5. 資　　料

5－1　R／D

THE RECORD OF DISCUSSIONS
BETWEEN
THE JAPANESE IMPLEMENTATION STUDY TEAM
AND
THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF MALAYSIA
ON
THE JAPANESE TECHNICAL COOPERATION
FOR
THE PROJECT ON THE MEASUREMENT CENTRE OF SIRIM (PHASE II)

The Japanese Implementation Study Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Norio Matsuzawa visited Malaysia for the purpose of working out the details of the technical cooperation program concerning the Project on the Measurement Centre of SIRIM (Phase II) in Malaysia.

During its stay in Malaysia, the Team exchanged views and had a series of discussions with the Malaysian authorities concerned in respect of the desirable measures to be taken by both Governments for the successful implementation of the above-mentioned Project.

As a result of the discussions, the Team and the Malaysian authorities concerned agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

Shah Alam, 8 September, 1995

Mr. Norio Matsuzawa
Leader,
Implementation Study Team,
Japan International Cooperation Agency,
Japan

Dato' Dr. Ahmad Tajuddin Ali
Director General,
Standards and Industrial
Research Institute of Malaysia,
Ministry of Science, Technology
and Environment,
Malaysia

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Malaysia will implement the Project on the Measurement Centre of SIRIM (Phase II) (hereinafter referred to as "the Project") in cooperation with the Government of Japan.

2. The Project will be implemented in accordance with the Master Plan which is given in ANNEX I.

II. MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

In accordance with the laws and regulations in force in Japan, the Government of Japan will take, at its own expense, the following measures through JICA according to the normal procedures under the Colombo Plan Technical Cooperation Scheme.

1. DISPATCH OF JAPANESE EXPERTS

The Government of Japan will provide the services of the Japanese experts as listed in ANNEX II.

2. PROVISION OF MACHINERY AND EQUIPMENT

The Government of Japan will provide such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as listed in ANNEX III. The Equipment will become the property of the Government of Malaysia upon being delivered C.I.F to the Malaysian authorities concerned at the ports and/or airports of disembarkation.

3. TRAINING OF MALAYSIAN PERSONNEL IN JAPAN

The Government of Japan will receive the Malaysian personnel connected with the Project for technical training in Japan.

III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF MALAYSIA

1. The Government of Malaysia will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of Japanese technical cooperation, through the full and active involvement in the Project by all related authorities, beneficiary groups and institutions.

2. The Government of Malaysia will ensure that the technologies and knowledge acquired by the Malaysian nationals as a result of the Japanese technical cooperation will contribute to the economic and social development of Malaysia.

3. The Government of Malaysia will grant in Malaysia privileges, exemptions and benefits to the Japanese experts referred to in section II-1 above and their families no less favourable than those accorded to experts of third countries working in Malaysia under the Colombo Plan Technical Cooperation Scheme.

4. The Government of Malaysia will ensure that the Equipment referred to in section II-2 above will be utilized effectively for the implementation of the Project in consultation with the Japanese experts referred to in ANNEX II.

5. The Government of Malaysia will take necessary measures to ensure that the knowledge and experience acquired by the Malaysian personnel from technical training in Japan will be utilized effectively in the implementation of the Project.

6. In accordance with the laws and regulations in force in Malaysia, the Government of Malaysia will take necessary measures to provide at its own expense:

   (1) Services of the Malaysian counterpart personnel and administrative personnel as listed in ANNEX IV;

   (2) Land, buildings and facilities as listed in ANNEX V;

   (3) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment provided through JICA under section II-2 above;

   (4) Means of transport and travel allowances for the official travel of Japanese experts within Malaysia in accordance with General Circular No.1 of 1979 and Amendment to the said Circular of the Government of Malaysia.

   (5) Housing and other allowances in accordance with General Circular No.1 of 1979 and Amendment to the said Circular of the Government of Malaysia.

7. In accordance with the laws and regulations in force in Malaysia, the Government of Malaysia will take necessary measures to meet:

   (1) Expenses necessary for the transportation within Malaysia of the Equipment referred to in section II-2 above as well as for the installation, operation and maintenance thereof;

   (2) Customs duties, internal taxes and any other charges, imposed in Malaysia on the Equipment referred to in section II-2 above;

   (3) Operating expenses necessary for the implementation of the Project.

IV. ADMINISTRATION OF THE PROJECT

1. The Director-General of the Standards and Industrial Research Institute of Malaysia, as the Project Director, will bear overall responsibility for the administration and implementation of the Project.

2. The Head of the Measurement Centre of SIRIM, as the Project Manager, will be responsible for the managerial and technical matters of the Project.

3. The Japanese Chief Advisor will provide necessary recommendations and advice to the Project Director and the Project Manager on any matters pertaining to the implementation of the Project.

4. The Japanese experts will give necessary technical guidance and advice to the Malaysian counterpart personnel on technical matters pertaining to the implementation of the Project.

5. For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described in ANNEX VI.

The organization chart is shown in ANNEX VII.

V. JOINT EVALUATION

The evaluation of the Project will be conducted jointly by the two Governments through JICA and the Malaysian authorities concerned during the last six (6) months of the cooperation term in order to examine the level of achievement.

VI. CLAIMS AGAINST JAPANESE EXPERTS

The Government of Malaysia undertakes to bear claims, if any arises, against the Japanese experts engaged in technical cooperation for the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in Malaysia except for those arising from the willful misconduct or gross negligence of the Japanese experts.

VII. MUTUAL CONSULTATION

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with this Attached Document.

VIII. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this Attached Document will be four (4) years from 1 March 1996.

ANNEX I. Master Plan

I. Objectives of the Project

Overall Goal

National Measurement Standards System is technologically and legally established.

Project Purpose

Measurement standards of length, pressure, electricity and vibration with higher accuracy are maintained by the Measurement Centre of SIRIM.

II. Outputs and Activities of the Project

(A) Outputs

In the fields of length, pressure, electricity and vibration in the Measurement Centre of SIRIM:

1. Measurement system configuration is to be fulfilled and equipment is to be upgraded.
2. Maintenance system of measurement standard equipment is to be developed.
3. The competence and proficiency of research officers and other technical staff members are to be upgraded.

(B) Activities

In the fields of length, pressure, electricity and vibration:

1-1. Configuration and specification of measurement standard equipment are to be designed.

1-2. Measurement standard equipment is to be procured and installed.

1-3 Instruction manuals on how to operate measurement standard equipment are to be developed.

2-1. Maintenance manuals of measurement standard equipment are to be developed.

2-2. Calibration record forms of measurement standard equipment are developed and utilized.

3-1. Implementation plan of technology transfer is to be compiled.

3-2. The Japanese experts are to provide technical guidance to the Malaysian counterparts by utilizing measurement standard equipment.

3-3. The Malaysian counterparts are to be trained in Japan.

3-4. Procedure manuals on management and control of measurement standards are to be developed.

3-5 The Malaysian counterparts are to provide technical guidance to the other staff members.

III. Site for the project

The Measurement Centre, Block 8, Standards and Industrial Research Institute of Malaysia, Persiaran Dato' Menteri, Section 2. P.O. Box 7035, 40911 Shah Alam, Malaysia.

ANNEX II. Japanese experts

1. Long-term experts

   a. Chief Advisor
   b. Project Coordinator
   c. Expert in the field of Length
   d. Expert in the field of Pressure
   e. Expert in the field of Electricity
   f. Expert in the field of Vibration

2. Short-term experts

Short-term experts will be dispatched for specific fields of technology transfer, the installation of machinery and equipment and training of technical personnel in relation to the scope of the Project, when necessity arises.

ANNEX III. Machinery and equipment

1. Equipment for Length Metrology
2. Equipment for Pressure Metrology
3. Equipment for Electricity Metrology
4. Equipment for Vibration Metrology
5. Equipment and materials for laboratories, library and others.

Other machinery, equipment and materials regarded as necessary for the effective implementation of the Project by both sides.

ANNEX IV. Malaysian counterpart and administrative personnel

1. Project Manager
2. Project Coordinator
3. Technical Staff
4. Administrative Staff
5. Secretary and other supporting staff

The above list may be revised in the course of the Project's implementation.

ANNEX V. Land, buildings and facilities

1. Office rooms and facilities necessary for the Japanese experts
2. Office space for the Malaysian counterpart personnel
3. Lecture rooms and meeting rooms necessary for the transfer of technology
4. Buildings, facilities and space for the machinery and equipment to be provided by the Government of Japan
5. Other facilities mutually agreed upon as necessary for the implementation of the Project.

ANNEX VI.

THE JOINT COORDINATING COMMITTEE

1. Functions

The Joint Coordinating Committee meetings will be held at least every twelve (12) months and whenever necessity arises. Its functions are:

(1) to formulate the Annual Work Plan of the Project in line with the Tentative Schedule of Implementation formulated under the framework of the Record of Discussions;

(2) to review the overall progress of the Technical Cooperation Program as well as the achievements of the above mentioned Annual Work Plan; and;

(3) to review and exchange views on major issues arising from or in connection with the technical cooperation program.

2. Organization

1) Chairman

Director General of SIRIM

2) Members

Malaysian side

Director, Research and Technology Development Division, SIRIM
Project Manager
Representative of the Economic Planning Unit
Representative of the Ministry of Science, Technology and Environment
Other personnel designated by the chairman

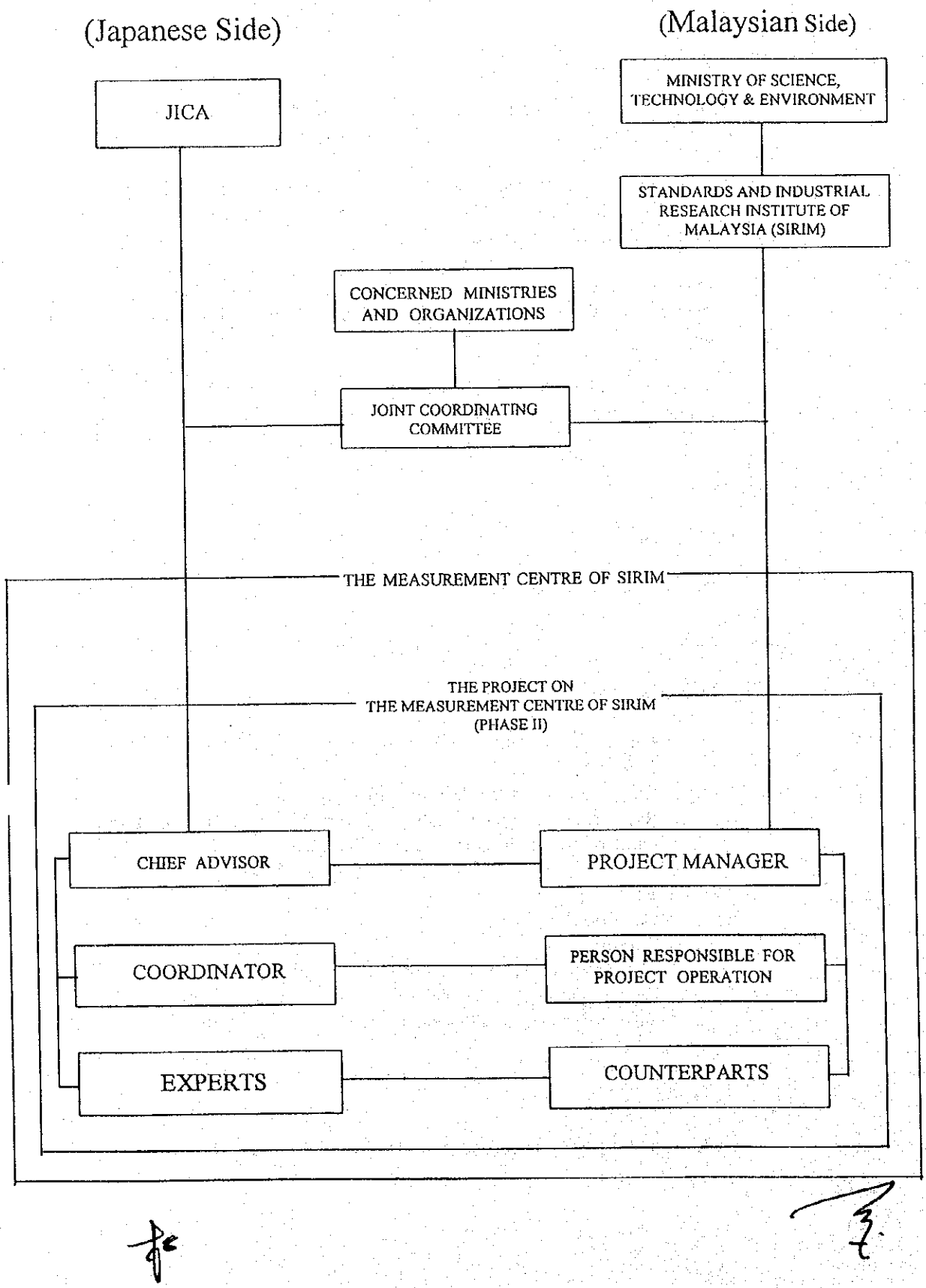
Japanese side

Chief Advisor
Coordinator
The Japanese Experts designated by the Chief Advisor
Representative of JICA Malaysia Office
Other personnel to be dispatched by JICA, if necessary

3) Observer

Officials of the Embassy of Japan in Malaysia

ANNEX VII THE ORGANIZATION CHART OF THE PROJECT



5－2　M／D

MINUTES OF DISCUSSIONS
ON
THE JAPANESE TECHNICAL COOPERATION
FOR
THE PROJECT ON THE MEASUREMENT CENTRE OF SIRIM (PHASE II)

The Japanese Implementation Study Team (hereinafter referred to as "the Team"), and the Director General of Standards and Industrial Research Institute of Malaysia signed the Record of Discussions (hereinafter referred to as "R/D") on the technical cooperation program for the Project on the Measurement Centre of SIRIM (Phase II). The following Minutes of Discussions are intended to record the understandings reached between both sides concerning the provision of the R/D.

During its stay in Malaysia, the Team exchanged views and had a series of discussions with the authorities concerned of the Government of Malaysia.

As a result of the discussions, both sides came to the understanding concerning the matters referred to in the document attached herewith.

Shah Alam, 8 September 1995

Mr. Norio Matsuzawa
Leader,
Implementation Study Team,
Japan International Cooperation Agency,
Japan

Dato' Dr. Ahmad Tajuddin Ali
Director General,
Standards and Industrial
Research Institute of Malaysia,
Ministry of Science, Technology
and Environment,
Malaysia

THE ATTACHED DOCUMENT

I. Scope of technical cooperation

Both sides agreed that the following areas will be covered as the scope of technical cooperation. Details of the program will be worked out by the Japanese experts and the Malaysian counterpart personnel at the beginning of the Project.

Measurement technology in the fields of:

1. Length

   a. Length measurement
   b. Angle measurement
   c. Form measurement

2. Pressure

   a. Pressure range from 10^{-2} Pa to 500 MPa

3. Electricity

   a. DC voltage (up to 1 kV) and DC current (up to 100 A)
   b. Resistance (1 m Ω to 10^{12} Ω)
   c. AC voltage (up to 1 kV) and AC current (up to 50 A)
   d. Capacitance and impedance
   e. RF power (up to 18 GHz, 50 Ω)
   f. Attenuation (up to 18 GHz, 50 Ω)
   g. Calibrations of current transformer and voltage transformer
   h. Electric power and electric energy

4. Vibration

   a. Frequency range from 5 Hz to 10 kHz

Contents of the technical cooperation:

(1) Technology of establishing the national measurement standards
(2) Technology of maintaining the national measurement standards
(3) Calibration technology

II. Dispatch of experts

Application forms for the long-term experts will be submitted by the Malaysian side by the end of November 1995.

With regard to short-term experts, the experts will be dispatched in accordance with the progress of the Project. The Team requested that the Malaysian side should submit A-1 forms for the short-term experts to the Government of Japan no later than three (3) months prior to their assignment, the Malaysian side agreed to the request.

III. Training of Malaysian counterpart personnel

Counterpart personnel will be awarded training in Japan each year from Japanese fiscal year 1996. The number of counterpart accepted will be decided each year.

Application forms for training award in Japan (hereinafter referred to as "A-2 and A-3 form") should be submitted to the Government of Japan two (2) months prior to their scheduled arrival in Japan.

IV. Provision of equipment

The Malaysian side requested the provision of equipment to the Team as shown in Appendix I.

The Team stated that the Government of Japan, through JICA, provide such items of equipment to the Project during the cooperation periods within the limits of the budget, taking the Malaysian priority into consideration.

The Malaysian side will submit the application form for equipment and materials (hereinafter referred to as "A-4 form") by September 20, 1995. Expenses for transportation within Malaysia, maintenance and adjustment of equipment and materials will be borne by the Malaysian side. Domestic duties and other charges are borne by the executing institutions, in case such expenses occur. The Implementing agency provide equipment and materials necessary for the implementation of the Project other than those provided through JICA.

The consignee of equipment is the Project Manager.

V. Provision of Offices and Facilities

Malaysian side agreed to the provision of necessary space and facilities for the implementation of the Project.

Malaysian side confirmed that the extension work of the measurement centre of Block 8 will be completed by the end of January, 1996. The layout plan is shown in Appendix II.

Malaysian side also agreed that when the new measurement centre of Bukit Jalil is completed in early 1998, all the cost and the responsibility for the moving of the centre will be borne by Malaysian side.

VI. Counterpart personnel and Administrative staff

The list of counterpart to the Project is shown in Appendix III. The Malaysian side stated that they would inform JICA of the name of counterpart who are not listed in Appendix III before the arrival of the experts/equipment. Malaysian side also agreed to allocate appropriate number of administrative staff for the Project.

VII. Local costs

The Team confirmed that the necessary amount of local costs for the implementation of the Project will be provided by Malaysian side. The tentative schedule of budget allocation plan of the Malaysian side is shown in Appendix IV.

VIII. Language

Both sides agreed that English shall be used for technology transfer and for preparation of official documents.

IX. Others

(1) Both sides confirmed the contents of Minutes of Discussions which were signed on March 23, 1995 and June 21, 1995.

(2) The attendants list in the discussion is shown in Appendix V.

Appendix I Equipment list requested by the Malaysian side
Appendix II Layout plan of the Measurement Centre of SIRIM at Block 8
Appendix III Allocation plan of Malaysian counterpart
Appendix IV Budget allocation plan for Measurement Centre
Appendix V Attendants list

Appendix I : EQUIPMENT LIST

1. Length Metrology

	Proposed Equipment	Quantity	Accuracy Required/ Range &Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
1	Gauge Block Comparator(mechanical)	1	TESA: Range 100mm Unc.: (0.05+0.5xL)mm	Yes	No	B
2	Long Gauge Block	1 set	JIS-00, 125-500, 1000mm	Yes	No	A
3	Thin gauge Block set	1 set	JIS-00: 0.5 - 100mm	Yes	No	A
4	Gauge Block Accessories	1 set	Mitsutoyo: Code 516-611	Yes	No	B
5	Gauge Block Maintenance Kit	3 set	Mitsutoyo Code:516-650	Yes	No	A
6	Length bench(20m) w/laser measuremement system	1 set	Special order	Yes	No	A
7	Autocollimators	1	Nikon, 10sec/div	Yes	No	A
8	Photoelectric Autocollimator	1	Rank Taylor Hobson, Acc: 0.2sec/div	Yes	No	B
9	Combination Angle Gauges0.05min-90degC(3sec step)	1 set	Tesa:NPL spec MOY/ SCMI /18, Acc.:2sec	Yes	No	A
10	Combination Angle Gauges0.05min-90degC(6sec step)	1 set	Tesa:NPL spec MOY/ SCMI /18, Acc.:2sec	Yes	No	B
11	Precision Polygon sets(Ref. Grade)	1 set	TESA: NPL spec MOY/SCMI/87	Yes	No	B
12	Precision Polygon sets(Calibration Grade)	2 set	TESA: NPL spec MOY/SCMI/87	Yes	No	B

Appendix I : EQUIPMENT LIST

1. Length Metrology

	Proposed Equipment	Quantity	Accuracy Required/ Range &Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
13	Sine bar	1	Tsugami,size:100mm	Yes	No	A
14	Engineer's Parralel	1 set	Tesa, BS 906, Grd.: A	Yes	No	A
15	Calibrated Steel Balls(1-25mm)	1 set	TESA,-RSD Acc.: 0.001mm	Yes	No	B
16	Calibrated Steel Balls(1.5 - 12.5mm)	1 set	TESA-RSD, Acc.: 0.001mm	Yes	No	B
17	Optical flats	15pcs	Mitsutoyo, OF-60B	Yes	No	A
18	Optical Parallels: 12-12.37mm	2 set	Mitsutoyo, OP25, dia 30mm	Yes	No	B
19	Optical Parallels: 20.00-20.37mm	1 set	Mitsutoyo, OP50, dia 30mm	Yes	No	B
20	Toolmakers Flat	1 set	Tesa Spec BS 869, dia.:200mm	Yes	No	B
21	Taper Parallels Combination set	1 set	Tesa size 6.4-25.4mm	Yes	No	B
22	Master Cylidrical Plug Gauge	1 set	Mahr, Model: 426G, 0.1mm - 10mm, tol.:1um	Yes	No	B
23	Master Taper Plug Gauges	1 set	Mahr, Model: 426M	Yes	No	B
24	Self Centering Inside Micrometers	1 set	TESA IMICRO, 3.5-300mm	Yes	No	B
25	Micrometer Heads w/sliding Spindle	1 set	Mitsutoyo	Yes	No	B
26	Screw thread Micrometer w/interchangeable Anvils	1 set	Mitsutoyo	Yes	No	B

Appendix I : EQUIPMENT LIST

1. Length Metrology

	Proposed Equipment	Quantity	Accuracy Required/ Range &Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
27	Thread pin gauges	1 set	Mitsutoyo, dia 0.17mm-5.05mm	Yes	No	B
28	Thread Limit Plug Gauges	1 set	Mahr 705:size:1 -200mm	Yes	No	B
29	Thread Limit Roller Gauges	1 set	Mahr:size 706:1 -200mm	Yes	No	B
30	Thread Limit Setting Gauges	1 set	Mahr 707:size:1 -200mm	Yes	No	B
31	Precision Comparator Stands	2 unit	Tokyo Seimitsu, 0.1um/div.	Yes	No	A
32	Digital Height Measuring Machine	1 unit	Mitsutoyo: Code:518-304 with accessories	Yes	No	A
33	Centre Bench	1 unit	Mitsutoyo	Yes	No	B
34	Surface Plate with Centre	1	Mitsutoyo:500mmX500mm	Yes	No	B
35	Universal Measuring Machine	1	Mitsutoyo	Yes	No	C
36	Roundness Measuring Machine	1	Mitsutoyo:RA-211, Acc.: (0.04+3H/10000)um or Tokyo Seimitsu	Yes	No	B
37	Surface Texture Measuring Machine	1	Mitsutoyo:Surftest 701	Yes	No	B
38	Screw Thread Gauging and Measuring Machine	1	Mitsutoyo: Code 163-101	Yes	No	C
39	Granite Surface Plate	1	Size: 1mx1m, Gr.:0, Maker: Mitsutoyo	Yes	No	B

1. Length Metrology

	Proposed Equipment	Quantity	Accuracy Required/ Range &Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
40	Temperature Humidity Chart Recorder	2	Sato: 0-50degC, 20-80%RH	Yes	No	A
41	Laser Micrometer	1	Mitsutoyo: LSM-301N, Range 0 to 30mm, Acc. 2um	No	No	A
42	Long Gauge Block	1 set	Mitsutoyo, Gr.1 Range: 125mm-1000mm	No	No	B
43	Gauge Block set	2 set	Mitsutoyo, Gr.2 Range: 0.5mm-100mm	No	No	A
44	Gauge Block set	1 set	Mitsutoyo, Gr.1 Range: 0.5mm-100mm	No	No	B
45	Quartz Thermometer System	1 set	Tokyo Dempa: 0-50degC, 0.001K/div.	No	No	A
46	Toolmaker's Microscope	1	Mitsutoyo 176 series	No	No	A
47	Thin Gauge Blocks	1 set	Mitsutoyo (+ 1um step)Gr.1	No	No	B
48	Thin Gauge Blocks	1 set	Mitsutoyo (- 1um step)Gr.1	No	No	B
49	Circular Table	1 set	Rank Taylor Hobson,Grad. 1sec.	No	No	B
50	4-Pin Thread Gauges	1 set	Tsugami/Mitsutoyo	No	No	B
51	Check Plate for 3 Coordinate Measuring Machine	1	Mitsutoyo	No	No	B
52	User Training Kit for 3 Coord.Measuring Machine	1	Mitsutoyo	No	No	B

Appendix I : EQUIPMENT LIST

1. Length Metrology

	Proposed Equipment	Quantity	Accuracy Required/ Range &Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
53	Digital Barometer	1	Nakaasa Inst., Acc.: 0.2mb	No	No	A
54	Humidity Meter	2 set	Sato Keiryoki: Model SK-5RAD(Assman type)	No	No	A
55	Oil Stone	10 pcs	Mitsutoyo	No	No	A
56	Micrometer test bar	1 set	Mitsutoyo: 25-1000mm	No	No	A
57	Dehumidifier	2 unit	TID-1200(Toyomi), Dehumidifier cap.:15l/day, Cooling Cap.:850kcal/h (240Vac)	No	No	A
58	Other Equipment	1 set		No	No	A

2. Pressure Metrology

No.	Proposed Equipment	Quantity	Specifications	Project Doc. Ref.	Similar Proposal in 7MP.	Priority
	(National Primary Standards)			Table 7-7		
1.	Primary Standard Mercury Manometer (Schwien Model mm 1025Fx60)	1 unit	1025 mm, 0~108 kPa, Acc. 1 Pa + 0.004%R, capacitive sensing type, built-in laser measurement system.	Item 3(1)	Yes	B
2.	Gas-operated dead weight pressure gauge (DH Model PG7601)	1 unit	5~350 kPa/1.7 Mpa, 10/2 cm^2, Acc. 0.002%, ga/abs.	Item 1(2)	No	B
3.	Gas-operated dead weight pressure gauge (Nagano Model PD82-89)	1 unit	4~500 kPa, 5 cm^2, Acc. 0.02%.	Item 1(2).	No	A
	(National Secondary Standards)					
4.	Precision water manometer (Futaba Model UTH)	1 unit	0~500 Pa (0~50 mm H_2O), 0.1 Pa.	Item 2(1)	No	B
5.	Gas-operated dead weight pressure gauge (Futaba Model AV-02).	1 unit	5~200 kPa, 2 cm^2, 0.01%, ga/abs.	Item 1(2)	No	A
6.	Gas-operated dead weight pressure gauge (Nagano Model PD82-89).	1 unit	0.02 ~ 2 Mpa, 1 cm^2, 0.02%.	Item 1(2)	No	B
7.	Low pressure digital piston gauge (DH Model 22110-111, PPC-1-0030).	1 unit	0~10 kPa/50 kPa, 10/2 cm^2, Acc. 0.005% FS + 0.005%R.	Item 1(1)	No	A
8.	Absolute & gauge pressure digital pressure gauge (DH Model 24610).	1 unit	0~120 kPa/600 kPa, 5/1 cm^2, Acc. 0.005%FS + 0.005%R, abs.	No	No.	B

2. Pressure Metrology (continued)

No.	Proposed Equipment	Quantity	Specifications	Project Doc. Ref	Similar Proposal in 7MP.	Priority
9.	Dead weight pressure gauge (Nagano Model PD66).	1 unit	0.5 ~ 5 MPa, 0.5 cm^2, Acc. 0.05%.	No	No	A
10.	Dead weight pressure gauge (Futaba Model HT).	1 unit	0.5 ~ 50 MPa, 0.25 cm^2, Acc. 0.02%, motor driven.	No	No	A
11.	Dead weight pressure gauge (Nagano Model PD100).	1 unit	30~300 MPa, 0.2 cm^2(100MPa), 0.1 cm^2 (200MPa), 0.067 cm^2(300MPa), Acc. 0.01%.	No	No	A
	(Working Standards)					
12.	McLeod vacuum standard system (Okano Model VP-A).	1 unit	1.3×10^{-2} Pa ~ 1.3 kPa, McLeod gauge & mercury manometer, vacuum system.	Item 4(1)	No	A
13.	Haas barometer (Hass).	1 unit	0~102 kPa, Acc. 3×10^{-6}	Item 2(2)	Yes	B
14.	Fortin barometer (Tokyo Suzuki).	1 unit	870 ~ 1090 hPa (650 ~ 820 mm Hg).	Item 3(2)	Yes	A
15.	Water manometer (Futaba Model STR-H).	1 unit	0~13 kPa, min div. 0.01 kPa, dia. 14 mm, vernier.	Item 2(1)	Yes	B
16.	Mercury manometer (Nagano Model PM43.26-232).	1 unit	0~200 kPa (0~1500 mm Hg), min. div. 0.2 kPa,vernier.	Item 2(1)	No	A
17.	Low pressure calibrator (Yogokawa Model 2657).	1 unit	0~25 kPa, Acc. 0.05%FS, oscillating transducer type.	Item 2(4)	No	B

2. Pressure Metrology (continued)

No.	Proposed Equipment	Quantity	Specifications	Project Doc. Ref	Similar Proposal in 7MP.	Priority
18.	Pressure calibrator (Yokogawa Model 2657).	1 unit	0~200 kPa (0~1500 mm Hg), Acc. 0.05%FS (0.1%R), oscillating transducer type.	Item 2(4)	No	A
19.	Pressure calibrator (Nagano Model PC33).	1 unit	0~1/5/20 MPa, Acc. 0.1% FS.	Item 2(4)	No	B
20.	Air-operated dead weight pressure gauge (Futaba Model AP-01).	1 unit	5~500 kPa, 2 cm^2, Acc. 0.01%.	No	No	A
	(Precision Pressure Gauges)					
21.	Precision digital manometer (Yokogawa Model MT110-265231).	1 unit	0~10 kPa, Acc. 0.015%FS.	No	No	A
22.	Precision digital manometer (Yokogawa Model MT110-265242).	1 unit	0~130 kPa, abs., Acc. 0.03%R + 6 digits.	No	No	A
23.	Precision digital manometer (Yokogawa Model MT110-265234).	1 unit	0-3 MPa, Acc. 0.02%R + 10 digits, DMM.	No	No	A
24.	Differential pressure gauge (Ruska Model 2413-2416).	1 unit	DP 13kPa, p:20 MPa, sensitivity 1.4 Pa, gas pressure, null detector.	No	No	B
25.	Differential pressure gauge (Baratron).	1 unit	Max. 1 MPa, DP 1.3 kPa, Baratron.	No	No	A

2. Pressure Metrology (continued)

No.	Proposed Equipment	Quantity	Specifications	Project Doc. Ref	Similar Proposal in 7MP.	Priority
26.	Ionization vacuum gauge (Okano Model IV-7D).	1 unit	$10^{-6} \sim 10^{-2}$ Pa ($10^{-8} \sim 10^{-4}$ mm Hg), Min. div. 0.1×10^{-6} Pa.	No.	Yes	A
27.	Pirani vacuum gauge (Okano Model PGA-2S).	1 unit	$1.3 \times 10^{-1} \sim 2.7 \times 10^{3}$ Pa ($1 \times 10^{-3} \sim 20$ mm Hg).	No	No	A
	(*Others*)					
28.	Tools.	1 set	Maintenance and essential tools.	No	No	A
29.	Thermometer (Chino CNA series).	1 unit	Pt. resistance thermometers, –199.9 ~ 800 °C, Acc. 0.01 °C, multi measurement.	No	No	A
30.	Gauge block set (Mitutcyo).	1 set	Grade 0, stainless steel, 0.5 ~ 50 mm.	No	No	B
31.	Digital micrometer (Mitutoyo Model 293-111) with stand Model 156-101.	1 unit	0~25 mm, min. div. 0.001 mm.	No	No	A
32.	Laser scan micrometer (Mitutoyo).	1 unit	0~50 mm, min. div. 0.1 μm.	No	No	B
33.	Multi-pen recorder.	1 unit	Paper size A3.	No	No	A

3. Electricity Metrology

(a) DC Voltage

No.	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
1.	DMM (8.5 digits)	1 unit	DATRON 1281 or HP 3458A	7-90	Nil	B

(b) Resistance

No.	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
1.	DC Shunts 50A, 100A, 200A	1 each	0.04% or better	7-91	Nil	A
2.	1 mΩ standard Resistor	1 unit	20 ppm	7-91	Nil	A
3.	10 mΩ standard Resistor	1 unit	20 ppm	7-91	Nil	A
4.	100 mΩstandard Resistor	1 unit	20 ppm	7-91	Nil	A
5.	Liquid Paraffin for oil bath	30 cans	1 can = 18 liters		Nil	A
6.	High Resistance Standard	1 each	100 MΩ, 1GΩ, 10GΩ, 100GΩ		Nil	A
7.	Pt Resistance Thermo Recorder for monitoring oil bath temperature	1 unit	0 to 50°C with 0.1°C Resolution RTD(6 pieces)		Nil	A
8.	Lead (Heavy Current)	20m	~30A, with terminals			A

(c) AC Voltage & Current

No.	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
1.	RMS Voltmeter	1 unit	DATRON 4920 or Fluke 5790A		Nil	A
2.	AC/DC Transfer Standard	1 unit	Fluke 792A 100mV ~ 1100V, 10 Hz ~ 1MHz		Nil	A
3.	DC Digital Voltmeter	2 units	Keithley 182/1506 3mV~30V, 1nV Sensitivity		Nil	A
4.	DC/AC Calibrator	2 units	5700A 22mV~1100V, 10Hz~1MHz		Nil	A
5.	Amplifier	1 unit	5205A 100V~1000V, 0~100kHz		Nil	A
6.	Digital Thermometer	1 unit	Tokyo Denpa DMT-610B(G) 50~1200°C, 0.001°C Resolution		Nil	A
7.	Switching Unit	1 unit	JEMIC (Max. 220V. GPIB)		Nil	A
8.	CV.CF Power Stabilizer	1 unit	Tokyo Seiden, 1kVA, 240V 45.0~99.9Hz		Nil	A
9.	Computer	1 unit	MS-Win., Quick C & others. IBMPC/AT compatible		Nil	A
10.	Rack	1 unit	RKC-1750-710G		Nil	A
11.	Standard CT and AC Resistor	1 set	(1A/2A/5A/10A/20A/50A)/1A with 1Ω AC Standard Resistor		Nil	A

3. Electricity Metrology

(d) Capacitance & Impedance

No.	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
1.	High Homogeneity Standard Magnets	1 set	500G,1kG, 2kG, 3kG, 5kG, 10kG for axial and radial fields	7-101	Nil	A
2.	High Resistance Meter	1 unit	HP4339A, 10^{9} to 10^{16}		Nil	A

(e) RF Power

No.	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar Proposal in RM7 with comment	Priority
1.	Power Meter	1 unit	Dual Sensor M438A(HP)		Nil	A
2.	Power Sensor	3 units	0.1MHz~4.2GHz M8482A(HP)		Nil	A
3.	Power Sensor	2 units	10MHz~18GHz M8481A(HP)		Nil	A
4.	Signal Generator	1 unit	2~20GHz M83624A(HP)		Nil	A
5.	Air Gaging System for Air Line	1 set	To measure Type N&APC7 airline. (including Pin Gages & ring gages)		Nil	B
6.	Adapters for Connector Conversion	4 each	N to/from APC-7, SMA, APC-3.5, 2.4, K, BNC and Combination between others.		Nil	A
7.	RF Impedance Analyzer	1 unit	1MHZ~1.8GHz M4291(HP)		Nil	B

3. Electricity Metrology

(f) Attenuation

No.	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar Proposal in RM7 with comment	Priority
1.	Programmable Attenuator	1 unit	0~110dB, GPIB M/8496H, 8494H, 11716A(HP) with Driver M/11713A, OPT. 001, 890.		Nil	A
2.	Fixed Attenuator	2 each	3, 6, 10 & 20dB (N)		Nil	A
3.	Fixed Attenuator	2 each	3, 6, 10 & 20dB (APC-7)		Nil	A
4.	Fixed Attenuator	2 each	3, 6, 10 & 20dB (APC-3.5)		Nil	A
5.	Coaxial Double Stub Tuner	2 each	0.4~1GHz, M 1778A 0.8~4GHz, M 1778A 4~18GHz, M 1778D		Nil	A
6.	Directional Coupler	1 unit	0.5~500MHz M/DC 2006 (TRM)		Nil	A
7.	Directional Coupler	1 unit	0.5~18GHz M4226 (Narda)		Nil	A
8.	Adapters for Connector Conversion	2 each	N to/from APC-7, SMA, APC-3.5, 2.4, K, & BNC and combination between others		Nil	A
9.	RF Cables	5 each	0.3m, 0.6m, 0.9m, 1.5m, N-male connectors		Nil	A
10.	Torque Wrenches	1 each	for N, &7mm, for SMA, for 3.5 & K		Nil	A

(g) VT.CT Calibration System

No.	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
1.	CV.CF Stabilizer	1 unit	Tokyo Seiden 240V 10kVA		Nil	A
2.	Voltage Adjuster	1 unit	Keihen Densoku S-230		Nil	A
3.	Step-Up Transformer	1 unit	Tokyo Seiden ~40kV (30min. rating)		Nil	A
4.	Standard Voltage Transformer	1 unit	Minato Kogyo 3.3kV~33kV/110V		Nil	A
5.	Burden for CT	2 units	5A, 40VA cosφ=1, and 0.8 BX-C401A, BB-C 408A		Nil	A
6.	Burden for VT	2 units	110V, 40VA cosφ=1 and 0.8 BX-P401A, BX-P1008A		Nil	A
7.	Automatic Instrument Transformer Comparator	1 unit	Keihen Densoku ATS-51		Nil	A
8.	Step-Down Transformer	1 unit	Keihen Densoku DTK-2010 ~2000A		Nil	A
9.	Standard Current Transformer	2 units	Keihen Densoku CT-12C 5A~2000A/5A, 1A		Nil	A
10.	Heavy Current Lead Wires and others	1 set			Nil	A
11.	AC Ammeter & Voltmeter	2 units	Yokogawa AC 1/5A, AC150V		Nil	A

3. Electricity Metrology
(h) Power & Energy

No.	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
1.	Power Calibration Source	1 set	Volt. output ~ 324V, 30VA Curr. output ~ 64.8A, 60VA Single&3 Phase. 45~65Hz M/PWS-307 (Keihen Densoku)	7-94	Nil	A
2.	CV CF Stabilizer	1 unit	240V 1kVA (M/CV FT1-1k)		Nil	A
3.	Watt Converter	2 units	~300V, ~20A ~±0.02% of F.S. M/2885-20 S7 (YOKOGAWA)		Nil	A
4.	Standard Wh Meter	3 units	110V, 5A, 50Hz 10000 pulse/kw.s M/KS 1A (Toshiba)		Nil	A
5.	Counter Unit	1 set	VXI bus, counter 12 channel M1300A (E1332A) (HP)		Nil	A
6.	Computer	1 set	IBM PC/AT or equivalent with CRT & Printer MS Visual Basic, MS-Win. & others		Nil	A
7.	Digital Voltmeter	2 units	DCV~1000V M/3458(HP) 8 digit	7-94	Nil	A
8.	Digital Thermometer	1 unit	-50°C~+200°C GPIB M/DMT-610B(G) (Tokyo Denpa)		Nil	A
9.	Rack	1 unit	for mounting above		Nil	A
10.	Whmeter Setting Board	1 set	for Whmeter calibration		Nil	A
11.	Digital Power Meter (3 phase-4 wire) with integrator	1 unit	Yokogawa 2533E or equivalent, 0.05%	7-94	Nil	B

(i) General (Electricity)

No.	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
1.	Jigs	1 set	For assembly of coaxial cable connectors		Nil	A
2.	Tools	1 set	For electronic circuit assembling		Nil	A
3.	Cable & leads	1 set	For coaxial cable, low thermal wire, connectors, coaxial connectors, terminations and GPIB cables		Nil	A
4.	Dehumidifier	5 units	For controlling laboratory's humidity TID-1200 (TOYOTOMI)		Nil	B
5.	Portable Notebook Computer	1 set	IBM PC/AT or equivalent and software with PCMCIA-GPIB (National Instruments) Connector for mobile and field work		Nil	A

4. Vibration (Primary Vibration Standards)

	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
1.	Laser Interferometer (Primary vibration calibration system)	2	Frequency range & inaccuracy (3σ %) 5 Hz - 2 kHz 0.5% 2 Hz - 5 kHz 1.0% 5 kHz - 10 kHz 3.0%	Nil	Nil	A
2.	Band pass filter FV- 661 (NF)	2	100dB/oct, with GPIB	Nil	Nil	A
3.	Shaker 4809 (Bruel & Kjaer)	1	1st resonance frequency : 20 kHz	Nil	Nil	A
4.	Standard condenser SM228C (SOSHIN DENKI)	3	100pF, 300pF, 1000pF (each 1 piece) inaccuracy of calibration : 0.003% coefficients of temperature : 11ppm/°C inaccuracy of dissipation factor : $\pm 1 \times 10^{-4}$	Nil	Nil	A
5.	Standard accelerometer 8305 (Bruel & Kjaer) 2270 (ENDEVCO) 2270M8 (ENDEVCO)	 1 1 1	 back-to-back 1Hz - 4500Hz (2%) back-to-back 2 Hz - 20 kHz (20%) back-to-back 2 Hz - 20 kHz (20%)	 Nil Nil Nil	 Nil Nil Nil	 B A A
6.	Charge amplifier 2717 (Bruel & Kjaer)	1	0.3 Hz - 100 kHz 0.1 - 100mV/pC or mV/mV sensitivity conditioning : 4 digit	Nil	Nil	A
7.	Shaker 4290 (Bruel & Kjaer) 4808 (Bruel & Kjaer)	 1 1	 50 kHz (for resonance test) 1st resonance frequency : 12 kHz	 Nil Nil	 Nil Nil	 B A
8.	Power amplifier 2712 (Bruel & Kjaer)	2	max. output : 180VA max. voltage (rms) : 12V max. current (rms) : 15A full power : 40 Hz - 10 kHz reduced power : DC - 100 kHz voltage gain : 5V/V(±2 dB) input impedance : 10 kΩ	Nil	Nil	A

4. Vibration (Primary Vibration Standards)

	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
9.	Synthesizer			Nil	Nil	A
	1732 (NF)	1	0.1 μHz - 100 kHz, 2 Phases with GPIB, sinusoidal & arbitrary wave et al			
	1940 (NF)	1	1 phase with GPIB	Nil	Nil	A
10.	Band pass filter 3625 (NF)	1	48dB/oct with GPIB	Nil	Nil	A
11.	Analogue Voltmeter M-174B (NF)	1	4 Hz - 500 kHz, 10 μV - 100 V rms	Nil	Nil	A
12.	Digital Multimeter 8840A-059 (FLUKE)	2	5 1/2 digit with GPIB	Nil	Nil	A
13.	Switch Scanner 705-7056 (KEITHLEY)	2	with GPIB	Nil	Nil	A
14.	Universal Counter TR5823-GP (ADVANTEST)	2	with GPIB	Nil	Nil	A
15.	AC Calibrator 1520 (NF)	1	with GPIB	Nil	Nil	A
16.	AC Voltage Stabilizer 4210-10-3 (NF)	1	1 phase, 1 kVA	Nil	Nil	A
17.	Accelerometer for experiment					
	12 (ENDEVCO)	1	1 Hz - 2.8 kHz (surface mount type, 85 mg)	Nil	Nil	A
	22(ENDEVCO)	1	1 Hz - 10 kHz (0.14 g)	Nil	Nil	A
	213E (ENDEVCO)	1	5 Hz - 6 kHz (32 g)	Nil	Nil	A
	PV-90B (RION)	1	1 Hz - 25 kHz (1.2 g)	Nil	Nil	A
	8614A (KISTLER)	1	1 Hz - 25 kHz (low impedance output, 0.5 g)	Nil	Nil	A
18.	Torque Wrench 60CL (TONICHI)	2	1 N·m - 2 N·m : 1 piece 2 N·m - 6 N·m : 1 piece attachment : 8 open heads	Nil	Nil	A
19.	Tool Microscope (CHUO PRECISION)	1	X 100	Nil	Nil	A
20.	Oscilloscope SS - 7804 (IWATSU)	2	DC - 40MHz	Nil	Nil	A
21.	Personel Computer (NEC)	1	with GPIB, software : MS-DOS, BASIC, file handling tools etc.	Nil	Nil	A
22.	Step-down Transformer	1	P:S = 240:100, 500VA	Nil	Nil	A
23.	FFT Analyser R9211C (ADVANTEST)	1	2 channels, upper frequency : 20 kHz	Nil	Nil	A
24.	Dual tracking power supply	2	DC 0 - ± 30 V, 1 A	Nil	Nil	A

4. Vibration (Primary Vibration Standards)

	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
25.	Roberval Balance	1	capacity of scale : 200 g reciprocal sensibility : 200 mg	Nil	Nil	A
26.	Balance	1	capacity of scale : 10 kg reciprocal sensibillty : 20 g	Nil	Nil	A
27.	Micrometer Caliper M210-25, MS-R (MITSUTOYO)	1	0 - 25 mm	Nil	Nil	A
28.	Dial Gauge	1	0.01X10 mm	Nil	Nil	A
29.	Tools	1	-	Nil	Nil	A
30.	Vernier Caliper (MITSUTOYO)	1	300 mm	Nil	Nil	A
31.	Dehumidifier TID-1200 (TOYOTOMI)	2	dehumidifing capacity : Max 15 l/day cooling capacity : 850 kcal/h power source : 240 V, 350 W	Nil	Nil	B
32.	Temperature and Humidity chart recorder (SA70)	1	quartz type	Nil	Nil	B
33.	Others equipments (1 set)	1	-	Nil	Nil	A

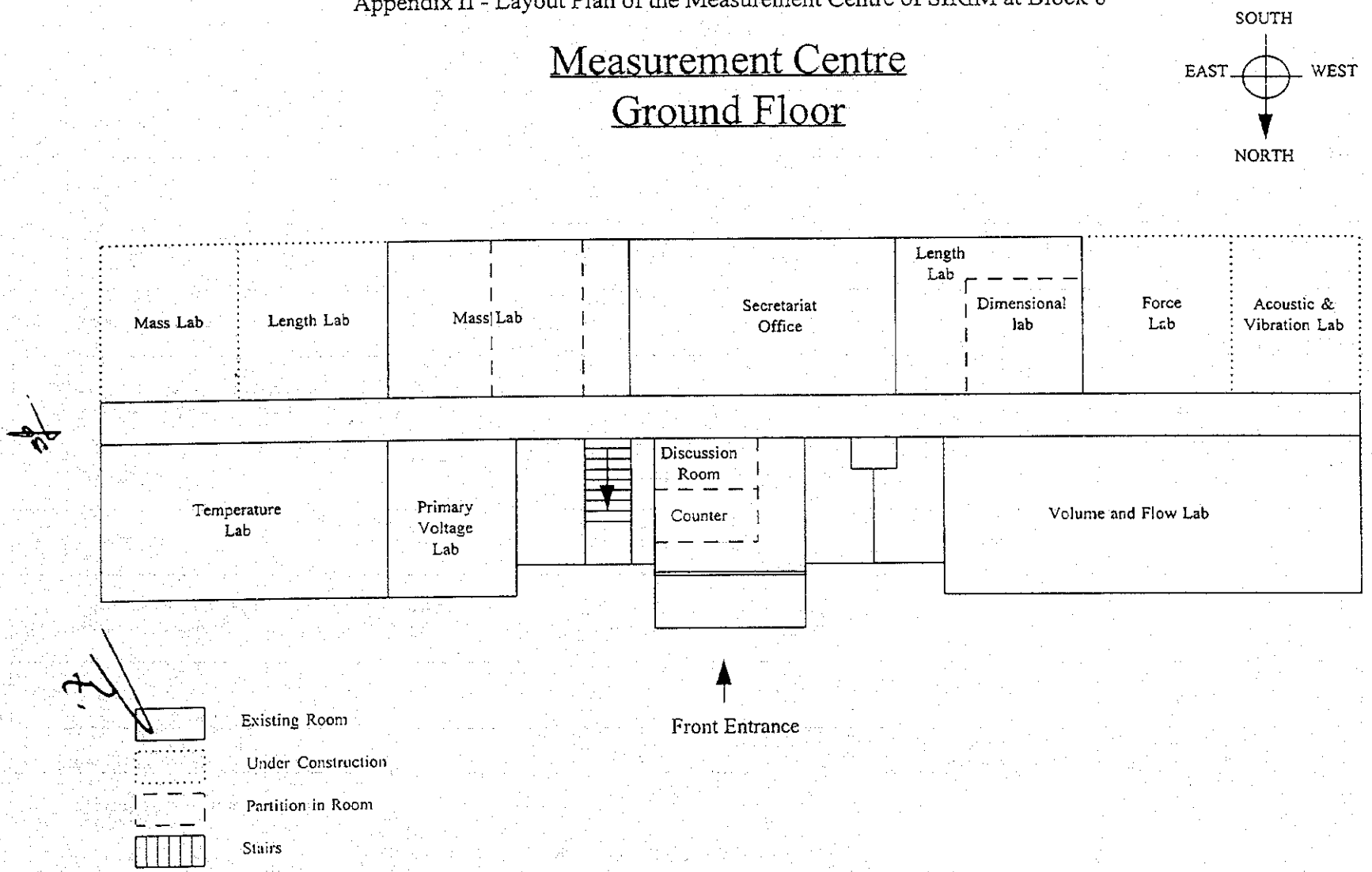
Appendix I. EQUIPMENT LIST

5. General Equipment.

	Proposed Equipment	Quantity	Accuracy Required/ Range & Specification	Reference in Project Document	Similar proposal in RM7 with comment	Priority
1.	Station wagon	1 unit	Nil	Nil	Nil	A
2.	Audio-visual equipment such as multisystem TV and video player, video camera, slide projector, overhead projector and screen	1 unit	Nil	Nil	Nil	A
3.	White Board	1 unit	Nil	Nil	Nil	B
4.	Fax Machine	1 unit	Nil	Nil	Nil	A
5.	Multimedia, computer system, printer, colour scanner, projection system and external storage media (IBM Compatible)	1 unit	Nil	Nil	Nil	B
6.	Local area network	1 unit	Nil	Nil	Nil	B
7.	Heavy duty photocopy machine	1 unit	Nil	Nil	Nil	A
8.	Fork lift	1 unit	1 ton	Nil	Nil	A
9.	Refrigerator	1 unit	Nil	Nil	Nil	B
10.	Books	1 set	Nil	Nil	Nil	A

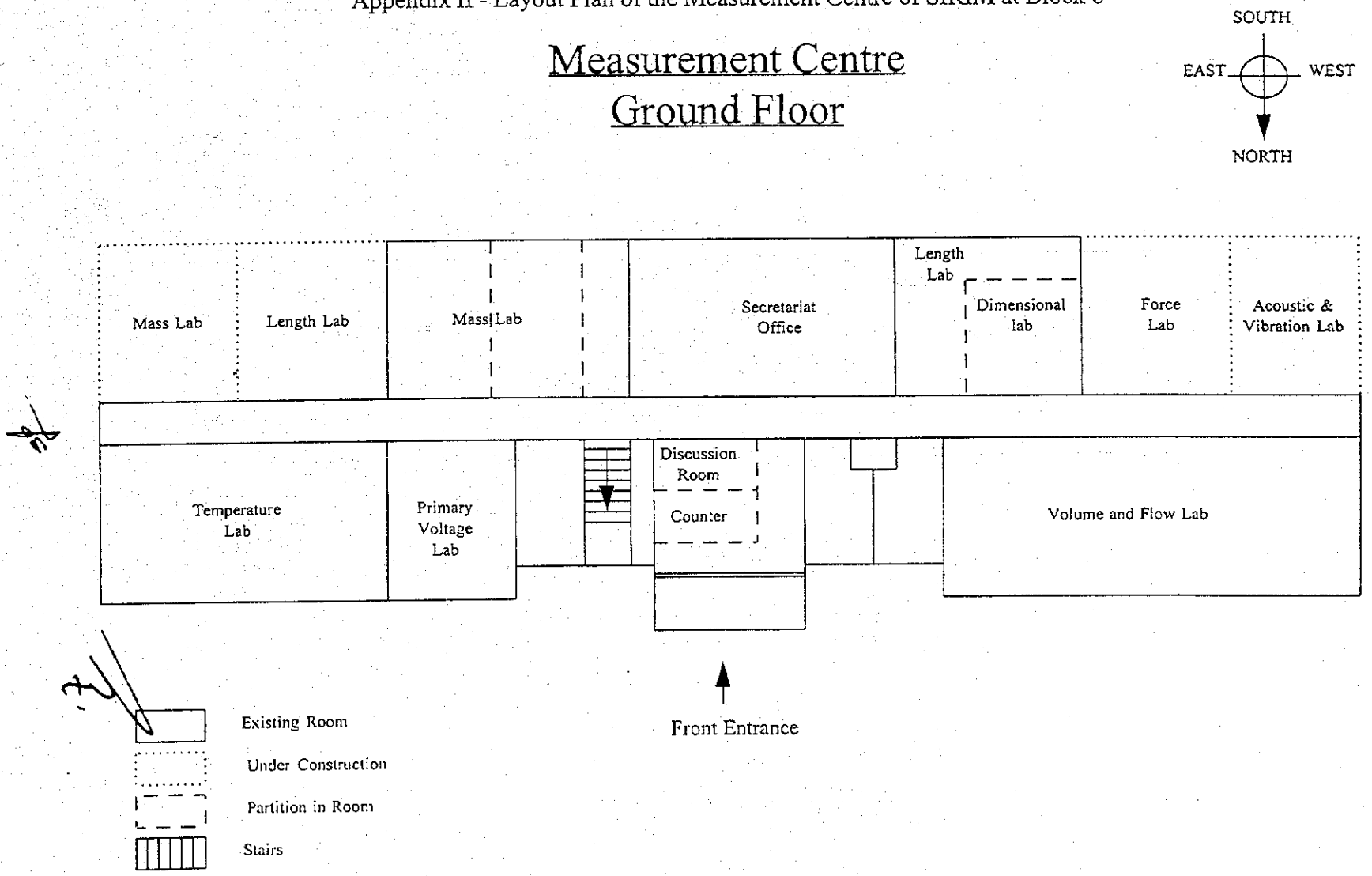
Appendix II - Layout Plan of the Measurement Centre of SIRIM at Block 8

Measurement Centre
Ground Floor

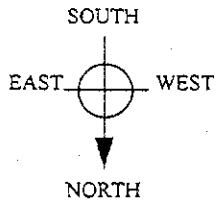


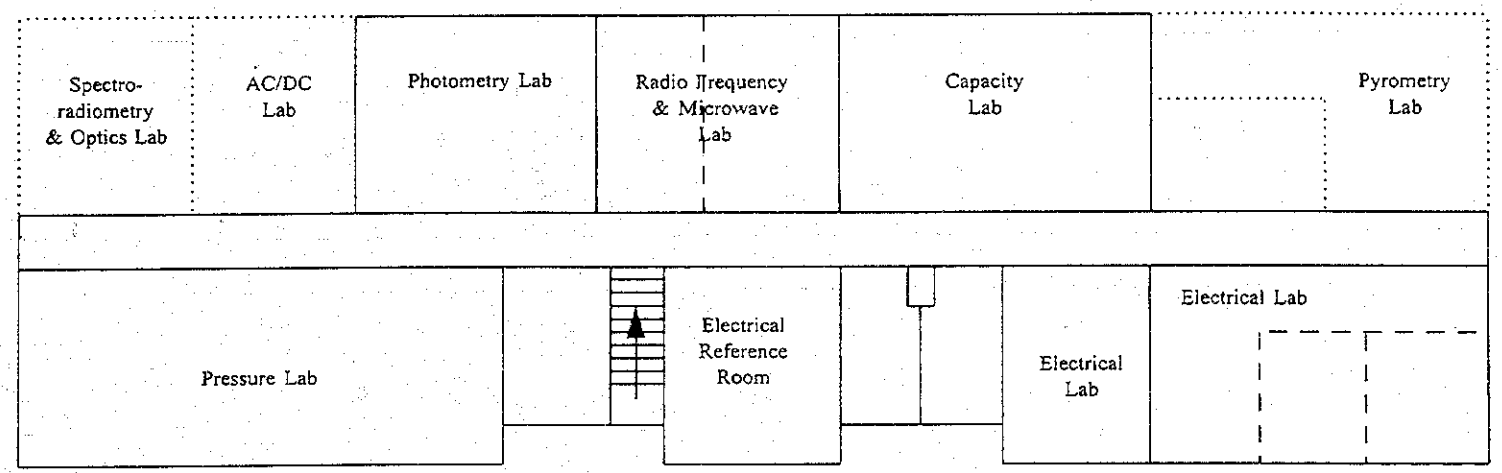
Appendix II - Layout Plan of the Measurement Centre of SIRIM at Block 8

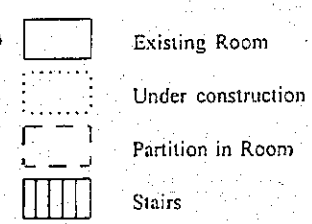
Measurement Centre
Ground Floor



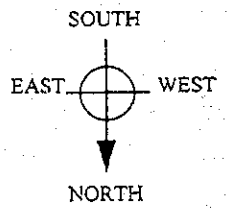
Measurement Centre
First Floor

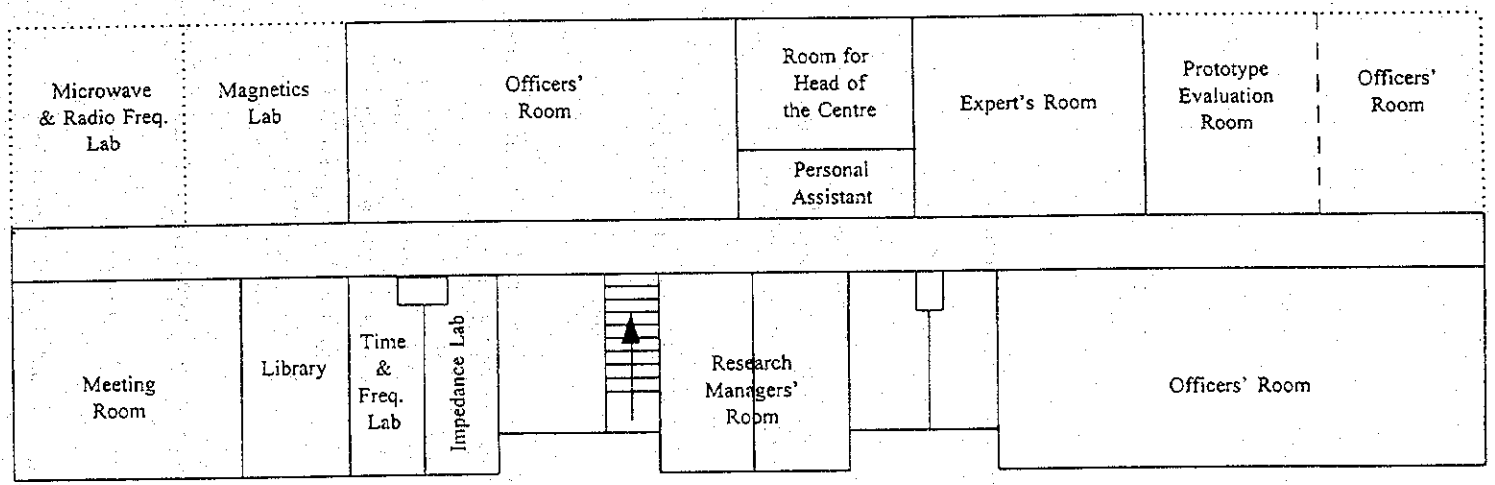


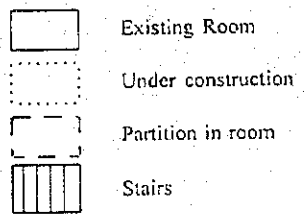




Measurement Centre
Second Floor







Appendix III - ALLOCATION PLAN OF MALAYSIAN COUNTERPART

1. **Counterpart Personnel for the Chief Advisor**

Name	Title	Level
(1) Woo Seng Khee	Head, Measurement Centre	Senior Research Officer

2. **Counterpart Personnel for the Coordinator**

Name	Title	Level
(1) Ong Chin Giap	Research Manager Measurement Standards Group	Senior Research Officer
(2) Siti Maryam bt. Othman	Operation Coordinator	Research Officer

3. **Secretarial and Administrative Supporting Staff**

Name	Title	Level
(1) Emeryet Fernandez	Secretary to Head of Centre	Secretary
(2) Rosiah Jabar	Chief Clerk	Clerk
(3) Anita Yusof	Clerk	Clerk
(4) Laila Durum	Administrative Assistant	Typist
(5) Norzaila Adnan	Administrative Assistant	Typist
(6) Zura Siron	Administrative Assistant	Typist
(7) Velautham Renganathan	General Assistant	Office boy

4. **Counterpart Personnel for the Expert in the field of Length**

Name	Title	Level
(1) Ahmad Makinuddin bin Dahlan	Head, Length Laboratory	Research Officer
(2) *	Asst. Research Officer Length Laboratory	Asst. Research Officer
(3) Hasnah Mohd. Joned	Research Assistant Length Laboratory	Research Assistant

5. **Counterpart Personnel for the Expert in the field of Electricity**

Name	Title	Level
(1) Abdul Rashid bin Zainal Abidin	Head, Electrical Metrology	Senior Research Officer
(2) Fadeli Hizam bin Shamsudin	Head, Microwave Lab.	Research Officer
(3) *	Research Officer DC & Low Frequency Lab.	Research Officer
(4) Mohd. Nor bin Hashim	Senior. Research Asst. Microwave Lab.	Senior Research Asst.
(5) Seek Seu Gan	Research Assistant DC & Low Frequency Lab.	Research Assistant

6. **Counterpart Personnel for the Expert in the field of Pressure**

Name	Title	Level
(1) Chen Soo Fatt	Head, Mechanical Metrology	Senior Research Officer
(2) Nurul Shamshi bt. Haji Saidin	Research Officer Pressure Lab.	Research Officer
(3) Zulkifli bin Mat	Research Assistant Pressure Lab.	Research Assistant

7. **Counterpart Personnel for the Expert in the field of Vibration**

Name	Title	Level
(1) Wan Aziz bin Wan Salleh	Head, Acoustic & Vibration Lab.	Research Officer
(2) Zailani bin Mahamood	Asst. Research Officer Vibration Lab.	Asst. Research Officer
(3) Norizan bt. Mohd. Yassin	Research Assistant Vibration Lab.	Research Assistant

* Vacant posts

Appendix IV - Budget Allocation Plan For Measurement Centre**

Year	1995	1996	1997	1998	1999	2000
Operating Budget*	1.90	2.16	2.67	3.6	4.31	4.98
Development Budget (Building & Equipment)	12.0	12.7	18.81	21.88	10.24	1.55
R&D Budget*	0.867	0.5	1.2	2.0	1.1	0.2
Total	14.77	15.36	22.68	27.48	15.65	6.73

*Budget estimate are in million ringgit.

**Industrial Measurement Group of Measurement Centre does not have a development and R&D budget. Its Operating Budget is about 40% of total budget.

Appendix V. ATTENDANTS LIST

1. **The Japanese Side**

Mr. Norio Matsuzawa (Leader)	Managing Director, Mining & Industrial Development Cooperation Department Japan International Cooperation Agency (JICA).
Mr. Sadato Shimokoshi	Assistant Section Chief, Weights and Measures Office, Machinery and Information Industries Bureau, Ministry of International Trade and Industry.
Mr. Toshio Kato	Consultant, Standards Laboratory, Yokogawa Engineering Service Corporation.
Mr. Masaru Yokoo	Coordinator, International Cooperation Business Japan Quality Assurance Organization.
Mr. Tatsuya Murase	Technical Cooperation Division, Mining & Industrial Development Cooperation Department, Japan International Cooperation Agency (JICA).
Mr. Masato Yoneda	Second Secretary, Embassy of Japan.
Mr. Yoshikazu Yamada	Deputy Resident Representative, JICA Malaysia Office.
Mr. Kojiro Matsumoto	Assistant Resident Representative, JICA Malaysia Office.

2. **The Malaysian Side**

Mrs. Raja Zaharaton Raja Zainal Abidin	Director, Trade and Industry Section, Economic Planning Unit, Prime Minister's Department
Ms. Havindar Kaur	Principal Assistant Director, Trade and Industry Section, Economic Planning Unit, Prime Minister's Department

Dr. Islahudin Baba	Deputy Secretary General I Ministry of Science, Technology and Environment
Ms. Adilah bt. Mohd. Din	Deputy Director Science and Technology Section, Ministry of Science, Technology and Environment
Mr. Abdul Mutalib Shafie	Principal Assistance Director Science and Technology Section, Ministry of Science, Technology and Environment
Mr. Ghazali Abdullah	Assistant Director, Science and Technology Section, Ministry of Science, Technology and Environment
Dato' Dr. Ahmad Tajuddin Ali	Director General, Standards and Industrial Research Institute of Malaysia.
Hj. Abdul Aziz b. Abdul Manan	Deputy Director General, Standards and Industrial Research Institute of Malaysia.
Dr. Chong Chok Ngee	Director, Research and Technology Development Division, Standards and Industrial Research Institute of Malaysia.
Mr. Woo Seng Khee	Head, Measurement Centre, Standards and Industrial Research Institute of Malaysia.
Mr. Ong Chin Giap	Research Manager, Measurement Standards Group, Measurement Centre, Standards and Industrial Research Institute of Malaysia.
Dr. Montaj Mustakim	Research Manager, Industrial Measurement Group, Measurement Centre, Standards and Industrial Research Institute of Malaysia.
Mr. Chen Soo Fatt	Senior Research Officer, Measurement Standards Group, Measurement Centre, Standards and Industrial Research Institute of Malaysia.
Mr. Abdul Rashid bin Zainal Abidin	Senior Research Officer, Measurement Standards Group, Measurement Centre, Standards and Industrial Research Institute of Malaysia.
Ms. Siti Khamnah Hashim	Research Officer, Planning and Coordination Unit, Standards and Industrial Research Institute of Malaysia.

Mr. Ahmad Makinudin Dahlan	Research Officer, Measurement Standards Group, Measurement Centre, Standards and Industrial Research Institute of Malaysia.
Mr. Fadeli Hizam Shamsudin	Research Officer, Measurement Standards Group, Measurement Centre, Standards and Industrial Research Institute of Malaysia.
Mrs. Siti Maryam Othman	Research Officer, Measurement Standards Group, Measurement Centre, Standards and Industrial Research Institute of Malaysia.
Mr. Wan Aziz Wan Salleh	Research Officer, Measurement Standards Group, Measurement Centre, Standards and Industrial Research Institute of Malaysia.

5－3　T S I

TENTATIVE SCHEDULE OF IMPLEMENTATION OF THE JAPANESE TECHNICAL COOPERATION FOR THE PROJECT ON THE MEASUREMENT CENTRE OF SIRIM (PHASE II)

The Japanese Implementation Study Team and the Authorities concerned of the Government of Malaysia have jointly formulated the Tentative Schedule of Implementation of the Project on the Measurement Centre of SIRIM (Phase II) (hereinafter referred to as "the Project") as annexed hereto.

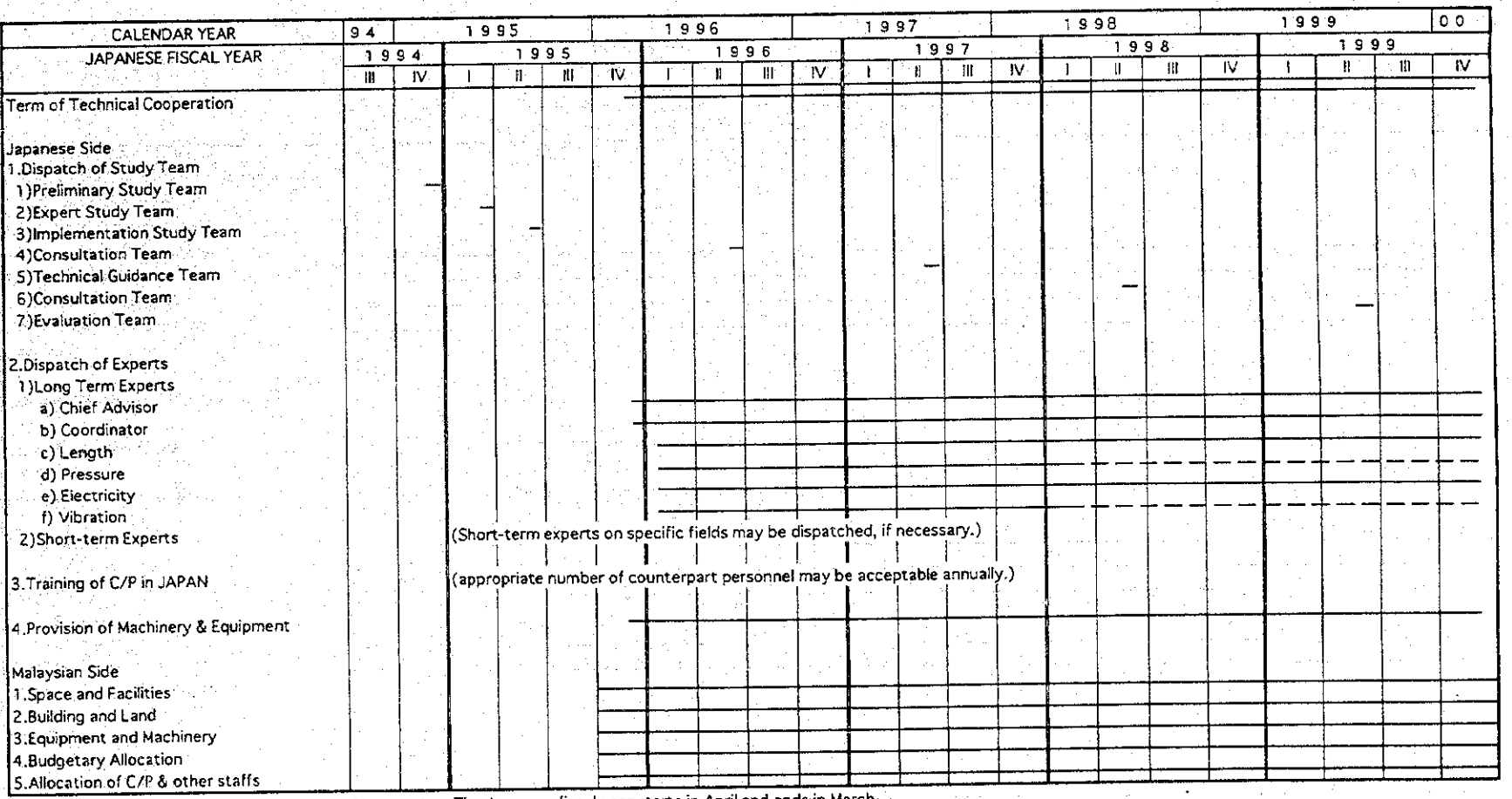
These documents have been formulated in connection with the Article I.2 of the Attached Document of the Record of Discussions signed between the Japanese Implementation Study Team and Standards and Industrial Research Institute of Malaysia, on condition that the necessary budget be allocated for the implementation of the Project by both sides and that the schedule is subject to change within the framework of the Record of Discussions when necessity arises in the course of the implementation of the Project.

Shah Alam, 8 September 1995

Mr. Norio Matsuzawa
Leader,
Implementation Study Team,
Japan International Cooperation Agency,
Japan

Dato' Dr. Ahmad Tajuddin Ali
Director General,
Standards and Industrial
Research Institute of Malaysia,
Ministry of Science, Technology
and Environment,
Malaysia

Annex A. TENTATIVE SCHEDULE OF IMPLEMENTATION



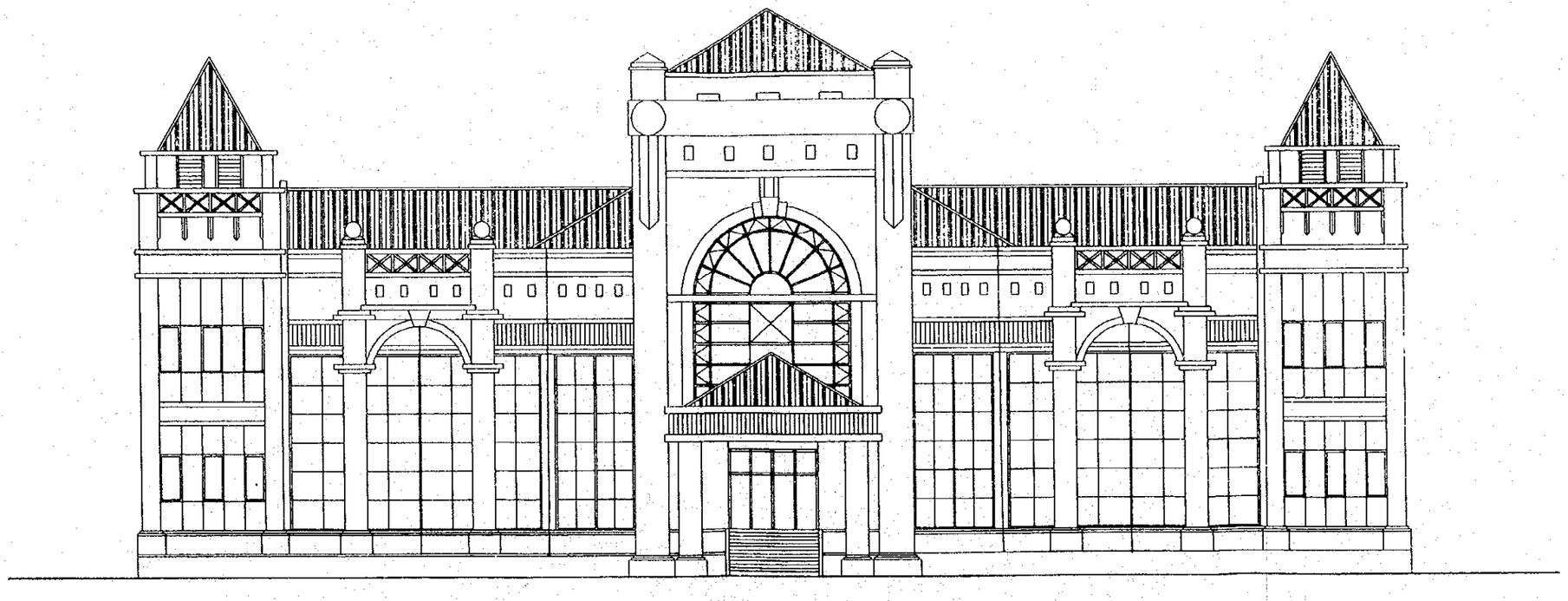
Note:
1. The Japanese fiscal year starts in April and ends in March
2. This schedule is subject to change in accordance with the progress of the Project.
3. Long-term experts may be changed during the cooperation period.
4. The term for the experts in the fields of Pressure and Vibration may change in accordance with the progress of the Project.

Annex 8. ANNUAL WORK PLAN (from February, 1995 to March, 1997)

CALENDAR YEAR	1995		1996									1997		
JAPANESE FISCAL YEAR	1995		1996											
	February	March	April	May	June	July	August	September	October	Nobember	December	January	February	March
Japanese Side														
1.Dispatch of Study Team														
1)Consultation Team								—						
2.Dispatch of Long-term Experts														
1) Chief Advisor		—												
2) Coordinator		—												
3) Length				—										
4) Pressure				—										
5) Electricity				—										
6) Vibration				—										
3.Dispatch of Short-term Experts			(Short-term experts on specific fields may be dispatched, if necessary.)											
4.Training of C/P in JAPAN			(appropriate number of counterpart personnel may be acceptable annually.)											
5.Provision of Machinery & Equipment		—	—											—
Malaysian Side														
1.Building, Space and Facilities														
2.Equipment and Machinery														
3.Budgetary Allocation														
4.Allocation of C/P & other staffs														
5.Submission of the documents														
(1)A-1 Forms for experts														
(2)A-2,3 Forms for Counterpart Training in Japan														
(3)A-4 forms for the Equipment														

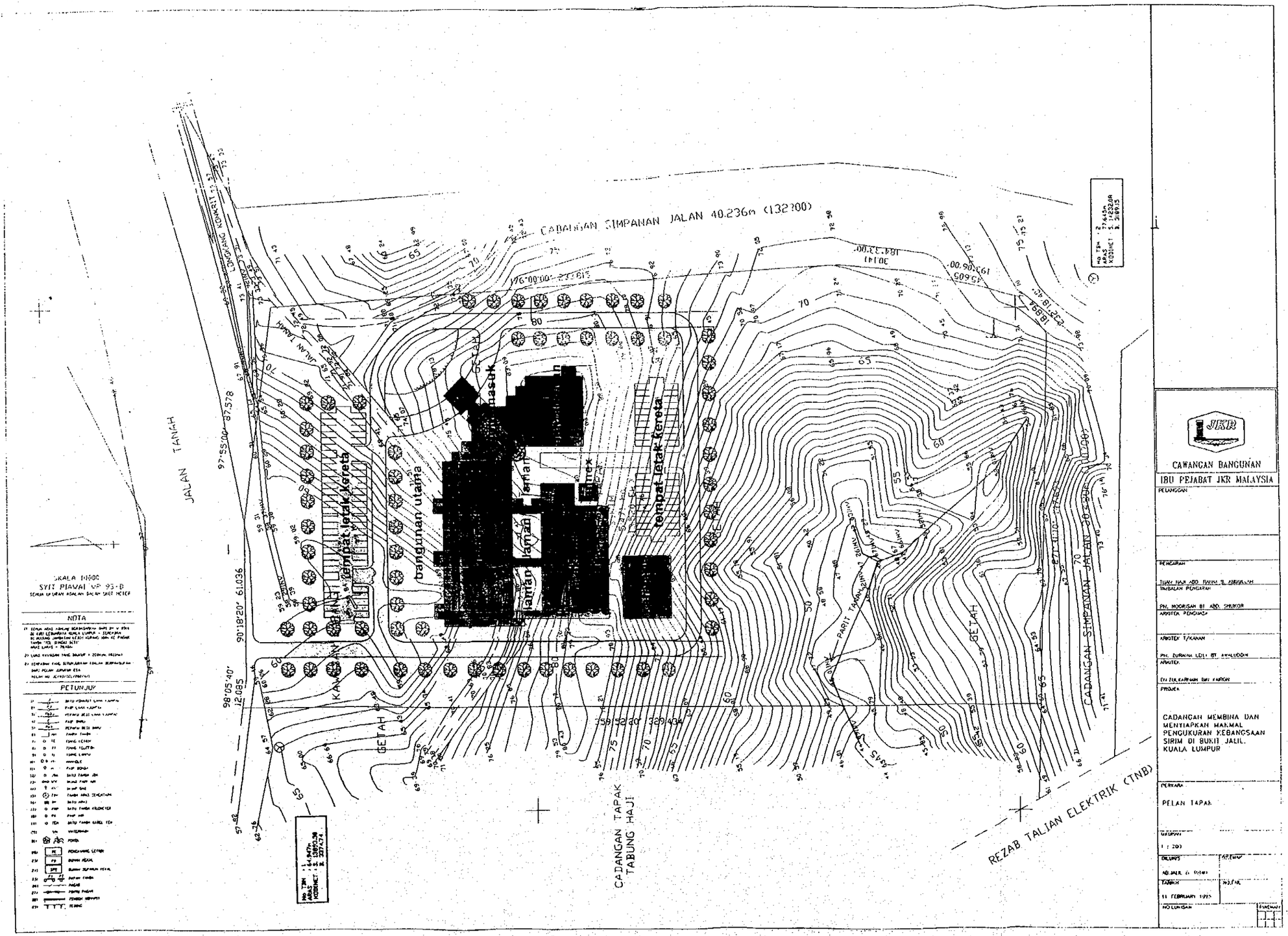
Note:

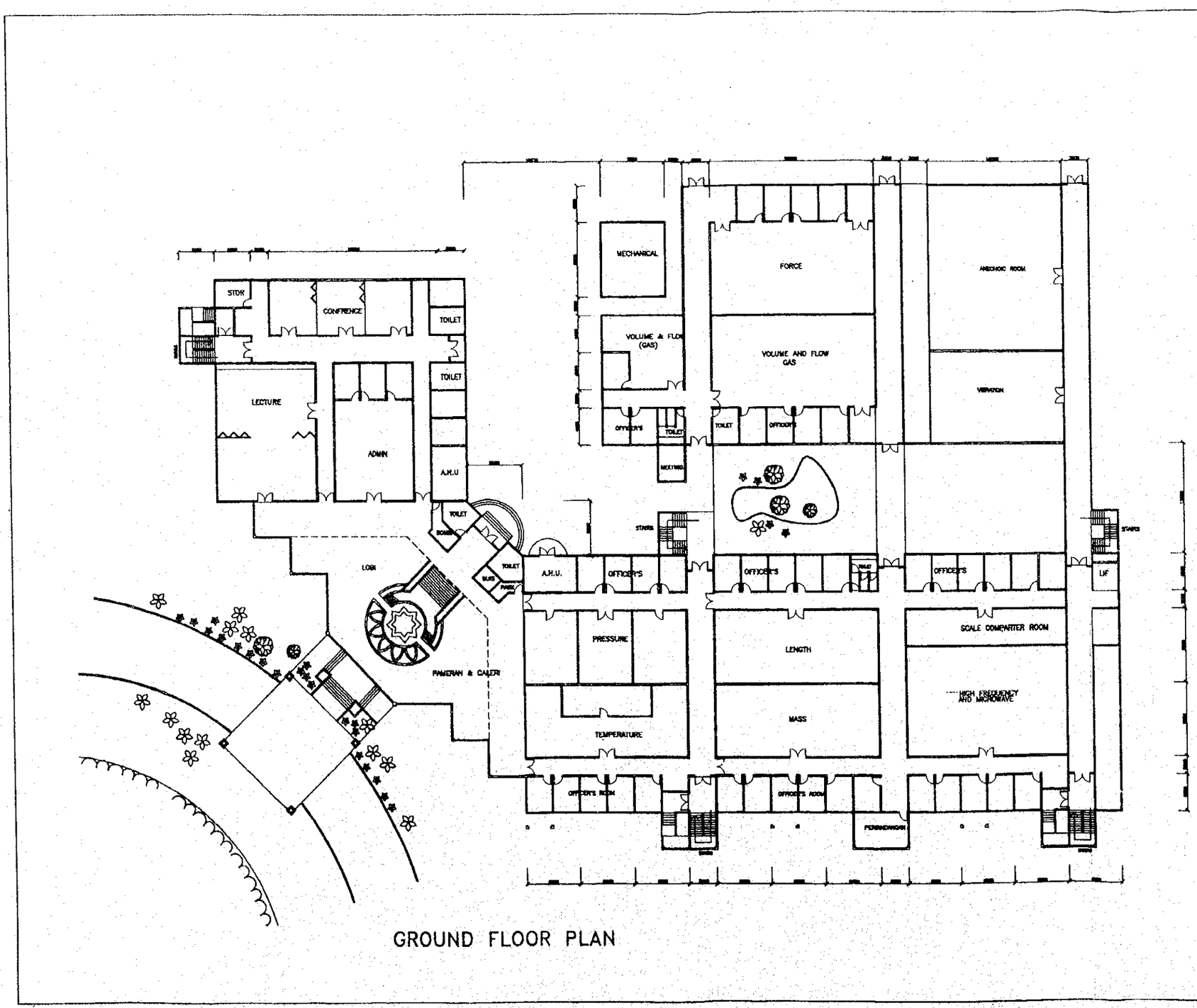
1. The Japanese fiscal year starts in April and ends in March
2. This schedule is subject to change in accordance with the progress of the Project.
3. A-1 Forms will be obtained by the end of November, 1995
4. A-2, 3 Forms will be obtained two months before the training in Japan.
5. A-4 Forms will be obtained by September, 20, 1995



CADANGAN PEMBINAAN BANGUNAN
MAKMAL PENGUKURAN KEBANGSAAN, SIRIM
DI BUKIT JALIL, KUALA LUMPUR

JKR


CADANGAN SIMPANAN JALAN 40.236m (132?00)
JALAN TANAH
LONGKANG KONKRIT
JALAN TANAH
87.578
90°18'20" 61.036
98°05'40" 12.085
159°32'20" 329.404
KAWASAN LANDSCAPE
GETAH
GETAH
CADANGAN TAPAK TABUNG HAJI
CADANGAN SIMPANAN JALAN 30.480m
REZAB TALIAN ELEKTRIK (TNB)
bangunan utama
tempat letak kereta
tempat letak kereta
taman
taman
taman
SKALA 1:1000
SYIT PIAWAI JP 93-B
NOTA
PETUNJUK
JKR
CAWANGAN BANGUNAN
IBU PEJABAT JKR MALAYSIA
PELANGGAN
PENGURUS
TUAN HAJI ABD. RAHIM B. ABDULLAH
TIMBALAN PENGARAH
PN. NOORISAH BT ABD. SHUKOR
ARKITEK PENGIMA
ARKITEK T/KANAN
PN. ZURAINA LOUI BT. KHALIDDIN
ARKITEK
CIK ZULKARNAIN BIN KARIM
PROJEK
CADANGAN MEMBINA DAN MENYIAPKAN MAKMAL PENGUKURAN KEBANGSAAN SIRIM DI BUKIT JALIL, KUALA LUMPUR
PERKARA
PELAN TAPAK
SKALA
1 : 200
DILUKIS
DISEMAK
TARIKH
11 FEBRUARI 1993
NO. LUKISAN



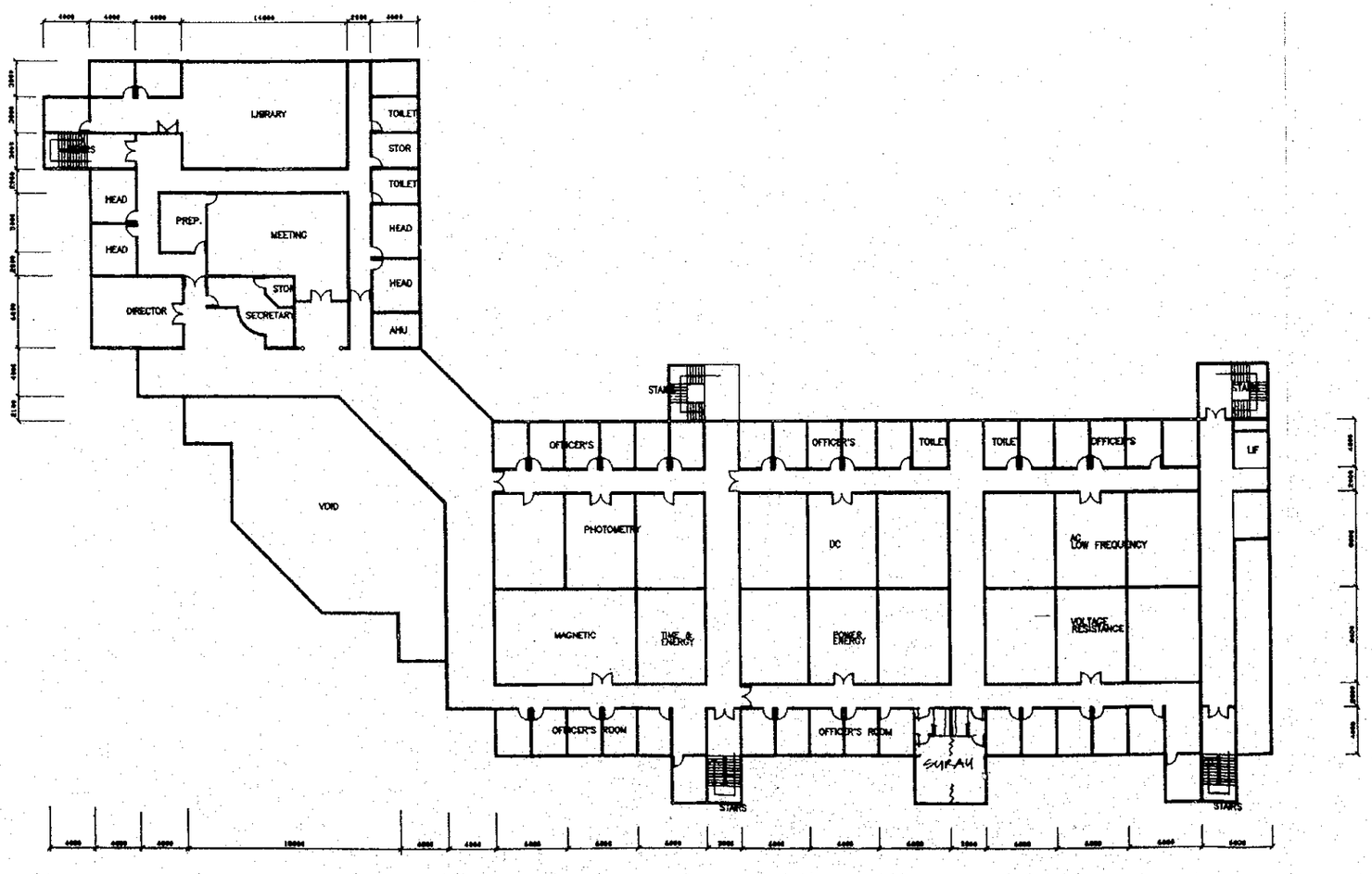
GROUND FLOOR PLAN

i

JKR

CAWANGAN BANGUNAN

IBU PEJABAT JKR MALAYSIA



FIRST FLOOR PLAN

JKR

CAWANGAN BANGUNAN

IBU PEJABAT JKR MALAYSIA