

3-3 Summary of the Project

3-3-1 Project Implementation Body

The Project Management Office has been established within the BSWM under the guidance of the Project Steering Committee of the DA to promote the planning and implementation of the Project. The Project Management Office is headed by the Director of the BSWM who will be responsible for issuing the necessary instructions and negotiating with the related organizations for the smooth implementation of the Project.

Following the completion of the Project, the BSWM will be reorganized to establish the Center which will be a soil research and development organization belonging to the DA. The Center will consist of the following five departments and will be managed by the Director under the supervision of the Advisory Committee (headed by the Secretary of Agriculture with representatives of related government organizations and academics).

- Research and Survey Department
- Special Projects and Services Department
- Integrated Soil Resources Information System Department
- Training and Information Dissemination Department
- Administration Department

With the completion of the Project, the Center will commence operation with 713 employees, i.e. 671 current employees of the BSWM (474 full-time and 197 part-time) in addition to 42 new recruits (see Figure 3-3-1).

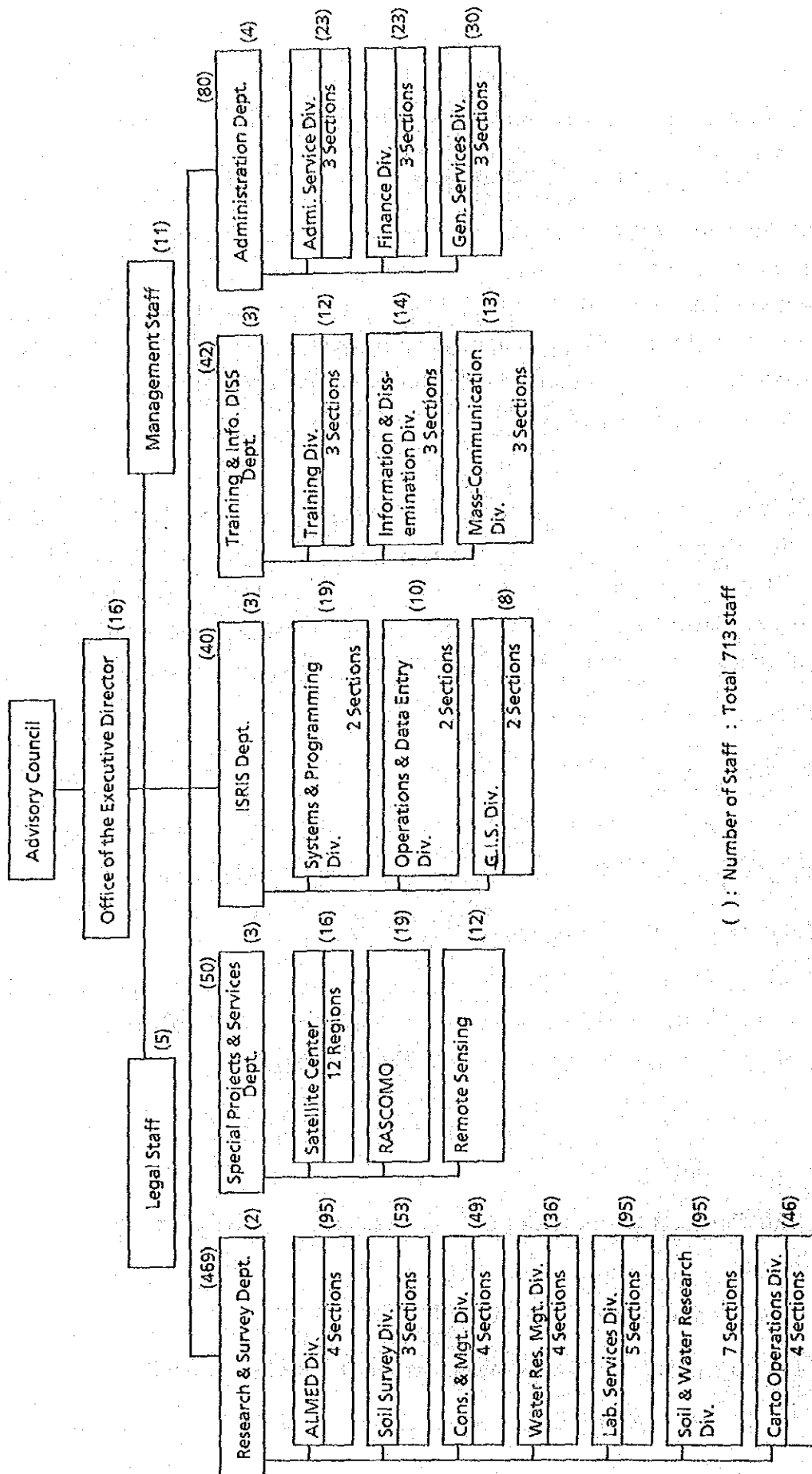
3-3-2 Activities

With the Center's inauguration, each department will promote the following activities.

(1) Research and Survey Department

1) Agricultural Land Management and Evaluation Division

- Survey and evaluation of farmland resources and assets
- Research on farmland management and its revitalization



() : Number of Staff : Total 713 staff

Fig. 3-3-1. Organization of the Center and Projected Staff Allocation

- Control of farmland information
- 2) Soil Survey Division
 - Soil condition surveys: parent materials, mode of deposition, topography, vegetation and climate
 - Preparation of soil classification maps based on soil profile surveys and soil analysis
 - Preparation of land productivity classification maps and others
- 3) Soil Conservation and Management Division
 - Planning of soil conservation programs
 - Rehabilitation of soil fertility of eroded soils
 - Development and conservation of farmland
- 4) Water Resources and Management Division
 - Development surveys on irrigation water resources
 - Design of reservoirs for agricultural use and research on relevant construction technologies
 - Effective utilization and management of water resources
- 5) Laboratory Services Division

Analysis of the following items on samples forwarded by other departments and local soil laboratories

- Chemical Analysis

Soils : total nitrogen, total organic carbon, pH, electric conductivity, cat iron exchange capacity, exchangeable acidity, exchangeable calcium, potassium, magnesium, sodium, available phosphorus, silicon, phosphoric acid absorption co-efficient and microelements, etc.

Plants : nitrogen, potassium, phosphorus, magnesium and microelements, etc.

Water : total nitrogen, ammonia, nitric acid, nitrous acid, phosphoric acid, calcium, potassium, magnesium, silicon, heavy metals, pH, electric conductivity, BOD and SS, etc.

— Physical Analysis

Particle size distribution, bulk density, water holding capacity, permeability, and three phases of distribution, etc.

— Mineral Analysis

primary and secondary identification of minerals in soils

— Biological Analysis

nitrification of soil and nitrogen fixation capacity, etc.

6) Soil and Water Research Division

— Research on chemical and physical properties of soils and their improvement methods

— Research on identification of rhizobia

— Improvement of fertilizers, especially organic fertilizers and fertilizer trials

— Preparation of fertilizer application criteria using STKs

— Studies on micronutrients deficiency and remedial measures

— Research on irrigation water resources and water pollution

7) Cartographic Operations Division

— Design and preparation of maps, including soil classification maps and land use maps

— Preparation of maps by aerial photograph interpretation

— Reproduction of maps

(2) Special Projects and Services Department

This department will consist of three groups engaged in activities on a national scale.

1) Satellite Center

The regional and provincial soil laboratories will be directly connected to the Center and the accuracy of the soil, water and fertilizer analyses conducted by these laboratories will be improved with the introduction of new equipment. In addition, the Satellite Center will collect soil and water-related data and will assist farmers in improving their technical level. Furthermore, it will design fertilizer application using soil test kits.

Analysis Items: soils, water, nitrogen content of crops, phosphorous, potassium, calcium, magnesia, pH, EC, physical properties of soils, water and plant tissues.

2) RASCOMO

Agro-meteorological observation data in each region of the Philippines are collected and analysed to conduct studies on possible countermeasures for agricultural improvement based on the local meteorological conditions.

3) Remote Sensing

It is already well-known that the remote sensing technology using satellites greatly assists the preparation of soil maps and land use maps and also the understanding of vegetation, soil erosion, soil water content, etc. This section is responsible for the preparation of soil-related graphic information by applying the remote sensing technology as well as conducting ground surveys.

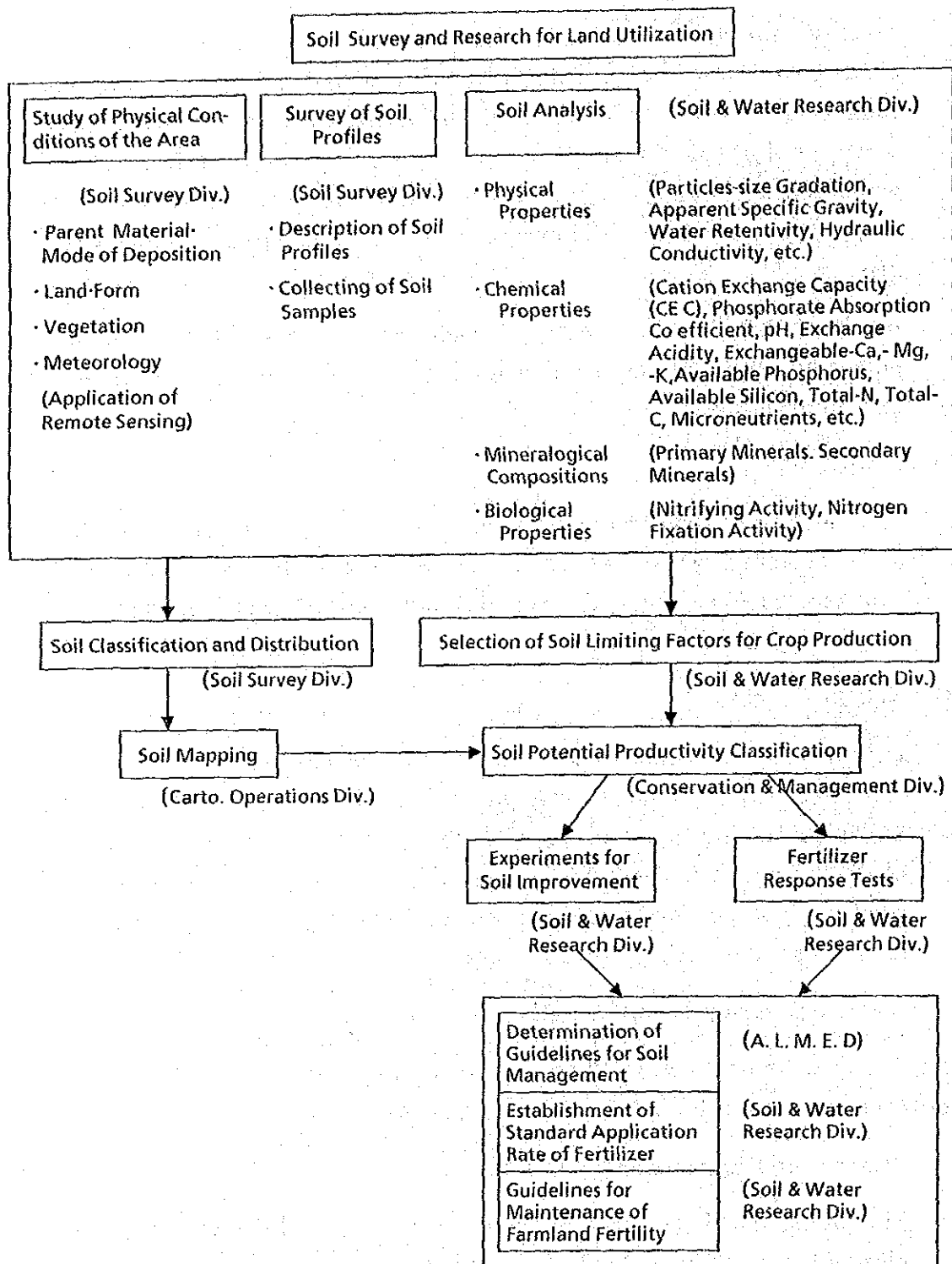
(3) Integrated Soil Resources Information System Department

Consisting of the following three divisions, this department will play a central role in computer operation at the Center.

1) System and Programming Division

This division will be responsible for analysing and designing systems planned by the ISRIS Department, evaluating and making suggestions for systems planned and executed by other departments and creating software for these systems.

Fig. 3-3-2. Flow Chart of Soil Survey and Research



2) Operation and Data Entry Division

This division will be responsible for controlling the schedule of the computers operated by the ISRIS Department so that many users can conduct their work based on smooth and useful data processing. It will also provide a backup for the safety control of the systems and will control the system hardware. It will further input the various data for processing and handle the data exchange between magnetic disks, tapes and diskets.

3) Geographic Information System Division

This division will command special status in the ISRIS Department, integrating data and information provided by the Research and Survey Department and the Special Projects and Services Department and then developing and operating the soil-oriented geographical information system to support the land use plans of policy makers, agricultural engineers and others, water resources management system, forestry management system and crop forecast system.

(4) Training and Information Dissemination Department

Consisting of three divisions, this department aims at providing training not only for researchers and engineers but also for regional and provincial agricultural officers and policy makers so that the trainees can master the new farming techniques developed by the Center and conduct information dissemination activities.

1) Training Division

In cooperation with the other technical divisions, the Training Division will plan and implement training on technical and scientific themes in line with the objectives of the Center. Lectures will be given by senior staff members of the related departments and divisions and experts will also be invited from other related research organizations. Table 3-3-1 shows the training schedule for the first five years of the Center's operation.

In the beginning, training will concentrate on the employees of the Center and local agricultural offices so that they can acquire the knowledge required for soil surveys, soil analysis and resources control. The subject trainees will eventually include farmers and agriculture-

related people in view of the planned wide dissemination of the newly developed techniques in accordance with the progress of the soil survey and research efforts.

In accordance with the implementation of the training courses, the Center will prepare targets for national soil survey, research and development work, decide the priority order of projects, reinforce cooperation between projects and carry out project coordination. The planned activities of the Training Division using the facilities of the Center include academic conferences and seminars, etc. with participants from universities, research organizations and those sections of the DA which are engaged in research in fields in which the Center has interest. Table 3-3-2 gives a list of the currently planned regular seminars and conferences.

2) Information and Dissemination Division

This division publishes papers and reports, etc. giving the results of survey/research activities and collects related information from other organizations, storing these documents and information in the library. It also displays various soil samples and water quality analysis results so that the research results can be widely understood, not only by related people but also by the general public.

Less than 1,000 soil-related books and magazines have so far been collected. As the consolidation of documents, reference materials and data is essential for future research work, the collection of 8,000 - 10,000 soil-related reference items should be aimed at. The in-house publication which has so far been fairly active will be continued.

3) Mass-Communication Division

The main activity of this division is the introduction of farming techniques stressing soil and water management to which farmers have direct access. Audio-visual equipment will be extensively used as part of this dissemination work.

(5) Administration Department

Consisting of three divisions, i.e. Management, Finance and Administration, the Administration Department provides administrative support for all the survey, research and service departments/divisions.

Table 3-3-1. Training Program of the Center

Note : L Level 1A - Center Personnel : supervising and senior researchers
 1B - " " : junior researchers and technicians
 1C - " " : supervising and senior technical staff
 1D - " " : junior technical staff
 1E - " " : maintenance

2 - Regional Dept. of Agriculture soil research planners and implementers, extension workers
 3 - Farmer leaders, private agri.-business groups, students and researchers from educational and research institutions.

2. Figures in Parenthesis indicate that more than one (1) level of participants are trained at the same time.
 3. Courses with asterisks (*) are recommended to be included under the Technical Cooperation.

Training Course	Source of Trainees	Year I				Year II				Year III				Year IV				Year V			
		Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.
I. Soil Survey Method 1. Aerial Photogrammetry (on-the-job) : - Theories on aerial photogrammetry, use of stereom plotter, mapping and interpretation	Cartography Soil Conservation Survey ALMED Research	1A, 1C	5~10	1 mo.	1	1A, 1B 1C, 1D L-2	3 12 TI 15	1 mo.	1	1A, 1B 1C, 1D L-2	3 12 TI 15	1 mo.	1	1A, 1B 1C, 1D L-2	3 12 TI 15	1 mo.	1	1B, 1C 1D L-2	3 12 TI 15	1 mo.	1
						1A, 1B 1C L-2	20 25 TI 145	3 wks	1	1A, 1B 1C, 1D L-2	5 20 TI 25	3 wks	1	1A, 1B 1C, 1D L-2	5 20 TI 25	3 wks	1	1A, 1B 1C, 1D L-2	13 12 TI 25	3 wks	1
2. Soil Taxonomy : - Course includes lectures; and field work. - Techniques in monolith preparation.	Soil survey Research Conservation ALMED					L-1 L-2	13 12 TI 25	2 wks	1	L-1 L-2	13 12 TI 25	2 wks	1	L-1 L-2	6 18 TI 24	2 wks	1	L-1 L-2	6 18 TI 24	2 wks	1
II. Analytical Laboratory Methods 3. Soil Plant Tissue, Irrigation Water and Fertilizer Materials.	Research Lab. Service Region																				
III. Methods for Instrumentational Operations *4. Operation and maintenance of special lab. equipment for chemical analyses; gas/ liquid chromatograph. Auto-analyzers, atomic spectrophotometer, etc.	Lab. Services Research Maintenance	1A, 1E	5	1 mo.	1	1A, 1B 1E	5	1 mo.	2	1B, 1C 1E	10~15	1 mo.	1 mo.	1B, 1C 1E	10~15	1 mo.	1	1B, 1C 1E	12~15	1 mo.	1
*5. Operation and maintenance of special lab. equipment for soil physics; X-ray diffractometer for mineralogical studies, moisture volume tester soil aggregate analyzer, polarizing microscope	Lab. Service Research Maintenance	1A, 1E	5	1 mo.	1	1A, 1B 1E	5	1 mo.	1	1B, 1E	5~10	1 mo.	1 mo.	1B, 1E	5~10	1 mo.	1	1B, 1E	5~10	1 mo.	1

Training Course	Source of Trainees	Year I				Year II				Year III				Year IV				Year V			
		Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.
*6. Operation and maintenance of special lab. equipment for biological studies : Composed microscope with photographic facility analyzer, etc.	Research Lab. Serv. (Inoc. Prod. Maintenance)	1A, 1E	6	1wk	1	1A, 1B 1E	6	1wk	1	1A, 1B 1E	6	1wk	1	1B, 1E	6	1wk	1	1B, 1E	6	1wk	1
7. Short Course in Remote Sensing : a. Introduction to Remote Sensing b. Image interpretation and mapping c. Digital Analysis of remote sensing d. Remote sensing planning and management e. MOS-1 satellite system f. Mission observation instruments g. MOS-1 data format h. Use of MOS-1 data for various applications i. Digital processing j. Geometric correction for LANDSAT MSS data k. Application of Remote Sensing Technology for Agricultural land-use planning	ALMED Survey Conservation Cartography Research Water Res. Dev./Mgt.					1A	5	1mo	1	1A, 1B 1C	15~20	1mo	1	1A, 1B 1C, 1D	15~20	1mo	1	1A, 1B 1C, 1D	15~20	1mo	1
IV. Soil Cartography *8. Cartographic Equipment Operation : - Includes automated cartography, photolithography and direct reproduction process in map preparation	Cartography	1A, 1C	5~10	1mo	1	1A, 1B 1C	15~20	1mo	1	1A, 1B 1C, 1D L-2	3 12 TI 15	1mo	1	1A, 1B 1C, 1D L-2	3 12 TI 15	1mo	1	1B, 1C 1D L-2	3 12 TI 25	1mo	1
V. Soil Interpretation and Land Evaluation 9. Thematic Map Interpretation and Uses : - Includes lectures, project exercises and field trips	Cartography ALMED Research Soil Conservation Water Res. Dev./Mgt. Survey					1A, 1B	30	1wk	2	1B, 1C 1D L-2	5 20 TI 25	2wks	2	1B, 1C L-2 L-3	8 12 5 TI 25	2wks	2	1B, 1C 1D L-2 L-3	5 20 5 TI 30	2wks	2

Training Course	Source of Trainees	Year I				Year II				Year III				Year IV				Year V			
		Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.
10. Farm Management Viability	ALMED Soil Conservation Soil Survey Water Mgt. Research Region					1A, 1B 1C L-2	28 12 TI 40	2wks	1	1A, 1B 1C, 1D L-2	28 12 TI 40	2wks	1	1A, 1B 1C L-2	16 24 TI 40	2wks	2	1A, 1B 1C, 1D L-2	16 24 TI 40	2wks	1
11. Land-Use Data Mgt. : - Covers utilization of data for project development, crop zonification	ALMED Survey Conservation Water Res. Dev./Mgt. Research Cartography					1A, 1C L-2	18 12 TI 30	2wks	1	1A, 1B 1C L-2	18 12 TI 30	2wks	1	1A, 1B 1C L-2	18 12 TI 30	2wks	1	1A, 1B 1C L-2	18 12 TI 30	2wks	1
VI. Technology for Soil Management 12. Soil Fertility Management and Improvement : - Course includes factors aggravating soil fertility; use of indigenous materials and fertility evaluations - Lectures, lab. & field exercises	Soil Conservation ALMED Research Lab. Serv. Region					1A, 1C L-2	11 24 35 TI 70	2wks	1	1A, 1B 1C L-2 L-3	11 24 5 TI 40	2wks	1	1A, 1B 1C L-2 L-3	11 24 5 TI 40	2wks	1	1A, 1B 1C L-2 L-3	11 24 5 TI 40	2wks	1
13. Improvement of Problem Soils for Crop Production : - Discussion on distribution of acid sulfate soils/ saline soils; development, proper-ties, identification of problem soils; soil amelioration - Lectures and field work	Research Lab. Serv. Soil Conservation Region					1A, 1B 1C, 1D L-2	11 24 TI 35	1wk	1	1A, 1B 1C, 1D L-2	11 24 TI 35	1wk	1	1A, 1B 1C, 1D L-2	4 36 TI 40	1wk	1	1A, 1B 1C, 1D L-2	4 36 TI 40	1wk	1
14. Organic Matter Resources in the Farm : - Composting and sludge utilization for crop production - Lectures and field work	Soil Conservation Research Lab. Serv. Region					1A, 1C L-2	13 12 TI 25	2wks	1	1A, 1B 1C, 1D L-2 L-3	13 12 10 TI 35	2wks	1	1A, 1B 1C, 1D L-2 L-3	13 12 10 TI 35	2wks	1	1A, 1B 1C, 1D L-2 L-3	5 24 6 TI 35	2wks	1

Training Course	Source of Trainees	Year I				Year II				Year III				Year IV				Year V			
		Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.
VII. Technology for Water Utilization and Management 15. Design and constitution of water impounding projects; Lectures and field visits	Water Res. Dev./Mgt. Region Research					1A, 1B 1C L-2	13 12 TI 25	1mo	1	1A, 1B 1C L-2	5 20 TI 25	1mo	1	1A, 1B 1C L-2	5 20 TI 25	2wks	1	1A, 1B 1C L-2	5 20 TI 25	2wks	1
* 16. Watershed Development and Management : - Includes operations and maintenance of water impounding socio-eco. evaluation	Water Res. Dev./Mgt. Soil Conservation ALMED Research Region	1A	2~3	2mos (Jpn)	1	1A, 1B 1C L-2	13 12 TI 25	2wks	1	1A, 1B 1C L-2	5 20 TI 25	2wks	1	1A, 1B 1C L-2	5 20 TI 25	2wks	1	1A, 1B 1C L-2	5 20 TI 25	2wks	1
* 17. Water Resources Management	Water Res. Dev./Mgt.	1A	2~3	2mos (Jpn)	1	1A, 1B 1C L-2	13 12 TI 25	2wks	1	1A, 1B 1C, 1D L-2	5 20 TI 25	2wks	1	1A, 1B 1C, 1D L-2 L-3	5 12 8 TI 25	2mos		1A, 1B 1C, 1D L-2 L-3	5 12 8 TI 25	2wks	1
* 18. Rain Stimulation Project : - Training includes use of weather sensors (computers)	Rain Stimulation	1A, 1B	2~3	2月 (Jpn)	1	1A, 1B 1C	2~3	2mos (Jpn Thai)	1	1A, 1B 1C	2~3	2wks (Thai)	1	1A, 1B 1C	2~3	2mos (Thai)		1A, 1B 1C	2~3	2mos (Thai)	1
VIII. Technology for Fertilization 19. Soil Fertilizer Use and Efficiency : - Course includes soil and environmental factors affecting fertilizer efficiency methods, and time of application; evaluation of fertilizer efficiency in fertility improvement and crop production	Soil Conservation ALMED Research Lab. Service Region					1A, 1C L-2	23 12 TI 35	2wks	1	1A, 1B 1C L-2 L-3	11 24 5 TI 40	2wks	1	1A, 1B 1C L-2 L-3	11 24 5 TI 40	2wks	1	1A, 1B 1C L-2 L-3	11 24 5 TI 40	1mo	1

Training Course	Source of Trainees	Year I				Year II				Year III				Year IV				Year V			
		Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.	Level of Trainees	No. of Trainees	Duration	Freq.
IX. Utilization of Agro-Biological Resources 20. Inoculant Production, Quality Control and Field Demonstrations of Inoculant Effectivity - Course includes lectures, audio visuals. Laboratory exercises and field demonstrations	Research Lab. Serv. Region					1A, 1B 1C, 1D L-2	8 12 TL 20	1mo	1	1A, 1B 1C, 1D L-2	8 12 TI 20	1mo	1	1A, 1B 1C, 1D L-2	2 18 TI 20	1mo	1	1A, 1B 1C, 1D L-2	2 18 TI 20	1mo	1
21. Utilization of Soil Micro Organisms in Reduced-input Production - Course includes use of azolla, BGA, sesbania, compost - Lectures, demonstration, field trips	Research Lab. Serv. Soil Conservation ALMED Region					1A, 1B 1C L-2 L-3	6 24 10 TL 40	2wks	1	1A, 1B 1C L-2 L-3	6 24 10 TI 40	2wks	1	1A, 1B 1C L-2 L-3	6 24 10 TI 40	2wks	1	1A, 1B 1C L-2 L-3	6 24 10 TI 40	2wks	1
X. Technology for Soil Conservation 22. Soil Conservation and Management - Course includes lectures, and preparation of soil conservation project planning and development. - Lectures, audio visuals, field trips.	Soil Conservation Research ALMED Water Res. Dev./Mgt. Region					1A, 1B L-2	12 13 TL 25	1mo	1	1A, 1B 1C L-2 L-3	6 24 5 TI 35	2wks	1	1A, 1B 1C L-2 L-3	6 24 5 TI 35	2wks	1	1A, 1B 1C L-2 L-3	6 24 5 TI 35	2wks	1
23. Management and Rehabilitation of Hillylands - Course includes discussion and audio visuals of different strategies in soil conservation and fertility improvement.	Soil Conservation Soil Survey Research ALMED Water Res. Dev./Mgt. Region					1A, 1C L-2	23 12 TL 35	1wk	2	1A, 1B 1C, 1D L-2 L-3	11 24 5 TI 40	1mo	1	1A, 1B 1C, 1D L-2 L-3	11 24 5 TI 40	1wk	1	1A, 1B 1C, 1D L-2 L-3	11 24 5 TI 40	1wk	1
XI. Environmental Sciences 24. Some problems of pesticide application - Course also includes discussion of implications of pesticides use to beneficial soil organisms as N ₂ fixers, environmental pollution and health hazards.	Research Lab. Service Soil Conservation Region ALMED					1A, 1C L-2 L-3	6 24 10 TL 40	1wk	1	1A, 1B 1C, 1D L-2 L-3	6 24 10 TI 40	1wk	1	1A, 1B 1C, 1D L-2 L-3	6 24 10 TI 40	1wk	1	1A, 1B 1C, 1D L-2 L-3	6 24 10 TI 40	1wk	1

Table 3-3-2. Convention List to be carried out in the center

Name of Convention	Object	Nos. of Participants	Duration & Frequency per year
Annual Evaluation	Research & Survey Dept. D/A, Bureau of Research Regional Office	150~200 Persons	1week, 1/year
Semi-Annual Evaluation of Projects by Division	Research & Survey Dept. Regional, Provincial Office <ul style="list-style-type: none"> ● ALMED Div. ● Soil Survey Div. ● Cons. & Mgt. Div. ● Water Res. Mgt. Div. 	200~250 Persons 100~150 // 100~150 // 100~150 //	1week, 1/year // // // // // //
Monthly Seminar by Individual Divisions	<ul style="list-style-type: none"> ● Research & Survey Dept., each Sec. ● Special Projects & Services Dept. ● ISRIS Dept. 	40~100 Persons	24/Year
Joint Seminar by two or more Divisions	Divisions & Sections	200~400 Persons	4/year
Annual Convention of Soil Researchers in the Whole Country	Researchers (Center) Researchers (Provincial, Regional) Educational and Research Institutions	400 Persons	1week, 1/year

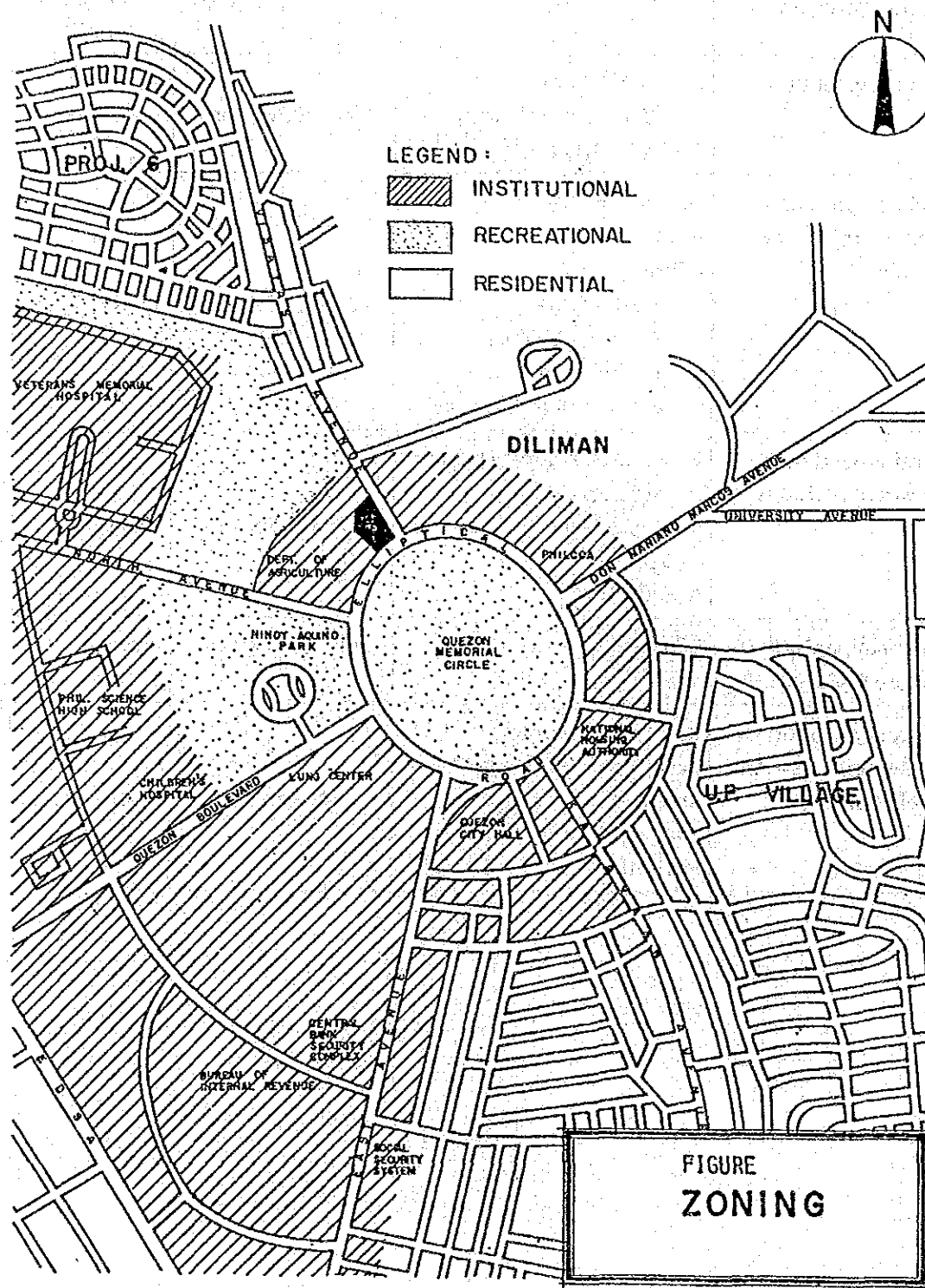


Fig. 3-3-3. Location and Zoning

3-3-3 Outline of Project Site

(1) Site Location

The project site is located at the corner of Quezon Memorial Circle and Visayas Avenue in the Diliman District of Quezon City, which forms part of Metropolitan Manila, which has a population of some six million. There is a series of government buildings related to the Department of Agriculture, including the Bureau of Agricultural Statistics and Agricultural Extension, the Department of Agrarian Reform, the Philippine Coconut Authority and the main building of the Department of Agriculture along Quezon Memorial Circle with the latter neighbouring the site. The Media Center and the Department of Natural Resources are located on Visayas Avenue, with the latter neighbouring the site. In view of the existence of a complex of government buildings, the planned location of the Center appears to be extremely appropriate for the smooth processing of the work and the collection as well as the dissemination of information with not only other DA sections but also other departments and agencies.

The project site is some 10km and 12km (via trunk roads) respectively from Malate, Manila's main shopping area, and Makati, the main office area and its location is, therefore, very advantageous in terms of its easy access and the execution of daily work, training and public relations activities. (Figure 3-3-1)

(2) Site Conditions

The project site has an almost rectangular shape and is some 65m in width along Quezon Memorial Circle and some 130m in length along Visayas Avenue, covering a total area of approximately 1.2 ha. The ownership of the site was officially transferred from the Ministry of Agriculture to the Bureau of Soils and Water Management on July 3, 1987, in anticipation of the construction of the Center.

The site is bordered by the main premises of the Ministry of Agriculture to the west and by the Media Center to the north. As an access road to the Media Center of 19m in width runs along the northern boundary, the resulting area of some 180m² should be deducted from the Center's total site area.

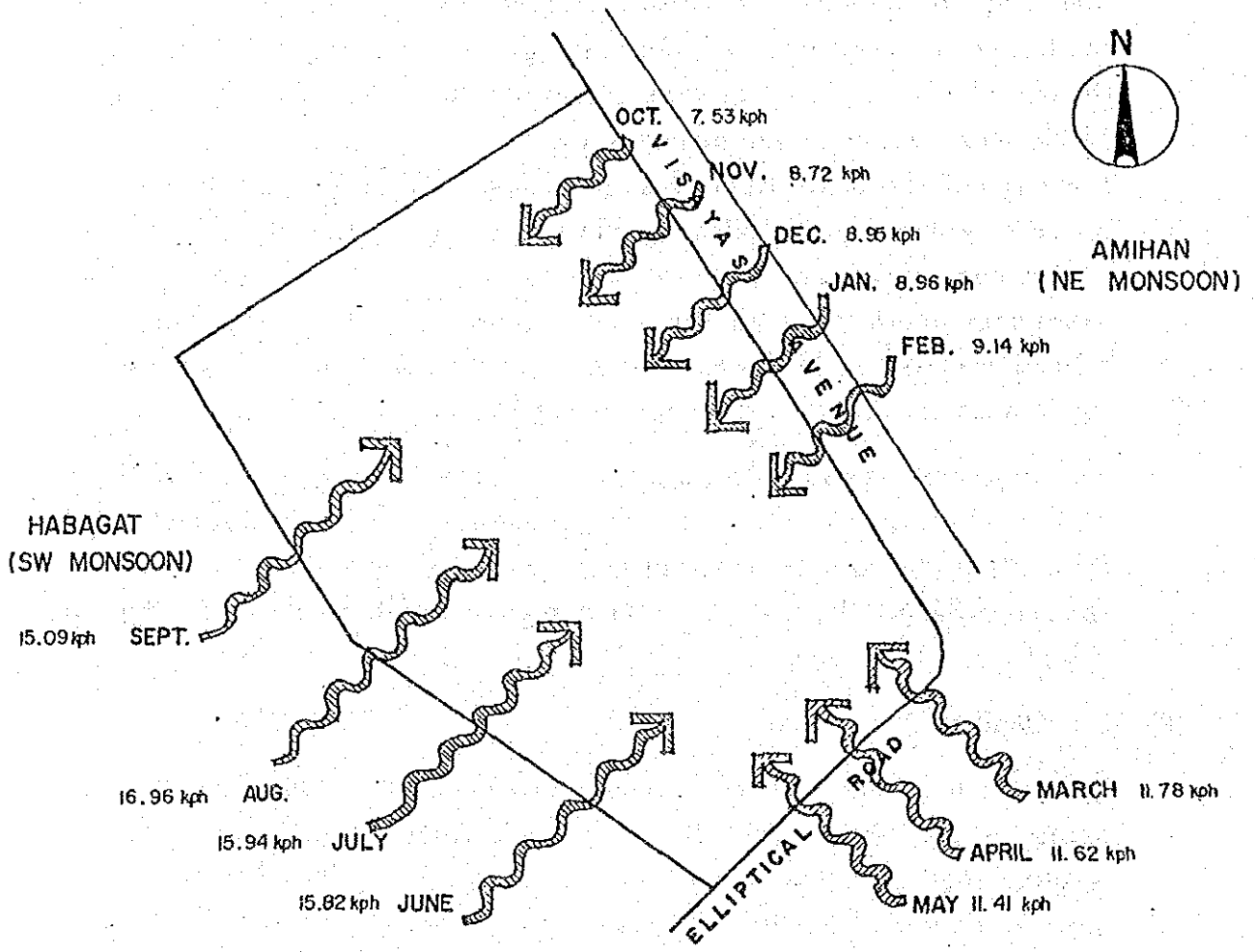


Fig. 3-3-4. Prevailing Wind Direction

There is currently a two-story building belonging to the Bureau of Agricultural Research and a prefabricated warehouse along the border with the Ministry of Agriculture and this warehouse will be removed prior to the implementation of the Project.

As the remainder of the project site is empty, only minor preparatory work involving the removal of bushes, etc. and the clearance of the ground surface is anticipated.

The site has a gentle downward slope towards the north, resulting in a difference of some 5m between the elevations of the Quezon Memorial Circle side and the Media Center side. When planning the land use and facility distribution, therefore, measures should be taken to minimize the land preparation work while utilizing the difference in elevation where possible.

(3) Climatic Conditions

Quezon City has a normal temperature of 25°C – 29°C. The temperature rises sharply in March and reaches a peak in May. It steadily declines between early June and January and the cycle starts again in February. The temperature can reach as high as 33°C and as low as 22°C in extremely hot and cold weather respectively.

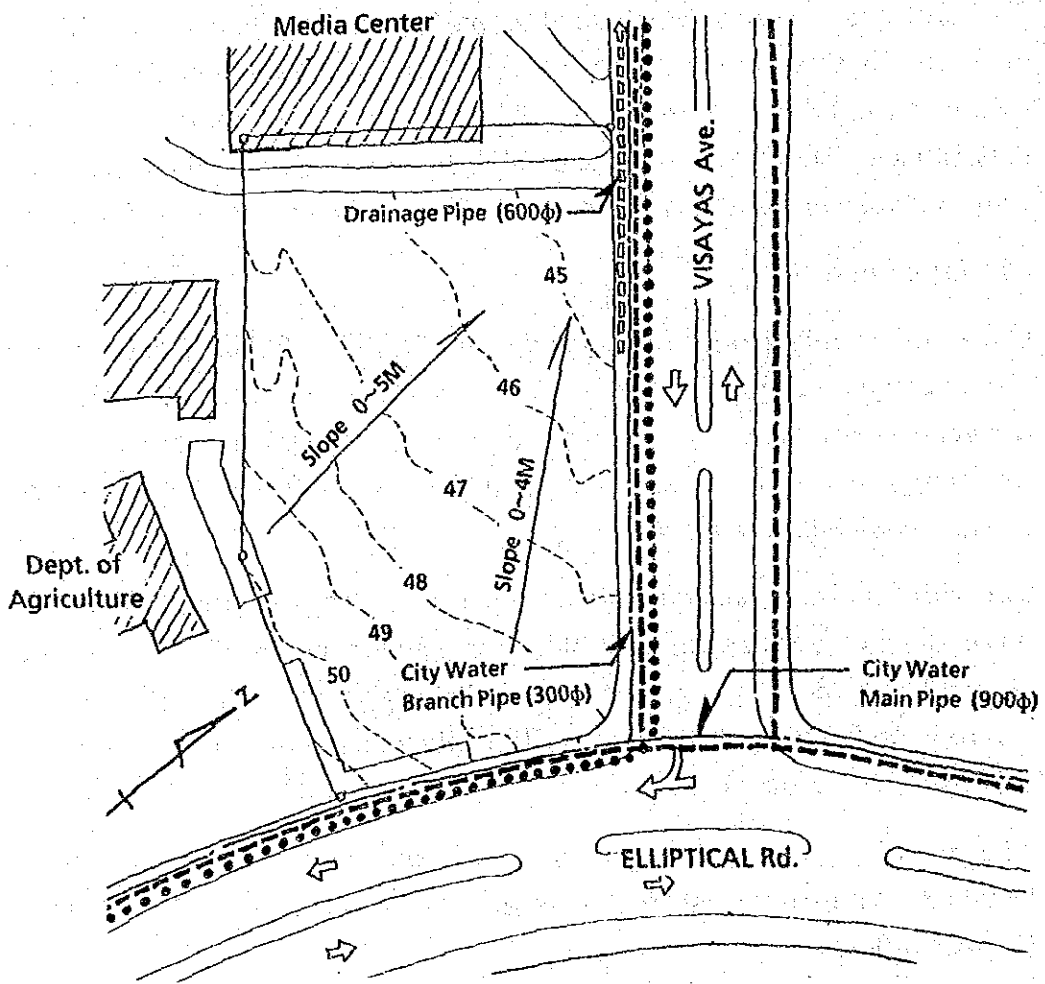
The rainfall increases sharply in April and July, August and September have the heaviest rainfall (300mm – 500mm or more). It decreases in November and January, February and March have the lightest rainfall. There is no flooding at the site itself, in its vicinity or along the major roads leading to the center of Manila.

The prevailing wind directions are northeast, southeast and southwest for October – February, March – May and June – September respectively. (Figure 3-3-2)

(4) Infrastructure

1) Water

900φ and 300φ water mains are buried along Quezon Memorial Circle to the south of the site while a 300φ water main is buried along Visayas Avenue to the east of the site. As this 300φ water main along Visayas Avenue is a branch of the 900φ water main, it can most likely supply a large volume of water and, therefore, it is desirable that the water



- Legend -

- : Elec. Power Line (MERALCO)
- : Telephone Line (PLDT)
- : City Water Supply Line
- : Drainage Line

Fig. 3-3-5. Existing Infrastructure around Site

supply be made from the Visayas Avenue side. The water quality is good and the pressure of $3.15 \text{ kg/cm}^2 - 4.2 \text{ kg/cm}^2$ is adequate.

2) Drainage

A 600ϕ main drainage pipe is buried along Visayas Avenue and is connected to Culiati Creek, some 1.3km to the north. Waste water from the Center will be treated to meet the national pollution control values (BOB: 20ppm, SS: 30ppm, etc.) and will then be discharged with rain water.

3) Gas

There are no municipal gas supply pipes in the vicinity of the site and, therefore, LPG will be used.

4) Electricity

As the site is located in an area of government buildings, the trunk power line (3-phase, 3-line, 34.5kV, 60Hz) of Meralco is available. Areas near Quezon Memorial Circle and Visayas Avenue belong to the same distribution system and the adjacent buildings of the Ministry of Agriculture receive their power supply from Visayas Avenue. In view of the site's location, power supply by means of an overhead power line from Visayas Avenue is preferable. Although the available power supply capacity is large enough to meet the requirements of the Center, measures should be taken in view of the frequent power cuts (some 50 power cuts a year, mostly during the rainy season).

5) Telephone

Both overhead and underground trunk telephone cables are available around the site. In regard to a service cable to the site, it is recommended that a branch be made from the trunk cable (200P, 2 circuits) running along Visayas Avenue.

6) Television

Of the available 5 VHF channels (Channels 2, 4, 7, 9 and 13), the broadcasting stations for Channels 2, 4, 7 and 9 are located in Quezon city and, therefore, the reception is good.

3-3-4 Technical Cooperation

(1) Requested Contents of Technical Cooperation

The Government of the Philippines has made a strong request to the Government of Japan for the provision of technical cooperation for the Project in order to establish research and development implementation standards, as well as an appropriate, relevant implementation system. The requested contents of the technical cooperation are as follows.

1) Objectives of Technical Cooperation

The objectives of the technical cooperation are the development and propagation of appropriate soil and farming technologies which are indispensable to achieve the policy priorities of the Government of the Philippines, i.e. increased agricultural productivity and profitability, and the provision of the necessary services for the Government and other sectors engaged in agriculture and related activities, thereby contributing to the overall economic development of the Philippines.

To achieve these objectives, joint research by the Center and Japanese experts will be conducted in the following fields.

- a. Soil Research and Development (including surveys, classification and evaluation)
- b. Soil Analysis and Experiments
- c. Manpower Resources Development (lectures and practical training)
- d. Water Resources Management

2) Technical Cooperation Activities

- a. Expediting Soil Surveys and Research
- b. Acceleration of Preparation of Land Use Maps, Soil Classification Maps, Soil Potential Productivity Maps and Other Soil-Based Thematic Maps
- c. Recommendation of Appropriate Cropping System and Farming Systems
- d. Water Utilization Studies

- e. Training on Soil Research and Development
- 3) Dispatch of Japanese Experts
 - a. Specialized Fields of Experts on Long-Term Assignment
 - Soil Surveys
 - Soil Conservation and Management
 - Soil Fertility
 - Fertilizer Evaluation
 - Electronic Data Processing
 - Remote Sensing
 - b. Experts on Short-Term Assignment Fields where the dispatch of these experts is deemed necessary.
- 4) Overseas Training of Counterpart Personnel

Counterpart personnel will be accepted for training in Japan.
- 5) Provision of Equipment

The necessary equipment and materials for the implementation of the technical cooperation will be provided within the budgetary limits.
- 6) Duration of Technical Cooperation
 - a. Duration - 5 years
 - b. Actual Period - from the second quarter of 1989
- 7) Others
 - a. Executive Organization in the Philippines

The Bureau of Soils and Water Management of the Department of Agriculture.
 - b. Establishment of Joint Committee

A joint committee consisting of representatives of both sides will be established and meetings will be held on a regular basis for the smooth and effective implementation of the technical cooperation.

(2) Soil Research and Development Project and Technical Cooperation

The objective of the Project is the systematic development of soil resources and conservation data (on farmland, basic characteristics of soil, factors adversely affecting soil productivity and soil conservation, etc.), which forms the scientific basis for the preparation and implementation of national land-use plans and for farming, agricultural development and agrarian studies for both the immediate and future benefit of the Philippines.

Any project in this field must be promoted by the central government since as long as 10 -- 20 years are required to accumulate the soil resources and conservation data required for the preparation of basic farming indices for the entire country.

The concrete activities of the Center aim at the preparation of soil classification maps, land capability maps and appropriate cropping maps, etc. using data obtained through on-site soil surveys (location surveys and cross-section surveys), soil classification surveys and on-site tests at farms (local judgement tests and confirmation tests on the effects of measures) so that soil management guidelines and fertilizing standards can be established, thereby contributing to the preparation of guidelines for soil fertility conservation measures. The anticipated activities are diverse with research and development activities at the core.

The technical cooperation for the Project in terms of the preparation of a realistic basic plan (guidelines/manuals) and the implementation of model projects is, therefore, extremely important. The provision of Japanese technical cooperation in this field should prove extremely effective in the light of the previous experience of Japan and, therefore, the Government of Japan is currently conducting a study in view of providing project-type technical cooperation.

CHAPTER 4. BASIC DESIGN

CHAPTER 4 BASIC DESIGN

4-1 Design Principles

The Center is designed to act as a national center for soil research and development and for soil information and, as an organization belonging to the Department of Agriculture, to perform a coordinating function between the related organizations and departments, etc. Facing Quezon Memorial Circle, the Center will occupy an important position among a number of buildings of the Department of Agriculture.

The basic design of the buildings will be based on the following with special attention paid to functionability, durability and economy to achieve the project objectives, while responding to the design requirements and taking the environmental conditions of the Project site into consideration.

(1) Functional and Easily Accessible Facilities

As the Center will house more than 700 full-time staff of the Research and Survey Department (seven Divisions), Special Projects and Services Department, ISRIS Department, Administration Department and Training and Dissemination Department, all the facilities will have a high staff density. In addition, the facilities for the training sector must be designed to permit the smooth movement of both visitors and staff members. In short, clear flow lines will be necessary to make the daily movement of a large number of people efficient and the departments must be distributed in such a way as to facilitate their easy access.

(2) Comfortable Space Incorporating Climatic Characteristics

In consideration of the tropical climate, the building plan should employ eaves and louvres to shut out strong sunlight and to prevent torrential rain from entering the buildings. Natural lighting and ventilation should be adopted where possible to achieve a comfortable environment with little dependence on machinery. The canteen and other communal areas should be planned to face open spaces to create a relaxing atmosphere for staff members whose offices/rooms are highly functional and densely populated.

(3) Easy-to-Maintain Facilities with Low Maintenance Cost

A low facility maintenance cost should be aimed at, by stressing the introduction of energy saving measures, simple systems and durable equipment and employing durable and reliable construction materials and methods.

4-2 Examination of Basic Design Conditions

4-2-1 Contents of facilities

The buildings will house the following facilities/rooms with due consideration given to their functions and easy management.

(1) Main Building

1-1 Facilities for Research and Survey Department

- a. Rooms for Agricultural Land Management and Evaluation Division (ALMED)
- b. Rooms for Soil Survey Division
- c. Rooms for Soil Conservation and Management Division
- d. Rooms for Water Resources and Management Division
- e. Rooms for Laboratory Services Division
- f. Rooms for Soil and Water Research Division
- g. Rooms for Cartographic Operations Division

1-2 Facilities for Special Projects and Services Department

1-3 Facilities for Integrated Soil Resources Information System Department (ISRIS)

1-4 Facilities for Administration Department

- Management Offices
- Conference Rooms
- Library

1-5 Other Necessary Facilities (greenhouses, etc.)

(2) Training and Information Building

2-1 Facilities for Training and Information Department

- a. Lecture Rooms
- b. Convention Room
- c. Dormitories

d. Printing and Reproduction Room

c. Soil Museum

2-2 Other Necessary Facilities

a. Offices

b. Lecturer's Rooms

c. Canteen, etc.

4-2-2 Facility Size

The size of the Center has been planned on the basis of the staff distribution plan for each room with reference to the list made by the Government of the Philippines of requested rooms and their respective floor areas and also to the following general standards in Japan (Basic Building Requirements compiled by the Japan Architects' Association).

(1) Office Space

The standard space varies from 4.5m²/person to 7.0m²/ person depending on the desk distribution plan, provided each staff member is allocated a desk. In regard to the Project, desks will in principle be facing each other to secure at least 4.5m²/person to obtain the most efficient use of the available space.

(2) Researchers' Space

Researchers are divided into assistant researchers usually working in laboratories and senior researchers using both staff rooms and laboratories. Based on the standard figure of 2.6m² - 4.0m²/person, 4.0m²/person and 3.0m²/ person will be adopted for senior researchers and assistant researchers respectively.

(3) Training and Conference Space

The revised annual training program includes small group (5 - 15 persons) training for 15 weeks, group (20 - 40 persons) training for 52 weeks, large seminars (100 - 150 persons) for 15 weeks and conferences (150 - 400 persons) for four weeks.

In addition to the convention hall, several seminar rooms of different sizes were included in the original request. However, examination of the training

plan found the provision of two rooms to accommodate 40 persons each and a convention room capable of seating 400 persons, which can be divided using moveable partitions, will suffice the training program requirements.

While the standard space for training is $1.5\text{m}^2 - 1.8\text{m}^2/\text{person}$ with individual desks or $0.7\text{m}^2 - 1.2\text{m}^2/\text{person}$ with only chairs, $1.0\text{m}^2/\text{person}$ for the training rooms and $0.75\text{m}^2/\text{person}$ for the convention room will be adopted for the Project.

(4) Dormitory Space

In addition to the training of the Center's staff, it is also planned to include the training of local staff and leading farmers in the training program. Since many of the Center's staff, let alone local staff and farmers, live outside the Metropolitan Manila area, the provision of dormitories will be necessary. Dormitories to accommodate 68 persons, including some single rooms, were specified in the original request. However, the provision of dormitories to accommodate all trainees during the training period is preferable in view of more effective training. The planned dormitory size will be capable of accommodating a maximum of 40 trainees in view of the fact that the largest number of trainees on a single training course will be 40. Therefore, there will be 15 dormitories which will accommodate three trainees each and each floor will have a common room, laundry room and kitchen.

Dormitories $10\text{m}^2 - 15\text{m}^2/\text{person}$

Common Rooms $3\text{m}^2/\text{person}$ for some 10 persons

(5) Canteen Space

The canteen will serve some 700 staff members of the Center and some 50 trainees, totalling 750 persons. Space for 250 seats is planned assuming three sittings.

Self-Service System:

Table with 4 seats - $1.2\text{m}^2/\text{person} - 1.5\text{m}^2/\text{person}$

Table with 6 seats - $1.0\text{m}^2/\text{person} - 1.2\text{m}^2/\text{person}$

(6) Library Space

Space to house some 8,000 items (soil-related books, reference materials and magazines issued by foreign research institutions) is planned with 30 seats.

Bookshelf Space — 160 — 220 books/m²

Reading Space — 1.6m²/person — 1.8m²/person for a table with four seats

The library space will be 130m² — 160m² based on the above standard figures. In addition, an office and storage space will be provided.

The sizes of the laboratories, cartographic room, information system room, etc. will be determined on the basis of the equipment layout plan for each room. The determined room sizes are given below.

Main Bldg.

1.0 Research & Survey Dept.

Div., Sec. & Rm. Name	Nos. of Person		General Standard Values, Remarks	Planning Area(m ²)
1.1 ALMED. Div.				
Div. Chief Rm.	Head	1		42
	Staff	1		
Land Resources Inventory Sec.	Chief	1	25 × 4.5m ² /person = 112m ²	168
	Staff	24		
Land Resources Evaluation Sec.	Chief	1	11 × 4.5m ² /person = 49.5m ²	105
	Staff	10		
Farm Management Viability Sec.	Chief	1	24 × 4.5m ² /person = 108m ²	42
	Staff	23		
Data Management & Technical Report Processing Sec.	Chief	1	10 × 4.5m ² /person = 45m ²	63
	Staff	9		
Admin. Sec.		17	17 × 4.0m ² /person = 68m ²	72
Drafting Rm.		-	Drafting table(11), Drawing shelf	63
Technical Report File Depository		-		21
Typing Rm.	Typist	6	6 × 3.0m ² /person = 18m ²	
Sub Total		95 persons		576
1.2 Soil Survey Div.				
Div. Chief Rm.	Head	1		30
	Staff	1		
Soil Survey Interpretation Sec.	Chief	1	13 × 4.5m ² /person = 58.5m ²	116
	Staff	12		
Aerial Photo-Interpretation Sec.	Chief	1	12 × 4.5m ² /person = 54m ²	116
	Staff	11		
Soil Classification & Correlation Sec.	Chief	1	13 × 4.5m ² /person = 58.5m ²	116
	Staff	12		
Soil Productivity Rating Sec.	Chief	1	13 × 4.5m ² /person = 58.5m ²	
	Staff	12		
Sub Total		53 persons		262

Div., Sec. & Rm. Name	Nos. of Person	General Standard Values, Remarks	Planning Area(m ²)
1.3 Soil Conservation & Management Div.			
Div. Chief Rm.	Head 1 Chief 1		30
Soil Conservation Planning Sec.	Chief Staff 1 10	$11 \times 4.5\text{m}^2/\text{person} = 49.5\text{m}^2$	105
Soil Fertility Rehab. Sec.	Chief Staff 1 11	$12 \times 4.5\text{m}^2/\text{person} = 54\text{m}^2$	
Land Development Sec.	Chief Staff 1 12	$13 \times 4.5\text{m}^2/\text{person} = 58.5\text{m}^2$	116
Land Management Sec.	Chief Staff 1 10	$11 \times 4.5\text{m}^2/\text{person} = 49.5\text{m}^2$	
Storage			33
Sub Total	49 persons		284
1.4 Water Resources & Management Div.			
Div. Chief Rm.	Head Staff 1 1		30
Water Resources Development Sec.	Chief Staff 1 8	$9 \times 4.5\text{m}^2/\text{person} = 40.5\text{m}^2$	168
Design & Engineering Sec.	Chief Staff 1 8	$9 \times 4.5\text{m}^2/\text{person} = 40.5\text{m}^2$	
Water Uses & Management Sec.	Chief Staff 1 8	$9 \times 4.5\text{m}^2/\text{person} = 40.5\text{m}^2$	
Agro-Meteorological Sec.	Chief Staff 1 6	$7 \times 4.5\text{m}^2/\text{person} = 31.5\text{m}^2$	
Sub Total	36 persons		198
1.5 Laboratory Services Div.			
Div. Chief Rm.	Head Staff 1 1		30
Physical Analysis Sec.	Senior Researcher 12 Assistant Staff 6	$12 \times 4.0\text{m}^2/\text{person} = 48\text{m}^2$ $6 \times 3.0\text{m}^2/\text{person} = 18\text{m}^2$	42 21
Chemical Analysis Sec.	Senior Researcher 20 Assistant Staff 12	$20 \times 4.0\text{m}^2/\text{person} = 80\text{m}^2$ $12 \times 3.0\text{m}^2/\text{person} = 36\text{m}^2$	74 30
Biological Production Sec.	Senior Researcher 12 Assistant Staff 7	$12 \times 4.0\text{m}^2/\text{person} = 48\text{m}^2$ $7 \times 3.0\text{m}^2/\text{person} = 21\text{m}^2$	42 21
Soil Test Kit Sec.	Senior Researcher 11 Assistant Staff 3	$11 \times 4.0\text{m}^2/\text{person} = 44\text{m}^2$ $3 \times 3.0\text{m}^2/\text{person} = 9\text{m}^2$	42 10
Meeting Rm.			21
Sub Total	85 persons		333

Div. Sec. & Rm. Name	Nos. of Person	General Standard Values, Remarks	Planning Area(m ²)
1.6 Soil & Water Research Div.			
Div. Chief Rm.	Head 1 Staff 1		30
Biology Research Sec.	Senior Researcher 11 Assistatn Staff 6	11 × 4.0m ² /person = 44m ² 6 × 3.0m ² / " = 18m ²	42 21
Chemistry Research Sec.	Senior Researcher 11 Assistatn Staff 6	11 × 4.0m ² / " = 44m ² 6 × 3.0m ² / " = 18m ²	42 21
Soil Physics & Minerology Research Sec.	Senior Researcher 11 Assistant Staff 6	11 × 4.0m ² / " = 44m ² 6 × 3.0m ² / " = 18m ²	42 21
Water Resources Research Sec.	Senior Researcher 15 Assistant Staff 4	15 × 4.0m ² / " = 60m ² 4 × 3.0m ² / " = 12m ²	72
Soil Fertility & Fertilizer Research Sec.	Senior Researcher 13 Assistant Staff 4	13 × 4.0m ² / " = 52m ² 4 × 3.0m ² / " = 12m ²	53 21
Meeting Rm.			21
Sub Total	89 persons		386
1.7 Laboratory & other Rm.			
Reception Rm. for Samples		Soil and plant sample	20
Sample prep. Rm. (Soil)			10
Sample prep. Rm. (Plant)			10
Drying Rm. (Soil)		Set up by equipment layout	40
Drying Rm. (Plant)		"	20
Weighing Rm.			21
Sample Storage			30
Fume Hood Rm.			30
Nitrogen Distillation Rm.		Lab. center table (1)	42
Instrument Rm. (Lab. Services Div.)		" (2)	63
Soil Characterization Lab.		" (3)	84
Special Assay Lab.		" (4)	105
Soil Test Kit Lab.		" (1)	42
Shaking Rm.			9
Hot Rm. (1)			9
Water Still Rm. (1)			9
Soil Fertility & Fertilizer Lab.		Lab. center table (1)	84
Instrument Rm. (Research & Survey Div.)		" (1)	42
Instrument Prep. Rm.			42
Chemical Storage			42
Soil Physics Lab.		Lab. center table (3)	84
Biological Prep. Rm.		" (1)	42
Culture Rm.		" (1)	42

Div. Sec. & Rm. Name	Nos. of Person	General Standard Values, Remarks	Planning Area(m ²)
Inoculation Rm.			10
Sterilizer Rm.			10
Centrifuge Rm.			10
Hot Rm. (2)			9
Water Still Rm.(2)			9
Biological Lab.		Lab. center table (2)	63
Microscope Rm.			21
Mineralogy Lab.		Lab. center table (2)	63
X-ray DTA Rm.		Set up by equipment layout	42
Technical Equipment Rm.	6		42
Equipment Work Shop	8	Center working table	42
Storage			42
Sub Total	14		1,295
1.8 Cartographic Operations Div.			
Div. Chief	Head 1 Staff 1		30
Cartography & Design Sec.	Chief 1 Staff 13	Set up by equipment layout	144
Map Depository Rm.			54
Photo Mapping Sec.	Chief 1 Staff 10	Set up by equipment layout	63
Lithography & Reproduction Sec.	Chief 1 Staff 8	◇	110
Printing Rm.		◇	63
Photo Laboratory	10	◇	20
Sub Total	46 persons		484

2.0 Special Projects & Services Dept.

Div., Sec. & Rm. Name	Nos. of Person	General Standard Values, Remarks	Planning Area(m ²)
Div. Chief Rm.	Div. Chief	1	30
	Staff	2	
Satellite Center	Head	1	16 × 4.5m ² /person = 72m ²
	Staff	15	
RASCOMO	Head	1	19 × 4.5m ² /person = 85.5m ²
	Staff	18	
Remote Sensing	Head	1	12 × 4.5m ² /person = 54m ²
	Staff	11	
Sub Total	50 persons		255

3.0 Integrated Soil Resources Information System (ISRIS) Dept.

Div., Sec. & Rm. Name	Nos. of Person	General Standard Values, Remarks	Planning Area(m ²)
Div. Chief Rm.	Div. Chief	1	30
	Staff	2	
System & Programming Div.	Head	1	19 × 4.5m ² /person = 86m ²
	Staff	18	
Operations & Data Entry Div.	Head	1	10 × 4.5m ² /person = 45m ²
	Staff	9	
Geographic Information System Div.	Head	1	8 × 4.5m ² /person = 36m ²
	Staff	7	
Computer Rm.		Set up by equipment layout	88
Sub Total	40 persons		293

4.0 Administrative Dept.

Div., Sec. & Rm. Name	Nos. of Person	General Standard Values, Remarks	Planning Area(m ²)
4.1 Office of Executive Director Rm.	Director 1		42
Advisory Committee Rm.			42
Conference Rm.		20~24person	42
Deputy Executive Director Rm.	Deputy Director 1		42
Legal Officer Rm.	1		30
Planning Officer Rm.	1		30
Administration Office	Staff 28	28×4.5m ² /person = 126m ²	136
4.2 Director Rm.	Div. Chief 1		42
	Staff 3		21
Admin. Service Div.	Head 1		-
	Staff 1		-
Records Sec.	Chief 1		-
	Staff 6		-
Personnel Sec.	Chief 1		-
	Staff 6		-
Property Sec.	Chief 1		-
	Staff 6		-
Finance Div.	Head 1		-
	Staff 1		-
Budget Sec.	Chief 1		-
	Staff 6		-
Accounting Sec.	Chief 1		-
	Staff 6		-
Cashier Sec.	Chief 1		-
	Staff 6	42×4.5m ² /person = 189m ²	198
Auditor's Office			42
Supplies Storage			63
Drawing Rm.			42
Lounge			21
Library		Storing 8,000 books, Reading space : 30 seats	132
Office			42
Storage			21
Security Rm.	6	6×3.0m ² /person = 18m ²	18
Electrical Rm.		Set up by equipment layout	180
A/C, Machine Rm.			79
Water Reservoir Tank Rm.			42
Sub Total	99 persons		1,307
Common Space (WC, Hall, Corridor etc.)			2,302
Total			7,975

Training & Information Bldg.

Div., Sec. & Rm. Name	Nos. of Persons	General Standard Values Remarks	Planning Area(m ²)
5.0 Training & Information Div.			
	Div. Chief	1	-
Training Office	Staff	14	15 × 4.5m ² /person = 67.5m ²
Information Office	"	14	14 × 4.5m ² / " = 63m ²
Video Production Rm.	-	-	24
Lecturer's Rm.	-	-	42
Training Rm.-1	-	40 × 1.0m ² / " = 40m ²	42
Training Rm.-2	-	40 × 1.5m ² / " = 60m ²	63
Convention Hall	-	400 × 0.75m ² /person To be divided by movable partitions.	300
Stage	-	10m × 4m	40
Utensil Rm.	-	-	15
Waiting Rm.	-	-	15
Storage	-	-	12
Control Rm.	-	-	12
Hall	-	0.3m ² / × 480person = 144m ²	160
Soil Exhibition Rm.	-	Set up by exhibition layout	130
Storage	-	-	20
Dormitory (15 Rms)	-	4.5 × 7m = 31.5m ² /Rm. × 15Rm.	476
Lounge	-	-	63
Laundry	-	-	32
Cooking Rm.	-	31.5m ² × 2Rm.	32
Office (Dormitory)	-	-	21
Dining/Canteen	-	250seats × 1.2m ² /seat Estimated customers : 750 persons 700 staff + 50 trainees 3 × turnover, 250 seats	300
Kitchen	-	Approx. 30% of the size of dining space	100
Office (Kitchen)	-	-	15
Linen Rm.	-	-	30
General Service Sec.	Staff	3	32
Work Shop	"	10	Work table, material storage 63
Common space (WC, Hall, Corridor & etc.)			1,330
Total			3,516m ²

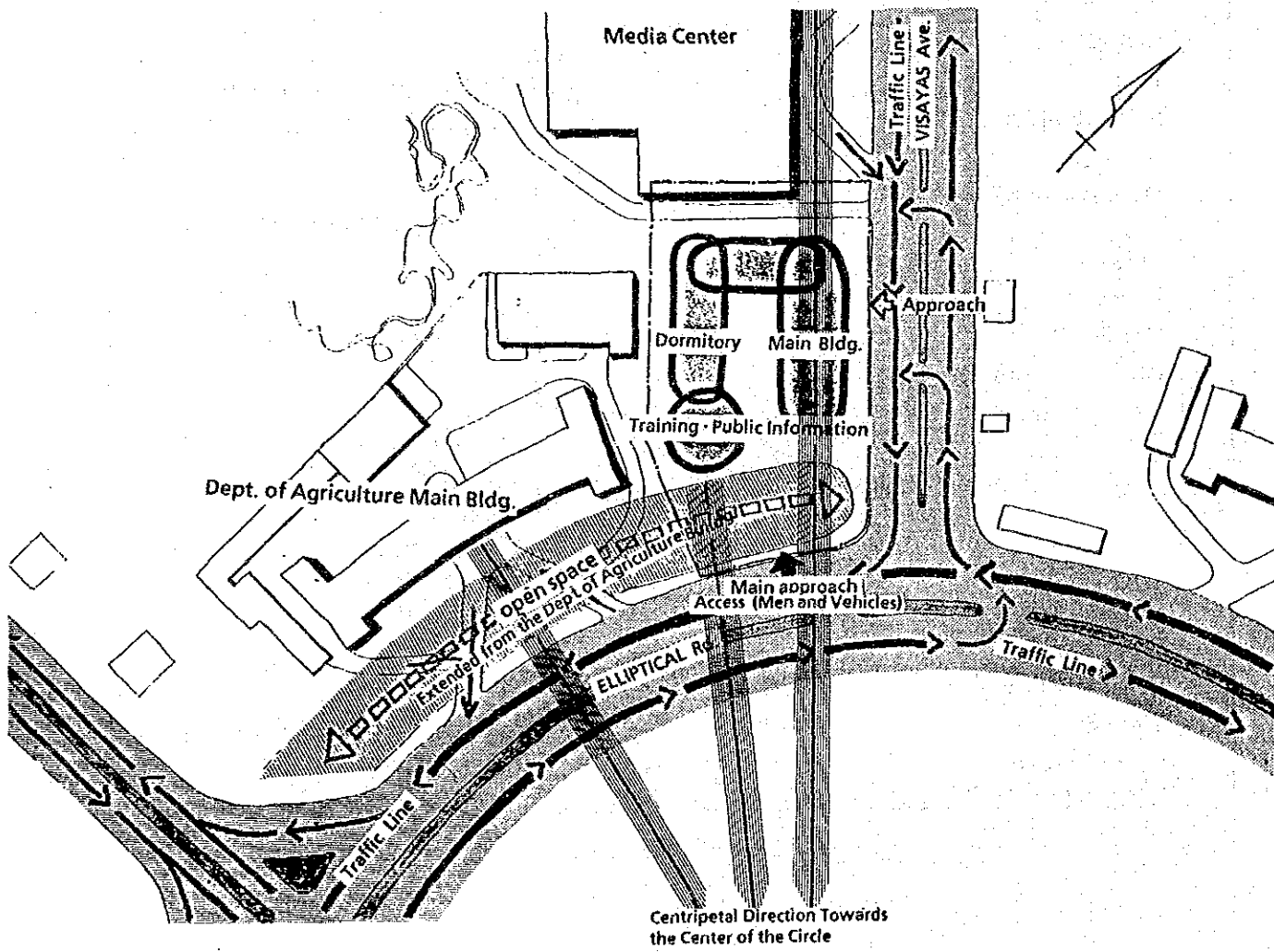


Fig. 4-3-1. Conceptual Drawing for Land Use and Facility Distribution Plan

4-3 Basic Plan for Facilities

4-3-1 Land Use and Facility Layout Planning

(1) Main Approach

As the project site faces Quezon Memorial Circle (Elliptical Road) and Visayas Avenue, access to the site can be made from both roads. The decision on from which road the main access to the site will be provided is a fundamental factor in determining the distribution of the entire facilities.

Although both roads are reported to have a fairly high traffic volume of around 20,000 vehicles/week, the traffic volume on Visayas Avenue appears to be slightly less than that on Quezon Memorial Circle. While in this context, Visayas Avenue may be preferable, traffic on Visayas Avenue would have to make a U-turn to obtain access to the site. As all traffic from central Manila to the site is via Quezon Memorial Circle, vehicle access to the site would be smoother from the Quezon Memorial side.

In view of these considerations, it is preferable that the main access to the site be from Quezon Memorial Circle while the service access be from Visayas Avenue.

(2) Building Axis and Facade

The long axis of a building is generally set in the east-west direction in a tropical climate in order to effectively prevent morning and evening sunlight entering the building. As the dominant axis of the project site runs in the north-west direction, however, the distribution of the buildings in the east-west direction would be awkward. A basic factor in determining the direction of the Center's main axis is that any building on Visayas Avenue should have a parallel axis in view of the fact that all other buildings on Visayas Avenue have walls parallel to the Avenue. In contrast, the buildings facing Quezon Memorial Circle have facades located in a centripetal manner facing the center of Quezon Memorial Circle and those buildings related to the Department of Agriculture have walls curving along the Circle. The building plan for the Project should, therefore, pay special attention to these characteristics of the site in view of the planned buildings harmonizing with the existing buildings in the vicinity.

Given these considerations, the resulting image of the Main Building is that its facade will face Quezon Memorial Circle and its main axis will be parallel

to Visayas Avenue. Since the axis of Visayas Avenue does not cross the axis of the adjacent building of the Department of Agriculture on Quezon Memorial Circle at a right angle, consideration should be given to a design which will bring them into harmony.

(3) Zoning and Blocks

While the Center will consist of two blocks (buildings), i.e. Main Building and Training and Information Building, it is preferable that the latter be divided into two functional blocks, i.e. Training and Information Block mainly for daytime use and Dormitory Block mainly for night-time use. There will, therefore, be three zones, i.e. Main Building Zone, Training and Information Zone and Dormitory Zone, in terms of the land use of the project site.

There will be an open space on the Quezon Memorial Circle side to match the open space in front of the main building of the Department of Agriculture. The facade of the Training and Information Building, which will be used by many unspecified persons, will be the focus point of this open space and will compensate for the sense of incompatibility caused by the odd angle of the Main Building's axis and that of the building of the Department of Agriculture.

The main entrance of the Main Building will also face this open space while the sub-entrance will face Visayas Avenue for use as a service entrance (sample deliveries, etc.) The Dormitory Zone will be located behind the other two zones so that a quiet environment can be secured.

(4) Utilization of Slope

The project site gently slopes from the side of the building of the Department of Agriculture (Quezon Memorial Circle) towards the Media Center side with a difference of some 4 -- 5m in the respective elevations. An additional floor will be planned for the section with a low land elevation to utilize effectively the available space while avoiding the necessity of substantial land preparation work, such as land filling.

(5) Utilization of Media Center's Service Road

A section of 19m in width along the northern boundary of the project site is currently used as a service road to the adjacent Media Center. If this service road can be jointly used by the proposed Center, the Center's open space

facing Quezon Memorial Circle could be widened. As the Media Center is a government building belonging to the Office of the President, the question of the service road's joint use should be discussed between the relevant government offices to reach a positive conclusion as soon as possible.

4-3-2 Building Planning

(1) Plan

1) Main Building

The Main Building will be L-shaped with a central corridor. Taking the size of the project site and the required facilities into consideration, the building will have three and four stories (five stories in part, including a semi-basement floor) to house more than 700 staff members of the Research and Survey Department (seven Divisions), Special Projects and Services Department, ISRIS Department and the Administration Department. An open space will be provided at the halfway point of the central corridor to facilitate natural ventilation and lighting. The standard room size will be 6m x 7m to allow the most efficient use of space for the laboratories. The number of small rooms will be kept to a minimum in view of the better utilization of natural ventilation and lighting while avoiding dependence on mechanical equipment. In addition, large rooms are also preferable vis-a-vis the effective use of the available space. Therefore, only those with the title of director or higher will be provided with personal offices.

The divisions and departments to be located on the first and second floors are the ALMED, Soil Survey, Soil Conservation and Management and Cartographic Operations Divisions, the Special Projects and Services Department, ISRIS Department and Administration Department. The Laboratory Service Division and the Soil and Water Research Division will be located on the third and fourth floors in view of the necessity of installing testing, ventilation and other equipment.

As there is no adequate space on the site for a greenhouse for experiments, the greenhouse will be located on the roof of the building's three story section in view of its easy access by the Soil and Water Research Division located on the fourth floor. The reception area for soil

and other samples, the printing machines for the Cartographic Operations Division and the Power Room will be located in the semi-basement section.

2) Training and Information Building

The Training and Information Building will have three stories and a side corridor. The Training and Information Offices, Soil Museum, Canteen and Administration Offices will be located on the first floor while the Convention Room will be located on the second floor. Six and nine dormitories, will be located on the second and third floors respectively, totalling 15 dormitories, which will all be on the same size and accommodate three trainees each. In principle, the dormitories for male and female trainees will be on different floors. Each floor will have a common room, laundry room and kitchen. Access to the dormitories will be separately planned from that to other sections of the Center. The Canteen for staff members and trainees will face the courtyard to provide a pleasant atmosphere and to facilitate communication between staff members.

3) Courtyard

The courtyard will be surrounded by the Main Building and the Training and Information Building. Functionally, it will act as a buffer zone between the static office work in the Main Building and the active movement in the Training Building. It will also effectively facilitate natural ventilation and lighting and will add variety to the Center.

(2) Elevation and Section Plans

In planning the elevations and sections for the buildings, stress is placed on functionability to reflect the local climate, economy to minimize the maintenance requirements and design to achieve harmony with the surrounding environment.

1) Elements of Exterior Design

Both vertical and horizontal louvres will be employed for the exterior walls of the buildings to shut out morning and evening sunlight. The structural pillars and beams will be also planned to function as louvres, creating a simple but strong appearance. The vertical louvres will also be used to guide wind into the buildings. By using louvres, the exterior

of the buildings will be strongly shaded and suitable for a tropical climate.

2) Floor Height

In view of the relatively dense use of all the rooms, it will be necessary to introduce high ceilings to create a feeling of space. Although the floor height should be changed in accordance with the topography of the site which dips towards the north, the basic height will be 4.5m for the first floor and 4m for the second floor and higher floors in the Main Building and 3.35m for the dormitories.

(3) Building Finish

The building materials to be used should suit the local climate and local materials and construction methods should be employed where possible. In view of their adaptability to the intended purpose of use, economy, durability and easy maintenance, the following building materials will be used.

1) Exterior Finish

Exterior wall will be covered with highly durable spray tiles.

With regard to the windows, highly durable aluminium window frames, the use of which is increasing in popularity in the Philippines, will be used instead of conventional steel window frames.

Asphalt waterproofing will be adopted in the case of the general flat roof while other parts will be sloping with metal slates on top of slab concrete. In both cases, particular attention should be paid to providing efficient heat insulation.

2) Interior Finish

Appropriate interior finishing materials will be selected in accordance with the functional requirements of the following groups of facilities, which have been decided based on their purposes.

Group A : public areas (halls, canteen, corridors, etc.) requiring durable and easily maintained materials

Group B : offices, staff rooms, etc., requiring durable and economical materials

Group C : laboratories and other rooms requiring chemical resistant and easily cleaned materials

Group D : dormitories and other rooms requiring comfort

Group E : convention room and audio visual production room requiring good acoustic absorption

Group F : equipment rooms, printing room, drying rooms, etc., requiring durability and workability

Group G : kitchen, toilets, etc., requiring stain resistant and easily cleaned materials due to the use of water in these facilities

The selected finishing materials for each group are as follows.

Group	Floor	Baseboard	Walls	Ceiling	Remarks
A	Terrazzo Tiles	Terrazzo Tiles	Vinyl Paint	Painted Calcium Silicate Bd, Painted Cement Bed	*for rooms without air-conditioning only
B	Vinyl Tiles	Vinyl	Vinyl Paint	Painted Cement Bed	
C	Long Polyvinyl Chloride Sheet	Terrazzo Tiles	Vinyl Paint	Painted Calcium Silicate Boards	
D	Parquet Flooring	Wood	Vinyl Paint	Painted Cement Bed	
E	Parquet Flooring	Wood	Acoustic Boards	Rockwool Boards	
F	Hardners	Painted Cement Bed	Vinyl Paint	Painted Cement Bed	
G	Ceramic Tiles	Ceramic Tiles	Ceramic Tiles	Painted Water-proof Boards	

(4) Exterior Work

The point to be particularly noted in regard to the outside work for the Project is the fact that the site dips in the northwest direction from the Quezon Memorial Circle side, resulting in an elevation difference of 5m. Road construction to provide smooth access to the Center from Visayas Avenue, land preparation to make the ground around the buildings level with the appropriate building floor and the drainage of rain water from the site should be planned. In addition, improvement work, including the introduction of an open space in line with the open space of the Department of Agriculture building, as well as paving work, should also be planned for the side facing Quezon Memorial Circle.

4-3-3 Structural Planning

Structural plans basically emphasize the adoption of a frame system which provides a firm and economical structure. Therefore, the most frequently used local method will be adopted where possible when deciding the structural design method, external forces, materials and construction method.

(1) Structural Design

The Philippines' National Structural Code for Buildings will be basically used for the structural design while referring to the relevant Japanese design standards where necessary and taking the following external forces affecting buildings into consideration.

- Dead Load

The weights of all structural materials, finishing materials and equipment attached to the building will be calculated.

- Live Load

The following figures will be adopted in accordance with the National Structural Code for Buildings for the live load of the respective rooms.

<u>Room</u>	<u>Live Load</u> Pa (kg/m ²)
Office	2,400 (245)
Research Room	2,900 (296)
Laboratory	2,900 (296)
Classroom	2,900 (296)
Convention Room	4,800 (490)
Dormitory	1,900 (194)

◦ **Wind Pressure**

According to the National Structural Code for Buildings, metropolitan Manila is located in the strong wind designation II area and, therefore, the following figures should be used for the wind speed and wind pressure depending on the building height.

<u>Building Height</u> (ft)	<u>Wind Velocity</u> (km/hr)	<u>Wind Pressure</u> (kg/m ²)
0 – 30	175	150
30 – 100	175	200

◦ **Seismic Force**

As the Philippines belongs to the Circum-Pacific Seismic Belt and is reported to experience several earthquakes a year, a seismic resistant design will be accordingly required for the building structure. Pursuant to the National Structural Code for Buildings, the design seismic force is calculated using the following formula.

$$V = Z \times I \times K \times C \times S \times W$$

where, V = Design Seismic Force
 Z = Coefficient for Seismic Zone
 I = Occupancy Importance Factor
 K = Coefficient for Building Structure Type
 C = Coefficient for Vibration Period
 S = Coefficient for Site-Structure Resonance
 W = Total Dead Load

(2) Structural System

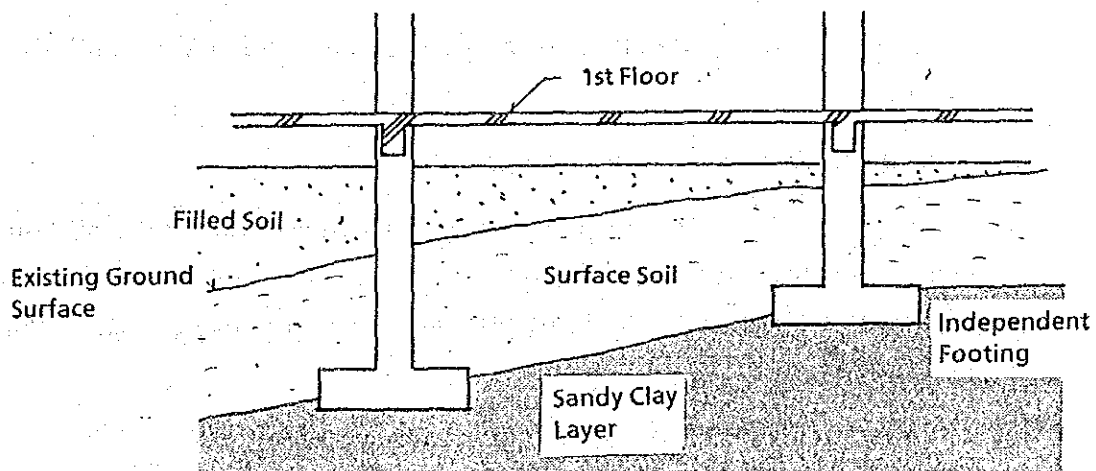
Since the shape and size of the Main Building and the Training and Information Building differ, expansion joints will be used between the buildings to separate them. Beams for each building will be placed at 3m intervals in the longitudinal direction to simplify the structure. In principle, local construction methods will be used. The structure of each building is outlined below.

<u>Building</u>	<u>No. of Stories</u>	
Main Building	4 (5 in part)	Reinforced concrete construction
Training and Information Building	3	As above; Concrete construction for part of roof girder

(3) Building Foundation

A compacted sandy clay layer exists at a depth of 1.5m below the ground surface. Therefore, the basic method to support the planned buildings will be an independent foundation which will be laid on this sandy clay layer.

Fig. 4-3-2. Supporting Foundation System



4-3-4 Building Utilities

(1) Electricity Installation

1) Power Receiving Facility and Substation

The Center will be supplied with power from MERALCO's existing 3-phase, 3-line, 34.5kV power line on the Media Center side (Visayas Avenue) to the pedestal on the site via an overhead power line. Power will be subsequently supplied to the substation (transformer vault room) in the building via an underground power line.

The secondary voltage from the substation will be as follows.

- Lighting and Socket Outlets : single-phase, 2-line, 230V
- Motor and Power Equipment : 3-phase, 3-line, 480V/230V
- Main Feeder : 3-phase, 4-line

The estimated full load for the main equipment is as follows.

- Lighting and Socket Outlets : 300kW
 - Motor and Power Equipment : 500kW
 - Laboratory Equipment : 200kW
- Total 1,000kW

The transformer capacity is estimated to be 1,000 kVA (333kVA x 3 sets).

2) Emergency Power Generating System

In order to deal with the power failures which occur some 50 times a year (especially during the rainy season), a standby power generator will be installed to prevent the stoppage of power to important testing equipment, security lighting, etc.

The specifications of the power generator are as follows.

- Capacity : 100kVA (3-phase, 3-line)
- Fuel : Kerosine or a Heavy Oil
- Operation Duration : Continuous 6 Hours

3) Main Power Circuit

Power will be supplied to each distribution board (3-phase, 4-line, 480V/277V) from the L/V panel. A minimum AVR will be installed on to the CPU to prevent voltage fluctuations.

4) Lighting Distribution Fixtures

Distribution lines will be provided for lighting equipment, switches and socket outlets located on the secondary side of the distribution boards. Lighting fixtures will have a switch covering each small block for energy-saving purposes. Similarly, lighting fixtures which are capable of being selectively switched on and off at certain intervals will be installed in the corridors. In principle, all socket outlets will be earthed.

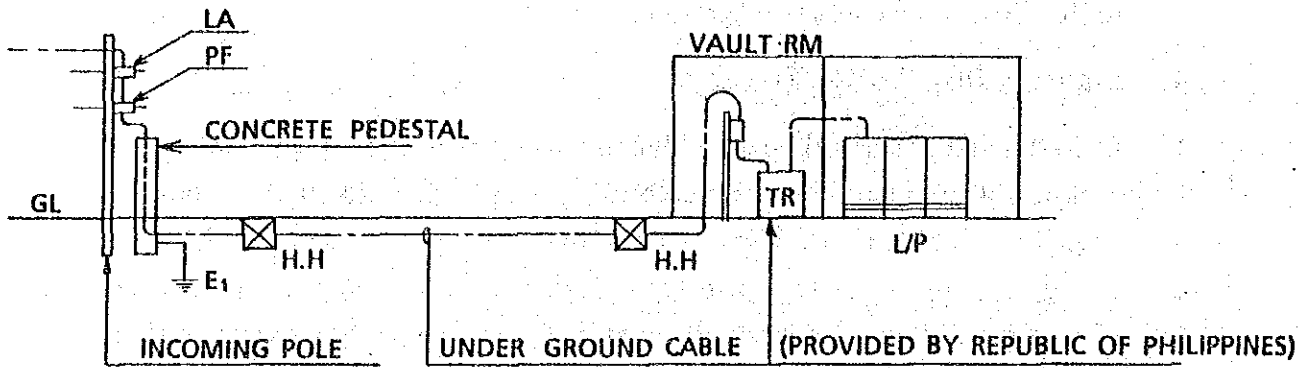
5) Lighting Apparatus

In principle, cost efficient fluorescent lamps will be used and incandescent lamps will be used, if functionally deemed necessary. The luminous intensity will be as follows.

— Administration Office and Conference Room	350 LX — 400 LX
— Training Room, Research Room	300 LX — 350 LX
— Laboratory	350 LX — 400 LX
— Corridor, Lobby	100 LX — 150 LX
— Canteen	200 LX
— Dormitory	250 LX — 300 LX

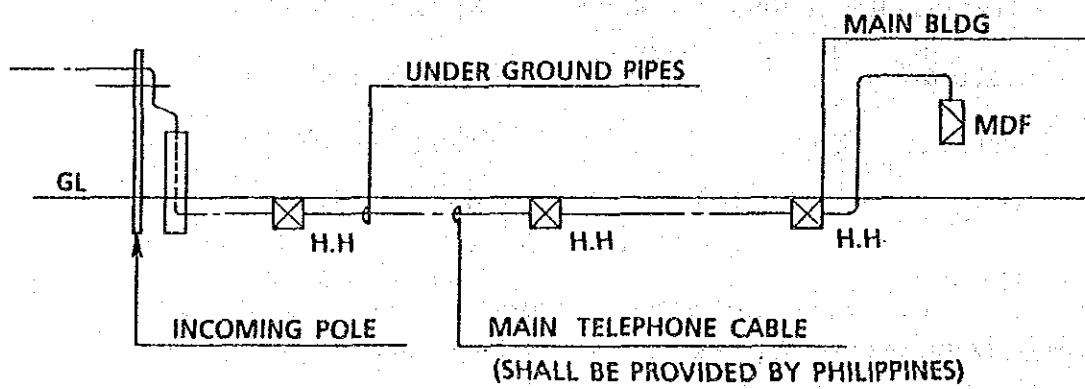
6) Main Telephone Line

The existing PLDT overhead telephone line will be extended to the site. Telephone conduits will be required for further extension to the MDF and those facilities beyond the MDF. All work will be conducted by the PLDT. Piping and wiring on the secondary side of the MDF will be conducted as part of the main construction work.



H.H : HAND HALL

Fig. 4-3-3. Power Supply Diagram



H.H : HAND HALL

Fig. 4-3-4. Telephone Wiring Diagram

7) Telephone Switchboard

Digital telephone switchboard equipment for ten lines will be installed to accommodate some 150 extensions. An on-line connection with a computer system is not planned at this time.

8) Public Address System

An amplifier will be installed in the Administration Office for paging and internal communications, while independent broadcasting equipment will be installed in the Convention Room.

9) TV Reception

A common TV antenna will be installed on the roof and wiring will be made to outlets. As several TV broadcasting stations are located in the area, the reception is good.

10) Fire Alarm System

A push button type fire alarm system will be installed to sound the alarm for fast evacuation.

11) External Lighting

The minimum number of external lights required for security purposes will be provided. Underground cables will be used as conduits.

12) Lightning Rod

A lightning rod will be installed on the roof in view of the frequent lightning in the area.

13) Elevators

The Main Building will be provided with both a passenger elevator and a service elevator.

Table4-3-1. Physical and Chemical Characteristics of City Water

	City Water	Standards by WHO	Remarks
1) PH	6.90	7.0~8.5	OK
2) Turbidity	2.12	5	OK
3) Acidity (mg/l)	2.00	-	No indication in WHO
4) Free CO2 (mg/l)	1.80	-	“
5) Alkalinity (mg/l)	55.40	-	“
6) Bicarbonate	67.60	-	“
7) Hardness (mg/l)	56.00	100~500	OK
8) Chlorides	5.00	Not more than 200	OK
9) Iron	0.05	Not more than 0.3	OK
10) Residual Chlorine (mg/l)	0.30	0.05~0.1	Much but acceptable

Data : Metro Manila Water Works System (19 April 1988)

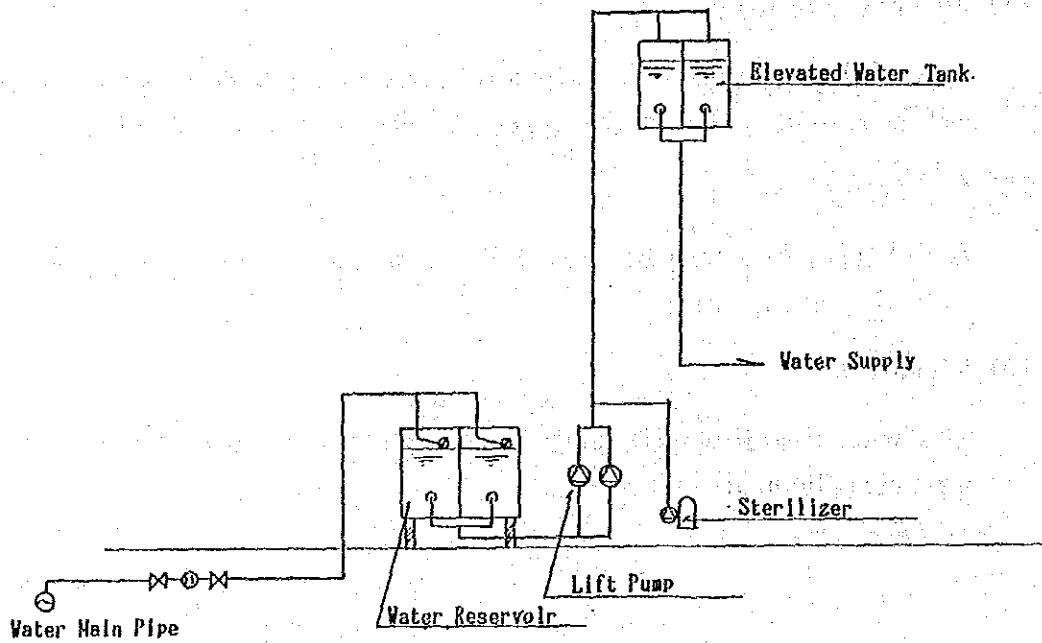


Fig. 4-3-5. Water Supply Diagram

(2) Plumbing and Sanitary Systems

1) Water Supply Source

As a 300ϕ water main is buried under Visayas Avenue to the east of the site with satisfactory water quality, this main will be used to supply water to the Center.

2) Required Water Volume

The maximum water volume required daily is calculated below based on the average water consumption volume per person and the number of persons using the Center.

Staff	539 persons x 100ℓ/person/day	= 53.900ℓ/day
Researchers	174 persons x 200ℓ/person/day	= 34.800ℓ/day
Trainees	40 persons x 200ℓ/person/day	= 8.000ℓ/day
	Total	= 96.700ℓ/day

Including the consumption volume of visitors to the Center, the daily water requirement will be 120m³.

3) Water Supply

A water tank capable of storing the maximum daily water requirement of 120m³ will be provided in view of a possible decrease of the water pressure or cut off in the dry season. Water will be pumped to the elevated water tank, from where it will be supplied by the gravity method.

4) Hot Water Supply

An instantaneous gas water heater will be provided to supply the kitchen with hot water.

5) Drainage

Waste water from the Center will be grouped into three categories, i.e. sewage, waste water from experiments and rain water. Excluding rain water, all waste water will be treated prior to discharge to comply with the Philippines' drainage standards.

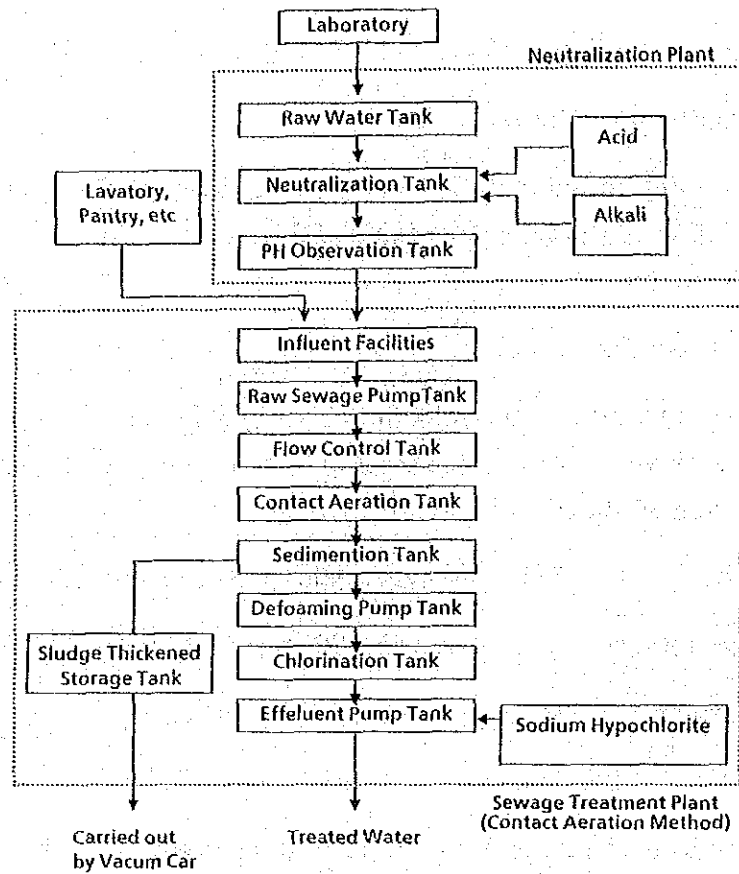


Fig. 4-3-6. Wasted Water Treatment Diagram

Table 4-3-2. Wasted Water Treatment Criteria

PARAMETER	PHILIPPINE *1 STANDARD CLASS C	JAPANESE STANDARD
1. Color	60	-
2. Temperature (°C)	30	-
3. Dissolved Oxygen	5	5
4. BOD (mg/l)	20	20
5. Total Dissolved Solids (mg/l)	1,000	-
6. Total Solids (mg/l)	2,000	-
7. PH	6.5~8.5	5.8~8.6
8. Coliform (/10cc)	5,000	Not more than 3,000
9. Phenolic Substance (mg/l)	0.02	-
10. Arsenic (mg/l)	0.05	0.05
11. Barium (mg/l)	0.05	-
12. Cadmium (mg/l)	0.01	0.01
13. Chrome (mg/l)	0.10	0.05
14. Copper (mg/l)	0.02	-
15. Cyanide (/10cc)	0.05	No appearance

*1. Source : Official Gazette of National Pollution Control Commission

- Sewage

Sewage will be sent to a sewage treatment plant (using contact aeration method) and will then be discharged.

- Waste Water from Experiments

Various undiluted solutions and both primary and secondary treated water will be recovered and further treated using a waste water treatment device. Other types of waste water from experiments will be sent to a neutralization plant and will then be discharged to the sewage treatment plant.

- Rain Water

Rain water from the site will be drained to side ditches and then to the 600φ main drainage pipe along Visayas Avenue together with the treated sewage.

6) Fire-Fighting Facilities

Indoor fireplugs will be installed throughout the Center so that fire-fighting activities can be conducted using fire pumps (the required power will be supplied by the emergency power generator).

7) Gas

LPG cylinders will be provided in the kitchen and experiment rooms.

8) Special Gases

The necessary plumbing for the supply of oxygen, nitrogen helium, acetylene, compressed air, etc. will be conducted.

(3) Air-Conditioning and Ventilation Systems

Air-conditioning and ventilation systems will be introduced with particular stress on a low running cost and easy maintenance while taking such requirements as natural ventilation, heat insulation and shading suggested in the building plan into consideration.

1) Design Conditions

The following outdoor conditions will be adopted based on the average maximum temperature and average absolute humidity in May which is the hottest month (based on Manila's annual weather data).

Temperature – 33.9°C

Humidity – 60%

The following indoor conditions will also be adopted to achieve a balance between the maximum comfort and the lowest running cost.

Temperature – 26°C

Humidity – 50% – 60%

2) Air-Conditioning

An independent air-conditioning system will be introduced and each of the following rooms will be provided with air-cooled separate type air-conditioners:

Offices, research rooms, laboratories, rooms of the Training and Information Department, library, exhibition hall, conference room and lecture rooms

3) Ventilation System

In principle, natural ventilation will be given priority. A mechanical ventilation system will be introduced for those places where natural ventilation cannot satisfy the ventilation required for their functions.

4-4 Equipment Plan

4-4-1 Equipment

The equipment listed below will be required to guarantee the activities of the Center and will be introduced in accordance with the progress of the construction of the Center's buildings.

a. Equipment for Agricultural Land Management and Evaluation

- Equipment for Soil Surveys
- Equipment for Water Resources Surveys
- Equipment for Chemical Analysis
- Equipment for Physical Analysis of Soils
- Equipment for Soil Microbiological Research and Analysis
- Equipment for Topography Surveying
- Equipment for Cartography
- Copiers, etc.

b. Data Processing Equipment

c. Audio Visual and Editing Equipment

- Audio Visual Equipment for Training and Convention Rooms
- Editing Equipment for the production of Training Video Tapes

d. Equipment for Regional Soil Laboratories

Chemical and Physical Analysis Equipment for the 12 Regional Soil Laboratories

e. Communication Equipment

Short-Wave Radio Equipment connecting the Center to the 12 Regional Soil Laboratories

f. Vehicles and Others

- Field Survey Vehicles
- Copiers, etc. for filing Field Survey Results

4-4-2 Equipment Plan

In view of the anticipated activities of the Center, attention should be paid to the following points when selecting the equipment for research, survey, training and public relations purposes.

- The equipment should be of durable quality and due attention should be paid to the spare parts supply capability of the manufacturers so that the operation and maintenance of the Center is not disturbed by a spare parts shortage.
- The equipment to be initially supplied will be those which can be efficiently used by the Center's technicians and researchers.

- Research and Survey Equipment

The equipment to be provided will be those which are necessary for soil surveys and related research in line with the Center's objectives and equipment for general administration purposes will not be provided. As the number of soil and water samples to be analysed is large, the provision of equipment capable of conducting low cost and quick analyses should be planned with stress on the effective utilization of the existing equipment.

- Data Processing Equipment

Soil and water research and development for all farmland in the Philippines, which is the main objective of the Center, requires the accumulation and efficient utilization of data through the analysis of huge number of samples as typically indicated by the preparation and improvement work for soil maps.

The analysis and classification of an enormous amount of survey/research data and the preparation of a database by changing the data to numerical or graphic information for its effective utilization are extremely important and urgent tasks.

In this context, data processing equipment, centralized by the requested general-purpose computer, will be provided. Remote sensing equipment for the image processing of earth resources data transmitted from satellites will be introduced subject to the implementation of the technical cooperation for this field by the Japanese Government. The design scope will be limited to equipment for basic research work. The software to be attached for the

effective functioning of the equipment will be limited to that generally available in the market.

— Communication Equipment

The provision of short-wave radio transmitters is planned to connect the Center with the regional soil laboratories. The function of the transmitters will be limited to sound transmission and their connection to the facsimile or host computer is not considered.

— Audio Visual and Production Equipment

One of the functions of the Center will be the dissemination of the research and development results which play a central role in this regard. In particular, the training of researchers, agricultural engineers and farmers will be extremely important. Simple audio visual equipment, including video recorders and slide projectors, will be provided for lecture rooms and for the convention room, where actual training will be conducted to make the training more effective. Video dubbing and editing equipment and photostat equipment will also be provided for training material production.

— Printer

The printer will be used to produce such agriculture-related maps for the Philippines as topographical maps, land use maps and soil maps. Some 50 different types of maps will be produced for different areas or with different scales and around 1,000 copies of each map will be made. As highly precise multicolor printing is required for map production, the printer will be capable of two color printing with repetition of the printing process achieving multicolor printing.

— Vehicles

As described earlier, the subject of the Center's research and development activities is farmland throughout the Philippines. While the BSWM currently has 11 vehicles, most of them were introduced in the first half of the 1970's. As soil surveys involve a lot of equipment and collection of soil and are usually conducted in areas with poor transportation conditions, these old vehicles cannot fully perform the necessary work. In addition, a microbus will be required for study trips and field surveys for the trainees. Therefore, the provision of vehicles for research and training purposes is planned.

— Meteorological Observation Equipment

Agriculture and the weather are closely related. Since the provision of irrigation facilities is still inadequate in the Philippines, agriculture largely depends on rain water. Soils are, in fact, closely connected with the local climate and can be considered products of the climate. In this context, meteorological observation equipment, including rain gauges, thermometers, hygrometers, heliographs, etc. will be provided for the regional stations.

— Regional Laboratory Equipment

Basic analysis equipment will be provided so that the regional laboratories can quickly respond to requests by farmers or others regarding the conservation or improvement of soils.

4-4-3. List of Equipment

(Phase-I)

I. Research & Survey Department

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
1. ALMED Div.			
1) Land Resources	Soil Color Chart	3	
Inventory Section	Soil Auger	4	
	Soil Core Sampler	2	
	Soil Core Cylinder	34	Set
	Permeability Meter	1	
	Hardness Meter	3	
	Soil Boring Stick	4	
	Pocket Size Alifimeter	3	
	Compass	3	
	Stereoscope Mirror	1	
	Tracing Device	1	
	Pocket Steroscope	4	
	Binoculars	1	
	Electric Planimeter	7	
	Current Meter	1	
	Water Sampler	2	
2) Common Use	Personal Computer	4	
	Serial Printer	2	
2. Soil Survey Div.			
1) Soil Survey	Soil Color Chart	4	
Interpretation	Soil Auger	4	
Section	Soil Core Sampler	2	
	Soil Core Cylinder	33	Set
	Permeability Meter	1	
	Hardness Meter	3	
	Soil Three Phase Analyzer	1	

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
	Soil Boring Stick	4	
	Poket Size Altimeter	3	
	Compass	3	
	Stereoscope Mirror	1	
	Tracing Device	1	
	Poket Steroscope	3	
	Binocular	1	
	Electric Planimeter	5	
	Stereo ZXoom Transfer Scope	1	
2) Common Use	Personal Computer	2	
	Serial Printer	1	
3. Soil Conservation & Management Div.			
1) Soil Conservation Planning Section	Soil Color Chart	2	
	Soil Auger	2	
	Soil Moisture Meter	2	
	Soil Core Sampler	2	
	Soil Core Cylinder	33	Set
	Permeability Meter	1	
	Cone Penetrometer	2	
	Hardness Meter	3	
	Soil Boring Stick	1	
	Poket Size Altimeter	3	
	Compass	3	
	Stereoscope Mirror	1	
	Tracing Device	1	
	Poket Steroscope	2	
	Theodolite, Universal	1	
	Theodolite, Transit	1	
	Binocular	1	
	Electric Planimeter	2	
	Auto-Mechanical Compactor	1	
	ASTH Sieve Set	1	
	Slump Test Apparatus	1	

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
2) Common Use	Personal Computer	2	
	Serial Printer	1	
4. Laboratory Service Div.			
1) Plant Grinder Room	Plant Grinder, Big Type	2	
	Plant Grinder, Small Type	1	
2) Plant Drying Room	Plant Dryer	2	
3) Soil Grinder Room	Jaw Crusher	2	
	Vibration Sieving Machine	1	
4) Heavy Metal Eliminator Room	Heavy Metal Eliminator	1	
5) Special Assay Laboratory	Auto-Diluter	2	
	Auto-Titrater	2	
	Magnetic Stirrer	2	
	Magnetic Stirrer W/Hot Plate	2	
	Pipette Washer	1	
6) Shaker Room	Multi-Shaker	2	
7) Water Still Room No.1	Water Still	2	
8) Hot Room No.1	Temperature Control Oven	3	
	Muffle Furnace	2	
9) Soil Characterization Room	Auto-Diluter	1	
	Auto-Titrater	1	
	Magnetic Stirrer	1	
	Magnetic Stirrer W/Hot Plate	1	1
	Pipette Washer	1	
	Test Tube Mixture	1	
	Vacuum Pump	1	
	Soil Exchange Capacity Analyzer	2	

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
10) Weighing Room	Electronic Top Loading Balance	3	
	Electronic Analytical Balance	3	
	Platform Balance	1	
11) Instrument Room No.1	Electric Conductivity Meter	1	
	pH Meter	2	
	Atomic Absorption	3	
	Flame Spectro-Photometer		
	Spectro-Photometer	2	
	Magnetic Stirrer	1	
	Liquid Chromatograph	1	
	Organic Carbon Analyzer	1	
12) Nitrogen Distillation Room	Auto Titrater	1	
	Magnetic Stirrer	1	
13) Fume Hood Room	Hot Plate	2	
	Semi-Micro-Kjeldahl Digester	4	
	Macro-Kjeldahl Digerster	2	
	Fume Hood, Regular	3	
	Fume Hood, Perchloric	2	
14) Physics Laboratory	Vacuum Pump	1	
	Actual Volume Meter	1	
	Pipette Analyzer	2	
	Volume Weight Tester	1	
	Liquid Limit Device	1	
	Moisture Retention Meter	2	
	Sand Piller Kit	2	
15) Centrifuge Room	High Speed Centrifuge with Refrigerator	1	
	Centrifuge	1	
	Shaker	2	

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
16) Water Still Room No.2	Water Still	1	
17) Hot Room No.2	Hot Plate	2	
	Water Bath	1	
18) Inoculate Room	Clean Bench, Vertical Type	1	
	Clean Bench, Horizontal Type	1	
19) Sterilizer Room	Autoclave	2	
	Dry Air Sterilizer	1	
20) Biological Preparation Room	Auto-Diluter	1	
	Jar Fermenter	1	
	Continuous Control System		
	Pipette Washer	1	
21) Culture Room	Incubator	3	
22) Common Use	Personal Computer	2	
	Serial Printer	1	

5. Soil Water Research Div.

1) Instrument Room No.2	Electric Conductivity Meter	1	
	pH Meter	1	
	Atomic Absorption Flame	2	
	Spectro-Photometer		
	Spectro-Photometer	1	
2) Fertilizer & Fer- tility Laboratory	Auto-Diluter	1	
	Auto-Titrater	1	
	Magnetic Stirrer	1	
	Magnetic Stirrer w/Hot Plate	1	
	Pipette Washer	1	

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
3) Mineralogy Laboratory	Certrifuge	1	
	Auto-Diluter	1	
	Magnetic Stirrer	1	
	Mechanical Stirrer	1	
4) X-Ray. DTA Room	X-Ray Diffraction	1	
	DTA-TGA Analyzer		
5) Microscope & Weighing Room	Biological Microscope	1	
	Polarizing Microscope	1	
	Electro-Top Loading Balance	1	
	Electro-Analytical Balance	1	
6) Biological Laboratory	pH Meter	1	
	Shaking Bath	1	
	Test-Tube Mixer	1	
	Gas Chromatograph	1	
7) Common Use	Personal Computer	2	
	Serial Printer	1	
6. Cartography Div.	Process Camera	1	
	Whirler	1	
	Printing Frame	1	
	Offset Proof Press (2 color)	1	
	Supporting Materials for Printing Equipment	1	L.S.
	Personal Computer	2	
	Serial Printer	1	
	Digitizer	2	
7. Water Resources Management Div.			
Common Use	Personal Computer	1	
	Serial Printer	1	

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
8. Lab. Service Div. & Soil/Water Research Div.			

Common Use	Center Table with 1 sink	18	
	Center Table with 2 sinks	1	
	Center Table with 1 sink & Rack	5	
	Side Table (3.0m)	23	
	Side Table (2.4m)	5	
	Side Table (1.5m)	42	
	Side Table (1.2m)	16	
	Side Table (0.9m)	10	
	Corner Table	22	
	Sink Table (1.5m)	14	
	Sink Table (0.9m)	3	
	Working Table (1.8m)	2	
Laboratory Glassware	1 L.S.		

II. Special Project & Services Department

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
1. Satellite Center	SSB/HF Telecommunication	13	

III. Administrative Department

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
1. Administrative Div.	Personal Computer	1	
	Serial Printer	1	
2. Finance Div.	Personal Computer	1	
	Serial Printer	1	
3. General Services Div.	Vehicles, Station-Wagon	4	
	Vehicles, Pick-Up	4	
	Copier	1	
	Laminating Machine	1	

(Phase II)

I. Integrated Soil Resources Information System Department

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
ISRIS	Main CPU	1 L.S.	
	Magnetic Disk Unit	1 L.S.	
	Magnetic Tape Unit	1 L.S.	
	Line Printer	1	
	Terminal Display	10	
	Personal Computer	2	
	Serial Printer	2	
	XY Plotter	1	

II. Special Project & Services Department

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
1. Remote Sensing Div.	Graphic Display *	1	
	Hard Copy *	1	
	Drum Scanner *	1	
	Photo-Printer *	1	

Note : Those equipment marked with asterisk "*" will be provided subject to the implementation of the technical cooperation for Remote Sensing by the Government of Japan.

2. Satellite Center

Spectro-Photometer	12
Electric Oven	12
Top Loading Balance	12
Hot Plate	12
Water Still	12
pH Meter	12
Electric Conductivity Meter	12
Flame Photometer	12
Mechanical Stirrer	12
Viscous Analyzer	12
Fume Hood	12

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
2. Satellite Center	Shaker	12	
	Semi-Micro-Kjeldahl	12	
	Digester		
	Rain Gauge	12	
	Thermo-Psychrometer	12	
	Wind Direction Anemometer	12	
	Sunshine Recorder	12	
	Evaporation Pan	12	

III. Training & Information Dissemination Department

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
1. Training Div.			
1) Lecture Room	Video Projector	1	
	Video Screen	1	
	Slide Projector	1	
	Slide Screen	2	
	Overhead Projector	2	
	OHP Screen	2	
	Microphone, Tie-Pin Type	1	
	Microphone w/Stand	1	
	Amplifier-Mixed w/Rock	1	
	Speaker	1	
	Video Deck	1	
2) Convention Hall	Video Projector	1	
	Video Screen	1	
	Slide Projector	1	
	Slide Screen	1	
	Overhead Projector	1	
	OHP Screen	1	
	Wireless Microphone	1	
	Microphone w/Stand	1	
	Speaker	1	
	Video Deck	1	

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
3) Editing Room	Portable Video Camera	2	
	Editing System	1 L.S.	
	Tape	1	

IV. Administrative Department

<u>Room Name</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Remarks</u>
1. Administrative Div.	Vehicles : Microbus	1	