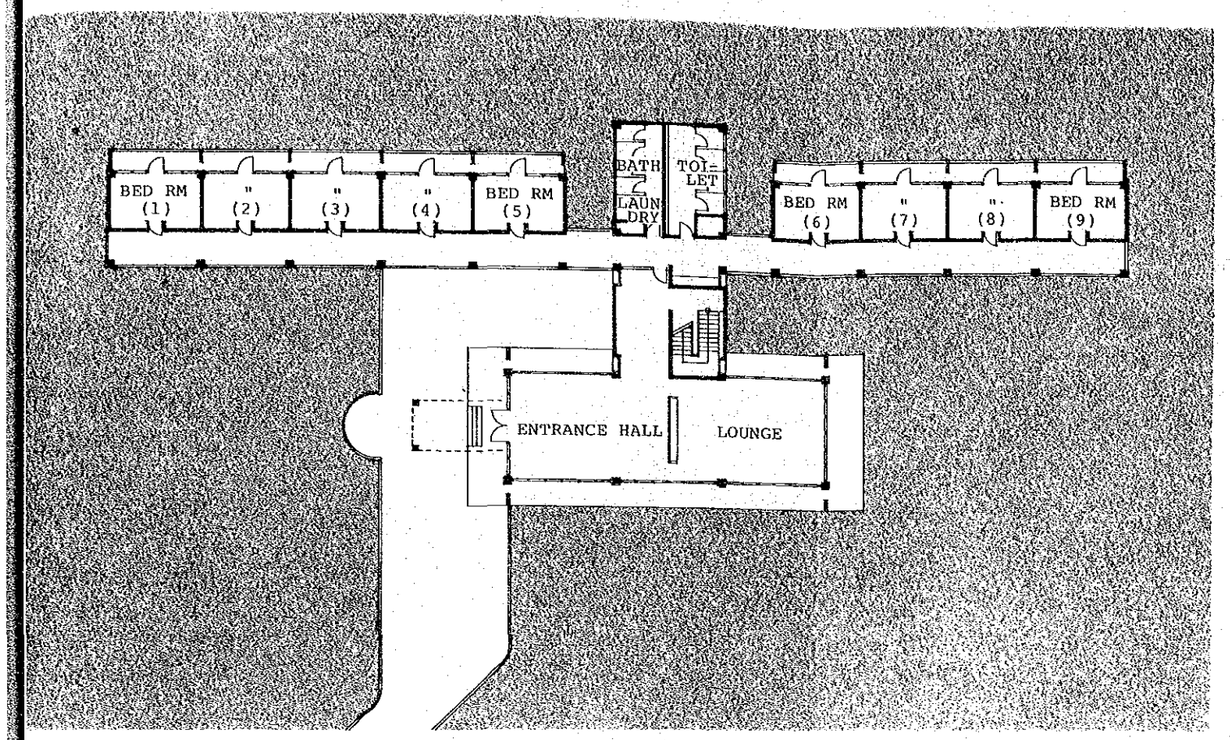


D-D SECTION

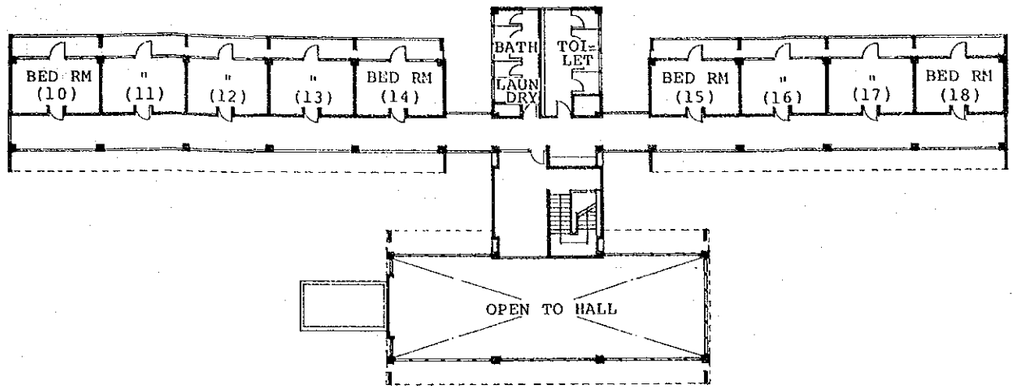
0 5 10 20 30 (m)

Electronic Engineering Polytechnic Institute in Surabaya

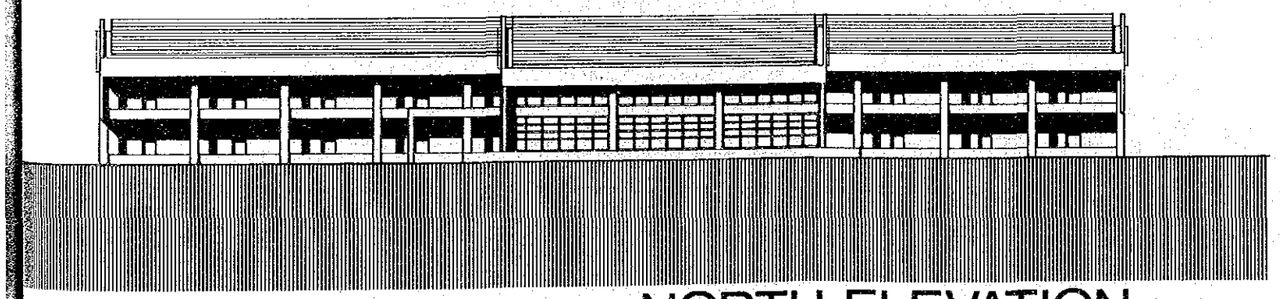
07



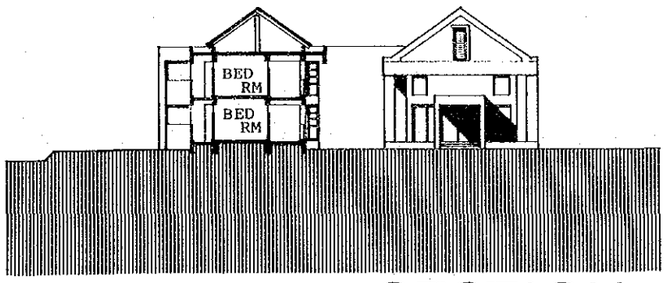
1ST FLOOR PLAN



2ND FLOOR PLAN



NORTH ELEVATION



SECTION

0 5 10 20 30 (m)

Electronic Engineering Polytechnic Institute in Surabaya

4-6 Construction Work Plan

4-6-1 Basic Policy

The Project is implemented in accordance with the grant aid system of the Government of Japan.

This project will be formally started after the Project is approved by both Governments and the Exchange of Notes is duly signed and exchanged.

The Government of the Republic of Indonesia will then appoint a Japanese consultant and detail design of facilities and equipment will be started.

After detail design documents have been completed, construction and procurement of equipment will be performed by Japanese contractors appointed by tender.

The construction work by the Japanese side is estimated to take approximately fifteen months considering the content and scale of the proposed facilities, local meteorological conditions, etc.
Surabaya has the rainy season for six months from December to May (average precipitation: about 250mm per month) which may delay the work schedule.
However, careful consideration given to the working schedule and drainage system would relieve the contractor of the suspension of work even in the rainy season.

The proposed construction site is in the ITS Sukolilo Campus. Lectures and experiments are performed at present in the existing ITS facilities.
In addition, Shipbuilding polytechnic in Surabaya is to be constructed in the site adjacent to the proposed site simultaneously.
Therefore sufficient safety countermeasures should be taken in the construction work of the Project.
The works by the Indonesian side include the banking and grading of the site (including area for the temporary site office, workshop, yard,

etc.), construction of access road, temporary supply of power, water and telephone service, and obtaining of building permission. Such work should be completed before the work is started. In particular, it is recommended that the proposed site and access road be filled to the specified level as soon as possible after the Exchange of Notes for the Project is signed.
Earlier banking work will enable the construction work to progress on the stabilized ground. As stated previously, the proposed construction site is swampland which used to be paddy field in the past and filled soil may settle by gravity.

It is further recommended that members of EEPIS Establishment Committee discuss the start period of respective work by each work item with Japanese counterparts, including the permanent work by the Indonesian side, during the period of detail design and construction in order to ensure the smooth progress of the work.

4-6-2 Scope of Work

The Project is implemented in accordance with the system of the grant aid of the Government of Japan. The scope of work is stipulated according to the demarcation rule of the system.

1. Japanese Work

(1) Infrastructure

1) Electric power supply:
Cable work in the electric building and from the electric building to the proposed buildings

2) Water supply:
Plumbing work from the boundary for municipal water

3) Drainage:
Drainage facilities (rainwater, soil water and waste water) within the site and septic tanks

4) Telephone:
Installation and supply of telephone equipment, pipings and cables in the proposed buildings.

(2) Buildings:

Construction of buildings indicated in the Basic Design Study Report.

(3) Exterior work:

Completion of the roads, walkways, exterior work of the courtyard within the site indicated in the Basic Design Study Report.

(4) Equipment:

Educational equipment indicated in the Basic Design Study Report.

(5) Transportation of materials and equipment:

Packing, insurance, shipping, ocean freight, unloading, and inland transportation of construction materials and equipment and, educational equipment which are imported to Indonesia.

2. Indonesian Work

(1) *Infrastructure*:

1) Site preparation:
Securing land necessary for the Project and clearing of obstacles, banking, and leveling of the site.

2) Electric power supply:
Installation of 20kV power line to the substation and installation of the substation and cables from substation to low voltage power receiving panel installed in the Electric Building (which is provided by the Japanese side)

3) Water supply:

Municipal water supply to the boundary of the site

4) Telephone:

Telephone tie-line work up to the main distribution board to be equipped in the proposed building.

5) Others

1. Construction of access road to the site
2. Provision of area necessary for construction such as temporary site office, workshop, yard, etc.
3. Supply of municipal water, electric power and telephone service for the construction.

(2) Building:

Construction of substation in the site

(3) Exterior work:

Access road and planting; gate and fence, if necessary.

(4) Equipment:

General furniture, fittings, curtains, and shades.

(5) Transportation of building materials and equipment:

Ensuring prompt unloading, tax exemption and custom clearance at the ports of disembarkation in Indonesia and prompt inland transportation of imported building materials and equipment for the Project. Payment of customs, duties, internal taxes and other fiscal levies for unloading, custom clearance, inland transportation, etc. of imported building materials and equipment for the Project.

(6) Permission, application, etc.

To cope with services such as application for building permission and approval, and bank arrangement necessary for the Project and to bear involved expenses and commissions.

(7) Tax exemption:

To exempt Japanese nationals engaged on the Project from custom duties, internal taxes and other fiscal levies which may be imposed in Indonesia with respect to the supply of building materials, equipment and services for the Project.

(8) Provision of convenience:

To accord convenience without delay to Japanese nationals whose services may be required in connection with the supply of the building materials, equipment and services under the verified contracts such facilities as may be necessary for their entry into Indonesia and their stay therein for the performance of their work.

(9) Others:

To bear all the expenses, other than those to be borne by the grant aid, necessary for the Project.

The works of (1)-1), (1)-5), and works such as obtaining building permission and making bank arrangement in (6) must be completed before Japanese work is started.

Other Indonesian work must be completed before the Japanese work is completed, especially the works of (1)-2), (1)-3), and (1)-4) must be completed at least two months ahead before the completion, to have necessary period for the completion inspection of the buildings and equipment.

(10) Rough cost estimation of the Indonesian works

The following rough cost estimation is made on the Indonesian works for preliminary works and the subsequent permanent works. The Indonesian side is requested to execute the budget procedure, design, and work on the above works at an appropriate time to ensure that the Project is implemented smoothly and EEPIS is effectively managed after being opened.

Of the items of permanent works, electric power supply, telephone, and exterior work will include the part which to be shared with the ITS facilities. For example, the access road to EEPIS (campus circular road) will be also used by Faculty of Non-degree and Shipbuilding Polytechnic, etc. It should be noted that the rough cost estimation of the permanent work is made on the premise that these infrastructures are not necessarily used solely by EEPIS.

1) Preliminary works

1.	Banking and leveling ..... Item (1)-1)	388,000,000 Rp
2.	Access road ..... Item (1)-5)-1	141,000,000 Rp
3.	Electric Power supply ..... Item (1)-5)-3	30,000,000 Rp
4.	Municipal water supply ..... Item (1)-5)-3	68,000,000 Rp
5.	Telephone ..... Item (1)-5)-3	8,000,000 Rp
	Total	635,000,000 Rp

2) Permanent Works

1. Electric power supply ..... 246,000,000 Rp

Item (1)-2, Installation of main switching station on the west of the Campus, aerial power line (from the main

switching station on the west of the Campus to the substation within the site), substation and cables (from substation to the low-tension receiving panel in Electric Building).

2. Municipal water supply

Item (1)-3), water supply of preliminary works is to be used successively.

3. Telephone service ..... 15,000,000 Rp

Item (1)-4, Installation of cables from existing ITS administration building to Lecture.
laboratory. Administration building.

4. Building ..... 49,000,000 Rp

Construction of substation building in the site.

5. Exterior work ..... 195,000,000 Rp

Item (3), access road (the road in Campus but outside the site)

6. Equipment ..... 19,000,000 Rp

Item (4), furniture for visitors, curtains, and shades in rooms for academic and administration staff.

Total 524,000,000 Rp

The approximate estimation of Indonesian work in the above excludes the planting, gate and periphery fence in the exterior work, and expenses of procedures and commissions, etc. in items (5), (6), (7), (8) and (9).

4-6-3 Supervision Plan

According to the grant aid system of the government of Japan, the consultant shall enter into a detail design and supervision contract with the Indonesian government and supervise the work of the Project. The purpose of supervision is to check whether the work is in progress as indicated in the design documents and drawings and to advise to improve in quality, during the period of the work, to ensure the proper performance of the construction and equipment procurement contracts, from the fair viewpoint. The service of the consultant will be as follows.

(1) Cooperation for tender and contracts

The Consultant will prepare tender documents necessary for selection of Japanese incorporations engaged in construction work and procurement of equipment, perform the tender, and give advice on conclusion of the contracts.

(2) Coordination for the Contractor

The consultant will review the project schedule, construction plan, etc. and afford necessary advice and recommendation to the Contractors.

(3) Approval of shop drawings, manufacturing drawings, etc.

The Consultant will examine and approve shop drawings, manufacturing drawings, application documents, etc., submitted by the Contractors.

(4) Confirmation and approval of construction equipment and materials as well educational equipment.

(5) Report of progress of work

The Consultant will submit reports on progress of the work to the Indonesian side.

(6) Inspection

Wherever necessary, the consultant will inspect the facilities and educational equipment from the commencement of the work to completion to ensure the quality and function of the above facilities and

equipment.

The Consultant will dispatch a resident engineer to the site to supervise the work through the whole period of the work.
In addition, the Consultant will send necessary engineers to the site to have them perform inspection, advice, and coordination, according to the progress of the work.
The Consultant will report progress, disbursement, completion, handing over, etc. of the Project to the Japanese Government authorities concerned

4-6-4 Procurement Plan

In the Project, most materials for the building construction are locally available. However, some building materials should be imported from Japan to ensure necessary performance for the purpose of carrying out the EEPIS curriculum and to reduce maintenance cost after completion of the facilities.

Concerning electrical and mechanical works, materials used for connecting equipment and devices, for example pipes and cables will be mostly procured in Indonesia, while equipment and devices themselves will be imported from Japan in consideration of performance and maintenance.

Practically none of the proposed educational equipment is manufactured in Indonesia, and the whole equipment will be imported from Japan, except wooden fittings for education.

(1) Materials to be locally procured

Cement
Aggregates (sand and gravels)
Brick
Steel reinforcing bar
Deformed steel reinforcing bar
Light-gauge steel
Lumber and timber

Plywood
Wooden window and door
Steel window and door
Glass
Paint
Ceramic Tile
Roof Tile
Slate
Wire and cable
Steel pipes
PVC pipes
Sanitary ware
Construction machinery
Educational wooden fittings

(2) Materials to be procured from Japan or other countries

Ceiling board
Spray tile for exterior wall
PVC tile
Switch panels
Lighting fixtures
Steel pipe (125 dia. or more)
Joint for PVC pipes
Valve
Pump
Fan
Package type air conditioner
Ducting Materials
Telephone exchange equipment
Educational equipment

Of materials which will be locally procured, main heavy materials such as cement, aggregates and steel reinforcing bars, are produced around Surabaya, and other materials are also easily available because of favorable domestic condition of distribution and transportation.

4-7 Project Schedule

The execution of the Project will start after the signing of Exchange of Notes between both Governments on the grant aid of the Government of Japan.
The Government of the Republic of Indonesia appoints the consultant, a Japanese corporation, and concludes a design and supervision contract with the consultant. Following schedule after this is roughly divided into the detail design, tender, and construction.

(1) Detail design

The Consultant will start detail design under the verification of the Government of Japan on the consultant contract. In the Detail design stage, the Consultant will prepare tender documents such as detail design drawings, technical specifications, instructions to tenderers, on the basis of the Basic Design Study Report. In the course of the detail design, the Consultant will discuss the proposed facilities and equipment with the Indonesian counterparts and obtain approval for the tender document from the Indonesian side.
It will take about three months for the detail design.

(2) Tender

The Construction company and the equipment supplier shall be appointed by tender. The tender is progressed in the procedure of publication of tender, prequalification of tenderers (Japanese corporations), tender, estimation of tender, appointment of the construction company and equipment supplier and conclusion of contracts. It will take about two months for the above procedure.

(3) Construction

Construction will be started after the contract is concluded and verified by the Government of Japan. The construction period is estimated to be about 15 months including supply of equipment, considering the grade and scale of the facilities, and local meteorological conditions.

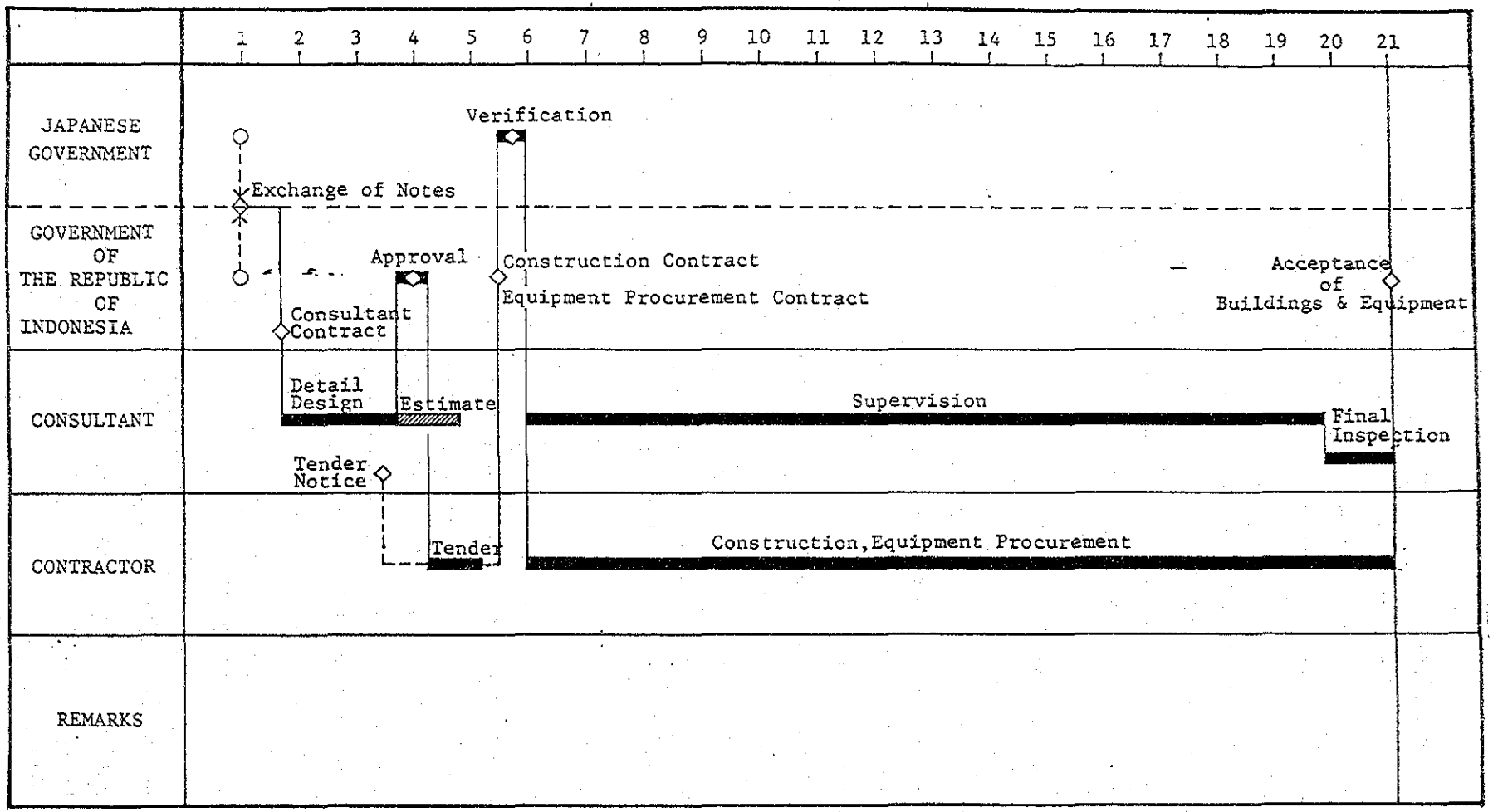


Fig. 4-9 Implementation Schedule

4-8 Maintenance and Administration Plan

(1) Maintenance of the Facilities and Equipment

ITS will assume the responsibility of maintenance and administration of EEPIS after EEPIS is opened, as stated in 3-3-1.

The facilities and equipment will be planned considering ease of maintenance. For the purpose of better maintenance, operation training, maintenance service training, etc. will be carried out at the site for persons involved in facility equipment and educational equipment near the end of the construction stage. In addition, necessary documents such as operation manuals will be submitted to ITS on completion of the work so that facilities and equipment can be properly maintained.

(2) Maintenance and Administration cost

The maintenance cost of EEPIS is roughly divided into personnel expenses and operating expenses.
As stated in 3-3-7, academic staff and administration staff will be successively employed in and after 1986, and will be raised to the prescribed number in 1989. The estimate of the maintenance cost of 1986 which is shown below is based on the number of the prescribed number of the academic and administrative staff in 1989.

1) Personnel Expenses

Unit: Rp

Roll	Basic salary per month	Allowance per month	Polytechnic* project special allowance per month	Total per month	Number of staff	Annual amount
Lecturer	81,000	60,000	9,000	150,000	13	23,400,000
Instructor	81,000	60,000	9,000	150,000	30	54,000,000
Lecturer's Assistant	66,900	0	20,600	87,500	9	9,450,000
Instructor's Assistant	66,900	0	20,600	87,500	15	15,750,000
Technician	33,200	0	32,800	66,000	16	12,672,000
					Total	115,272,000

* Incentives for those who desire to become the academic or administrative staff of polytechnic

Table 4-3 Personnel Expenses (Academic Staff)

Unit: Rp

Roll	Basic salary per month	Allowance per month	Polytechnic project special allowance per month	Rank allowance per month	Total salary per month	Number of staff	Annual amount
Director	125,000	157,000	88,000	70,000	440,000	1	5,280,000
Head of Department	118,200	140,000	21,800	50,000	330,000	2	7,920,000
Secretary	104,700	135,000	35,300	25,000	300,000	3	10,800,000
Administration	81,000	0	19,000	30,000	130,000	2	3,120,000
Finance & Accountant	81,000	0	19,000	30,000	130,000	1	1,560,000
Others	33,200	0	26,800	0	60,000	15	10,800,000
						Total	39,480,000

Table 4-4 Personnel Expenses (Administrative Staff)

Total personnel expenses 154,752,000 Rp ...1)

2) Operating expenses

. Electricity	42,400,000
. Water supply	11,135,000
. Telephone	470,000
. Gas	1,487,000
. Building maintenance	37,300,000
. Spareparts, repair of equipment comsumables, etc.	4,815,000
. Communication charge, etc.	7,490,000
Total operating expenses	105,097,000 .....2)
Grand total 1) + 2) =	259,849,000

The estimated annual maintenance cost of EEPIS is about 260,000,000 Rp as of 1986, excluding the food cost of the cafeteria. Assuming that EEPIS is opened in 1988, a possible rise in public official salaries, fuel and light expenses, general prices, etc. should be considered to be added to the above estimate to calculate the budget of the maintenance cost in 1988.

Estimated breakdown of main items of operating expenses is as follows.

. Electricity Charge

	Items	Load Capacity (kW)	Utilization hours (h/day)	Utilization days (day/M)	Average demand factor (%)	Power consumption (KWH))
1.	Lighting and outlets	150	8	25	60	18,000
2.	Air-conditioning and plumbing	160	7	25	60	16,800
3.	Educational equipment	550	7	25	30	28,875
4.	Others	30	7	25	20	1,050
	Total					64,725

Table 4-5 Estimated Power Consumption

The following rate of electricity will be applied to the project.

Basic charge: 2,100 Rp/kVA.M (assuming 600kVA)
Power consumption charge : 43.5 Rp/kWH

Therefore, the following fees are estimated.

6,000kVA x 2,100 Rp/kVA.M = 1,260,000 Rp/M

Power consumption charge
64,725 kWH/M x 43.5 Rp/kWH = 2,815,538 Rp/M
Total 4,075,538 Rp/M

Fees during school terms
4,075,538 Rp/M x 10M = 40,755,380 Rp/M

Fees during vacations
4,075,538 Rp/M x 2M x 0.2 = 1,630,215 Rp/,

Annual total 42,385,595 Rp/year
= 42,400,000 Rp/year

. water supply rate

Assumed water consumption: 1,450 m^3/M

- Water consumption rate per month
0 - 15 m^3: 15 m^3 x 170 Rp/m^3 = 2,550 Rp/M
16 - 30 m^3: 15 m^3 x 280 Rp/m^3 = 4,200
31 - 50 m^3: 20 m^3 x 400 Rp/m^3 = 8,000
51 - 1450 m^3: 1,400 m^3 x 750 Rp/m^3 = 1,050,000

1,064,750 Rp/M ..... (A)

- Meter rental fee etc. per month 5,900 Rp/M ..... (B)

(A) + (B) = 1,070,650 Rp/M

Therefore, the water rate per year (Wr) will be as follows.

$$Wr = 1,070,650 \text{ Rp/M} \times (10+2\times0.2)\text{M} = 11,134,760 \text{ Rp/year} \fallingdotseq 11,135,000 \text{ Rp/year}$$

. Telephone charges

Assumed number of calls per day will be 30, and telephone charge per call is 60 Rp.

Therefore,

$$60 \text{ Rp} \times 30 \text{ calls/day} \times 25 \text{ days/M} = 45,000 \text{ Rp/M}$$

$$45,000 \times (10+2\times0.2) = 468,000 \text{ Rp/year} \fallingdotseq 470,000 \text{ Rp/year}$$

. Building Maintenance

A major part of the maintenance cost is expended for re-paintng necessary surfaces to extend the service life of the facilities.
The annual average cost is calculated by totaling the cost of repainting to take into account of rise in prices and rental of temporary scaffolding. it is assumed that external steel handrails, inner walls, sashes, doors etc. will be repainted every three or five years.

(3) Assessment of maintenance and Administrative cost

The Ministry of Education and Culture will allocate the budget for maintenance and administration to EEPIS through ITS.
For reference, the maintenance and administration budget of ITS in the last two years is shown in table 4-6.

unit: Rp

	1984/1985	1985/1986	Remarks
Ordinary budget	1,192,820,000	1,417,331,000	
School tuition income	436,750,000	500,700,000	School tuition paid by students are once collected to the Treasury and distributed among universities according to number of students
Research and development budget	1,196,880,000	3,190,100,000	Universities request research and development expenses, which are allocated after examination
Public Support		5,314,000,000	Public support is direct income of each university. The income in 1985/1986 is the fund financed by World Bank to establish Shipbuilding Polytechnic
Total	2,826,450,000	10,422,131,000	

(Source: ITS)

Table 4-6 Maintenance and Administration Budget of ITS

The ITS budget in 1985/1986 is 5,108,131,000 Rp, excluding public support. The budget increased by 181% compared with that in the previous year. In particular, the research and development budget increased significantly by 267%.

The Fourth Five-year Plan places priority on three faculties; electric engineering, mechanical engineering, and chemical engineering, in order to promote the industrialization of Indonesia. During the term of the said Plan, these faculties will be awarded subsidies of one million Rp per student per year. The total number of ITS students in the specified faculties was 2,137 in 1985/1986. Therefore, the ITS maintenance budget is 12,559,131,000 Rp in 1985/1986, that is, 10,422,131,000 Rp in the above table plus 2,137,000,000 Rp the subsidy.

ITS has 6,909 students in the Degree Program and Diploma Program. The annual budget in 1985/1986 is 5,108,131,000 Rp, excluding the public support and subsidy, as shown above. Therefore, the budget per student is calculated to be 739,344 Rp (5,108,131,000 Rp/6,909).

On the other hand, the estimated annual maintenance budget of EEPIS is 260,000,000 Rp, which amount to 5% of the total amount of the ITS maintenance budget. The prescribed number of EEPIS students is 360. Therefore, the budget per student is 722,222 Rp. (260,000,000 Rp/360), which is slightly less than the corresponding budget per student (739,344 Rp).

In conclusion, the estimated EEPIS budget is considered almost appropriate and EEPIS can be satisfactorily managed considering that EEPIS is ranked equal to Faculties of Degree Program and Diploma Program and managed as stated in 3-3-1.

CHAPTER 5
EVALUATION OF THE PROJECT

CHAPTER 5 EVALUATION OF THE PROJECT

The Project forms a constituent of the Polytechnic Education Plan established for the purpose of bringing up middle level skilled manpower required in industries in Indonesia. The Project is established to construct facilities and to supply necessary equipment to educate middle level skilled manpower in electronic engineering field in particular among all industrial fields.

The maintenance and administration of EEPIS will be done under control of ITS after its completion.

The Polytechnic Education Plan is urgently needed in Indonesia and the Project is significantly appreciated as a part of the Polytechnic Education Plan.

At least following effects from the Project are expected when the Project is completed in due course and management and operation of EEPIS are smoothly carried out.

1. Education of middle level skilled manpower in electronic industry contributes to technical development in the practical fields such as operation, adjustment, and maintenance of technics introduced from foreign countries, resulting in widespread applications of electronic devices which were developed in foreign countries and promotion of domestic production in the form which meets the local situation in Indonesia.

2. In later stages, such manpower is expected to serve in the research and development of domestic electronic equipment and software in Indonesia accomplished by her own efforts, through cooperation with other engineers with degrees. As is the case with industiralized countries, research and development in industry is not progressed only by engineers, but also requires the cooperation of capable technicians.

   In Japan, such manpower from academies and colleges is increasingly demanded at present.

3. Establishment of EEPIS serves to improve the balance of the Polytechnic Education Plan, as a whole. In the past, the said Plan

did not stipulate the new polytechnic establishment schedule containing a polytechnic with electronic engineering department in Surabaya, a stragetic industrialized city in East Java. EEPIS is appreciated as a polytechnic to eliminate the drawback of the said Plan.

The number of new students to EEPIS amount to 17.9% of the total number of students to Electronic Engineering Departments of 3-year course Polytechnics. EEPIS can contribute to the Polytechnic Education Plan in terms of quantity.

4. The level of the curriculum and equipment of EEPIS is set a little higher than those of other existing Polytechnics. From the viewpoint of Indonesian potentials including the level of students and industrial sector, the level of the curriculum and equipment of the existing polytechnics need to be somewhat upgraded for the future of Indonesia, though it may be proper at this point.

   EEPIS is expected to play a roll of pilot school leading other polytechnics if it's advantageous location in the ITS campus along with ITS facilities can be successfully utilized and the Technical cooperation to EEPIS by Japan is extended.

In conclusion, the Project contributes to high industrialization of Indonesia together with other polytechnics through qualitative improvement and quantitative increase of middle level skilled manpower in electronic industry. The Project is of significance in terms of stabilized national development and national economy. This justifies the grant aid from the Government of Japan, and the effect of the aid is highly evaluated.

CHAPTER 6
CONCLUSION AND SUGGESTION

CHAPTER 6 CONCLUSION AND SUGGESTION

As detailed in the preceding chapters, the request of the Government of the Republic of Indonesia is reviewed, and the background and detail of the Project has been surveyed in Indonesia and subsequently analyzed in Japan. EEPIS will be established according to the plans presented in this Report and will be provided with facilities as defined in the plans. The necessity of the Project to establish EEPIS is fully recognized.

The proposed construction site is suitable for a place where education facilities will be constructed, in terms of management and operation such as mobility of academic and administration staff and in terms of physical conditions such as surrounding environments and configuration of the site. In addition, the Sukolilo Campus ITS Master plan is in progress and the infrastructure is to be arranged as the Project is put into practice.

The proposed buildings have been reviewed in consideration of the function, content, and structural plan as well as the service plan and construction plan. It is appropriate to plan the Lecture, laboratory & Administration building as a 3-storeyed, reinforced concrete building with a floor area of 9,083.6m^2, the student dormitory as a 2-storeyed, reinforced concrete building with a floor area of 1,108.7m^2 and the Electric Building and others with a floor area of 89.3m^2.

As stated in Chapter 5, the Project is necessary to the society and the economy of Indonesia, and the grant aid of the Government of Japan for EEPIS is considered to have sufficient appropriateness.

The following points are suggested so that the Project can be implemented without delay, and EEPIS can be operated smoothly and effectively on completion for the initial proposed purpose.

(1) Implementation of the Project

1) Expedition of approval

The Project is implemented according to the system of grant aid of Japan, this being subject to time limitation. Therefore, it is required that the Exchange of Notes between both Governments be rapidly concluded, and contracts with consultant, construction company and equipment supplier be concluded without delay.

2) Smooth execution of Indonesian work

It is expected that the Indonesian work will be steadily performed, because the Ministry of Education and Culture of Indonesia is familiar to the procedure of the grant aid system of Japan. The Indonesian work should be budgeted at an appropriate time according to the fiscal year of Indonesia.

In particular, the preliminary works such as banking and leveling of the site and access road to the site shall be completed before the construction company starts construction work. The permanent works such as power supply and municipal water supply shall be completed at least two months ahead before the facilities are completed, for the purpose of the inspection of both facilities and equipment and trial run.

3) Support to acceleration of the work

An implementation organization with an appropriate business control capacity should be established so that the Project promotion service can be performed within the shortest period. The service covers a wide range of business such as discussions with other ministries, customs clearance, transportation, and banking arrangements, and must also overcome a geographical disadvantage that Surabaya is far from Jakarta where the Ministry of Education and Culture is located.

(2) Education and administration of EEPIS

1) To ensure Qualified Academic staff

As stated in 2-1-5, (6), the most difficult problem for Indonesian higher education is to ensure excellent academic staff.

EEPIS has to recruite 27-56 teachers by 1988 when the facilities are completed, and 85 teachers by 1989.

It is recommended that EEPIS should take measures to ensure qualified teachers as described below.

- EEPIS should positively appeal to the Ministry of Education and Culture or PEDC to provide teachers with the opportunity of overseas training.
- In case where technical cooperation by Japan is performed, EEPIS should utilize technics transferred by Japanese experts and training in Japan as an incentive to ensure teachers.

- EEPIS should try to balance the teacher's salary of low level with staff houses and fulfilled welfare facilities by self-help efforts.
- Regarding settlement of the teachers after employment, EEPIS should develop the new ready-to-use education method to utilize the provided equipment and build up the environment where teachers will enjoy their jobs. This will motivate teachers to have a sense of dedication.

2) Efficient utilization of Local industry

Middle level skilled manpower is effectively educated by in-plant training, as pointed out in Technical Cooperation Long-term Experts Survey Report made in November, 1985.

EEPIS should positively approach electronics and associated industries in and around Surabaya to ask them to accept students for on-the-job training during vacations.

In Indonesia students seek for employment only at their own will. Although, this system is appreciated in that the independency of each student is highly regarded, no research can be performed to follow up graduates after employment, with the result that the effectiveness of curricula in actual society is difficult to be reviewed.

It is recommended to secure the budget of the periodical follow-up research for graduates in enterprises. Reviewing the curricula on the basis of the follow-up research will be effective in bringing up ready-to-use technicians.

3) Regulations of qualification for the middle level skilled manpower

In Indonesia, graduates are differently evaluated by the education institution, the faculty of non-degree, academy, and polytechnic, but they are equally regarded as DIII level. However, they differ from one another too much in their own capacities.

In almost all fields, no qualification test is stipulated, except radio communications.

If the regulations stipulate the licencing for various fields which affect income, students would make clear targets for their efforts.

4) Technical Cooperation

The preliminary survey has been done and Technical cooperation Long-term Experts have been dispatched for the technical cooperation of the Project by the Government of Japan. The domestic support system has been discussed practically.

Therefore, execution of the Technical Cooperation is presupposed in the grade selection of educational equipment in the project.

It is desirable that the Government of Japan and the Government of the Republic of Indonesia continue their efforts to realaize the Technical Cooperation by the Government of Japan and thus to further raise the effect of this Project.

ANNEX

1. Members of the Study Team

1-1 Basic Design Study Team (Dec.1 - Dec.22, 1985)

. Dr. Yoshiyuki NAITO	Team Leader	Professor, Tokyo Institute of Technology
. Mr. Osamu MAKINO	Radio Communication	Radio Communication Expert, Insitute for International Cooperation, JICA
. Mr. Takafumi ITOH	Project Coordinator	Grant Aid Planning and Survey Department, JICA
. Mr. Toshio ITOH	Project Manager	Yamashita Architects & Engineers, Inc.
. Mr. Mineo NAGAOKA	Architectural Designer	"
. Mr. Takeshi HIROTA	Facilities Planner	"
. Mr. Toshio SHINKO	Equipment Planer	"

1-2 Basic Design Study Team
(Explanation of Draft Final Report, Mar.13 - Mar.25, 1986)

. Dr. Yoshiyuki NAITO	Team Leader	Professor, Tokyo Institute of Technology
. Mr. Osamu MAKINO	Communication Engineering, Project Coordinator	Radio Communication Expert, Institute for International Cooperation, JICA
. Mr. Toshio ITOH	Project manager	Yamashita Architects & Engineers, Inc.
. Mr. Mineo NAGAOKA	Architectural Designer	"

2. Survey Schedule

2-1 Survey Schedule (Dec.1 - Dec.22, 1985)

1.	Dec. 1(Sun)	Lv. Tokyo (Messers. Naito, Makino, Itoh, Itoh, Nagaoka, Hiorta, Shinko) Ar. Jakarta
2.	" 2(Mon)	Meeting at JICA office Meeting at Ministry of Education and Culture (MOEC)
3.	" 3(Tue)	Explanation of Inception Report at MOEC. Discussion at JICA office
4.	" 4(Wed)	Lv. Jakarta Ar. Surabaya Courtesy Call on Japanese Consulate General Confirmation of the proposed site.
5.	" 5(Thu)	Explanation of Inception Report at ITS
6.	" 6(Fri)	Discussion at ITS Survey on Electronic Parts Supply Condition in Surabaya
7.	" 7(Sat)	Discussion at ITS Signing of Answer to the Questionnaires
8.	" 8(Sun)	Survey on existing facilities of ITS
9.	" 9(Mon)	Lv. Surabaya Ar. Jakarta Survey on the construction site of Institute of Agriculture, Bogor (IPB) project.
10.	" 10(Tue)	Meeting at BAPPENAS Reporting the survey result of Surabaya to MOEC
11.	" 11(Wed)	Meeting at MOEC
12.	" 12(Thu)	Survey on Electronic Parts Supply Condition in Jakarta. Survey and Data Collection on construction conditions
13.	" 13(Fri)	Signing of "Minutes of Discussions" at MOEC Discussion at JICA office
14.	" 14(Sat)	Reporting the survey result to JICA office Lv. Jakarta for Tokyo; (Messers. Naito, Makino, Itoh, Shinko)
15.	" 15(Sun)	Survey of the construction site of IPB project

16.	Dec. 16(Mon)	Lv. Jakarta Ar. Bandung Meeting at PEDC Survey on Existing Facilities of ITB Polytechnic. (ITB; Institue of Technology, Bandung)
17.	" 17(Tue)	Survey on Electronic Engineering Department and Architectural Engineering Department of ITB Collecting information at a local consultant
18.	" 18(Wed)	Lv. Bandung Ar. Jakarta Survey and Data collection on construction conditoins
19.	" 19(Thu)	Survey of the construction site of Emergency Medical Centre, Collecting Information on Education System at University of Indonesia (UI) Survey of Depok Campus, UI Survey of Existing facilities of UI polytechnic
20.	" 20(Fri)	Collecting Information on Vocational Training at CEVEST
21.	" 21(Sat)	Reporting the survey result to JICA office Lv. Jakarta (Messers Itoh, Nagaoka, Hirota)
22.	" 22(Sun)	Ar. Tokyo

2-2 Survey Schedule (Mar.13 - Mar.25, 1986)

1.	Mar.13(Thu)	Lv. Tokyo (Messers. Naito, Makino, Itoh, Nagaoka) Ar. Jakarta
2.	" 14(Fri)	Meeting at JICA Office Courtesy Call on Japanese Embassy Explanation of Draft Report at MOEC and BAPPENAS.
3.	" 15(Sat)	Lv. Jakarta Ar. Surabaya Submission of Draft Report to ITS
4.	" 16(Sun)	Additional Survey on the proposed site
5.	" 17(Mon)	Courtesy Call on Japanese Consulate General. Explanation of Draft Report at ITS
6.	" 18(Wed)	" Signing of Notes of Discussions.
7.	" 19(Wed)	Lv. Surabaya Ar. Jakarta Discussion at MOEC

8.	Mar.	20(Thu)	Signing of "Minutes of Discussions" at MOEC
9.	"	21(Fri)	Collecting Information on construction conditions
10.	"	22(Sat)	Meeting with Technical Cooperation Experts at CEVEST.
11.	"	23(Sun)	Analysis of the collected data
12.	"	24(Mon)	Courtesy Call on Sekneg, Sekab. Reporting the survey result to JICA office. Lv. Jakarta (Messers. Naito, Makino, Itoh, Nagaoka)
13.	"	25(Tue)	Ar. Tokyo

2-3 Member of the Indonesian Counterpart

(1) Department of Education and Culture

. Prof. Dr. Sukadji Ranuwihardjo	Director General, Directorate General of Higher Education
. Prof. Ir. Sidharto Pramoetadi	Director of Academic Affairs, Directorate General of Higher Education
. Ir. Oetomo Djajanegara	Secretary Directorate General, Directorate General of Higher Education
. Pof. Dr. Yuhara Sukra	Director of Research and Community Service Development Directorate General of Higher Education, Ministry of Education and Culture
. Mr. Purwadi HP	Head, Sub-Directorate of Inter-Institutional Cooperation, Directorate General of Higher Education

(2) Bappenas

. Dr. H. A. R. Tilaar	Head, Bureau for Education and Culture

(3) Institute of Technology Sepuluh Nopember

. Ir. Harjono Sigit BS.	Rector
. Ir. Surojo	Vice Rector on Academic Affairs
. Ir. Bambang Soejadi Dipl. HE	Vice Rector on Finance and Administration Affairs
. Ir. Susanto	Dean, Faculty of Non Degree Leader of EEPIS Committee
. Ir. Adi Suryanto	Dean, Faculty of Industrial Technology
. Ir. S. Gunadi	Project Manager Lecturer, Architectural Engineering Department, Faculty of Civil Engineering and Planning
. Ir. Syariffuddin Mahmudsyah	Lecturer, Electrical Engineering Department, Faculty of Industiral Technology
. Dr. Ir. Nonot Suwarno	Lecturer, Chemical Engineering Department, Faculty of Industrial Technology
. Dr. Ir. Agus Mulyanto	Lecturer, Electrical Engineering Department, Faculty of Industrial Technology
. Ir. Soetikno	Lecturer, Electrical Engineering Department, Faculty of Industrial Technology
. Ir. M. A. Purnomo	Secretary, Electrical Engineering Department, Faculty of Industiral Technology
. Ir. Iskandar Zulkarnain	Secretary, Faculty of Non Degree in Technology
. Ir. Supardi	Lecturer, Electrical Engineering Department, Faculty of Industrial Technology

. Ir. Doellatip	Lecturer, Electrical Engineering Department, Faculty of Industrial Technology
. Ir. Dunat Indratmo	Lecturer, Civil Engineering Department, Faculty of Non Degree in Technology
. Ir. Estutie Maulanie	Lecturer, Civil Engineering Department, Faculty of Non Degree in Technology
. Ms. Lubna Algadrie	Head of Language Laboratory
. Ms. Tuty. S.	Secretary
. Ms. Endang M.	Secretary

(4) Institute of Technology, Bandung

. Dr. Ir. Samaun Samadikun	Professor, Electrical Engineering Department
. Ir. Yuswadi Saliya	Lecturer, Architect, Architectural Engineering Department

(5) Univeristy of Indonesia

. Dr. Ir. W.A.F.J. Tumbelaka	Professor of Child Health First Deputy Rector

(6) Polytechnic Education Development Centre

. Ir. Tonny Soewandito	Project Director
. Ir. Hadiwaratama Msc.	Director
. Mr. Anton G. Bolliger	Team Leader Assistant, Swiss Technical Cooperation Team

(7) Polytechnic, ITB

. Ir. Rochhardjanto	Vice Director

(8) Polytechnic, UI, Depok

. Ir. Nursid SH	Secretary

3. Minutes of Discussions

3-1 Minutes of Discussions - 1

MINUTES OF DISCUSSIONS
ON
THE CONSTRUCTION PROJECT OF THE ELECTRONIC ENGINEERING POLYTECHNIC INSTITUTE IN SURABAYA IN THE REPUBLIC OF INDONESIA

MINUTES OF DISCUSSIONS

ON

THE CONSTRUCTION PROJECT

OF THE ELECTRONIC ENGINEERING

POLYTECHNIC INSTITUTE IN SURABAYA

IN THE REPUBLIC OF INDONESIA

In response to the request made by the Government of the Republic of Indonesia for Grant Assistance for the Construction Project of the Electronic Engineering Polytechnic Institute in Surabaya (hereinafter referred to as " the Project "), the Government of Japan has decided to conduct a basic design study, and the Japan International Cooperation Agency (hereinafter referred to as " JICA ") has sent the basic design study team headed by Dr. Yoshiyuki NAITO, Professor, Faculty of Engineering, Tokyo Institute of Technology, (hereinafter referred to as " the Team ") from 1st December to 22nd December, 1985.

The Team has carried out field survey, had a series of discussions and exchanged views with the authorities concerned of the Project.

As a result of the study and discussions, both parties have agreed to recommend to their respective Governments to examine the results of the survey attached herewith toward the realization of the Project.

Jakarta, 13th December, 1985

Dr. Yoshiyuki NAITO
Leader, Japanese Study Team
JICA

Prof. Dr. Sukadji Ranuwihardjo
Director General of Higher Education
Ministry of Education and Culture

A T T A C H M E N T

1. The objective of the Project is to provide necessary buildings, facilities and equipment for the establishment of the Electronic Engineering Polytechnic Institute in Surabaya (hereinafter referred to as " EEPIS ").

2. The proposed site of the Project, acquired by the Government of Indonesia, is located in the Sukolilo campus of the Institute of Technology Sepuluh Nopember in Surabaya (hereinafter referred to as " ITS ").

The Project Site is shown in Annex I.

3. The basic concept for EEPIS is as follows;

(1) EEPIS consists of the following two (2) departments.

* Electronic Engineering
* Electronic Communication Engineering

(2) Each department has two (2) classes. A class consists of 30 students. The students would follow a 3 year course. Total number of students of EEPIS is 360.

(3) Tentative curricula executed in EEPIS are shown in Annex II.

(4) EEPIS will be managed under the control of Rector of ITS after the completion of construction. Implementation organization structure for the construction of EEPIS is shown in Annex III.

(5) Staff necessary for the management and operation of EEPIS is as follows.

* Academic staff
* Administration staff

Contents and number of these staff are shown in Annex IV.

4. The Team will convey the desire of the Government of the Republic of Indonesia to the Government of Japan that the latter will take the necessary measures to co-operate in implementing the Project and will provide the buildings and other items as listed in Annex V within the scope of the Japanese economic cooperation in grant form.

   The items are listed in the order of priority and some of lower priority may be deleted or adjusted according to the budget allocated by the Government of Japan.

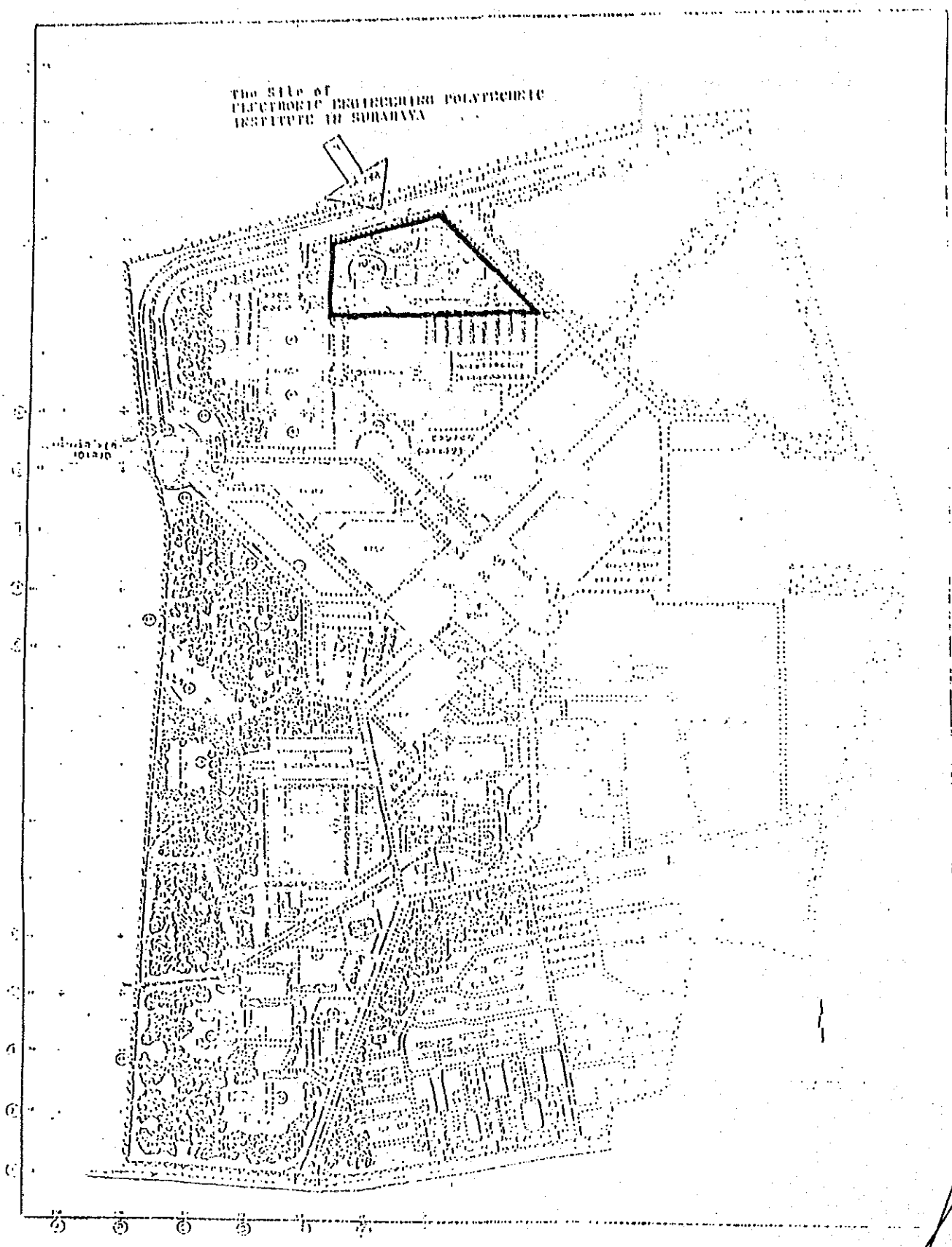
5. The Indonesian side has understood Japan's grant aid system explained by the Team which includes a principle of use of a Japanese consultant and a Japanese general contractor for the construction of EEPIS.

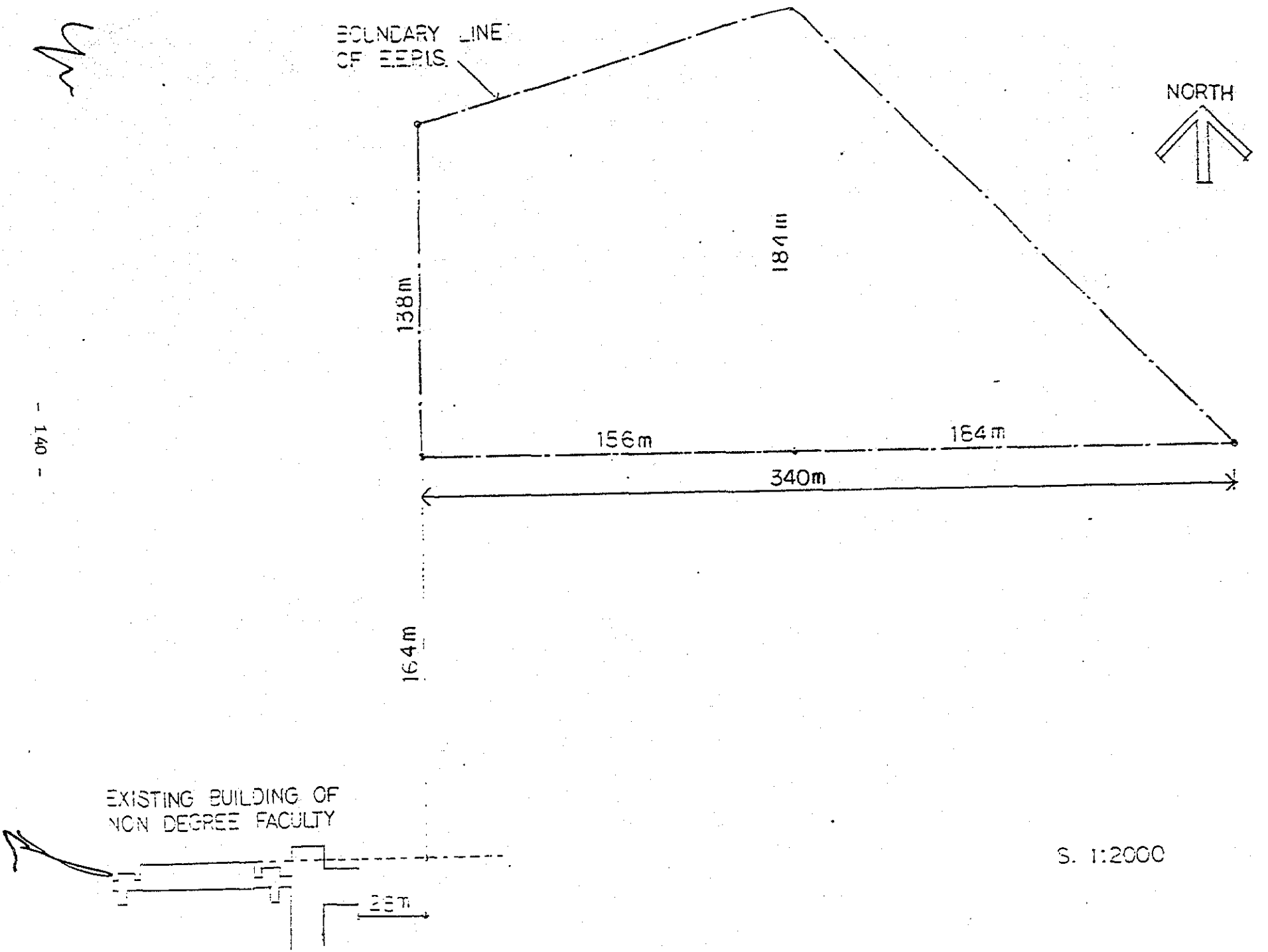
6. The Government of the Republic of Indonesia will take the necesarry measures as listed in Annex VI on condition that the Grant Aid by the Government of Japan shall be extended to the Project.

7. The Ministry of Education and Culture is the implementing body for the Project and will be responsible for the implementation of the preparatory work and contruction work of the Project.

ANNEX I

Project Site




BOUNDARY LINE
OF EEPIS
NORTH
184m
138m
156m
164m
340m
164m
EXISTING BUILDING OF
NON DEGREE FACULTY
28m

S. 1:2000

ANNEX II

Tentative Curricula executed in EEPIS

I. Department of Electronic Engineering

SUBJECT	SEMESTER	I	II	III	IV	V	VI	TOTAL (hour)
A. GENERAL SUBJECTS	T / P							
EE. 101 PANCASILA	88 / -	2/-	2/-					88
EE. 102 INDONESIAN	44 / -		2/-					44
EE. 103 ENGLISH	176 / -	2/-	2/-	2/-	2/-			176
EE. 104 INDUSTRIAL MANAGEMENT	88 / -				2/-	2/-		88
EE. 105 KEWIRAAN	22 / -	1/-						22
EE. 106 RELIGION	22 / -	1/-						22
EE. 107 TECHNOLOGY CONCEPT	22 / -	1/-						22
SUB TOTAL	462/ -	7/-	6/-	2/-	4/-	2/-		462
B. BASIC SCIENCE & ENGINEERING								
EE. 201 MATHEMATICS	242/ -	3/-	3/-	3/-	2/-			242
EE. 202 PHYSICS	44/66	2/3						110
EE. 203 CHEMISTRY	22/ -	1/-						22
EE. 204 TECHNICAL DRAWING	22/66	1/3						88
EE. 205 ELECTRICAL MATERIALS	22/44			1/2				66
EE. 206 ELECTRIC CIRCUITS	66/132	2/3	1/3					198
EE. 207 ELECTRICAL MEASUREMENT & INSTRUMENTATION	44/110	1/2	1/3					154
EE. 208 ELECTROMECHANICAL WORKSHOP	22/88		1/4					110

EE. 209	COMPUTER LANGUAGE	44/88	1/2	1/2						132
EE. 210	QUALITY CONTROL	66/-				3/-				66
	SUB TOTAL	594/594	11/13	7/12	4/2	5/-				1188
C. ENGINEERING										
EE. 301	ELECTRICITY & MAGNETISM	44/66	1/1	1/2						110
EE. 302	ELECTRONIC DEVICES	88/132	2/3	2/3						220
EE. 303	ELECTRONIC CIRCUITS	220/330		2/3	3/6	5/6				550
EE. 402	SIGNAL PROCESSING	44/-			2/-					44
EE. 304	DIGITAL ELECTRONICS & MICRO-PROCESSOR	154/396			2/3	2/3	2/6	1/6		550
EE. 305	ELECTRIC POWER SYSTEM	44/132			1/3	1/3				176
EE. 306	AUTOMATIC CONTROL	88/132			2/3	2/3				220
EE. 307	MAINTENANCE & REPAIR	44/132					1/3	1/3		176
EE. 308	APPLIED ELECTRONIC CIRCUITS	66/198					2/4	1/5		264
EE. 309	INDUSTRIAL ELECTRONICS	88/264					2/6	2/6		352
EE. 310	COMPUTER AIDED PROBLEM SOLVING	44/176			2/3	2/3				220
EE. 311	COMPUTER INTERFACE	44/66						2/3		110
EE. 312	OPTO-ELECTRONIC	44/66					2/3			110
EE. 500	P R O J E C T S	-/264					-/4	-/8		264
	SUB TOTAL	968/2398	3/4	5/8	12/18	12/18	9/26	7/31		3366
	T O T A L	2024/2992	21/17	18/20	18/20	21/18	11/26	7/31		5016
	Theory : 40.35 %, Practice 59.65 %									

II. Department of Electronic Communication Engineering.

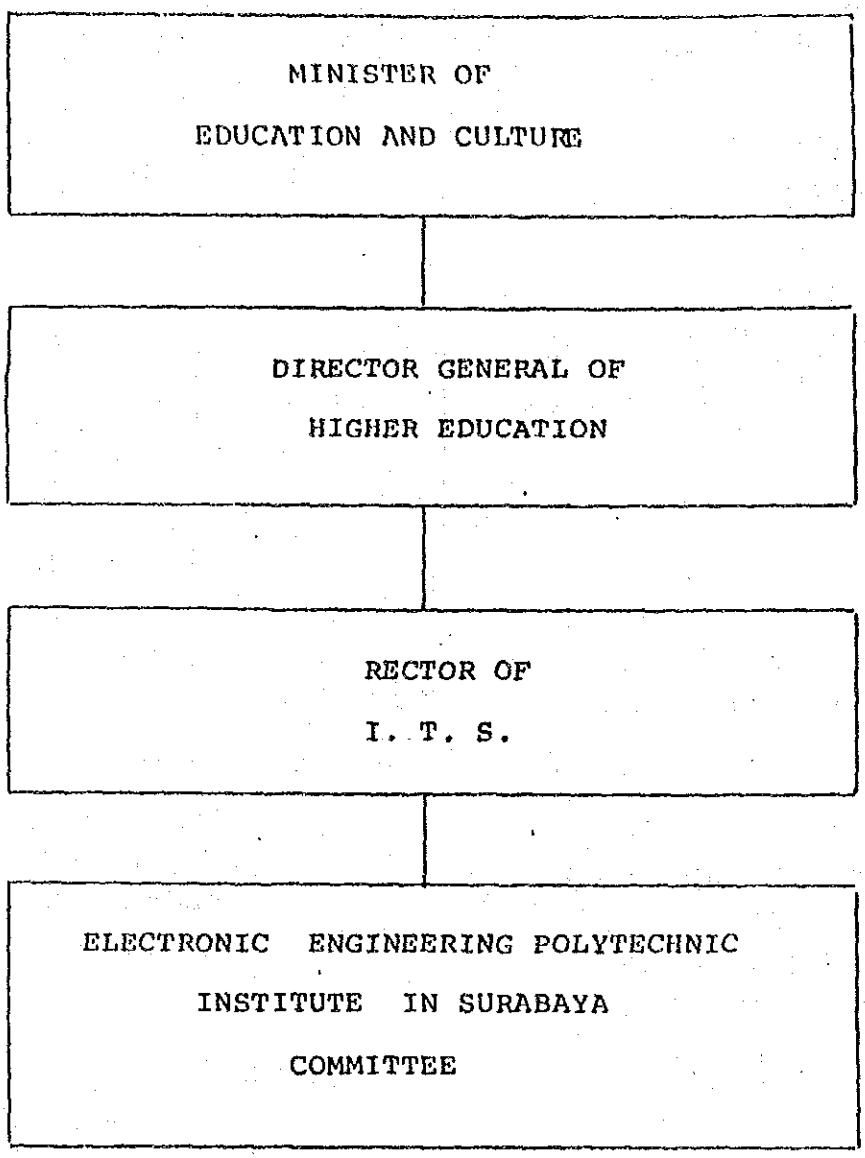
SUBJECT	SEMESTER	I	II	III	IV	V	VI	TOTAL (hour)
A. GENERAL SUBJECTS	T / P							
EE. 101 PANCASILA	88 / --	2/-	2/-					88
EE. 102 INDONESIAN	44 / --		2/--					44
EE. 103 ENGLISH	176 / --	2/--	2/--	2/--	2/--			176
EE. 104 INDUSTRIAL MANAGEMENT	88 / -				2/-	2/--		88
EE. 105 KEWIRAAN	22 / -	1/-						22
EE. 106 RELIGION	22 / -	1/--						22
EE. 107 TECHNOLOGY CONCEPT	22 / -	1/--						22
SUB TOTAL	462/ --	7/--	6/--	2/-	4/--	2/-		462
B. BASIC SCIENCE & ENGINEERING								
EE. 201 MATHEMATICS	242/ --	3/--	3/-	3/--	2/-			242
EE. 202 PHYSICS	44/66	2/3						110
EE. 203 CHEMISTRY	22/ -	1/-						22
EE. 204 TECHNICAL DRAWING	22/66	1/3						88
EE. 205 ELECTRICAL MATERIALS	22/44			1/2				66
EE. 206 ELECTRIC CIRCUITS	66/132	2/3	1/3					198
EE. 207 ELECTRICAL MEASUREMENT & INSTRUMENTATION	44/110	1/2	1/3					154
EE. 208 ELECTROMECHANICAL WORKSHOP	22/88		1/4					110

EE. 209	COMPUTER LANGUAGE.	44/88	1/2	1/2						132
EE. 210	QUALITY CONTROL	66/-				3/-				66
	SUB TOTAL	594/594	11/13	7/12	4/2	5/-				1188
C. ENGINEERING										
EE. 301	ELECTRICITY & MAGNETISM	44/66	1/1	1/2						110
EE. 302	ELECTRONIC DEVICES	88/132	2/3	2/3						220
EE. 401	ELECTRONIC CIRCUITS	132/198		2/3	2/3	2/3				330
EE. 402	SIGNAL PROCESSING	44/-			2/-					44
EE. 403	DIGITAL ELECTRONICS & MICRO PROCESSOR	88/132			2/3	2/3				220
EE. 305	ELECTRIC POWER SYSTEM	44/132			1/3	1/3				176
EE. 306	AUTOMATIC CONTROL	44/66			2/3					110
EE. 404	MAINTENANCE & REPAIR	44/132							2/6	176
EE. 405	COMMUNICATION CIRCUITS & SYSTEM	132/198			2/3	2/3	2/3			330
EE. 406	TRANSMISSION LINES, WAVE-PROP & ANTENNA	132/198				2/3	2/3	2/3		330
EE. 407	NETWORK&SWITCHING	88/132					2/3	2/3		220
EE. 408	COMPUTER AIDED PROBLEM SOLVING	22/66			1/3					88
EE. 409	MICROWAVE	44/66					2/3			110
EE. 410	APPLIED COMMUNICATION SYSTEMS	110/198				2/3	2/3	1/3		308
EE. 411	OPTICAL COMMUNICATION	44/66						2/3		110

EE. 412 RADIO WAVE MEASUREMENT & INSTRUMENTATION	88/132					2/3	2/3	220
EE. 500 P R O J E C T S	-/264					-/6	-/6	264
SUB TOTAL	1188/2178	3/4	5/8	12/18	11/18	12/24	11/27	3366
T O T A L	2244/2772	21/17	18/20	18/20	20/18	14/24	11/27	5016
Theory : 44.73 %, Practice 55.27 %								

ANNEX III

Implementation organization structure for the construction of EEPIS



A N N E X IV

Staff necessary for the management of EEPIS

I. ACADEMIC STAFF OF E.E.I.PS :

ACADEMIC STAFF / YEAR		1986	1987	1988	1989	TOTAL
LECTURERS		2	3	5	5	13
INSTRUCTORS		4	6	10	10	30
ASSISTANT OF LECTURER		–	3	3	3	9
ASSISTANT OF INSTRUCTOR		–	5	5	5	15
TECHNICIANS	Dep.of EE	–	2	3	3	8
	Dep.of EC	–	2	3	3	8
T O T A L		6	21	29	29	85

II. ADMINISTRATION STAFF OF E.E.P.I.S :

DIRECTOR OF E.E.P.I.S	1
HEAD OF DEPARTMENT	2
SECRETARY	3
ADMINISTRATION	2
FINANCIAL & ACCOUNTANT	1
O T H E R S :	
Security Guards	6
Cleaners	3
Garderners	2
Typists	2
Librarian	2
T O T A L	24

A N N E X V

Request of the Government of the Republic of Indonesia

A. CLASSROOMS

T Y P E	Number of Classes	Capacity per class (Students).
S m a l l	4	30
M e d i u m	2	60
L a r g e	1	150

B. LABORATORIES

LABORATORIES	11
WORKSHOP	1
TECHNICAL DRAWING ROOM	1
T O T A L	13

1. ELECTRIC LABORATORY
2. ELECTRONIC LABORATORY I
3. ELECTRONIC LABORATORY II
4. DIGITAL ELECTRONIC LABORATORY
5. AUTOMATIC CONTROL LABORATORY
6. COMMUNICATION LABORATORY
7. RADIO FREQUENCY & MICROWAVE LABORATORY
8. COMPUTER LABORATORY
9. ELECTRIC POWER SYSTEM LABORATORY
10. OPTO ELECTRONIC & OPTICAL COMMUNICATION LABORATORY
11. PHYSICS LABORATORY
12. ELECTROMECHANICAL WORKSHOP.
13. TECHNICAL DRAWING ROOM

C. ACADEMIC STAFF OFFICE

D. ADMINISTRATION OFFICE

E. LIBRARY

F. EDUCATIONAL EQUIPMENT FOR THE DEPARTMENT OF ELECTRONIC ENGINEERING AND FOR THE DEPARTMENT OF ELECTRONIC COMMUNICATION ENGINEERING.

THE REQUEST OF DORMITORY AND CANTEEN WILL BE CARRIED TO GOVERNMENT OF JAPAN BY THE BASIC DESIGN STUDY TEAM.

A N N E X VI

Required Arrangements to be taken by the Government of the Republic of Indonesia.

1. To secure land necessary for the construction of the facilities and to clear, fill and level the site as needed before the start of the construction.
2. To provide the space necessary for such construction as temporary offices, working areas, stock yards and others.
3. To construct and prepare the access road to the Project Site.
4. To construct fence and gate in and around the site.
5. To undertake incidental civil works such as planting, if needed.
6. To obtain the building permit before construction.
7. To connect distributing line of electricity to the site.
8. To connect city water main to the site and/or to construct a well for water supply.
9. To connect the drainage city main to the site.
10. To connect the telephone truck line to the MDF (Main Distribution Frame) to be equipped inside the building.
11. To provide general furniture and materials for daily activities.
12. To bear commissions to the Japanese foreign exchange bank for the Banking Arrangement.
13. To ensure prompt unloading, tax exemption and customs clearence at ports of disembarkation in Indonesia and prompt internal transportation therein of the products purchased under the grant.
14. To exempt Japanese nationals engaged on the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Indonesia with respect to the supply of the products and the services under the verified contracts.

15. To accord without delay to Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts such facilities as may be necessary for their entry into Indonesia and their stay therein for the performance of their work.

16. To maintain and use properly and effectively the facilities constructed and equipment purchased under the grant.

17. To bear all the expenses, other than those to be borne by the grant, necessary for the construction of the facilities as well as for the internal transportation of the products and services under the grant.

MINUTES OF DISCUSSIONS

ON

THE CONSTRUCTION PROJECT OF THE ELECTRONIC POLITECHNIC INSTITUTE IN SURABAYA

IN

THE REPUBLIC OF INDONESIA

In response to the request of the Government of the Republic of Indonesia for Grant Assistance for the Construction Project of the Electronic Polytechnic Institute in Surabaya (hereinafter referred to as " The Project "), the Government of Japan decided to conduct a basic design study on the Project and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Indonesia the team headed by Dr. Yoshiyuki NAITO, Professor, Faculty of Engineering, Tokyo Institute of Technology, from 1st December to 22nd December, 1986.

As a result of the study, JICA prepared a draft report and dispatched a mission to explain and discuss it from 13th March to March 24th 1986.

Both parties had a series of discussions on the Report and agreed to recommend to their respective Governments that major points of understanding reached between them, attached herewith, should be examined towards the realization of the Project.

Jakarta, 20th March, 1986

Y. Naito

Dr. Yoshiyuki NAITO
Leader, Japanese Study Team
JICA.

Prof. Dr. Sukadji Ranuwihardjo
Director General of Higher Education
Ministry of Education and Culture

MAJOR POINTS OF UNDERSTANDING :

1. The Indonesian side prinsipally agreed to the basic design proposed in the Draft Final Report.

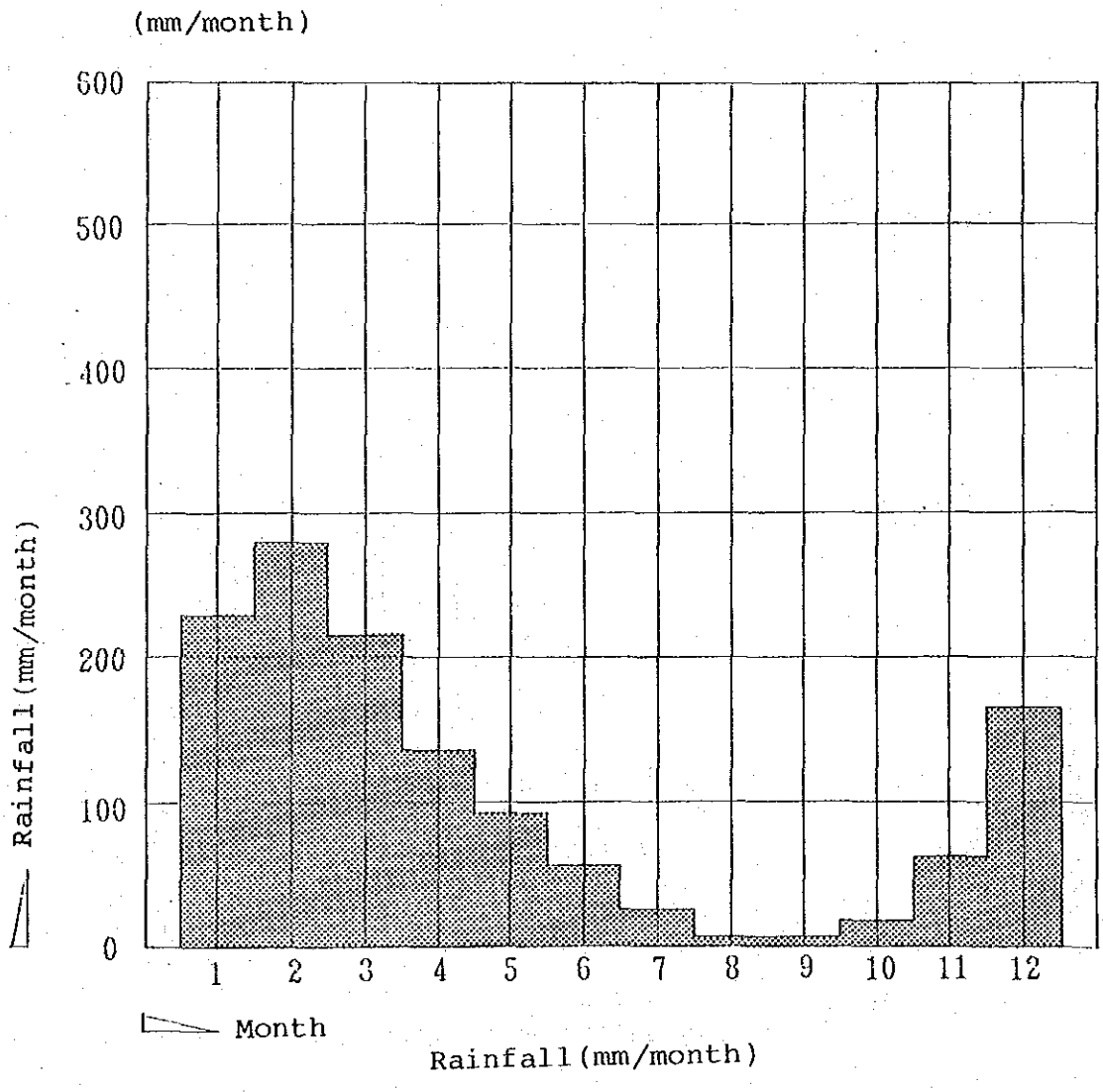
2. The Indonesian side understood the system of Japan's Grand Aid Programme and confirmed the measures to be taken by the Indonesian side towards the realization of the Project.

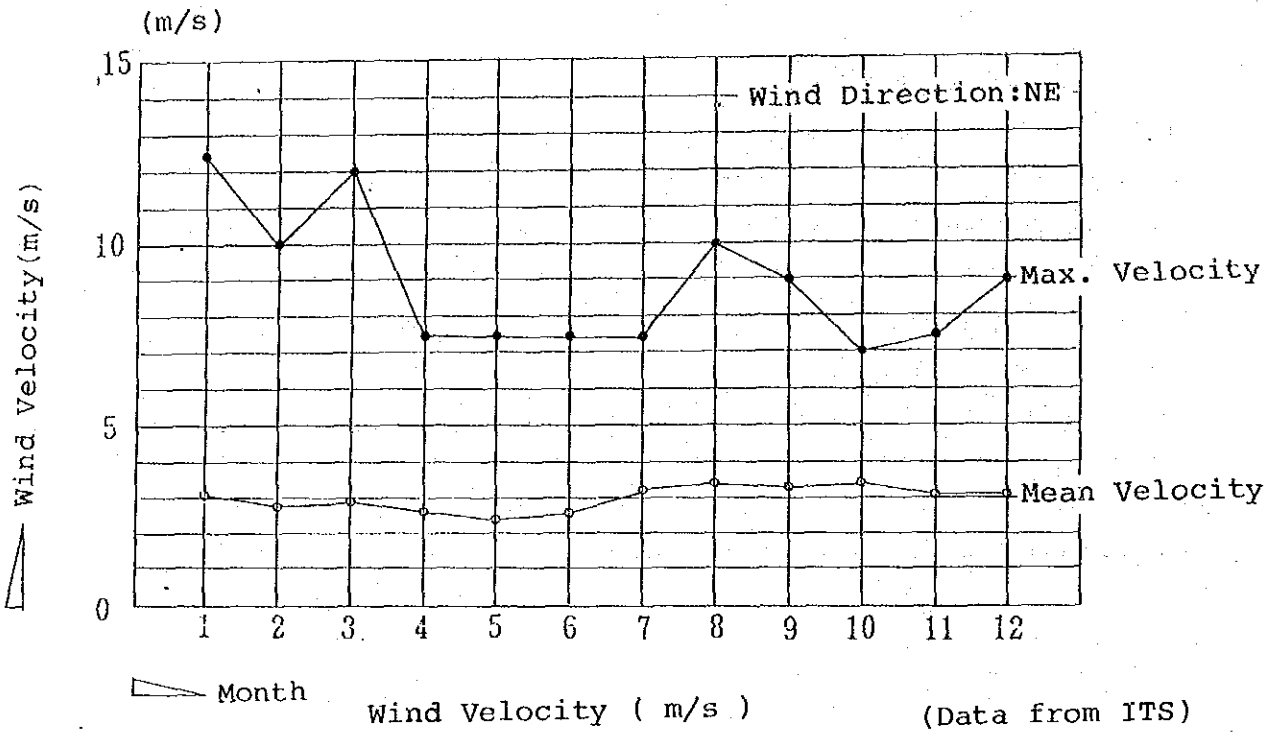
4. Meteorological Conditions

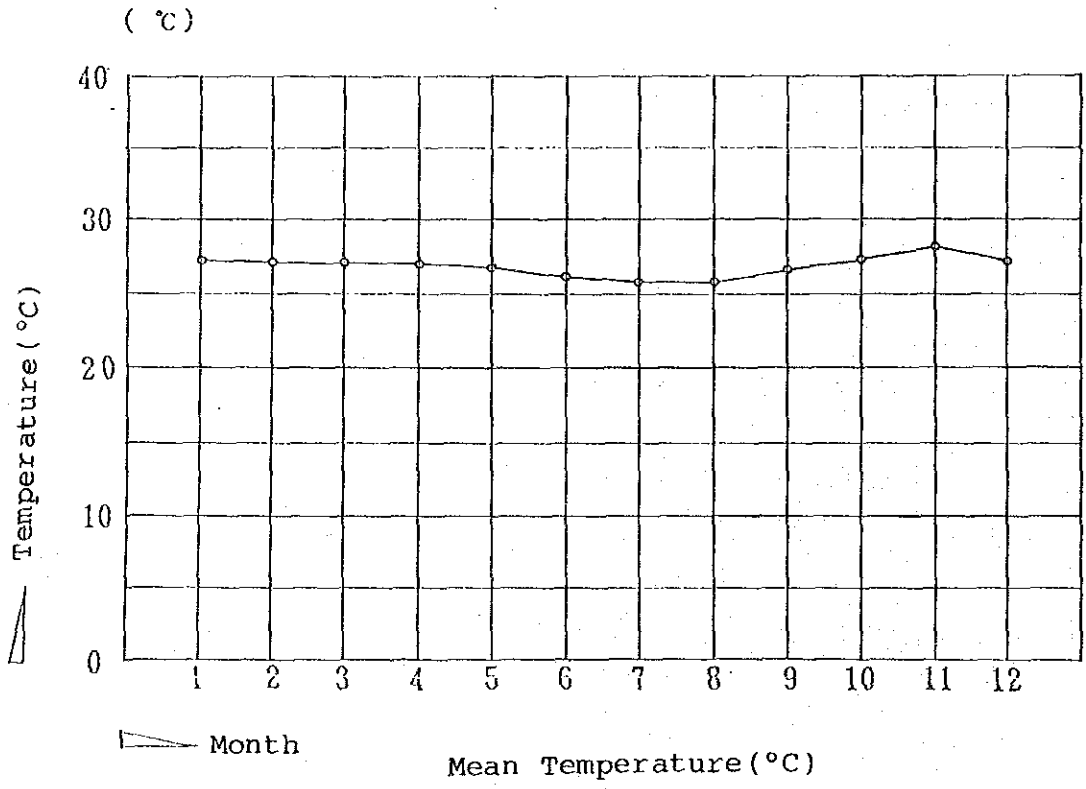
The climate of Indonesia belongs to the oceanic tropical climate featuring high temperature and high humidity. Seasons are clearly divided into the rainy and dry seasons.

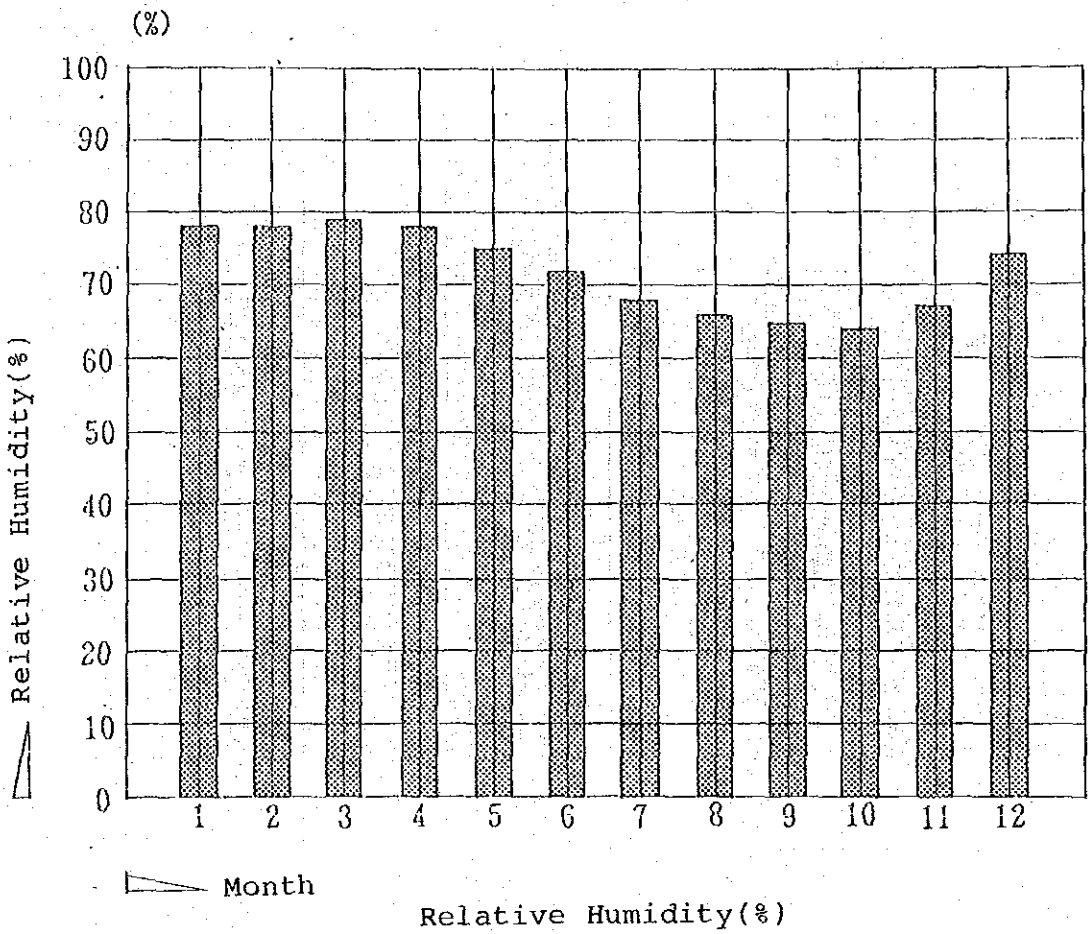
The wet monsoon (northwest) from the Asia Continent brings about rainwater to South Sumatra, Java, from December to April. On the contrary, the dry monsoon (southeast) from Australia brings about dry air, with least precipitation.

The climate graph on the following page shows the climate of Surabaya, an annual average temperature of 27°C, a relative humidity of 72%, and an annual average precipitation of 1,280mm, each of which clearly indicates the features of the Indonesian climate.




(m/s)
15
10
5
0
Wind Velocity(m/s)
Wind Direction:NE
Max. Velocity
Mean Velocity
1 2 3 4 5 6 7 8 9 10 11 12
Month
Wind Velocity (m/s)
(Data from ITS)


(℃)
40
30
20
10
0
Temperature (°C)
1 2 3 4 5 6 7 8 9 10 11 12
Month
Mean Temperature(°C)


(%)
100
90
80
70
60
50
40
30
20
10
0
Relative Humidity(%)
1
2
3
4
5
6
7
8
9
10
11
12
Month
Relative Humidity(%)

5. Water Quality Inspection Result

KOTAMADYA DATI II SURABAYA
(INSTALASI PENJERNIHAN II NGAGEL)
TILP/: 67745.

1. Contoh : Air kota — 2. Tanggal : 3 Desember 1985
3. J a m : — 4. Lokasi : Inst. Penjernihan I,II,III

Nomor.	Pemeriksaan atas		I	II	III	Syarat-2Airminum maximum yg.dipor bolehkan.-
	I. UJI FISIKA :					
1.	Warna	(ppm PtCo)	1	1	1	50
2.	Rasa		tak berasa	tak berasa	tak berasa	Tidak berasa
3.	Bau		tak berbau	tak berbau	tak berbau	Tidak berbau
4.	Kekeruhan	(ppm SiO_2/KMnO)	0,42	0,01	0,26	1,0
5.	Padatan terlarut	(ppm)	208	224	224	-
6.	Padatan jumlah	(ppm)	208	284	284	1500
	II. UJI KIMIA.					
1.	Reaksi pH		7,00	7,10	7,10	6,5 - 9,2
2.	Alkalinitas	(ppm $CaCO_3$)	67,08	115,43	103,28	500
3.	Karbondioksida bebas	(ppm CO_2)	17,42	17,76	15,89	tak dianjurkan
4.	Kesadahan total	(ppm $CaCO_3$)	117,95	119,23	120,51	170
5.	Calsium	(ppm $CaCO_3$)	85,71	84,29	85,71	500
6.	Magnesium	(ppm Mg)	3,46	4,09	4,28	150
7.	Silikat	(ppm SiO_2)	26,62	42,18	30,59	
8.	Chlorida	(ppm Cl)	25	19,47	20,83	250
9.	Sulfat	(ppm SO)	72	50	60	200
10.	Nitrat	(ppm NO_3)	1,06	1,26	1,25	20
11.	Nitrit	(ppm NO_2)	0,002	0,002	0,002	0,0
12.	Oksigen terlarut	(ppm O_2)	6,25	7,22	7,22	diatas 5
13.	Besi	(ppm Fe)	0,0	0,0	0,0	1,0
14.	Mangan	(ppm Mn)	0,0	0,0	0,0	0,50
15.	Tembaga	(ppm Cu)	0,047	0,047	0,094	1,5
16.	Timbal	(ppm Pb)	-	-	-	0,10
17.	Seng	(ppm Zn)	-	0,41	-	15
18.	Bilangan $KMnO_4$	(ppm $KMnO_4$)	1,23	2,75	1,54	10
19.	Chroom	(ppm Cr6+)	0,0	0,0	0,0	0,05
20.	Ammonium	(ppm NH_3)	0,0	0,0	0,0	0,0
21.	Chlor bebas	(ppm Cl_2aktif)	0,75	1,10	0,80	1,5
22.	Fluorida	(ppm F)	0,0	0,0	0,0	1,5 - 2,0
23.	Natrium	(ppm Na)				
24.	Phosphat	(ppm PO_4)	0,0	0,0	0,0	
25.	Sulfida.	(ppm H_2S)	-	-	-	0,0
26.	Arsen	(ppm AS)	0,0	0,0	0,0	0,05
27.	C.O.D.	(ppm O_2)	29,42	14,71	19,61	50
28.	Hydrargyrum	(ppm Hg)	0,0	0,0	0,0	0,001
29.						
30.						

Catatan : I. Air kota I tanggal 3 Desember 1985, jam 07.00 W.I.B.
II. Air kota II tanggal 3 Desembor 1985, jam 08.00 W.I.B.
III. Air kota III tanggal 3 Desembor 1985, jam 06.00 W.I.B.

Mengetahui :
Kepala
Instalasi Penjernihan II

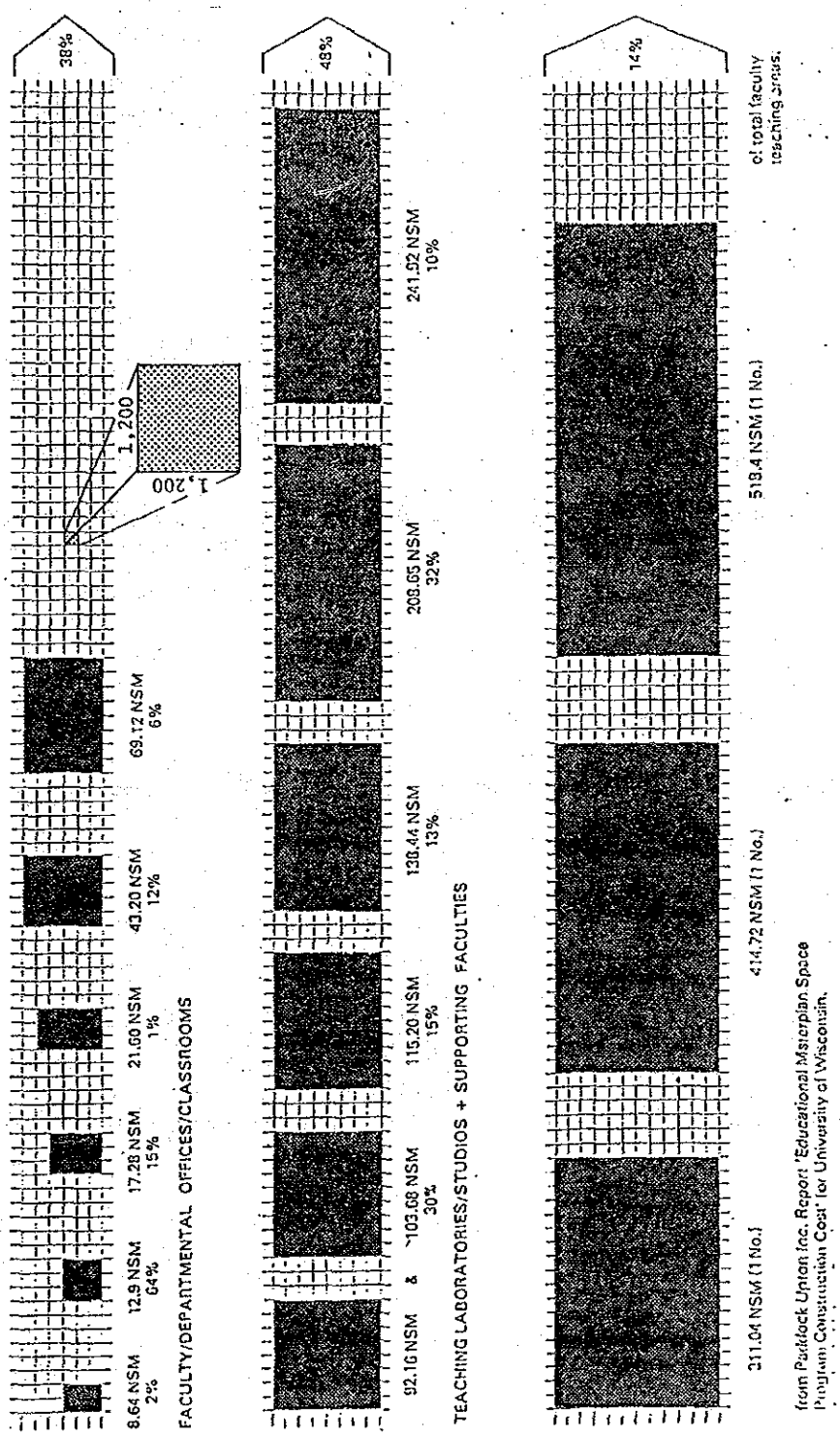
(Soerarjono Ds. B.A.)
Nip.: 510017913

Kasi Pengolahan/ Laboratorium:

(I. Soegijanto)
Nip.: 510020101

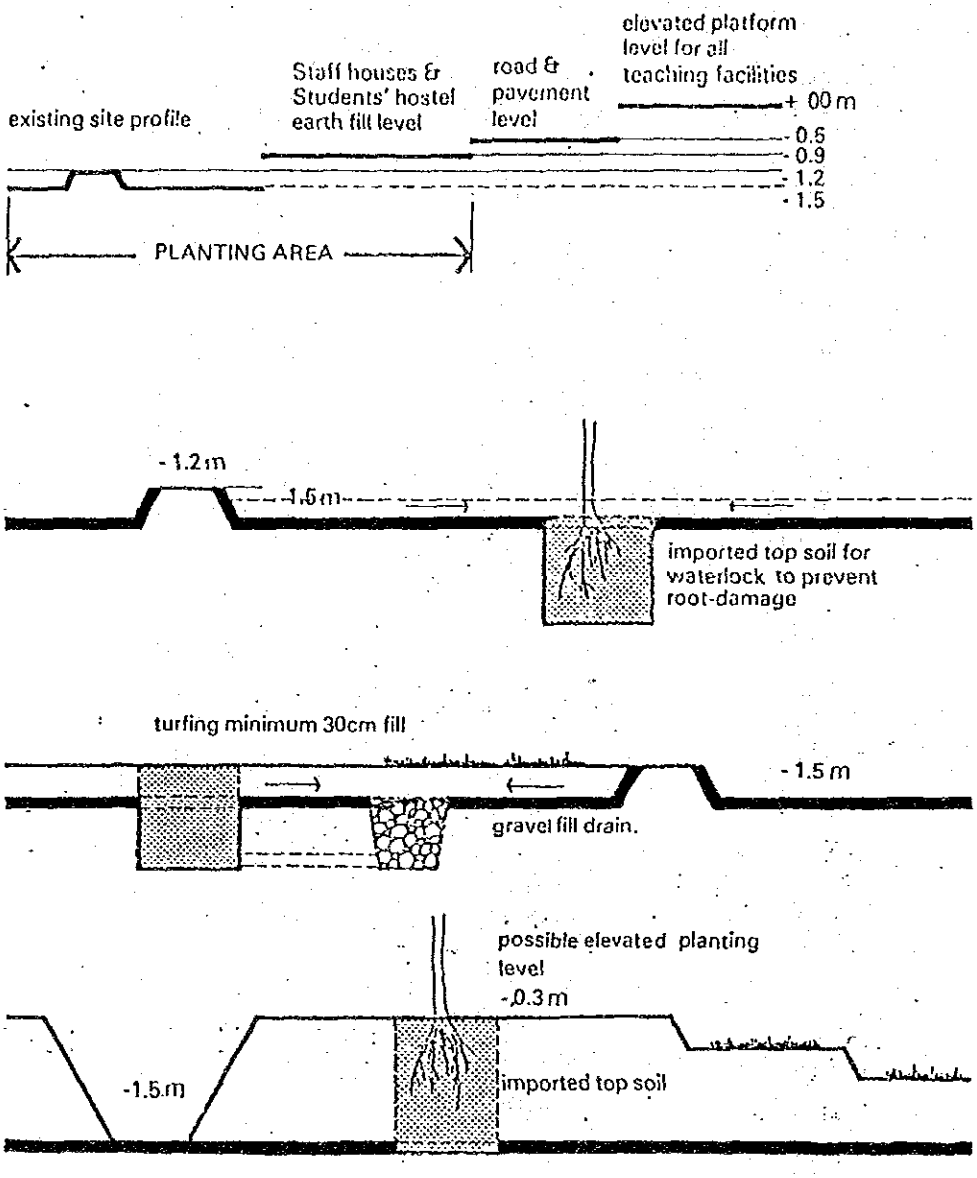
6. Sukolilo Campus Master Plan Design Criteria

6-1 Space Standards, Percentage of Occurrence with Reference Program Requirement



from Paddock Upton Inc. Report 'Educational Masterplan Space Program Construction Cost' for University of Wisconsin.

6-2 Recommended Site & Planting Profile



7. Soil Investigation Data

INSTITUT TEKNOLOGI SEPULUH NOPEMBER SURABAYA
FAK. TEK. SIPIL & PERENCANAAN — JURUSAN TEK. SIPIL
LABORATORIUM MEKANIKA TANAH
KAMPUS ITS. KEPUTIH SUKOLILO TELP. : 65239 SURABAYA

I. P R E F A C E :

According to the order from FNGT - ITS of September 19 th 1985 No. : 1615/P.T. 12.8/R/85 a soil investigation has been done by the soil mechanics laboratory ITS in Politeknik Electro ITS.

The investigation include site investigation for three boring points (sampling and SPT), six sounding points of medium capacity, and laboratory test .

Laboratory test include the index properties and engineering properties of the disturbed and undisturbed - sample of each point.

Laboratory data should be used for building foundation design.

II. IN SITU AND LABORATORY TEST :

II-1. IN SITU TEST .

II-1-1. Boring and sampling.

Boring has been done down to a depth of 30.00 meter for point A, B and C.

Split spoon of 24 inch long with inner diameter 1,75 inch and outer diameter 2 inch has been used for disturbed sample;

thin wall tube of 24 inch long with diameter 3 inch has been used for undisturbed has been done at interval of 3.00 meter depth for each point.

Machine bor is of Yoshida - YSO - I type.

II-1-2. Standard Penetration Test :

Standard Penetration Test has been done at interval of 3.00 meter depth for each point.

SPT equipment :

- Method ..... ASTM D 1586 - 67.
- Weight of blower 63.5 kg.
- Height of fall 76.2 cm.
- Split tube depth 45 cm.

II-1-3. Sounding Test.

- Dutch cone penetrometer was used for the test with Biconus Delft patent type.
- Measurement of the cone resistance and friction has been done for each 20 cm increament.
- Maximum capacity of the penetrometer is 2,5 ton.

II-1-4. Ground water table level during investigation -0,50 meter.

II-2. LABORATORY TEST :

- Laboratory test has been done for disturbed and undisturbed soil sample.

This test include :

a). Disturbed soil sample :

- Unit weight (γ_s) ..... ASTM D 854.
- Atterberg limit (LL, PL, IP) .... ASTM D 421-72.
- Grain size analysis ..... ASTM E 11-70 and ASTM D 422-72.

b). Undisturbed soil sample :

- Water content (Wc) ..... ASTM D 2216-68.
- Unit weight (γ_t) ..... ASTM D 1556-68.
- Triaxial test (U.U. test) ..... ASTM D 2166-66.
- Consolidation test ..... ASTM D 2435-70

III. RESULT OF INVESTIGATION .

III-1. BORING AND SPT.

- From the boring points it can can be resumed that from a depth of 0,00 meter B.G.S. to -10.00 meter B.G.S. is a layer of clayey silt and fine sand with an average N value of 0 to 3.

  From a depth of -10.00 meter B.G.S. to -16.00 meter - B.G.S. is a layer of silty sand with small amount of - clay with an average N value of 7 to 20 .

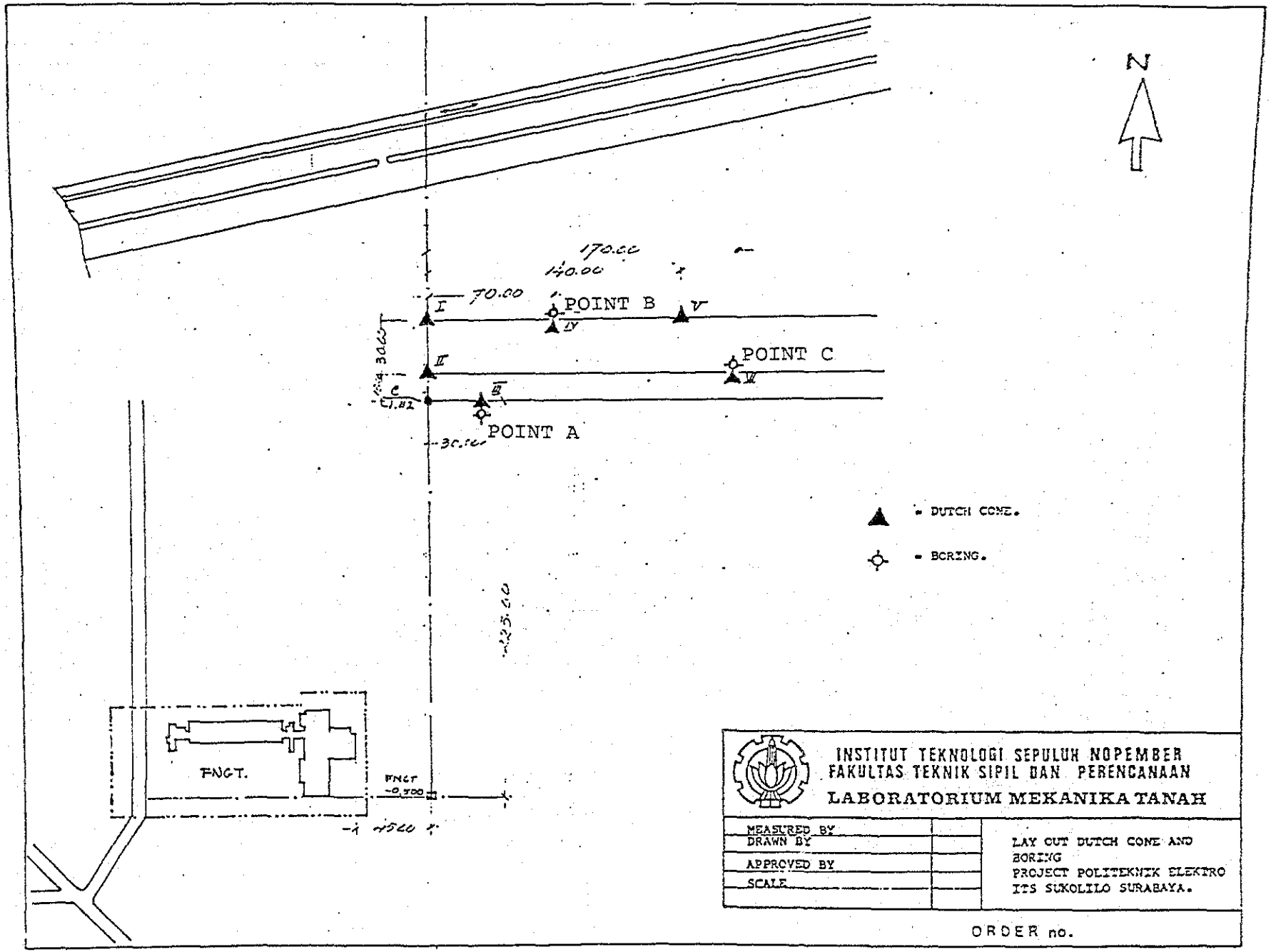
  From a depth of -16.00 meter B.G.S. to -30.00 meter - B.G.S. is a layer of sand and silt with an average N value = 16 to 30 .

III-2. SOUNDING :

- From the six sounding points it can be seen that from a depth of 0,00 meter B.G.S. to -10.00 meter B.G.S. is a layer with very low cone resistance (soft layer), the average value is 3 kg/cm2.

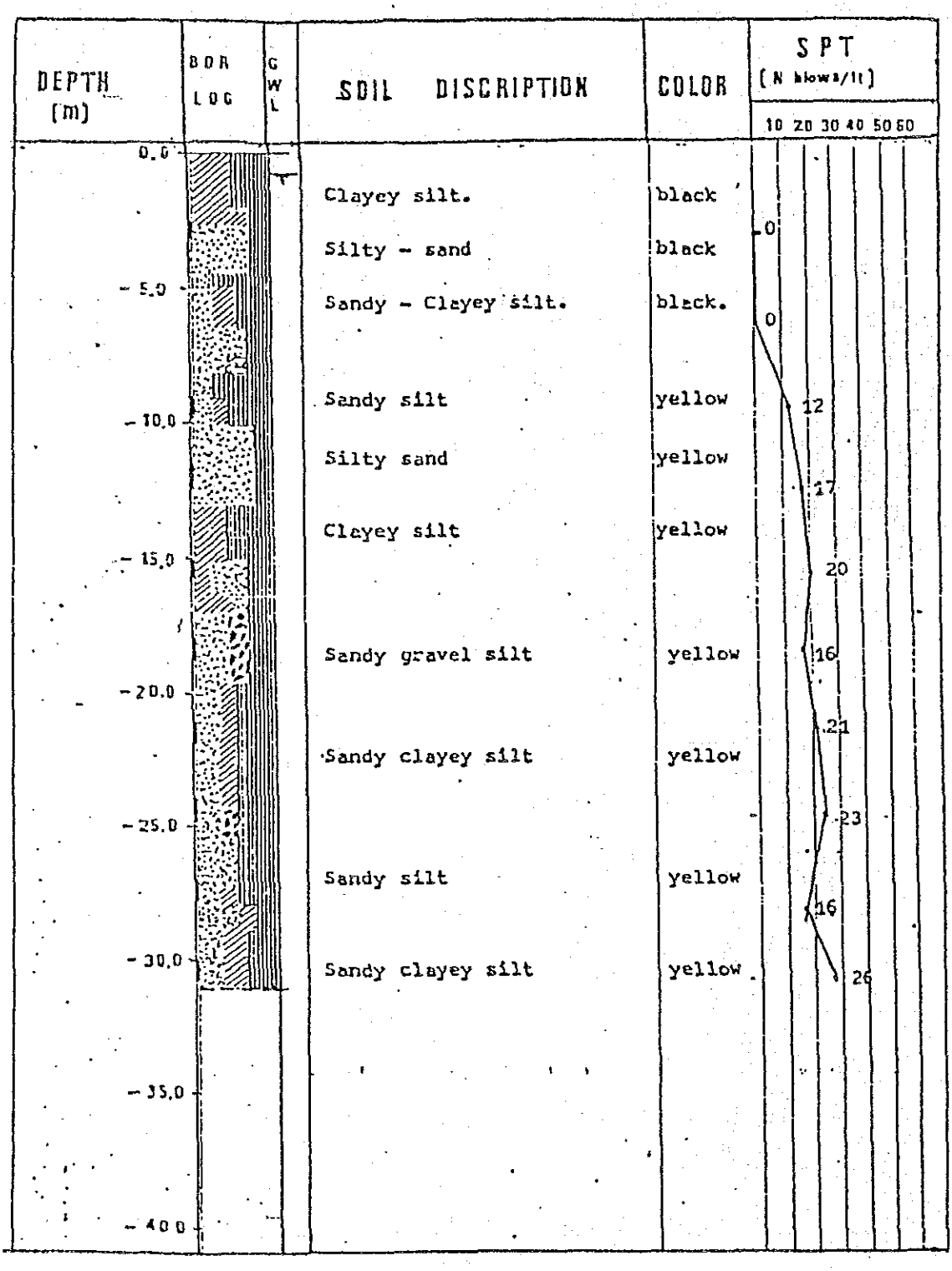
  At a depth of -10.00 meter B.G.S. to 15.00 meter B.G.S. the average cone resistance is 45 kg/cm2.

  At a depth of -16.50 meter B.G.S. to -18.00 meter B.G.S. the cone resistance is more than 200 kg/cm2.


N
170.00
140.00
70.00
POINT B
POINT C
POINT A
I
II
III
IV
V
VI
30.00
30.00
= DUTCH CONE.
= BORING.
FNGT.
FNGT
-0.300
INSTITUT TEKNOLOGI SEPULUH NOPEMBER
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
LABORATORIUM MEKANIKA TANAH
MEASURED BY
DRAWN BY
APPROVED BY
SCALE
LAY OUT DUTCH CONE AND BORING
PROJECT POLITEKNIK ELEKTRO ITS SUKOLILO SURABAYA.
ORDER no.

INSTITUT TEKNOLOGI SEPULUH NOPEMBER
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
LABORATORIUM MEKANIKA TANAH

POINT A



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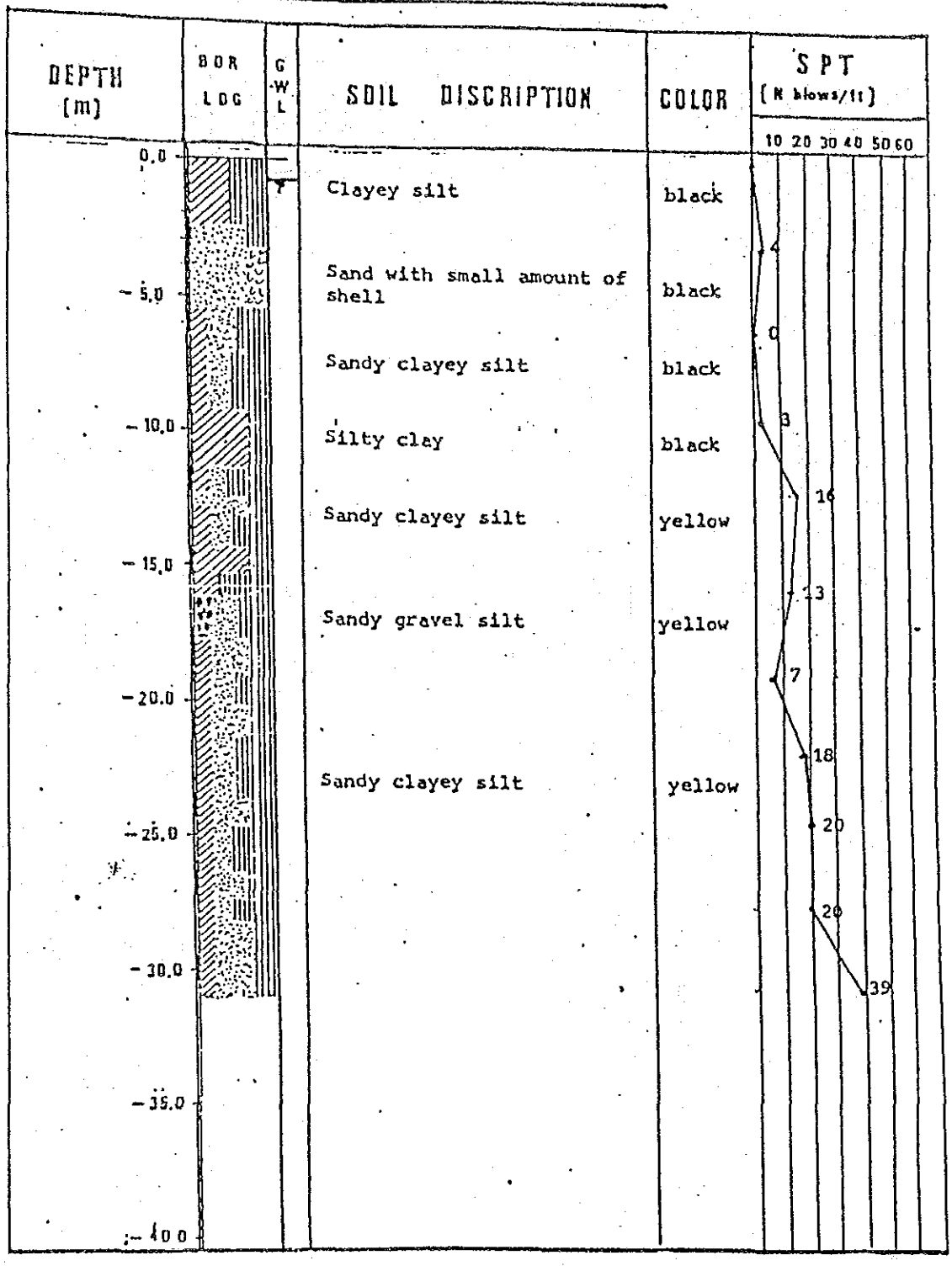
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
LABORATORIUM MEKANIKA TANAH . POINT B



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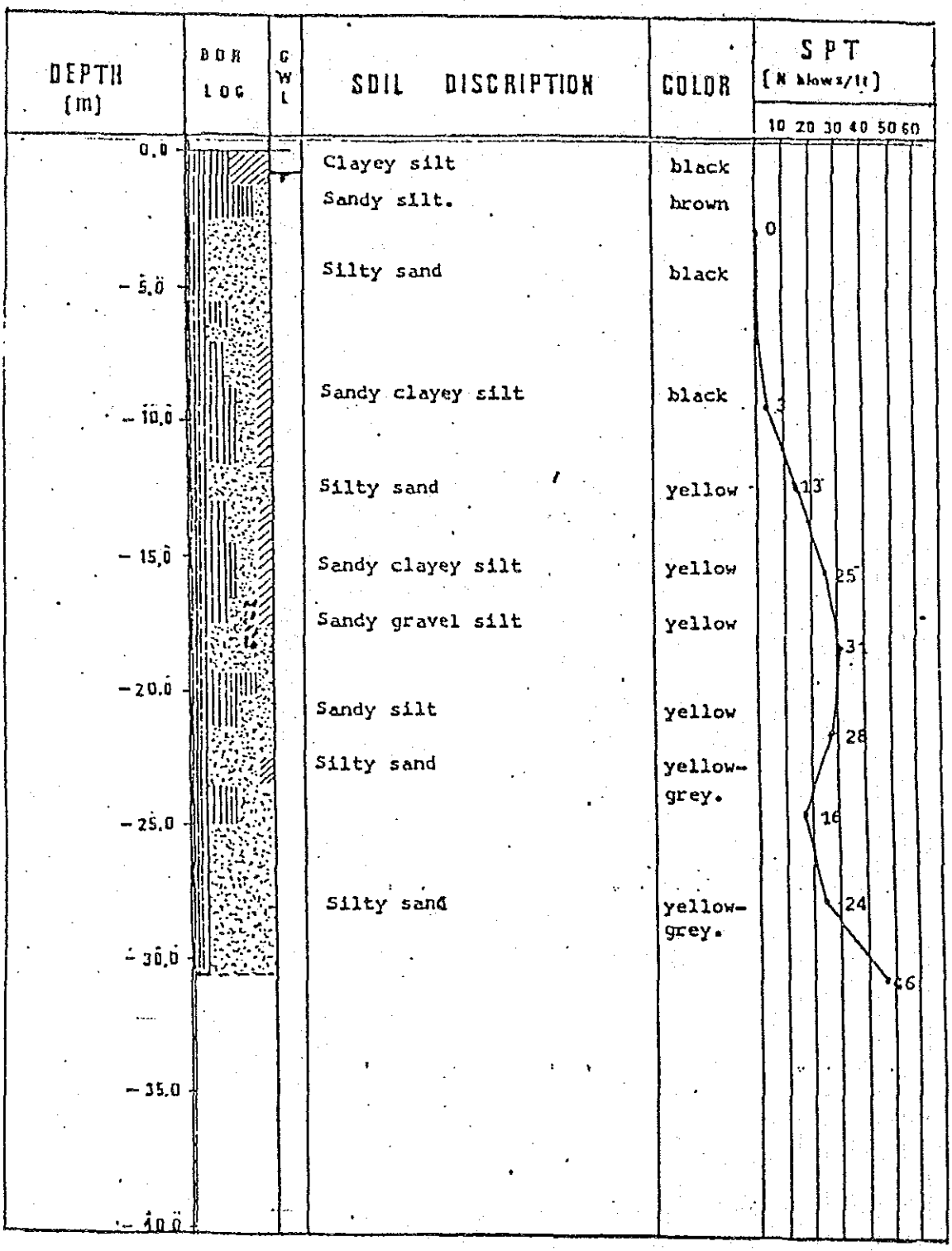
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
LABORATORIUM MEKANIKA TANAH

POINT C



8. List of Collected Data

Title of Data	Source
1. Worldbank Polytechnic Project principal layout of the streams electronic telecommunication	PEDC
2. Educational Programme for Polytechnics Electronics Department	PEDC
3. Brochure of Institut Teknologi Sepuluh Nopember	ITS
4. Master Plan Report - Sukolilo Campus -	ITS
5. Map of Surabaya	
6. Brochure of UI Polytechnic	UI
7. Standard Floor Area of Educational Facilities, Ministry of Education and Culture	ITS
8. Standard Salary of Teaching Staff, Ministry of Education and Culture	ITS
9. List of private university in East Java	ITS
10. The number of staff and student of National University	ITS
11. Instructional Space Requirement for ITS by *Paddock Upton Incorporated*	ITS
12. Credit/Contact hour distribution	ITS
13. Soil Investigation Report	ITS
14. Structur Beton Bertulang Biasa dan Strutur Tembok Bertulang Untuk Gedung 1983