(5) Care shall be taken to protect structural concrete work from adverse effects of heavy rain in the rainy season and from high temperatures.

4-4-2 Basic Construction Policy

The following considerations need to be taken into account to implement this project through Japanese grant aid:

(1) To maintain close contact with and provide information to the organizations concerned in both governments, and to complete the facilities without delay, based on the construction schedule;

(2) To treat the project from a standpoint of a technology transfer, to realize the effects of a grant aid project with respect to methods and technology in construction;

(3) To encourage the smooth operation of the station and extend adequate assistance and directions to the people concerned in the Philippines as to the operation and maintenance of the facilities after the termination and transfer.

The consultant will provide the following services in accordance with the progress of the project.

(a) Collaboration in procedures of the construction contract

To represent PhilRice, the owner of the project, in explaining the blueprints and carry out the tendering in the presence of the representative of the owner. To investigate and evaluate the details of construction and assist in the signing of the construction contract;

(b) Procedure of payment approval

To examine and approve requests for payment of construction costs payable during and after the work;

(c) Work reports

To hold periodical report meetings and present reports to PhilRice. To prepare monthly reports and submit them to PhilRice, the Japanese Embassy, the JICA Office and the Japanese Ministry of Foreign Affairs.

(d) Direction of the work

To hold meetings regularly at the site to confirm the workmanship and progress of the work, and to give necessary instructions to the contractor;

(e) Examination and approval

To examine shop drawings, fabrication drawings for the equipment, and samples of construction materials, to give approval to the contractor, and to assist inspections at each stage of the work from commencement to completion.

4-4-3 Supervisory Plan

The following are basic policies in the construction supervision stage:

(1) To endeavor to adopt local materials and construction methods;

(2) To keep close contact with the organizations and people concerned and to coordinate their views;

(3) To communicate with the contractor frequently to give appropriate advice on the site for the smooth progress of construction work;

(4) To grasp the material procurement period considering the distance from Manila and to supervise the construction progress;

(5) To establish a switching office in Muñoz or Cabanatuan for correspondence between the site and Manila because there are no telephone or other communication systems in the site area, and to do everything possible to assure good communication to overcome unfavorable circumstance, and

(6) To prevent complaints arising from residents around the site area.

Aware of the above principles for fulfilling supervisory services, a field representative of the consultant shall be stationed at the site for management and supervision of the work, and when necessary, architects and engineers will inspect and provide instructions at the site. In addition, architects and engineers will be sent to the site in accordance with the progress of construction to discuss, inspect and provide instructions when necessary.

4-4-4 Procurement Plan for Materials

Construction materials are produced based on the ASTM standards. However, some products such as reinforcing bars, galvanized steel sheets, piping materials and lighting fixtures seem to be of poor quality. As for structural steel, small products using angle and channel steel are available in the Philippines, while large pieces need to be imported.

Scarcity in the variation of color or design of finishing materials confines the design of the finishing work. Some are also unsatisfactory in strength, being rather fragile or brittle. Care needs to be taken in the use of large amounts of products of the same design because sometimes they may be in short supply.

Materials and equipment to be purchased in Japan will be shipped to Manila, and after customs clearance they will be forwarded to the site via inland transport.

Materials	Country	Reference (Selection reasons & notes)
(1) Construction Materials		
Cement	Philippines	The quality varies a little, but does not present problems in compressive strength. The market sometimes has shortages of goods due to deliberate control by the suppliers.
Sand, gravel	Philippines	River sand and gravel are available in sufficient quantity, and are of good quality in general.

Materials	Country	Reference (Selection reasons & notes)
Reinforcing bars	Japan	Mostly deformed bars, manufactured in inch units. Some products are of poor quality, causing cracks while bar bending.
Concrete	Philippines	A lot of products are available.
Wooden frames	Philippines	Locally available, with no problems in quality.
Plywood	Philippines	Locally available, with no problems in quality.
Lumber	Philippines	Plenty of good cheap lumber is available. Woodcraft skills are high.
Stones	Philippines	Plenty of cheap marble and granite are available in good quality.
Tiles	Japan	Local products have little variety of color and size and are in rather poor quality in size precision, strength and glazing.
Doors windows	Japan	Aluminum sashes are produced only for house use and are not very satisfactory in strength, finish, as well as water and air tightness.
Glass	Japan	Common plate glass only is produced; others are imports.
Paint (interior)	Philippines	Local products of good quality are available in quantity.
(exterior)	Japan	Local products are of rather poor quality.
(2) Materials for Mechanical Systems		
Pipes	Japan	Some are manufactured locally, but there are problems in quality, precision, and accessories. They are expensive because of using imported materials.
Sanitary ware	Japan	Local products are inappropriate as to quality in precision, strength, glazing and accessories.
Air conditioners	Japan	Not produced in the Philippines.
Wires, cables	Japan	Some are manufactured locally but are not very good in quality.

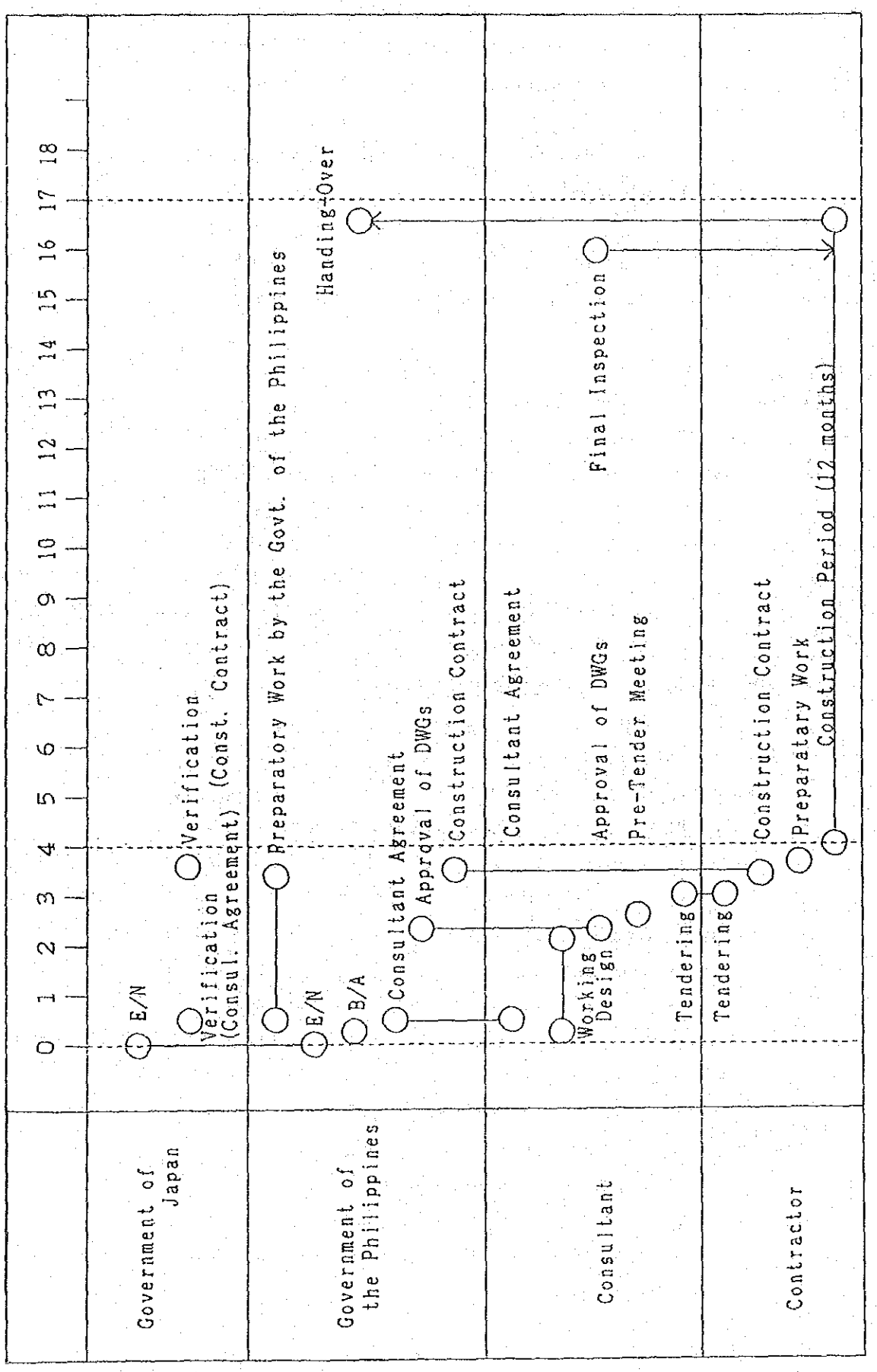
Materials	Country	Reference (Selection reasons & notes)
Conduits	Japan	Some are manufactured locally but are not satisfactory in quality and availability of accessories.
Lighting fixtures	Japan	Lighting fixtures are not produced locally except for fluorescent lamps.
Kitchen equipment	Japan	Most local equipment is of poor quality in size, precision, and accessories.
(3) Laboratory Equipment	Japan	Local products are not as good as those the station requires in quality, quantity and unit rate.
(4) Construc. Machinery	Philippines	Most machines are available in the Philippines.

4-4-5 Tentative Schedule of the Project

After the notes are exchanged between both governments (E/N), PhilRice will enter into an agreement for consulting services with a consultant. The consultant will proceed with the verification of the agreement by the Government of Japan while finalizing the basic design documents. Upon the finilization ,working design documents will be prepared. After completing the working design in about three months and having them approved by PhilRice, the consultant will explain the contract documents to and call for tenders from Japanese construction companies. The successful contractor will conclude a construction contract with PhilRice, which shall be verified by the Government of Japan, and construction work will start. PhilRice will complete the work in the area of its responsibilities during this period. The construction period will be about 12 months.

Table 4-5 shows a tentative schedule of the project starting from the day of signing of the E/N.

TABLE 4-5 TENTATIVE SCHEDULE OF THE PROJECT



4-4-6 Approximate Project Cost

(1) Project Cost Borne by the Philippines

The project cost to be borne by the Philippines is estimated at approximately 13,850,000 pesos.

Cost for site preparation including soil filling	7,770,000 pesos
Cost for exterior work like gates, fence, etc.	6,080,000 pesos

(2) Scope of Responsibilities

Under the condition that this project be realized, the following arrangements are to be undertaken by each government.

a) Japanese responsibilities

1. To construct buildings and facilities which are agreed upon between the governments of the Philippines and Japan
2. To provide utilities for the above buildings and facilities
3. To provide and install the equipment which is agreed upon between both governments

b) Philippine responsibilities

1. To secure the land for this project
2. To prepare the land including soil filling, which needs to be completed before the commencement of construction
3. To do exterior work including gates and fences which are not included in the grant
4. To secure the ground for temporary work
5. To apply for the permit (building permit), license and approval necessary for implementing the project
6. To provide the following systems
   a. Electric power supply to the site
   b. Water supply to the site
   c. Drainage piping to the site
   d. Telephone piping to the terminal board in the project building

7. To provide services according to the banking arrangement, and to pay the following commissions to the authorized foreign exchange bank in Japan
   a. Inspection fee for payment approval
   b. Payment commission
8. To handle unloading and customs clearance, as well as to assure exemption from excise taxes and duties to be imposed at the unloading port
9. To carry out official formalities and to give the approval necessary for the entrance to and residence in the Philippines to the Japanese whose services may be required in connection with the supply of the products and services according to the verified contract
10. To exempt the Japanese whose services may be required in connection with this project from Philippine taxes and levies
11. To operate and maintain the facilities and equipment which will be provided by the grant
12. To exempt the consultant and the contractor from value added tax (VAT) levied by the Government of the Philippines. In case they are liable to taxation, the Philippine administrative agency concerned shall pay the VAT.
13. To secure sufficient personnel for operation and services of the station

CHAPTER 5
EVALUATION AND CONCLUSION

CHAPTER 5 EVALUATION AND CONCLUSION

5-1 Effects of the Project

The ultimate goal of this project is to sustain self-sufficiency of rice production, which was once attained through the Masagana 99 Project and the Medium-Term Development Plan, to meet the rice requirement of an increasing population. As stated in the foregoing chapters, the Government of the Philippines has a strong desire to establish a national rice research R & D program, being aware that too much dependence on the IRRI in the past delayed national development. From this point of view, it is definitely necessary to improve the central experiment station of PhilRice, and the realization of this project is indispensable for this program. This project is expected to have the following effects when it is completed and managed smoothly by the Philippine authorities.

(1) Economic Effects

When a national rice research institute is established in the Philippines, it will make possible virtually unprecedented studies on rice varietal improvement, pest management, etc. adaptable to specific Philippine conditions and dissemination of their results through the training of numerous people, from rice researchers to farmers. The expected number of trainees is expected to be over 66,000, including about 43,000 farmers. Through these research and training programs, efficient rice farming will be promoted, improving rice productivity and increasing farm incomes.

(2) Social Effects

a) Technology developed by the IRRI and other national rice research institutions will be coordinated and adjusted to the circumstances in the Philippines for application throughout the country.

b) Sufficient supply of stable food will improve the living standards of the Filipinos, and contribute to social as well as economic stability.

c) Improved and stable rice production by small farms will provide more incomes and better living. Futhermore, it will promote the farmland reform program.

d) Stable rice prices owing to production improvement will lead to the stabilization of market prices.

5-2 Conclusion

It is believed that this project will contribute to R & D and dissemination of rice farming technology to provide the rice production program for which there is an urgent need in the Philippines. It will be significant for national development and a stable economy. The project is therefore well worth realizing through grant aid from the Government of Japan, with considerable benefit thereby engendered.

5-3 Recommendations

Since this project will be financed as a concomitant to the development of PhilRice, it shall be concerned only to urgent necessity, that is, to what is needed for rice production improvement to cope with the rapid population increase. The project shall be planned in accordance with the present PhilRice staff allocation program as well as research and training activities. High leveled research and studies are suggested to be introduced in the future after this project is completed with successful results in achieving its initial objectives.

The following recommendations are presented for the prompt realization of the project as well as the smooth and effective operation of the station to achieve its objectives.

(1) The research programs to be carried out at the station are planned exclusively basic research and studies so that PhilRice can make a new step as a national rice research institute. Thus, the initial objectives of varietal improvement and other research programs shall be accomplished promptly.

(2) The facilities are planned according to the current PhilRice staff members including the vacant positions. Thus, proper number of persons shall be employed promptly to fill this vacancy.

ANNEX

ANNEX

1 MEMBERS OF THE STUDY TEAM

(1) Basic Design Study

Hiromi KOBAYASHI	Leader	Head of Eco-physiology Div., Agronomy Dept., Shikoku National Experiment Station, Ministry of Agriculture, Forestry & Fisheries
Hiroshi TAKASAWA	Research Planning	Deputy Director of International Research Div., Agriculture, Forestry & Fisheries Research Council Secretariat, Ministry of Agriculture, Forestry & Fisheries
Osamu KOSEGAWA	Project Coordinator	First Basic Design Div. Grant Aid Dept., JICA
Ryoichi KIBE	Architectural Planning	Yokogawa Architects & Engineers, Inc.
Eiji IMADA	Architectural Design	Yokogawa Architects & Engineers, Inc.
Toshinori KUDO	Farming System Planning	Yokogawa Architects & Engineers, Inc.
Makoto ARIYOSHI	Equipment Planning	Yokogawa Architects & Engineers, Inc.

(2) Draft Mission

Hiroshi TAKASAWA	Research Planning	Deputy Director of International Research Div., Agriculture, Forestry & Fisheries Research Council Secretariat, Ministry of Agriculture, Forestry & Fisheries
Ryoichi KIBE	Architectural Planning	Yokogawa Architects & Engineers, Inc.
Toshinori KUDO	Farming System Planning	Yokogawa Architects & Engineers, Inc.

2 SCHEDULE OF THE STUDY TEAM

(1) Basic Design Study

Date	Activities
1. Mar. 29, Wed.	Tokyo to Manila courtesy visit to the Japanese Embassy, JICA
2. 30, Thu.	courtesy visit to PhilRice presentation of the inception report and questionnaire
3. 31, Fri.	Hearing as to the background, contents of the project and the PhilRice organization
4. Apr. 1, Sat.	Site survey, survey of existing equipment and construction situation in the site area
5. 2, Sun.	data editing
6. 3, Mon.	discussions of research and training programs
7. 4, Tue.	individual meeting as to personnel plan, function and grade of the Station and equipment plan Govt. staff: Tokyo to manila, courtesy visit to the Japanese Embassy, JICA Office
8. 5, Wed.	discussions of the inception report presentation of the Japanese grant aid system
9. 6, Thu.	confirming the research and training programs visit to the IRRI and PCARRD
10. 7, Fri.	discussions as to management system, management costs and budgetary measures
11. 8, Sat.	site survey, visit to CLSU
12. 9, Sun.	data editing
13. 10, Mon.	report to the Japanese Embassy and JICA Office courtesy visit to the DA draft minutes of discussions
14. 11, Tue.	final meeting draft minutes of discussions, typing and signing
15. 12, Wed.	report to the Japanese Embassy and JICA Office meeting with PhilRice
16. 13, Thu.	Govt. staff: Manila to Tokyo consul.staff: field survey, individual meeting

Date		Activities
17.	14, Fri.	individual meeting, market research
18. Apr.	15, Sat.	research on similar projects, individual meeting
19.	16, Sun.	data editing
20.	17, Mon.	final meeting, report to JICA Office
21.	18, Tue.	Manila to Tokyo

(2) Draft Mission

Date		Activities
1. July	2, Sun.	Tokyo to Manila JL-741 discussions with Mr. Niwa of JICA Manila Office
2.	3, Mon.	presentation of the draft report to and discussions with Mr. Niwa and Mr. Saburi at JICA Office presentation of the draft report to PhilRice and DA
3.	4, Tue.	discussions with PhilRice at Los Baños
4	5, Wed.	discussions with PhilRice at DA and AIT individual meeting on general matters and equipment
5.	6, Thu.	discussions with PhilRice, draft minutes of discussions at DA discussions with Mr. Niwa on minutes at JICA Office
6.	7, Fri.	final meeting, signing on the minutes of discussions report to the Japanese Embassy and Jica Office
7.	8, Sat.	receiving a letter from PhilRice Manila to Tokyo

3 LIST OF PERSONNEL INTERVIEWED

PhilRice	DR. SANTIAGO R.OBIEN	Director
	DR. RODOLFO M.ELA	Consultant, General Administration and Support Services (GASS) and Foreign Assisted Projects
	MR. LEOCADIO L. SEBASTIAN	Planning, Development and Monitoring Office Co-ordinator, Science Research Specialist IV
	ENGR. VICENTE C. RODRIGUEZ	Maligaya Branch Manager
	ENGR. FELIMAR M. TORRIZO	REMP Seniar Science Research Specialist
	DR. PETRONIO O. ONGKINGCO	Consultant, Technology Transfer Program (TTP), Urea Super Granules (USG) Project
	DR. PEDRO B. ESCURO	Consultant, Rice Varietal Improvement Program (RVIP)
	DR. JOSE R. MEDINA	Program Leader, Integrated Pest Management (IPM)
	DR. RAVINDRA C. JOSHI	Consultant, IPM
	DR. SILVESTRE C. ANDALES	Program Leader, Rice Engineering and Mechanization Program (REMP)
	DR. GENARO O. SAN VALENTIN	Program Leader,Planting and Fertilizer Management Program (PFMP)
	MR. REX L. NAVARRO	Program Leader, TTP, Training & Communications
	DR. ERNESTO V. CARPIO	Project Leader, Rice Chemistry and Food Science Program (RCFSP)
	MR. LOURDES D. DIMARANAN	Science Research Specialist II, RCFSP
	DR. JAIME R. ESCANO	Consultant, Farming Systems Program (FSP) Rice-Livestock
	MS. IMELDA M. REVILLA	Science Research Specialist III, Social Science and Policy Research Program (SSPRP)
	DR. MARCOS R. VEGA	Consultant, Research Management
	DR. JOSE E. HERNANDEZ	Program Leader, RVIP
	MR. ANTONIO GARCES	Consultant, Project Planning Development and Monitoring (PDM)
	MR. DAMASO R. CALLO, JR.	Program Leader, TTP, On-Farm
	MR. PHILBERT BONILLA	Science Research Specialist IV, RVIP
	DR. ARNULFO GARCIA	Program Leader, FSP
	DR. NGUYEN VAN NGUU	Consultant, PFMP
	ENGR. RODOLFO DOMINGO	Supervising Agricultural Engineer,PRRI-Maligaya

PhilRice	MS. MYRNA DELA CRUZ	Agronomist, PRRI-Maligaya
	MR. RUBEN SEVILLA	Training Coordinator, CLSU Freshwater Aquaculture Complex
	MR. TERESO ABELLA	Laboratory Coordinator CLSU FAC
	MS. ARSENIA CAGAWAN	Assistant Professor of Inland Fisheries
	MS. ELEONOR L. RETALES	Division Chief, Administration, GASS
	ARCH. RENATO B. BAJIT	Architect, GASS
	MR. MANUEL K. VERGARA, JR.	Executive Secretary, GASS
D A	MR. JOHNSON P. MERCADER	Assistant Secretary, IADCCO (International Agricultural Development Cooperation Coodinating Office)
	MR. ROMEO L. LEDESMA	DA-CO
	MR. MANUEL M. LANTIN	Assistant Secretary
	MR. CONRADO G. GOZUN	Undersecretary for Attached Agencies
D B M	MS. CLARO L. PICZON	Assistant Secretary, Member, Board of Trustees
U P L B	DR. EDWIN L. JAVIAR	Professor
	DR. RUBEN L. VILLAREAL	UPLB-CA, Dean
N E D A	MR. JOSE D. GOMEZ	Agricultural Staff
OTHERS	MR. NESTOR C. MARTIN	Accountant
	MR. GREGORIO G. SOTOYA	COA Auditor
JAPANESE EMBASSY	MR. NAOKI HAYASHIDA	First Secretary
JICA OFFICE	MR. MORIYA MIYAMOTO	Resident Representative
	MR. KATSUHIKO OSHIMA	Deputy Resident Representative
	MR. NORIAKI NIWA	Assistant Resident Representative
JICA EXPERT	MR. SHIGETAKA SABURI	Adviser

4 MINUTES OF DISCUSSIONS

(1) Basic Design Study MINUTES OF DISCUSSIONS
ON THE
PROJECT FOR THE IMPROVEMENT
OF THE
CENTRAL EXPERIMENT STATION
OF THE
PHILIPPINE RICE RESEARCH INSTITUTE
DEPARTMENT OF AGRICULTURE
REPUBLIC OF THE PHILIPPINES

In response to the request of the Government of the Republic of the Philippines, the Government of Japan decided to conduct a basic design study on the project for the improvement of the Central Experiment Station of the Philippine Rice Research Institute (hereinafter referred to as the "Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA"). JICA sent to the Philippines the basic design study team headed by Mr. Hiromi Kobayashi, Head of Eco-Physiology Div., Agronomy Dept., Shikoku National Agriculture Experiment Station, Ministry of Agriculture, Forestry and Fisheries, for 21 days from March 29 to April 18, 1989.

The team had a series of discussions and exchange of views with the concerned authorities of the Government of the Philippines headed by Mr. Santiago R. Obien, Director, the Philippine Rice Research Institute, Department of Agriculture.

As a result of the study and discussions, both parties agreed to recommend to their respective governments that the major points of understanding reached between them, attached herewith, should be examined towards the realization of the Project.

April 11, 1989

小林廣美

HIROMI KOBAYASHI
Leader of the Japanese
Basic Design Study Team

SANTIAGO R. OBIEN
Director
Philippine Rice Research
Institute

ATTACHMENT

1. The objective of the Project is to improve the Central Experiment Station (hereinafter referred to as the "Station") of the Philippine Rice Research Institute (hereinafter referred to as "PhilRice") in order to strengthen the following activities:
   (1) Varietal Improvement
   (2) Planting and Fertilizer Management
   (3) Integrated Pest Management
   (4) Rice-Based Farming Systems
   (5) Rice Engineering and Mechanization
   (6) Rice Chemistry and Food Science
   (7) Social Science and Policy Research
   (8) Technology Transfer for the above 7 (seven) programs

2. PhilRice has already acquired the land as the proposed site for the station. It is located in the compound of PhilRice at Maligaya, Muñoz, Nueva Ecija, as attached in Annex I.

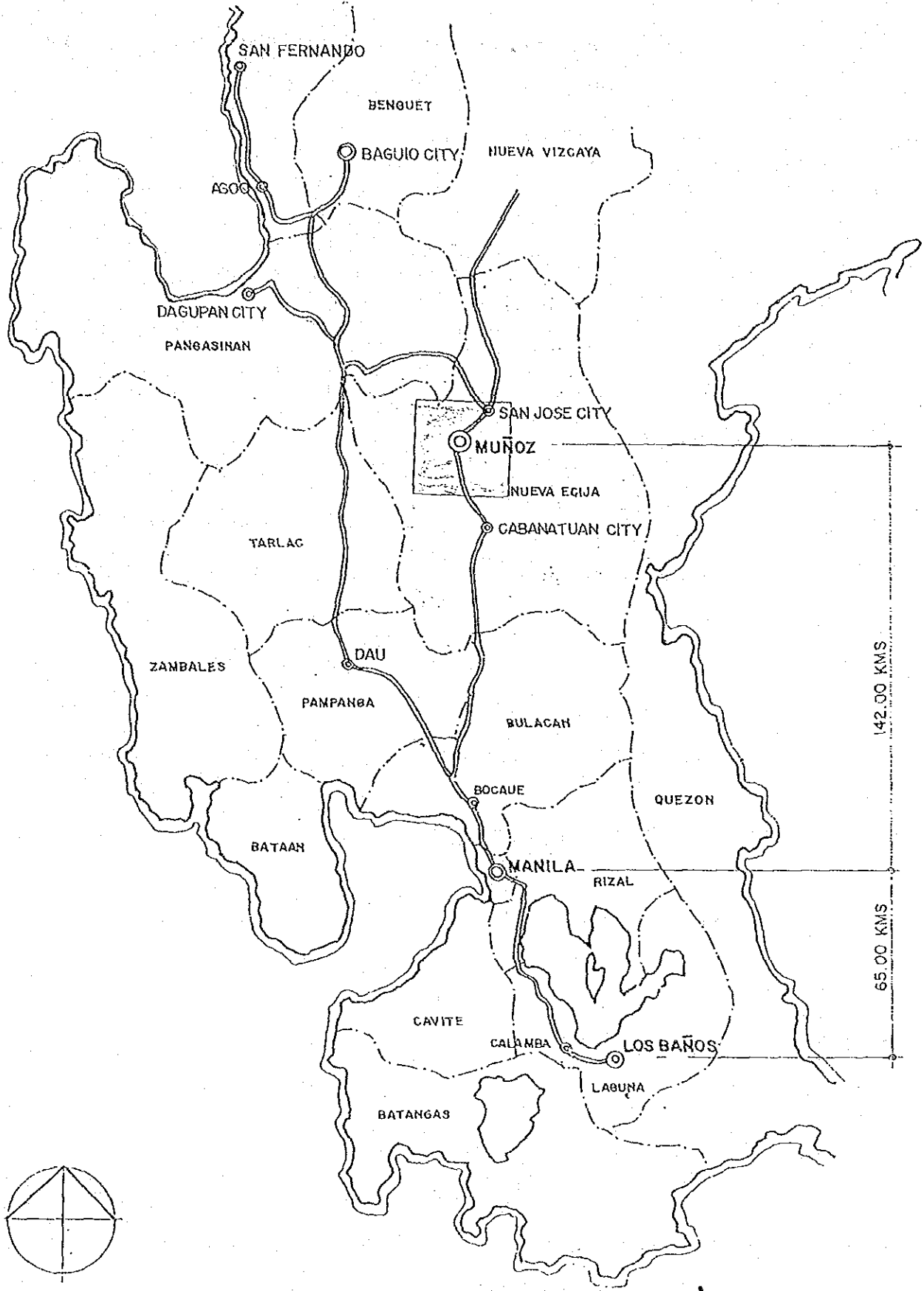
3. PhilRice is the overall executing and implementing agency for the Project and assumes responsibility for the management, administration and operation of the station.

4. The Japanese Study Team will convey to the Government of Japan the request of the Government of the Philippines that the former takes necessary measures to cooperate by implementing the Project within the scope of Japan's Grant Aid Program. (List of main facilities and equipment requested by the Government of the Philippines is attached as Annex II).

5. The Philippine side has understood the Japan's Grant Aid Program as explained by the team which includes a principle of use of a Japanese consulting firm and Japanese contractors for the implementation of the Project.

6. The Philippine side has confirmed to take necessary measures as listed in Annex III on condition that the Grant Aid is extended to the Project.

ANNEX I PHILRICE COMPOUND AT MALIGAYA, MUÑOZ, NUEVA ECIJA



LOCATION MAP OF MUÑOZ

SCALE: 1:1,500 MTS.

ANNEX II LIST OF MAIN FACILITIES AND EQUIPMENT REQUESTED BY THE GOVERNMENT OF THE PHILIPPINES

A. Facilities

(1) Research Building

(2) Greenhouse and its facilities

(3) Field Service Building and facilities

(4) Training Dormitory

(5) Main drainage canal for experiment field

(6) Guesthouse

The size, capacity and lay-out of the above facilities will be formulated in Japan after analyzing the collected data and information, and they will be proposed in a draft final report.

PhilRice reiterated its request for the inclusion of the Administration Building which was excluded by the Basic Design Study Team in the six items recommended above.

B. Equipment

The equipment for the following programs:

(1) Varietal Improvement

(2) Planting and Fertilizer Management

(3) Integrated Pest Management

(4) Rice-Based Farming Systems

(5) Rice Engineering and Mechanization

(6) Rice Chemistry and Food Science

(7) Social Science and Policy Research

(8) Technology transfer for the above 7 (seven) programs

(9) Research support equipment

ANNEX III LIST OF MEASURES TO BE UNDERTAKEN BY THE PHILIPPINE SIDE

The following are the necessary measures to be undertaken by the Philippine side in connection with the successful execution and operation of the Project.

1. To secure the land necessary for the Project,
2. To clear, level and fill as needed, the site prior to the commencement of construction work,
3. To construct gates and fences in and around the site,
4. To provide the following facilities/utilities and appurtenant work in connection with the construction work:
   - 3.1 Power distribution to the site
   - 3.2 Water supply to the site
   - 3.3 Main drainage to the site
   - 3.4 Telephone trunk line to the main distribution frame/ panel (MDF) of the buildings
5. To bear commissions to the Japanese foreign exchange bank for banking services based on the banking arrangement concerning -
   - 4.1 Advising Commission of Authorization to Pay
   - 4.2 Payment Commission
6. To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation in the Philippines of the products and commodities purchased under the grant-aid,
7. To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contract, such facilities as may be necessary for their entry into and stay in the Philippines for the performance of their work,

8. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the Philippines with respect to the supply of the products and services under the verified contracts,

9. To maintain and use properly and effectively the facilities to be constructed and the equipment to be provided under the grant-aid,

10. To bear all the expenses, including VAT, other than those to be borne by the grant aid, necessary for the execution of the Project, and

11. To assign all the necessary staff for the proposed activities of the Station upon the execution and completion of the Project.

(2) Draft Mission

MINUTES OF DISCUSSIONS

ON

THE DRAFT FINAL REPORT OF THE BASIC DESIGN STUDY

ON

THE PROJECT FOR

IMPROVEMENT OF THE CENTRAL EXPERIMENT STATION OF

THE PHILIPPINE RICE RESEARCH INSTITUTE

IN

THE REPUBLIC OF THE PHILIPPINES

In response to the request made by the Government of the Republic of the Philippines, the Government of Japan decided to conduct a basic design study on the Project for Improvement of the Central Experiment Station of the Philippine Rice Research Institute (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to the Republic of the Philippines a study team from March 29 to April 18, 1989.

As a result of the study, JICA prepared a draft report and dispatched a mission headed by Mr. Hiroshi Takasawa, Deputy Director of the International Research Division, Agriculture, Forestry and Fisheries Research Council Secretariat, Ministry of Agriculture, Forestry and Fisheries to explain and discuss it from July 2 to 8, 1989.

The team had series of discussions on the Project with the officials concerned of the Government of the Philippines headed by Mr. Santiago R. Obien, Director of PhilRice. After clarifying its contents, both parties 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.

July 7, 1989
Department of Agriculture
Quezon City, Philippines

HIROSHI TAKASAWA
Leader
Draft Report Team of
Basic Design Study
JICA

SANTIAGO R. OBIEN
Director
Philippine Rice Research
Institute

A T T A C H M E N T

1. The Philippine side agreed in principle to the basic design proposed in the Draft Report with appropriate alterations to be incorporated in the Final Report.

2. The Final Reports (10 copies in English) on the Project will be submitted to the Republic of the Philippines in the middle of August 1989.

3. The Philippine side understood the system of Japan's Grant Aid Program and confirmed the arrangement to be taken by the Government of the Philippines for the realization of the Project as agreed upon in the "Minutes of Discussions" dated April 11, 1989.

4. The Philippine side noted that the proposed basic design of the facilities was made on the basis of the 1989 manpower compliment of PhilRice. By the time these facilities will be completed in 1991, there will be a foreseeable fifty percent (50%) increase in the number of PhilRice personnel.

5 COUNTRY DATA

Major Economic Indexes in the Philippines

	1983	1984	1985	1986
GDP (billion dollars, IMF/IFS)	34.1	32.3	32.8	30.4
GNP per Capita (dollars, IMF/IFS)	655	592	584	544
GNP Growth Rate (%, Central Bank)	1.3	△ 7.1	4.2	1.5
Trade Balance (million dollars, IMF/IFS)	△ 2,485	△ 679	△ 482	△ 202
Current Balance (ditto)	△ 2,751	△ 1,268	8	1,022
Overall Balance (ditto)	△ 3,501	△ 403	952	1,130
Foreign Currency Researves (ditto)	864	890	1,116	2,527
Official Foreign Debt (billion dollars, World Bank)	10.6	11.6	13.6	19.8
DSR (of the above) (%, World Bank)	16.0	13.9	15.8	18.3
Consumer Price Increase Rate (%, IMF/IFS)	10.0	50.4	23.1	0.7

GDP in ASEAN Countries (GNP in the Philippines) (in US billion dollars)

	Indonesia	Malaysia	Philippines	Singapore	Thailand
1984	83.9 (6.2)	33.9 (7.8)	32.3 (△ 7.1)	18.8 (8.2)	41.8 (5.5)
1985	85.1 (1.9)	31.2 (△ 1.0)	32.8 (△ 4.2)	17.5 (△ 1.8)	38.3 (3.2)
1986	75.2 (-)	27.8 (1.0)	30.4 (1.5)	17.3 (1.9)	41.8 (3.5)
Refernce*	431 US$	1,600 US$	544 US$	6,949 US$	771 US$

Notes: Figures in parentheses are net growth rates.
Refernce* shows GNP per capita.

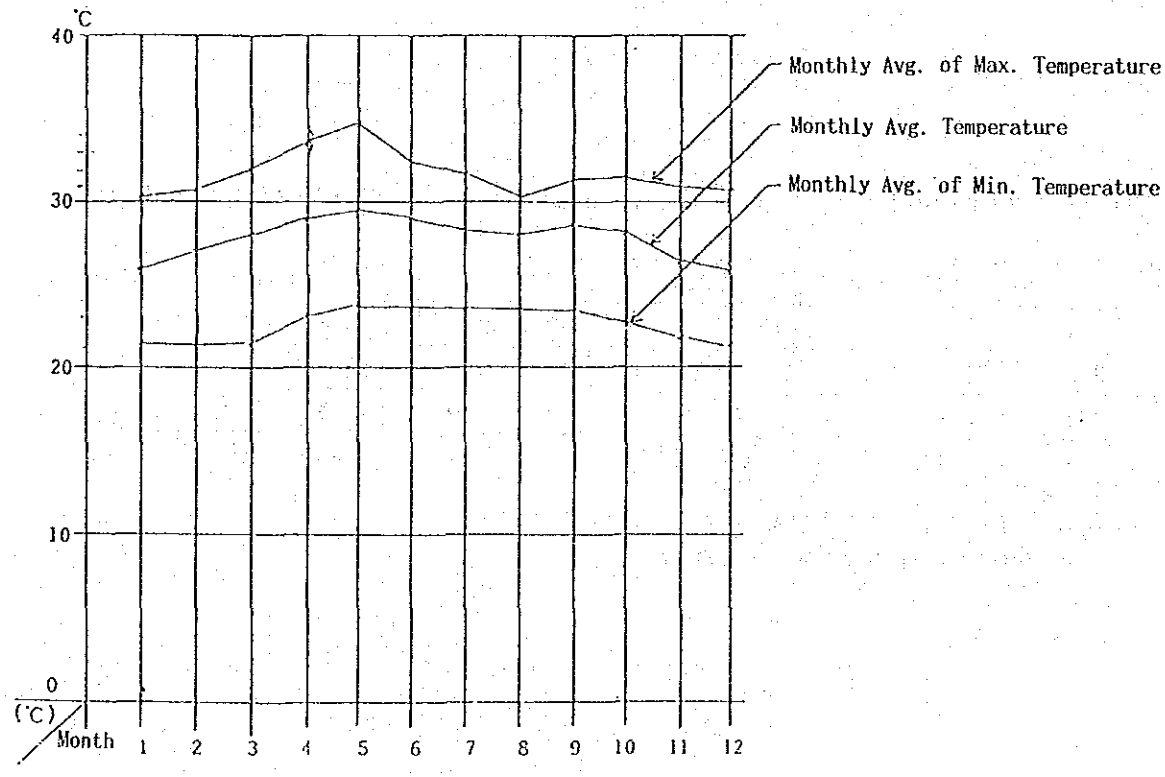
Source: IMF/IFS

CLIMATOLOGICAL AVERAGES

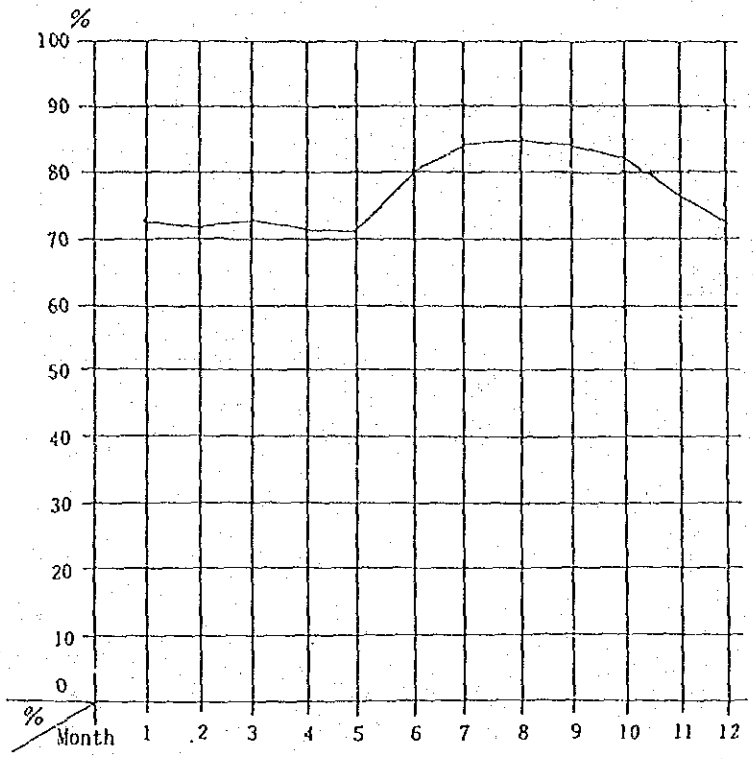
STATION : Muñoz, Nueva Ecija
COORDINATES: 15 43 N 120 54 E

PERIOD OF RECORDS 1981 - 1985

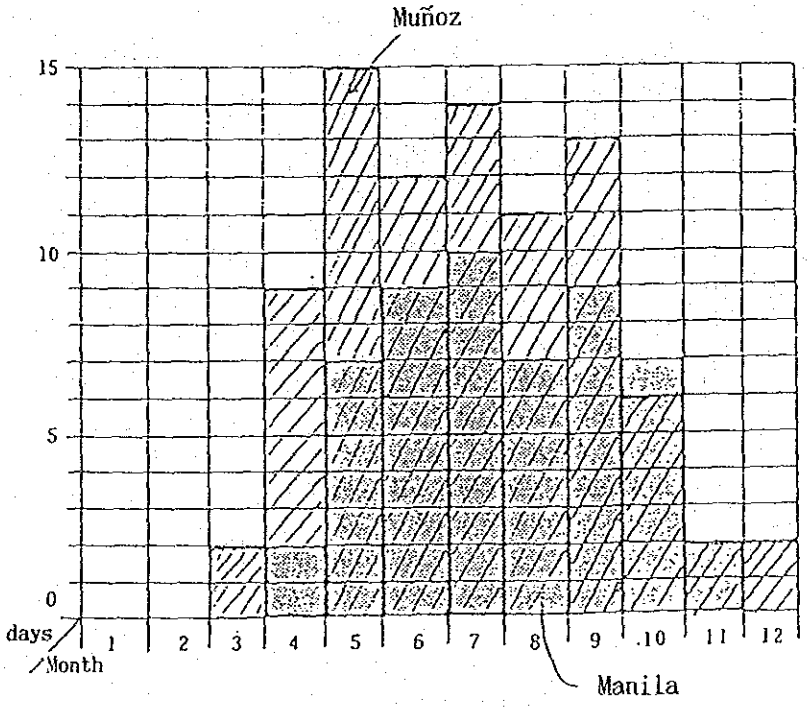
MONTH	RAIN-FALL (mm)	RAINY DAYS	TEMPERATURE (°C) MAX-IMUM	MIN-IMUM	MEAN	DRY BULB	WET BULB	DEW PT.	RH (%)	MEAN SEA LEVEL PRESSURE (mbs)	PREVAILING WIND DIREC-TION	SPEED (mps)	CLOUD (octa)	DAYS WITH TSTM	LGHT
JAN	9.4	1	30.2	21.4	25.8	25.0	21.4	20	73	1013.2	NE	4	4	0	0
FEB	1.7	1	30.9	21.3	26.1	26.0	22.2	21	72	1010.5	ENE	4	3	0	0
MAR	8.5	2	32.1	21.8	26.9	26.9	23.2	22	73	1012.0	ENE	3	3	1	2
APR	55.4	5	33.6	23.1	28.3	28.2	24.2	23	72	1010.3	E	3	3	9	11
MAY	88.9	10	35.0	23.8	29.4	28.9	24.8	23	72	1008.5	E	2	5	15	16
JUN	385.3	18	32.6	23.6	28.1	27.7	25.0	24	80	1006.7	VRBL	2	6	12	13
JUL	299.6	19	31.9	23.4	27.6	27.1	24.9	23	84	1007.4	S	2	6	14	13
AUG	466.2	25	30.6	23.2	26.9	26.3	24.3	24	85	1006.3	S	2	7	11	7
SEP	258.7	18	31.7	23.1	27.4	27.0	24.8	24	84	1008.5	E/ENE	2	6	13	14
OCT	169.7	15	31.8	22.2	27.0	26.7	24.3	24	82	1009.0	ENE	3	6	6	9
NOV	90.6	6	31.6	21.9	26.7	26.4	23.2	22	76	1009.9	NE	3	5	2	2
DEC	15.6	2	30.9	21.2	26.0	25.6	21.7	20	71	1011.9	NE	3	4	2	1
ANNUAL	1849.6	122	31.9	22.5	27.2	26.8	23.7	23	77	1009.5	ENE	3	5	85	88



Temperature (Muñoz)

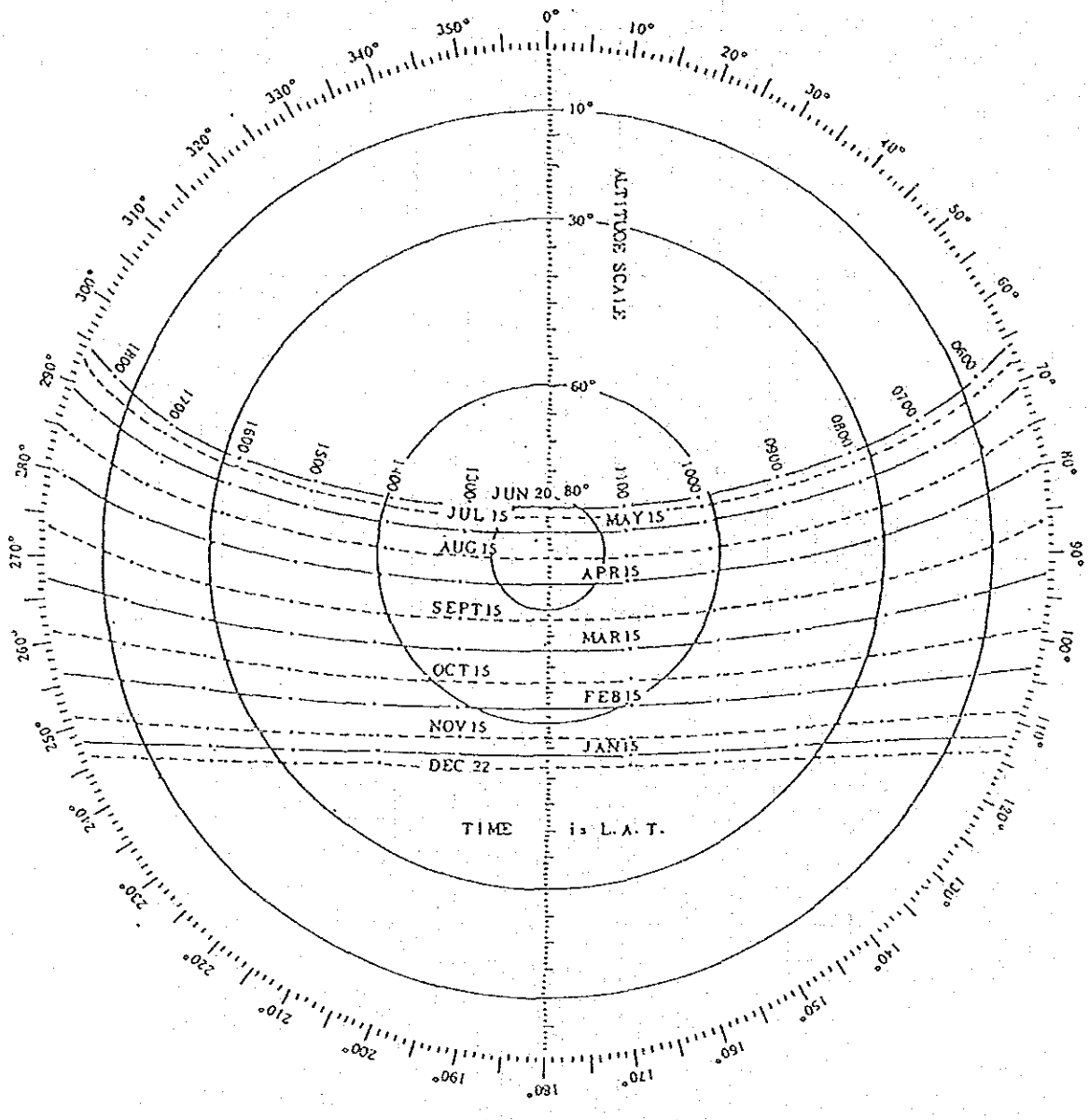


Monthly Avg. Humidity



Days w/ Thunderstorms

53 days annually



Solar Position Diagram

PHILIPPINE MILLED RICE PRODUCTION, IMPORTS, EXPORTS, AND GOVT. STOCKS (000 MT)

CROP YEAR	PRODUC-TION	IMPORTS	EXPORTS	STOCKS
70-71	3380	20	0	840
71-72	3248	633	0	632
72-73	2835	238	0	698
73-74	3621	311	0	445
74-75	3693	238	0	837
75-76	4052	71	0	929
76-77	4280	24	0	777
77-78	4607	7	46	841
78-79	4847	0	38	1212
79-80	5093	0	236	1540
80-81	5020	0	175	1575
81-82	5279	0	10	1331
82-83	5040	0	11	1520
83-84	5128	0	30	1478
84-85	5363	389	0	990
85-86	5949	320	0	999
86-87	5858	0	111	1641
87-88	5712	170	0	1417

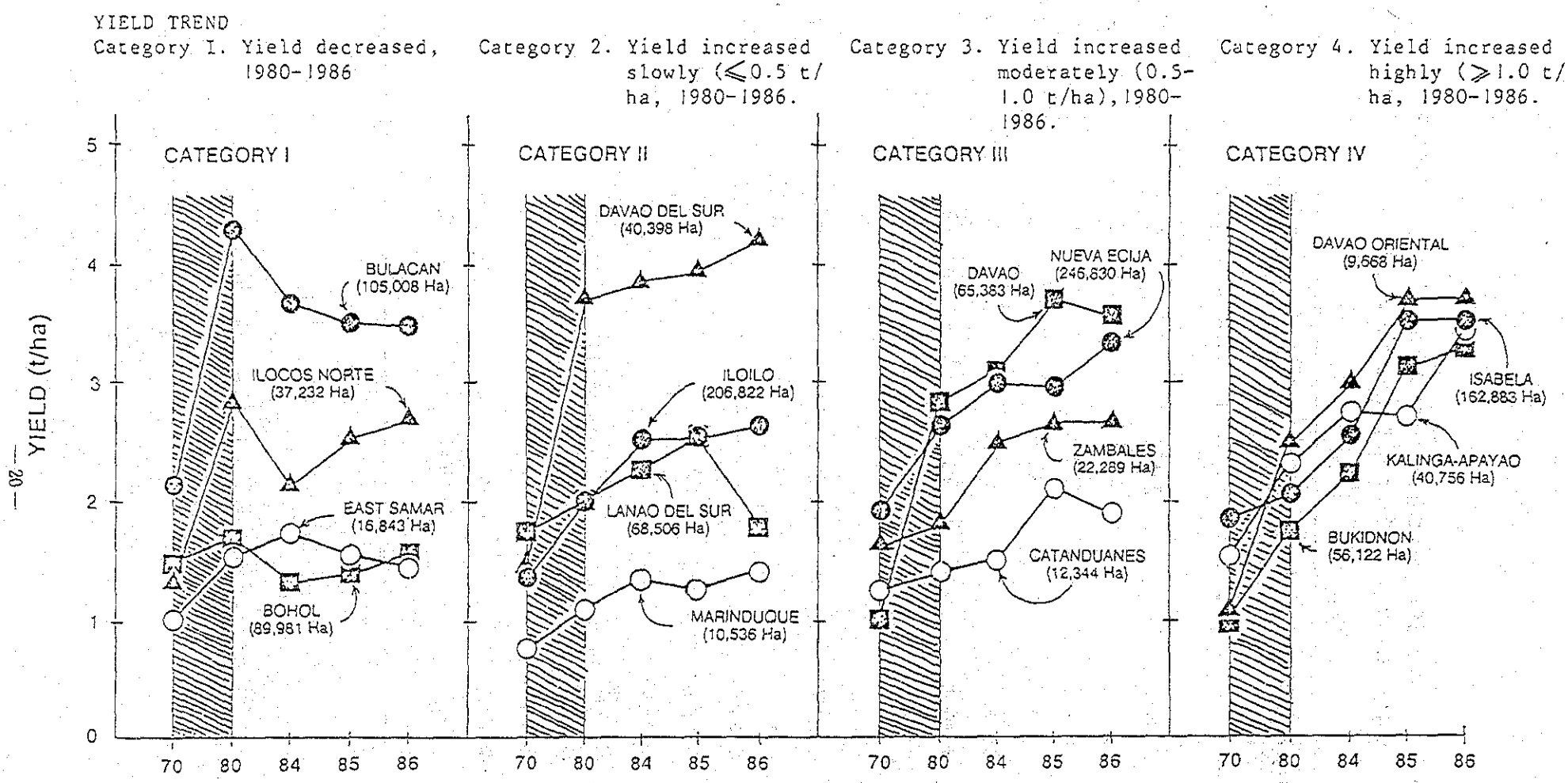


FIGURE 1. YIELD (PROVINCIAL AVERAGE) OF RICE FROM SOME PROVINCES OF THE PHILIPPINES, 1970-1986 PERIOD.

Sources: Agricultural Statistic, for 1970 and 1980; Agricultural Situations, for 1984, 1985 and 1986.

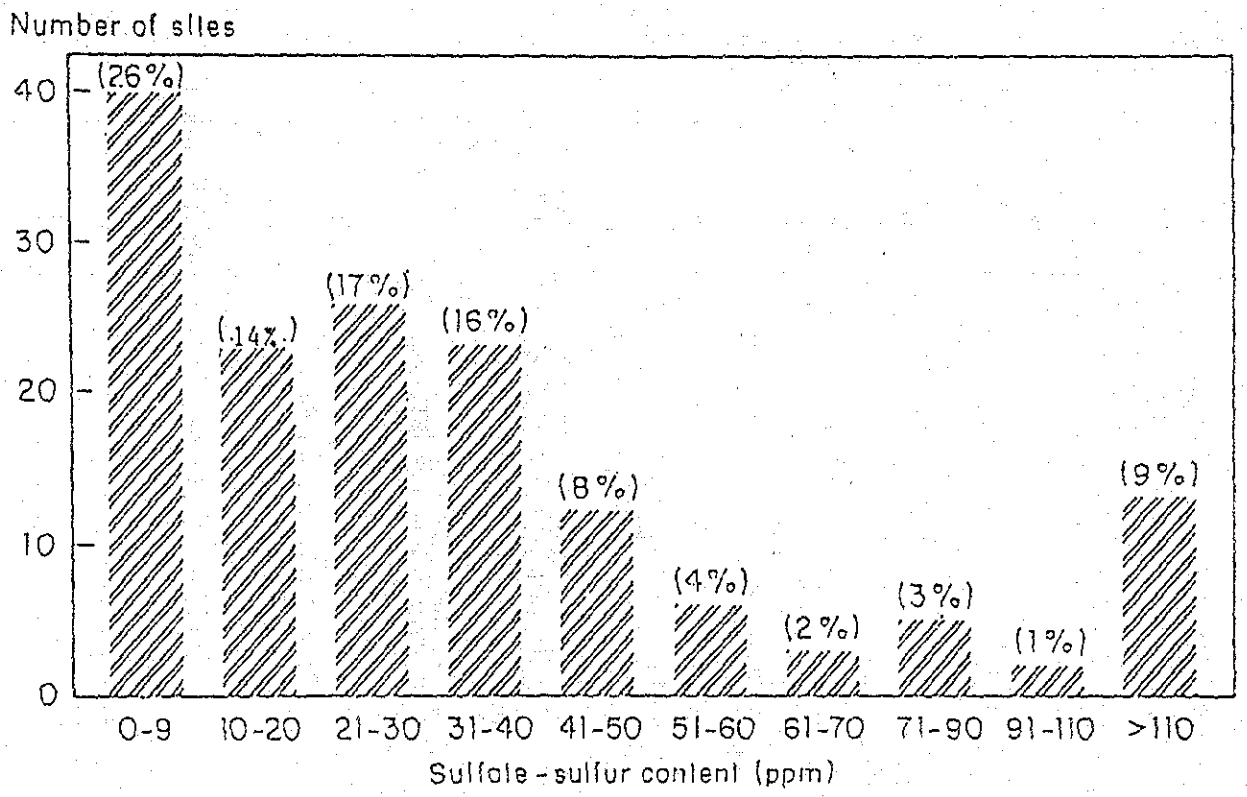


Fig.13. Frequency distribution of 153 rice growing sites in the Philippines based on sulfate-S content in the surface soil (0-20 cm depth).

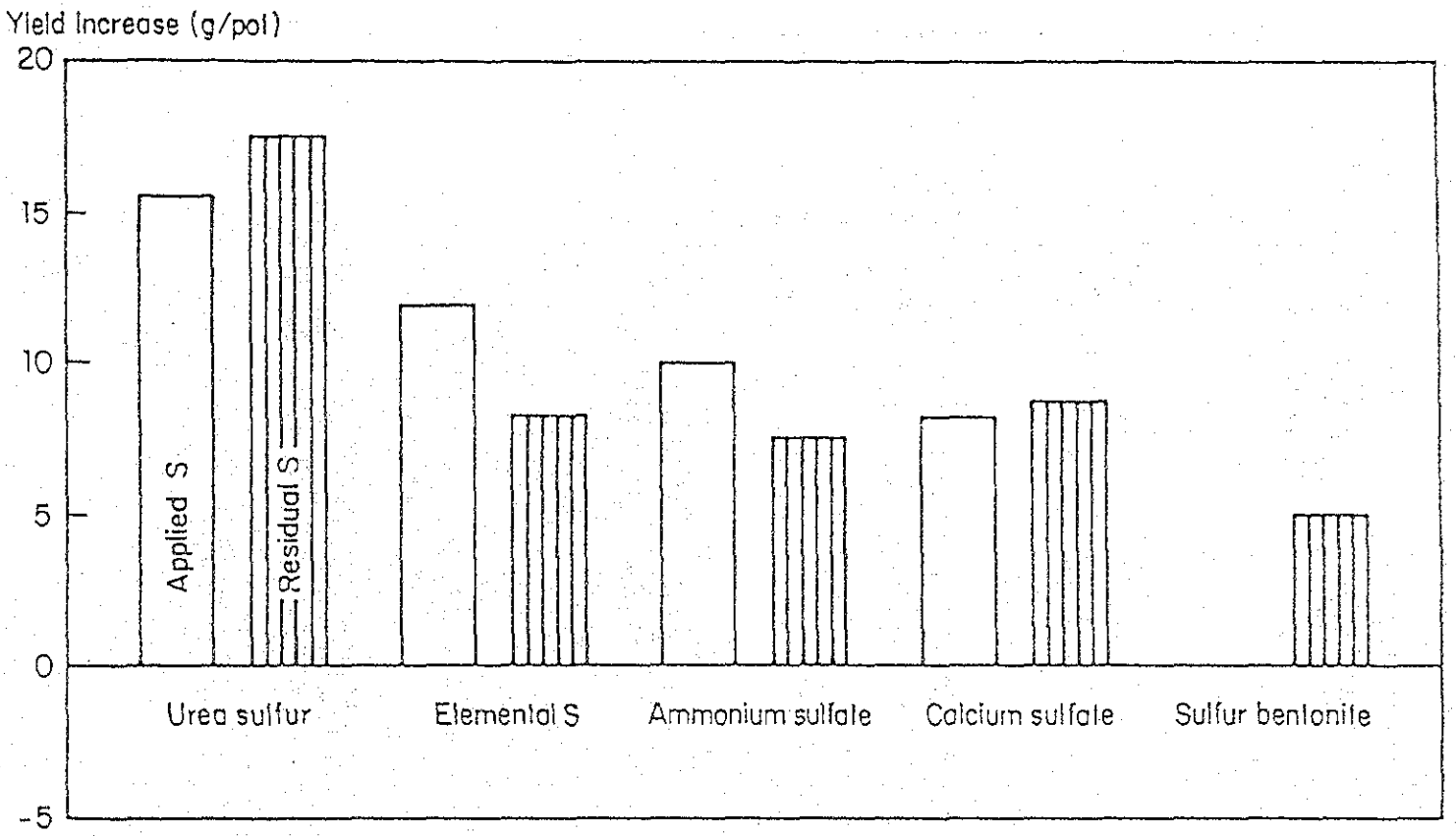


Fig.14. Average yield increase of IR36 with S fertilizers in soils from 11 locations in the Philippines. IRRI, greenhouse, 1984-85.

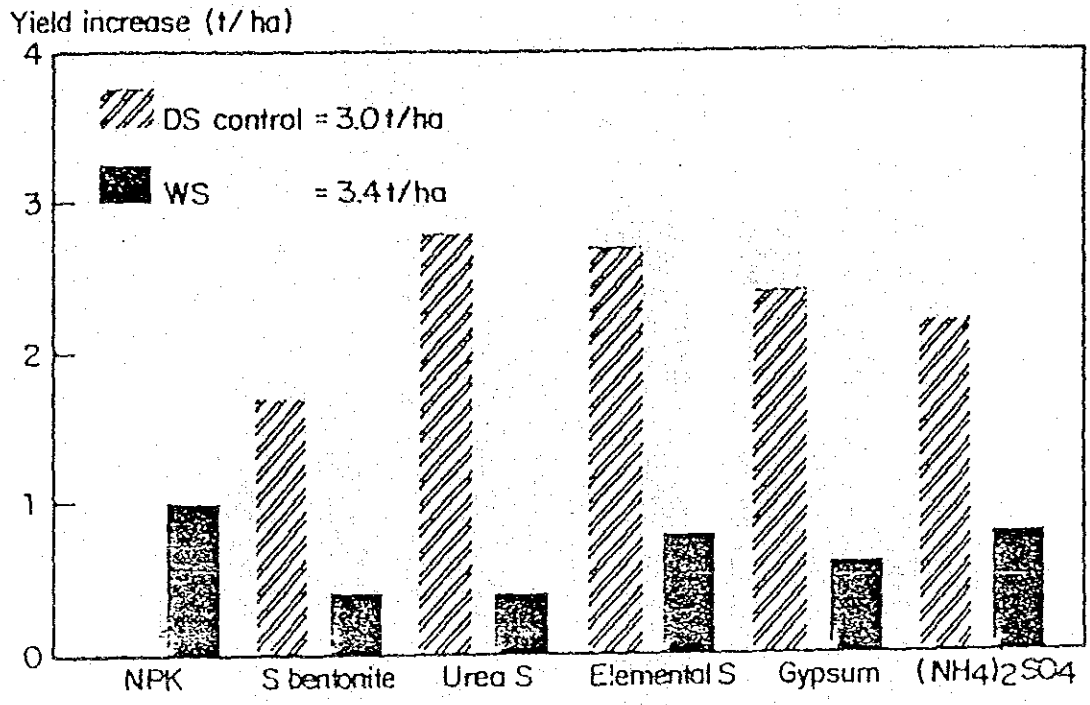


Fig.15. Average yield increases of IR64 over the control due to the residual effects of applied S for 2 successive cropping seasons. Batangas, Philippines.

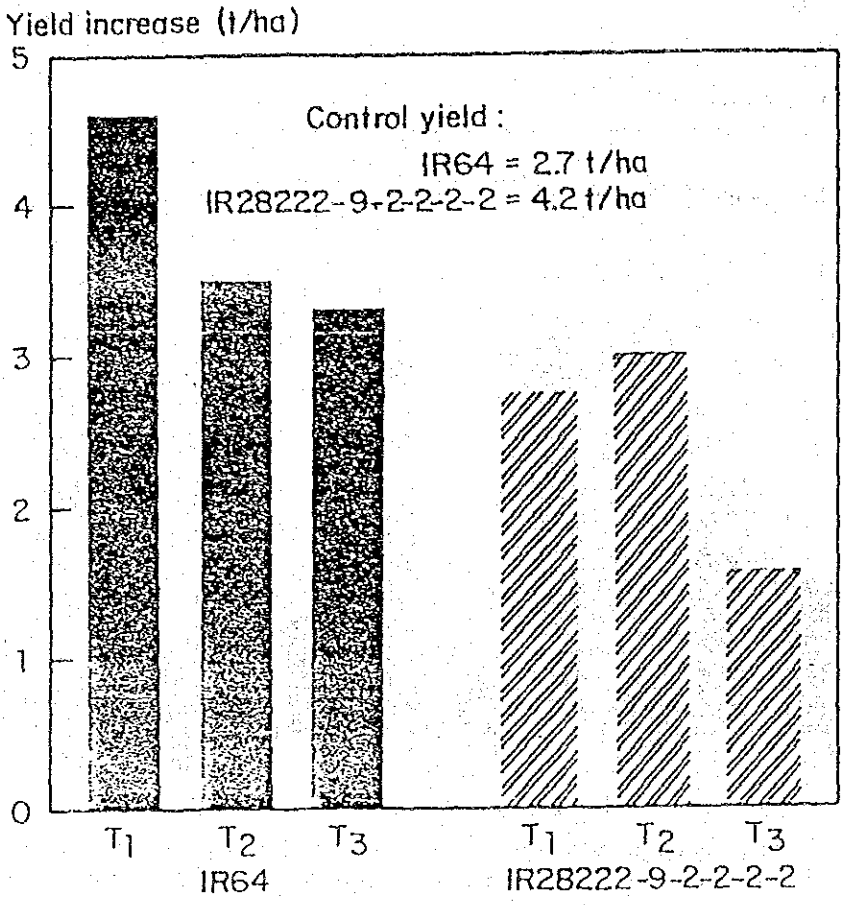


Fig. 17. Average yield increases over control of 2 lowland rices due to 3 different times of S application: T_1 - S applied at transplanting; T_2 - at 15 days after transplanting (DT) and T_3 - at 30 DT. Batangas, Philippines, 1987.

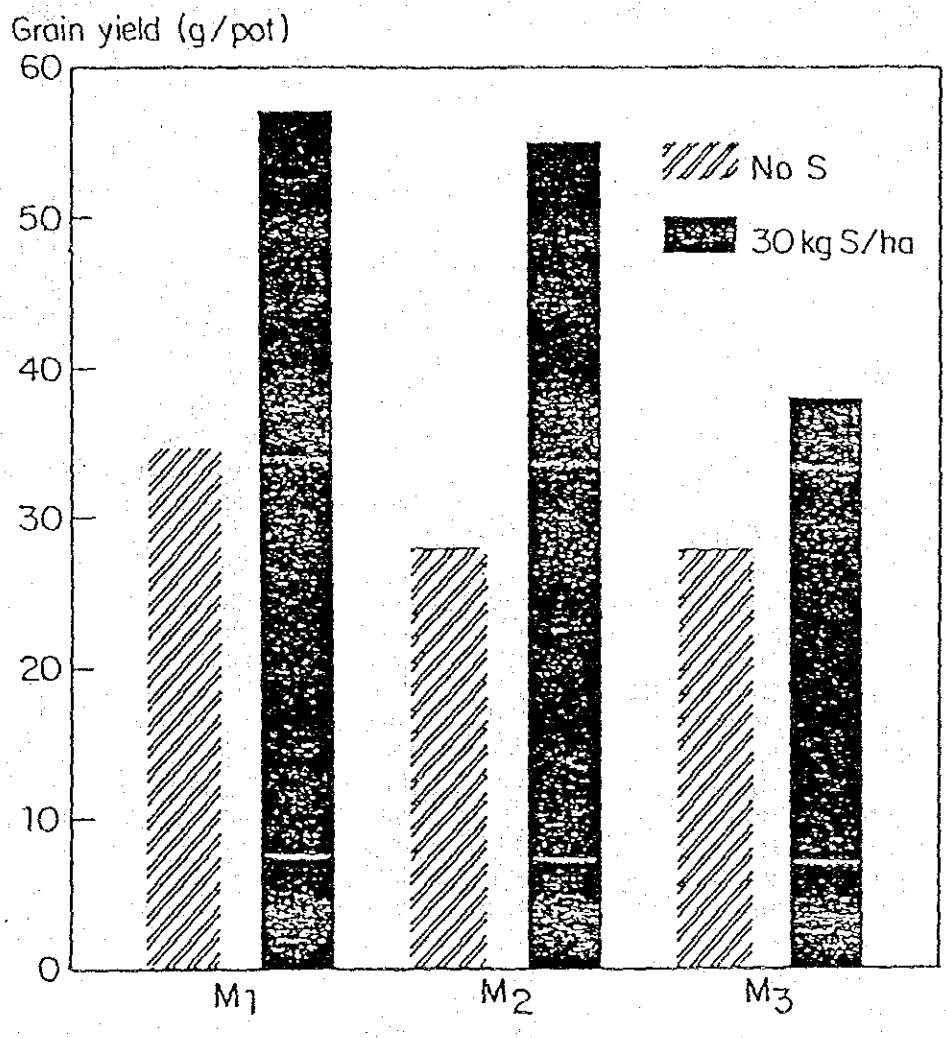


Fig.16. Average grain yields of lowland rice grown under 3 types of water management and 2 S levels: M_1 - predrying, then continuous flooding; M_2 - continuous flooding; M_3 - predrying, then alternate drying and wetting. Data are averages of 3 greenhouse trials. IRRI.

Table 2. Major characteristics of Philippine SeedBoard released irrigated-lowland rice varieties (1968-88).

Variety	Year Released	Yield (kg/ha)	Growth Duration (days)	Plant Height	Amylose Content	Gelatinization Temperature	Grain size and appearance
IR 5	1968	-	140	130	High	Intermediate	Medium, Long, Bold
IR 8	1968	3337	130	100	High	Low	Long, Bold
C4-63 (6)	1968	-	130	105	Intermediate	-	Medium, Long, Slender
BPI-76 (NS)	1968	-	130	-	Intermediate	-	Medium, Long, Slender
IR 20	1969	4139	125	110	High	Intermediate	Medium, Long, Slender
C4-137	1969	-	139	110	Intermediate	-	Medium, Long, Slender
IR 22	1970	-	125	90	High	Low	Long Slender
IR 24	1971	3771	120	90	Low	Low	Long, Slender
IR 26	1973	4892	130	100	High	Low	Medium, Long, Slender
BPI-3-2	1973	-	130	-	-	-	Medium, Long, Slender
IR 28	1975	4326	105	100	High	Low	Long, Slender
IR 30	1975	-	110	100	High	Intermediate	Medium, Long, Slender
IR 32	1975	-	140	105	High	Intermediate	Medium, Long, Slender
BPI Ri-2	1975	-	115	-	-	-	Medium, Long, Slender
IR 34	1976	3939	130	125	High	Low	Long, Slender
IR 36	1976	4856	110	85	High	Intermediate	Long, Slender
IR 38	1976	-	125	100	High	Intermediate	Long, Slender
IR 40	1977	-	120	100	High	Intermediate	Medium, Long, Slender
IR 42	1977	5044	135	110	High	Low	Medium, Long, Slender
IR 44	1978	-	130	110	High	Low	Long, Slender
BPI Ri-4	1978	-	112	-	-	-	Medium, Long, Slender
IR 48	1979	4420	140	120	Intermediate	Low	Long, Slender
IR 50	1980	4558	105	90	High	Intermediate	Long, Slender
IR 54	1980	4319	120	95	High	Low	Long, Slender
IR 56	1982	4568	110	90	High	Low	Long, Slender
UPLRi-4	1982	4762	111	82	High	High	Long, Slender
IR 58	1983	4155	100	76	High	Low	Medium, Long, Slender
IR 60	1983	4750	107	86	High	Low	Long, Slender
BPI Ri-10	1983	4657	108	84	Intermediate	-	Long, Slender
IR 62	1984	4770	115	100	High	Intermediate	Medium, Long, Slender
IR 64	1985	5307	113	105	Intermediate	Intermediate	Long, Slender
IR 66	1987	5194	108	88	High	Intermediate	Long, Slender
BPI Ri-12	1987	4892	119	96	-	Intermediate	Long, Slender
IR 68	1988	4479	121	100	High	Intermediate	Long, Slender
IR 70	1988	4816	129	90	Intermediate	Medium	Long, Slender
IR 72	1988	5004	112	88	High	Low	Long, Slender
IR 74	1988	4710	131	88	High	High	Long, Slender

Table 3. Major characteristics of Philippine SeedBoard released rainfed lowland rice varieties.

Variety	Year Released	Yield (kg/ha)	Growth Duration (days)	Plant Height (cm)	Amylose Content	Gelatinization Temperature	Grain size and Appearance
C168	1973	4063	128	110	Intermediate	-	Medium, Long, Slender
IR 46	1978	3977	123	107	High	High	Medium, Long, Slender
UPLRi-2	1978	2752	123	98	-	-	Medium, Long, Slender
IR 52	1980	3167	119	96	High	High	Long, Slender

Table 4. Major characteristics of Philippine SeedBoard released upland rice varieties.

Variety	Year Released	Yield (kg/ha)	Growth Duration	Plant Height	Amylose Content	Gelatinization Temperature	Grain Size and Appearance
C22	1972	2182	128	108	-	-	Medium, Long, Slender
IR 43	1978	3525	129	77	Low	Low	Medium, Long, Slender
IR 45	1978	2511	131	100	High	Intermediate	Medium, Long, Slender
UPLRi-3	1979	2405	125	109	-	-	-
BPIRi-6	1979	2539	125	104	-	-	Long, Slender
UPLRi-5	1980	2678	120	117	-	-	Long, Slender
UPLRi-7	1981	3044	116	104	-	-	Medium, Long, Slender

Table 5. Major characteristics of PhilRice SeedBoard released lowland-irrigated (glutinous) rice cultivars.

Variety	Year Released	Yield (kg/ha)	Growth Duration	Plant Height	Amylose Content	Gelatinization Temperature	Grain size and Appearance
IR 29	1975	3717	115	110	Glutinous	Low	Medium, Long, Slender
UPLRi-1	1977	3988	130	97	Glutinous	-	Medium, Long, Slender
BPIRi-1	1979	4311	120	91	Glutinous	-	Medium, Long, Bold
BPIRi-3	1981	4701	121	90	Glutinous	-	Medium, Long, Bold
IR 65	1985	4719	115	86	Glutinous	Low	Long, Slender

Table 6. Disease and insect reactions[1] of Philippine SeedBoard released irrigated-lowland varieties.

Variety	Blast	Bacterial Blight	Grassy Stunt	Tungro	BPH			Green Leafhopper	Stemborer
					1	2	3		
IR 5	MR	S	S	S	S	S	S	R	MS
IR 8	S	S	S	S	S	S	S	MR	MS
C4-63 (G)	MR	MR	R	S	-	-	-	MR	-
BPI-76 (NS)	MR	MR	MR	MR	-	-	-	-	R
IR 20	MR	R	S	MR	S	S	S	R	MR
C4-137	MR	MS	R	MR	S	S	S	R	MR
IR 22	S	R	S	S	S	S	S	S	S
IR 24	S	S	S	S	S	S	S	R	S
IR 26	MR	R	S	MR	R	S	R	R	MR
BPI-3-2	MR	MR	R	R	-	-	-	R	MS
IR 28	R	R	R	R	R	S	R	R	MR
IR 30	MS	R	R	R	R	S	R	R	MR
IR 32	MR	R	R	R	R	S	R	R	MR
BPI Ri-2	MR	MR	R	MR	-	-	-	-	R
IR 34	R	R	R	R	R	S	R	R	MR
IR 36	R	R	R	R	R	R	S	R	MR
IR 38	R	R	R	R	R	R	S	R	MR
IR 40	R	R	R	R	R	R	S	R	MR
IR 42	R	R	R	R	R	R	S	R	MR
IR 44	MR	R	S	R	R	R	S	R	MR
BPI Ri-4	R	R	MR	R	-	-	-	MR	R
IR 48	MR	R	R	R	R	R	S	R	MR
IR 50	MS	R	R	R	R	R	S	R	MR
IR 54	R	R	R	R	R	R	S	R	MR
IR 56	R	R	R	R	R	R	R	R	MR
UPL Ri-4	MR	MS	S	S	-	-	-	R	MR
IR 58	R	R	R	R	R	R	S	R	MR
IR 60	R	R	R	R	R	R	R	R	MR
BPI Ri-10	MR	MR	R	MR	-	-	-	-	-
IR 62	R	R	R	R	R	R	R	R	MR
IR 64	R	R	R	R	R	MR	R	R	MR
IR 66	MR	R	R	R	R	R	R	R	-
BPI Ri-12	S	MR	S	R	-	-	-	MR	MR
IR 68	R	I	S	I	MR	MR	-	-	I
IR 70	I	I	S	I	I	I	-	-	I
IR 72	I	I	S	R	MR	MR	-	-	MR
IR 74	MR	I	I	R	I	I	-	-	MR

[1] R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible

[2] BPH = brown planthopper

Table 7. Disease and insect reactions of Philippine SeedBoard released rainfed-lowland rice varieties.

Variety	Blast	Bacterial Blight	Grassy Stunt	Tungro	BPH[2]			Green Leafhopper	Stemborer
					1	2	3		
C168	MR	MR	MR	MR	-	-	-	-	R
IR 46	R	R	S	R	R	S	R	R	MR
UPL Ri-2	MR	S	MR	S	-	-	-	-	MR
IR 52	MR	R	R	R	R	R	S	R	MR

Table 8. Disease and insect reactions of Philippine SeedBoard released upland rice varieties.

Variety	Blast	Bacterial Blight	Grassy Stunt	Tungro	BPH[2]			Green Leafhopper	Stemborer
					1	2	3		
C22	MS	MS	R	MR	-	-	-	-	R
IR 43	R	R	R	-	-	-	-	-	-
IR 45	-	-	-	-	R	-	-	-	R
UPL Ri-3	MR	MR	-	-	-	-	-	-	-
BPI Ri-6	MR	MR	-	R	-	-	-	-	-
UPL Ri-5	MS	S	R	MS	-	-	-	-	MR
UPL Ri-7	MR	MS	R	MR	-	-	-	-	-

Table 9. Disease and insect reactions of Philippine SeedBoard released lowland-irrigated glutinous.

Variety	Blast	Bacterial Blight	Grassy Stunt	Tungro	BPH[2]			Green Leafhopper	Stemborer
					1	2	3		
IR 29	R	R	R	R	R	S	R	R	MR
UPL Ri-1	MR	MS	MS	MR	-	-	-	-	MR
BPI Ri-1	R	R	-	R	-	-	-	-	-
BPI Ri-3	MR	MR	R	R	-	-	-	-	MR
IR 65	R	R	R	R	R	R	S	R	MS

OFFICE: 921-52-41 Loc. 225
921-04-81
921-13-49
LAB. 99-36-02

GEOTECHNICS PHILIPPINES, INC.

800 E. DE LOS SANTOS AVENUE, QUEZON CITY, PHILIPPINES * CABLE ADDRESS: GEOTECH

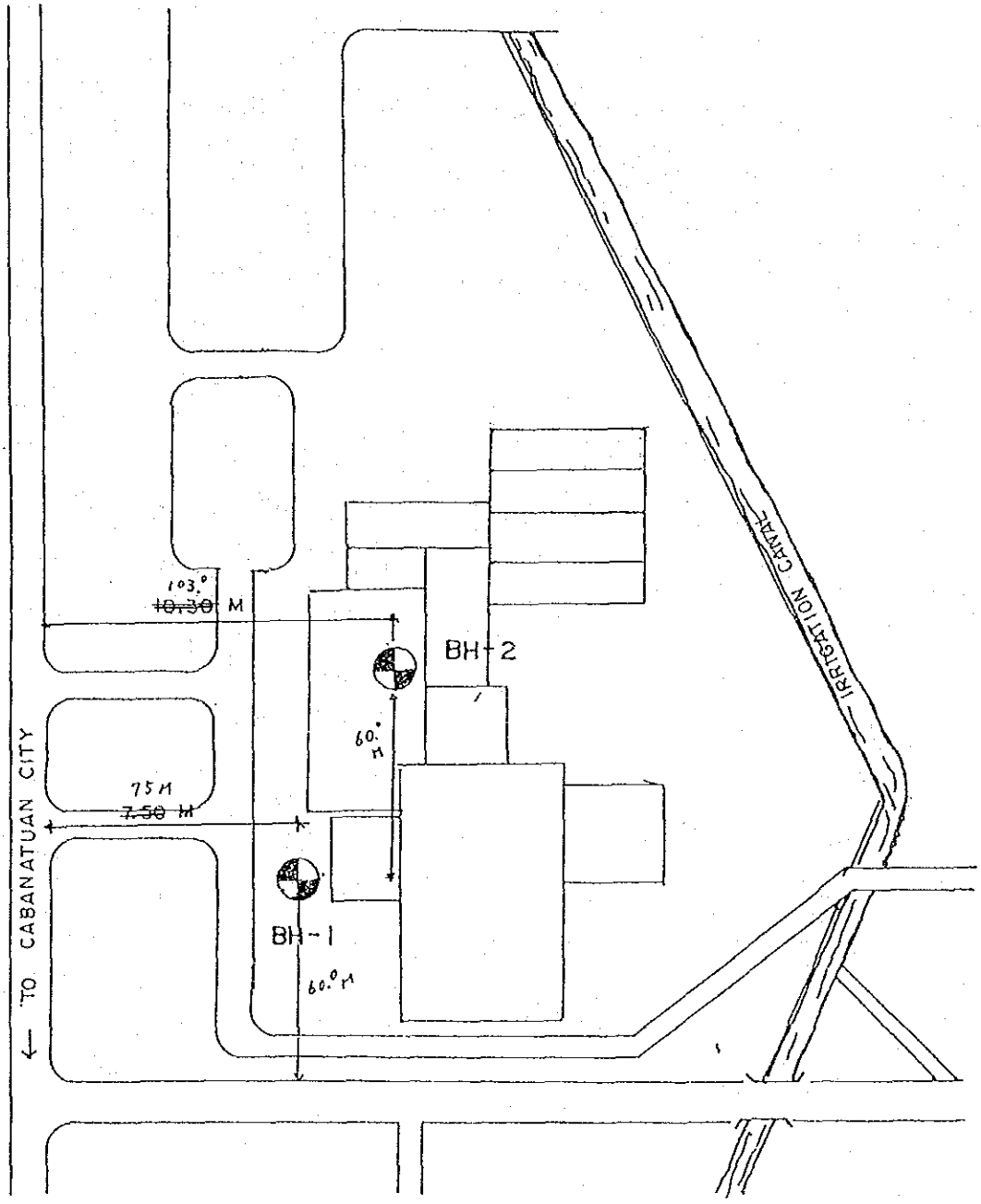
FINAL REPORT
SUBSURFACE INVESTIGATION
PROPOSED PHIL. RICE RESEARCH INSTITUTE
MUNOZ, NUEVA ECIJA

INTRODUCTION

This report contains the results and evaluation of subsoil investigation conducted by Geotechnics Philippines, Incorporated at the site of the Proposed Philippine Rice Research Institute in Munoz, Nueva Ecija.

As required for the design of the foundation structures, a subsoil investigation program was carried out to establish the geotechnical design parameters. Two (2) borings, both carried out to a depth of 21.00 meters were drilled at the site as shown in the attached Borehole Location Plan.

The boreholes were advanced in between sampling by wash boring method wherein a chopping bit attached to the bottom end of a string of drilling rods was alternately raised and dropped and, at the same time, the cuttings resulting from the process were continously pumped out of the hole by pressure-controlled water. At regular intervals through soils, representative samples were obtained using a standard 5.0 cm diameter split-spoon sampler coupled to the bottom end of the string of rods. Standard penetration tests were



PROP. PHIL. RICE RESEARCH INSTITUTE

SCALE: 1: 200 MTS.

conducted contemporaneous to split-spoon sampling in order to measure the consistencies of strata encountered. This test was carried out by dropping a standard 63.6 kg hammer through a free fall of 76.2 centimeters onto a drive head coupled to the top end of the string of rods. The number of blows (drops) for three (3) successive fifteen (15)-centimeters increments of penetrations were recorded and the total number of blows for the last two (2) increments of penetration was taken as the standard penetration value or SPT N-value of the stratum.

Finally the representative soil samples obtained were subjected to routine laboratory classification tests (grain size analysis, natural moisture content, plastic limit and liquid limit tests). The results of all the field and laboratory tests undertaken were appended to this report.

DISCUSSION OF RESULTS

The substrata found at the site consist essentially of two distinct strata.

The first stratum is composed of brown silty sand or silty sandy gravel about 8.0 meters thick in both boreholes and is overlain by a surficial layer (about 1.0m) of stiff to hard silty clay or clayey silt. Consistencies increasingly vary with depth from firm to very dense (standard

penetration values from 15 to more than 60 blows per 30 centimeters). Laboratory tests showed that these materials are non-plastic with an average natural moisture content of about 10%.

The second stratum consists of brown or gray clayey silt or silty clay found in both boreholes from 9.0-m depth all the way to the bottom of the boreholes at 21.0 meters below the existing ground surface. The consistency of this cohesive stratum is hard to very hard having medium to high plasticity index. Natural moisture contents of the samples average at about 30% with the values being close to or at the plastic limits which indicate that this layer exhibits precompression or overconsolidation.

The water table was located at from 0.50 meters to 1.50 meters from the existing ground surface.

RECOMMENDATIONS

The subsurface condition of the project site is suitable for shallow foundations as the bearing stratum of non-plastic soil formation exhibits high shearing resistance. The choice of the type of shallow foundation depends on the loading conditions of the proposed structure.

For the design of shallow foundation placed in the surficial layer (i.e., footing base placed 1.0 - 1.5 meters below the existing ground surface), the allowable soil bearing capacity should be assumed at 12.5 tons/sq. meter (2500 lbs/sq. ft) net. Higher soil bearing pressures can be expected at lower depths in the non-plastic formation since the standard penetration values obtained in this layer increase with depth. Bearing pressure up to one-third in excess of the allowable bearing value may be permitted for transient live load from wind or earthquake.

Settlements are expected to be predominantly immediate or instantaneous which take place as soon as the load is applied. The magnitude of settlement is expected to be limited to 25 millimeters (one inch) using the above recommended allowable soil bearing capacity based on empirical equations utilizing directly the standard penetration values. For theoretical settlement analysis, a compression index of 0.10 and a void ratio of 0.40 may be used for the non-plastic layer while for the cohesive layer, a compression index of 0.35 and a void ratio of 1.0 may be used.

GILBERTO S. REYES
Civil Engineer
20269

GEOTECHNICS PHILIPPINES INCORPORATED
800 EDSA, QUEZON CITY, M M.

BORING LOG

PROJECT PROP. PHIL. RICE RESEARCH INSTITUTE JOB NO. B57 BORE HOLE NO. BH-1
LOCATION Muñoz, Nueva Ecija DATE STARTED 5-4-89 DATE COMPLETED 5-6-89
GROUND WATER ELEV. 1.50 m) BORE HOLE REFERENCE ELEV.
DRILLING METHOD wash boring SAMPLERS USED 5.0 cm O.D SS
WT. OF HAMMER 63.6 kg HAMMER FALL 76.2 cm

DEPTH IN M.	GRAPH	DESCRIPTION	CONSISTENCY	NMC PL — 0 — LL (20 40 60 80 100)	P.I.	○ BLOW COUNT, N. ● % CORE RECOVERY (20 40 60 80 100)	OTHER TEST DATA RQD
0	CH	Silty CLAY, moist, brown.	HARD		34		
	SM		FIRM		NP		
	SM GM GC	··· silty SAND	DENSE		NP		
	SM SC				NP		
5.0	GW	Silty sandy GRAVEL, moist, dark brown.			NP		
	SM SC				NP		
	GM GC		VERY DENSE		NP	···59-60/15cm	
					NP		
					NP	···50-60/12cm	
10.0	ML	Clayey sandy SILT, moist, dark brown.			17		
	MH	Clayey SILT, very moist, dark brown mottled with gray.			24		
					33		
15.0	CH	Silty CLAY with traces of fine sand, very moist, brown.	HARD		37		
					48		
					43		
	MH	Clayey SILT, moist, brown with gray mottling.			30		
20.0							
		END OF BORING AT 21.00 M			32		

SHEET 1 OF 1

GEOTECHNICS PHILIPPINES INCORPORATED
800 EDSA, QUEZON CITY, M. M.

BORING LOG

PROJECT PROP. PHIL. RICE RESEARCH INSTITUTE JOB NO. 857 BORE HOLE NO. BH-2
LOCATION Muñoz, Nueva Ecija DATE STARTED 5-7-89 DATE COMPLETED 5-8-89
GROUND WATER ELEV. 0.50 m BORE HOLE REFERENCE ELEV.
DRILLING METHOD wash boring SAMPLERS USED 5.0cm O.D S.S.
WT. OF HAMMER 63.6 kg HAMMER FALL 76.2 cm

DEPTH IN M.	GRAPH	DESCRIPTION	CONSISTENCY	NMC (PL — 0 — LL) 20 40 60 80 100	P.I.	BLOW COUNT, N. / % CORE RECOVERY 20 40 60 80 100	OTHER TEST DATA RQD
0	MH	Clayey SILT, moist, brown	STIFF		30		
	SM				NP		
	SM SC	··· silty SAND brown.	FIRM		NP		
	GM GC				NP		
5.0	SM SC	Silty sandy GRAVEL, moist, dark brown.	DENSE		NP		
	GM GC		VERY DENSE		NP		
	SM				NP		
10.0	MH	Clayey SILT, very moist, dark gray mottled with gray.			4		
					23		
					24		
					36		
15.0	CH	Silty CLAY, very moist, traces of fine sand, brown.	HARD		39		
					50		
					45		
20.0	MH	Clayey SILT, moist, traces of fine sand, brown mottled with gray.			28		
		END OF BORING AT 21.00 M			31		

SHEET 1 OF 1