Ministry of Agriculture
The Republic of Indonesia

No.

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT
OF
ANIMAL HEALTH LABORATORIES FOR DIAGNOSISES
OF AVIAN INFLUENZA AND
OTHER MAJOR DISEASES OF ANIMALS
IN
THE REPUBLIC OF INDONESIA

August 2007

JAPAN INTERNATIONAL COOPERATION AGENCY

The Consortium of Nihon Sekkei, Inc. and Fujita Planning Co., Ltd.

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PREFACE

In response to a request from the Government of the Republic of Indonesia, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Animal Health Laboratories for Diagnosises of Avian Influenza and Other Major Diseases of Animals and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Indonesia a study team from February 5th to March 2nd, 2007.

The team held discussions with the officials concerned of the Government of Indonesia, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Indonesia in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Indonesia for their close cooperation extended to the teams.

August 2007

Masafumi Kuroki
Vice President
Japan International Cooperation Agency

August 2007

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of Animal Health Laboratories for Diagnosises of Avian Influenza and Other Major Diseases of Animals in the Republic of Indonesia.

This study was conducted by the Consortium of Nihon Sekkei, Inc. and Fujita Planning Co., Ltd. under a contract to JICA, during the period from January to August 2007. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Indonesia and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

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

Very truly yours,

Takeshi Endo
Project Manager

Basic Design Study Team on
the Project for Improvement of Animal Health Laboratories for
Diagnosises of Avian Influenza and Other Major Diseases of Animals

The Consortium of Nihon Sekkei, Inc. and Fujita Planning Co., Ltd.

Summary

The Republic of Indonesia (hereafter Indonesia) has its eastern edge at longitude 141 º east in Western Papua (Irian Jaya) on New Guinea Island, its western edge at longitude 95 º east in Banda Aceh on Sumatra, its northern edge at 5º north in Kalimantan and southern edge at 10 º south in Timor. Its population is 245 million (Indonesian Government estimate for 2006) and has a land area almost five times as large as Japan of approximately 1.89 million square kilometres consisting of over 15 thousand islands including Java the most populous island.
Mass deaths of chickens occurred in several provinces in central Java in August 2003, and the Indonesian government confirmed in January 2004 that the cause of death was “Highly Pathogenic Avian Influenza (HPAI) virus (H5N1)”. Poultry, and particularly chicken, are staples of the Indonesian diet, with about 1.3 billion birds being raised nationwide by most of the farming population, which makes up 42.1% (FAO 2003) of the total population of Indonesia. Since avian influenza (AI) could not only have a large impact on the national economy through directly affecting the livelihoods of subsistence farmers that comprise the majority of Indonesia’s farming sector, but could also cause widespread social unease if it were to spread among humans, preventing its spread is an urgent issue. The government accordingly implemented vaccination programs and sanitization measures such as the extermination of all poultry in affected broods. However, since AI continued to spread to 29 of the country’s 33 provinces, and 213 of its 444 regencies, the government has taken further measures to control the epidemic, drawing up a priority plan titled “National Strategy Plan for Avian Influenza Control and Pandemic Influenza Preparedness 2006-2008” (hereafter NSP) in December 2005, and establishing a National Committee in March 2006. Under the NSP, in December 2005 Indonesia’s Ministry of Agriculture drew up the “National Strategy Work Plan (hereafter NSWP) for the Proactive Control of HPAI in Animals”, in which it set the following project goals:

- Stronger HPAI prevention an eradication system
- Strengthening of vaccination and selective extermination measures
- Strengthening of proactive surveillance and monitoring
- Improvement of diagnostic and vaccine quality control capabilities of Disease Investigation Centers (DIC), which are responsible for disease control and eradication
- Strengthening of quarantine system for both domestic and overseas transport of chickens

The Ministry of Agriculture’s Directorate General for Livestock Services (DGLS) is the organization responsible for implementing HPAI prevention measures under these plans. The two islands of Java and Sumatra are home to 63% of Indonesia’s population of 245 million (as of 2006), with Java in 1995 accounting for 46% (114 million) and Sumatra 17% (41 million). The two islands are also home to 70% of the total national domesticated poultry population, mostly chicken. Therefore, DGLS is putting priority on improving the HPAI prevention system in these two islands, and has formulated a plan for improving DIC inspection and diagnosis capabilities. Under this plan, DGLS is seeking to strengthen and improve AI inspection and diagnosis capabilities by constructing a new DIC in West Java, which includes Jakarta and boasts the highest population density and number of poultry farmers nationwide and where the number of disease control facilities was insufficient to cover the area, , and by similarly enhancing capabilities at two existing DICs in Medan in the north and Lampung in the south of Sumatra, the two areas of the island that have the densest population and number of poultry farmers.
The project has three sites, one in the vicinity of Subang, a city Central Java approximately 2 hours by car from the capital Jakarta, and two sites in existing DIC compounds, a site in Medan in North Sumatra, the second most populous island, and a site in Lampung, southern Sumatra.
Subang is located 40 km inland from the sea at 100meters above sea level. The highest average annual temperature is 31.2℃ and lowest average annual temperature is 24.9℃. The average humidity is 70.1%, but is very humid (over 85 %) between November to April during the rainy season. Annual rainfall is 1700mm about the same as for Tokyo.
Medan is 20km inland from the Malacca Straits. The highest average annual temperature is 32.8℃ and lowest average annual temperature is 23.8℃. Humidity is high throughout the year at 84.4%. Annual rainfall is 1760mm about the same as for Tokyo and is constant throughout the year.
Lampung is port city facing the Sunda Straits. The highest average annual temperature is 31.5℃ and

lowest average annual temperature is 22.5℃. Humidity is high throughout the year at 80.4%. Annual rainfall is 1290mm with the rainy season between November and April.

The summary of the project is provided below.

Total Schedule: 23.5 months including Detail Design and tendering.
Structure: Reinforced concrete structure, single story with a portion two stories high.
Summary of Facilities and Equipment: see Table1-1 below;

Summary of the Project

Building	Section	Facilities	Equipment
DIC Subang	Administrative section	Reception, offices, director's office, management office	
	Training section	Seminar and meeting rooms	
	Laboratory block	Epidemiology lab, reception Bacteriology, pathology, parasitology labs Examination Room, Washing room, Cell preparation room necropsy room, sterilization room, staff changing room Virology and molecular virology labs Molecular virology necropsy room	Autoclave, Tissue Embedding Apparatus, Rotary Microtome, Freezing Microtome, Binocular Microscope, Inverted Microscope, Fluorescence Microscope, Refrigerated Centrifuge, High-Speed Refrigerated Centrifuge, CO_2 Incubator, Egg Incubator, Biosafety Cabinet, Real Time PCR, Necropsy Table, Spectrophotometer , Ultrasonic Cleaner, Pure Water Apparatus, etc.
		Subtotal 2,384.6 sqm	
	Poultry and small animal housing	Animal care staff room Poultry and small animal houses	
		Subtotal 244.7 sqm	
	Building services	Water supply and purification facility, wastewater treatment system, generator, incinerator	
		Subtotal 336.0 sqm	
		Total 2,965.3 sqm	
DIC Medan	AI diagnosis block	AI examination room, necropsy room, PCR diagnosis lab, sterilization room, Cell preparation room, staff changing room, epidemiology lab, reception	Necropsy Table, Autoclave, Inverted Microscope, Refrigerated Centrifuge, Deep Freezer -80°C, CO_2 Incubator, Egg Incubator, Biosafety Cabinet, Laminar Flow Cabinet, PCR Workstation, etc.
		Subtotal 564.0 sqm	
	Poultry house	Animal care staff room, poultry house	
		Subtotal 152.5 sqm	
	Building services	Water supply and purification facility, wastewater treatment system	
		Subtotal 137.0 sqm	
		Total 853.6 sqm	
DIC Lampung	AI diagnosis block	AI laboratory, necropsy room, sterilization room, staff changing room, epidemiology lab, Cell preparation room, reception	Autoclave, Inverted Microscope, Fluorescence Microscope, Refrigerated Centrifuge, CO_2 Incubator, Biosafety Cabinet, Egg Incubator, Spectrophotometer, etc.
		Subtotal 460.3 sqm	
	Poultry house	Animal care staff room, poultry house	
		Subtotal 152.5 sqm	
	Building services	Water supply and purification facility, wastewater treatment system	
		Subtotal 120.7 sqm	
		Total 733.5 sqm	
		Grand total 4,552.4 sqm	

The cost for the Project is estimated to be Japanese Yen 2049 million (Japanese Grant Aid Portion J¥1,781 million, Indonesian Government Portion J¥268 million).
The operation and maintenance cost for the Project facilities in DIC Subang are estimated to be Indonesian Rp521,907,000 (approximately J¥7.46 million) for the initial year (2009) after completion and IRp790,390,000 (approximately J¥11.335 million)for successive years. The costs for DIC Medan are estimated to be Indonesian Rp620,000,000 (approximately J¥8.90 million) for the initial year (2009) after completion and IRp719,000,000(approximately J¥10.330 million)for successive years. The costs for DIC Lampung are also estimated to be Indonesian Rp620,000,000 (approximately J¥8.90 million) for the initial year (2009) after completion and IRp719,000,000(approximately J¥10.330 million)for successive years. The budget for operation and maintenance of the Project facilities are distributed by DGLS, which has recognized the additional costs to be incurred by the new facilities and equipment to be provided by the Project and has agreed to acquire the necessary budgetary funding to rectify the deficit. Therefore, it is judged that there will be no impediments to the operation and maintenance of the Project facilities.

The following direct benefits are expected when the project is implemented;

1. Numbers of Examination and Diagnosis of AI and other veterinary diseases in all Java will be increased by 60% from the present 12,00cases annually by 2009 when the new DIC Subang is completed.
2. The present annual HPAI diagnosis numbers are 22,000 for DIC Medan and 23,000 for DIC Lampung. The numbers will be increased by 50% in 2009 when the new AI diagnosis laboratories are completed at each site.
3. The provision of appropriate facilities proper delivery, pre-treatment, diagnosis and after procedures will enable the establishment of Operation Standards which incorporate maintenance of Bio-Safety measures.

The following indirect benefits are also expected;

1. Procedures for maintaining bio-safety in the facility environment will be established and an efficient and sustainable maintenance system with preventive maintenance norms will be established.
2. Diagnostic data will be recorded, contributing to policy decisions on the prevention and eradication of AI and other strategic veterinary diseases.
3. Environmental concerns of the neighbouring communities will be reduced from the completion of appropriate facilities and equipment for the diagnosis of Ai and other strategic veterinary diseases.

The direct benefits of the Project are improved examination and diagnosis of veterinary diseases through the provision of facilities and equipment for the appropriate and safe handling of HPAI by the veterinary staff. The three project sites will cover the area of 70% of livestock farmers and provide facilities for effective control measures against HPAI and other strategic veterinary diseases for 155million people corresponding to 63% of the total population.
Furthermore, Soft Component activities will be carried out on transferring technical know how for safe operation and maintenance of AI diagnosis facilities and equipment to further ensure the benefits from the implementation of the Project. The Soft component activities at each DIC will aim to organically complement the technical assistance being carried out for PCR diagnosis and other equipment training by US Department of Agriculture (USDA) and Australian International Cooperation Agency (AusAID). The activities will take into consideration the capabilities of the newly employed staff, technical levels, financial capabilities, state of access to consumables and spare parts, state of maintenance, etc and seek to reduce operation and maintenance costs and assist in the organization of a technically and financially sustainable structure.

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Location Map

The Republic of Indonesia

Artist’s Rendering (DIC Subang)

Artist’s Rendering (DIC Medan)

Artist’s Rendering (DIC Lampung)

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Chapter 2

ABBREVIATIONS

A/B	Banking Arrangement
A/P	Authorization to Pay
AI	Avian Influenza
BH	Biohazard
BSL	Bio-Safety Level
Balitvet	Domestic Animal Sanitation Laboratory
DGLS	The Ministry of Agriculture's Directorate General for Livestock Services
DIC	Disease Investigation Center
E/N	Exchange of Notes
GDP	Gross Domestic Product
GNI	Gross National Income
HPAI	Highly Pathogenic Avian Influenza
JASS	Japanese Architectural Standard Specification
JICA	Japan International Cooperation Agency
JIS	Japan Industrial Standard
NSP	National Strategy Plan for Avian Influenza Control and Pandemic Influenza Preparedness 2006-2008
NVDAL	National Veterinary Drug Analysis Laboratory
Rp.	Rupiah

Chapter 1. Background of the Project

CHAPTER 1. Background of the Project

The Indonesian Minsitry of Agriculture (hereafter “MOA”), the responsible agency for the agricultural field in the NSP implemented the “National Strategy Work Plan for Proactive eradication of HPAI in Animals” (NSWP) in December 2005 and is carrying out the following activities.

1. Stregnthing of reporting organization to local Health Centers of poultry suspected of AI infection and on site examination, sample collection and AI diagnosis at AI infected areas.
2. Strengthing of selective elimination (restricted extermination), sterilization, vaccinization activiyies in identified infected areas.
3. Conducting epidemiological surveys, idenfiying infection routes, and infection propagation situation in infected areas.
4. Strengthing of domestic and overseas quarrantine organization
5. Increased educational activities for residents
6. Improvement of facilities and equipment at Veterinary Diseases Investigation Centers (hereafter “DIC”) entrsuted with eradication activities and improvement of diagnostic capabilities.
7. Improvement of vaccine quality control functions

DICs are at the center of diagnosis and examination of veterinary diseases and functional improvement, strengthening and reinforcement of facility and equipment for AI diagnosis and the acquisition of examination and diagnostic technology have become urgent.

Indonesia has urgently introduced diagnostic equipment, but the technical level of veterinary disease diagnosis is insufficient for the appropriate operation and accurate diagnosis of the facilities and equipment.
At present the Food and Agriculture Organization (FAO) is coordinating efforts by various donors to assist in the acquisition of this technical knowledge.
On the other hand, improvement of functional capabilities and facilities requires high level technical know how and technology in the design and construction of the facilities for the appropriate handling the highly infectious viruses involved in AI diagnosis. Theses capabilities are not available in Indonesia. The Directorate General for Livestock Services (DGLS), the responsible and implementing agency in the Ministry of Agriculture, submitted a request for Grant Aid Assistance to Japan, a leading country in this field, in February 2006.

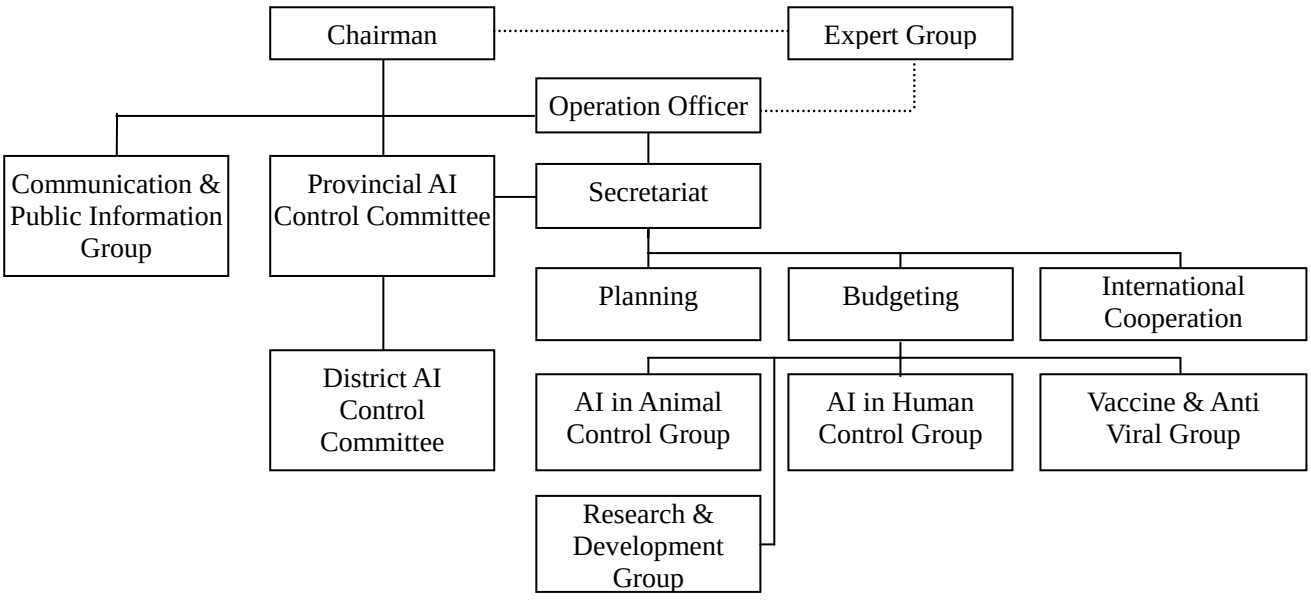


Figure 1-1 Organization of National Strategy Committee

The original request addressed the requirements for "Improvement of Diagnosis of In Agencies for eradication(DIC)" and "Improvement of Vaccine Quality Control Functions" and requested (1) Provision of Facilities and Equipment for the National Veterinary Drug Analysis Laboratory (NVDAL) which is responsible for quality control of veterinary pharmaceuticals, (2) Construction of New DIC in Eastern Java where poultry population is very dense and the incidence of HPAI is high, (3) improvement of facilities and equipment at DIC Medan and DIC Lampung.
Based on the request the Government of Japan conducted a preliminary survey and refined the requested items following discussions with Indonesian Government. Based on the results of the preliminary survey, a Basic Design Study was conducted in February 2007 and the request from the Indonesian Government was finalized during the Study.

Table 1-1 Changes in Contents of Request

	Original Request of February 2006	Request following October 2006 Preliminary Survey	Final Request
NVDAL	Renewal of Diagnosis Lab:450 ㎡ Related facilities:370 ㎡ Water Treatment Facilities	Renewal of Diagnosis Lab Related facilities Water Treatment Facilities	Deleted from Project
DIC Subang	Facility Diagnosis Lab Block: Diagnosis: 850 ㎡ Administration: 500 ㎡ Seminar: 300 ㎡ Staff Housing: 900 ㎡ Total 2,350 ㎡ Animal House: 300 ㎡ Small Animal H.:300 ㎡ Generator, Incinerator: 300 ㎡ Equipment for above activities	Same as left	Facility Lab: Pathology, Virology (incl. AI Diagnosis) , Bacteriology, Epidemiology, Parasitology, Necropsy Administration: 500 ㎡ Seminar: 300 ㎡ Staff Housing: 900 ㎡ Total 2,350 ㎡ Animal House: 300 ㎡ Small Animal H.:300 ㎡ Generator, Incinerator: 300 ㎡ Equipment for above activities
DIC Medan	Facility AI Diagnosis Lab: 390 ㎡ Poultry House, Small Animal House, Garage Equipment for above activities	Facility AI Diagnosis Lab Incinerator, Generator Water Treatment Facility, Garage Equipment for above activities	Facility AI Diagnosis Lab: AI Diagnosis, Necropsy, PCR Diagnosis Poultry House, Water Treatment Facility Equipment for above activities
DIC Lampung	Facility AI Diagnosis Lab: 536 ㎡ Equipment for above activities	Facility AI Diagnosis Lab Incinerator, Generator, Poultry House, Garage Equipment for above activities	Facility AI Diagnosis Lab: AI Diagnosis, Necropsy, PCR Diagnosis Poultry House, Water Treatment Facility Equipment for above activities

Preliminary Survey results showed that although the requested NVDAL improvements for diagnosis laboratory facility and equipment was intended for improving quality control of vaccines, it was judged that the improvement of Ai diagnosis facilities and equipment for the DICs at the forefront of the prevention and eradication of AI in Indonesia was most urgent. Its was decided to prioritize the construction of a new DIC in west Java and improvment of the facilities and equipment at DIC Medan and DIC Lampung.

Figure 1-2 Location of DICs

Java is the most heavily populated island with the largest concentration of poultry. However, the only DIC conducting the diagnosis of HPAI is located in Yogyakarta in central Java. The average numbers of AI diagnosis conducted at this facility is 12,000 cases annually. This represents only 20% of the actual need. The population of domesticated poultry is concentrated in western Java where Jakarta is located and is also the area with a high concentration of human population. However, since the distance to DIC Yogyakarta, which covers West Java, is over 500km, some samples are carried to another organization under Ministry of Agriculture, BALITVET, which has similar diagnosis functions. Therefore, the construction of a new DIC in Subang, which is centrally situated in western Java, which has the highest demand for HPAI diagnosis is judged to be also the most effective.

There are presently three DICs in Sumatra. Of these, the DIC located in Medan, North Sumatra, the largest city in Sumatra, and the DIC in Lampung, South Sumatra, are located in areas with dense population of both poultry and humans where demand for HPAI diagnosis is high. However, the present number of AI diagnosis in Medan is approximately 3,000 cases annually, approximately 6,500cases in Lampung, corresponding to only 50% and 60% respectively of actual demand. The Government of Indonesia is urgently improving the organization for AI eradication and prevention and vaccine quality control in these areas, but there are difficulties in procuring the necessary funds and the technical expertise required in the design and construction of HPAI diagnosis facilites is not available in Indonesia. The facilities and equipment of DIC Medan and DIC Lampung were constructed and procured in 1978 under Japanese Government Grant Aid. Accordingly the Government of Indonesia submitted arequest to the Japanese Government for Grant Aid aisstance. Based on the results of the preliminary survey conducted by the Government of Japan in 2006, the existing DIC facilities are structurally sound and have recieved refurbishing of the interior floors and walls. New incinerators have been recently begun operations. However, the water supply equipment is barely functinoning; water filters are no longer functioning, underground watertanks and pumps are in extreme disrepair and water supply to diagnosis equipment do not meet water quality requirements. There are no reserved entry points or specialized laboratories for diagnosis of HPAI and other strategic veterinary diseases and samples are recieved at the common front reception and examined in normal laboratories and the staff are exposed to the highly infectious samples. The contamination of surrounding neighborhood from infected water discharge and waste is another serious concern.

According to the results of the preliminary survey conducted by the Gvernment of Japan in 2006, the request from DGLS concerning a total of three sites, the construction of a new DIC with AI diagnosis facilities and equipment in Subang, West Java and the extension of the AI diagnosis facilities and equipment and related facilities for the two existing DICs in Medan and Lampung, Sumatra are justified.

Chapter 2. Contents of the Project

CHAPTER 2. CONTENTS OF THE PROJECT

2-1 Basic Concept of the Project

Poultry, and particularly chicken, are staples of the Indonesian diet, with about 1.3 billion birds being raised nationwide. They are raised by almost all of the farming population, which makes up 42% of the total population of Indonesia., Since avian influenza (AI) could not only have a large impact on the national economy through directly affecting the livelihoods of subsistence farmers that comprise the majority of Indonesia's farming sector, but could also cause widespread social unease if it were to spread among humans, preventing its spread is an urgent issue, and the government accordingly implemented vaccination programs and sanitization measures such as the extermination of all poultry on affected farms. However, since AI continued to spread to 29 of the country's 33 provinces, and 213 of its 444 regencies, the government has taken further measures to control the epidemic, drawing up a priority plan titled "National Strategy Plan for Avian Influenza Control and Pandemic Influenza Preparedness 2006-2008" (hereafter NSP) in December 2005, and establishing a National Committee on Avian Influenza Control Campaign 2006-2008 (hereafter NSP) in March 2006. Under the NSP, in December 2005 MOA drew up a National Strategy Work Plan (hereafter NSWP) for the Progressive Control of Highly Pathogenic Avian Influenza in Animal, Avian Influenza Control Campaign 2006-2008, in which it set the following project goals:

- Stronger HPAI prevention system
- Strengthening of vaccination and selective extermination measures
- More proactive surveillance and monitoring
- Improvement of diagnostic and vaccine quality control capabilities of institutions, particularly Disease Investigation Centers (DIC), which are responsible for disease eradication and prevention
- Stronger quarantine system for both domestic and overseas transport of chickens

The Ministry of Agriculture's Directorate General for Livestock Services (DGLS) is the organization responsible for implementing HPAI prevention measures under these plans. Because the two islands of Java and Sumatra are home to 63% of Indonesia's population of 245 million (as of 2006), with Java in 1995 accounting for 46% (114 million) and Sumatra 17% (41 million), DGLS is putting priority on improving the HPAI prevention system in these two islands, and has formulated a plan for improving DIC inspection and diagnosis capabilities. Under this Project, DGLS is seeking to strengthen and improve AI inspection and diagnosis capabilities by constructing a new DIC in West Java, where the number of disease control facilities was insufficient to cover the area, which includes Jakarta and boasts the highest population density and number of poultry farmers nationwide, and by similarly enhancing capabilities at two existing DICs in Medan in the north and Lampung in the south of Sumatra, the two areas of the island that have the densest population and number of poultry farmers. The Project will provide facilities and equipment to improve the inspection and diagnosis of animal diseases enabling livestock hygiene staff to safely and appropriately carry out handling of HPAI virus specimens. The three projects can be expected to contribute significantly to measures for controlling AI and other livestock diseases in regions that account for 63% (155 million) of Indonesia's population and about 70% of its poultry farmers.

The facilities and equipment to be provided under this Project are summarized in Table 2-1 below.

Table 2-1 Summary of Project Facilities and Equipment

Building	Section	Facilities	Equipment
DIC Subang	Administrative section	Reception, offices, director's office, management office	
	Training section	Seminar and meeting rooms	
	Laboratory block	Epidemiology lab and reception Bacteriology, Pathology, Parasitology labs Washing room, Cell Culture room, Necropsy room, sterilization room, staff changing room Virology and molecular virology labs Cell preparation room Molecular virology necropsy room	Autoclave, tissue embedding apparatus, rotary microtome, freezing microtome, binocular microscope, inverted microscope, fluorescence microscope, refrigerated centrifuge, high-speed refrigerated centrifuge, CO_2 incubator, egg incubator, biosafety cabinet, real time PCR, necropsy table, spectrophotometer , ultrasonic cleaner, pure water apparatus, etc.
		Subtotal 2,490.4sqm	
	Poultry and small animal housing	Animal care staff room Poultry and small animal housing	
		Subtotal 244.7sqm	
	Building services	Water supply and purification facility, wastewater treatment system, generator, incinerator	
		Subtotal 230.2sqm	
		Total 2,965.3sqm	
DIC Medan	AI diagnosis block	AI examination room, necropsy room, PCR diagnosis lab, sterilization room, staff changing room, epidemiology lab, reception	Necropsy table, autoclave, inverted microscope, refrigerated centrifuge, deep freezer -80°C, CO_2 incubator, egg incubator, biosafety cabinet, laminar flow cabinet, PCR workstation, etc.
	Poultry house	Animal care staff room, poultry house	
	Building services	Water supply and purification facility, wastewater treatment system	
		Total 853.6qm	
DIC Lampung	AI diagnosis block	AI laboratory, necropsy room, sterilization room, staff changing room, epidemiology lab, reception	Autoclave, inverted microscope, fluorescence microscope, refrigerated centrifuge, CO_2 incubator, biosafety cabinet, egg incubator, spectrophotometer, etc.
	Poultry house	Animal care staff room, poultry house	
	Building services	Water supply and purification facility, wastewater treatment system	
		Total 733.5sqm	
		Grand total 4,552.4sqm	

2-2 Basic Design of the Assistance Project

2-2-1 Design Policy

(1) Basic Policy

1) Facility plan

① With regard to the Project, the facilities and equipment for Subang will be the minimum required not only to handle molecular virology and other forms of examination and diagnosis required for the prevention of avian influenza (hereafter, AI), but also to serve as a full DIC facility. The facilities for DIC Medan and DIC Lampung will be the a the minimum required to carry out the AI examination and diagnosis procedures not possible at present and minimum of related facilities.

② The main component of the Project for DIC Medan and DIC Lampung will be extensions to existing facilities. Indonesia will carry out the demolition of existing facilities and arrange alternative facilities for the duration of the construction period in line with the Project.

③ During the construction period, every effort will be made to ensure that ongoing activities are affected as little as possible by construction.

④ For the basic design of the DIC Subang facility, architectural, structural and building services components will be planned to enable Indonesia to expand the facility as per its requirements in the future.

⑤ The facility management and control systems designed for the three DICs will be of a technological level that is appropriate with the facility management and maintenance capabilities of Indonesian management personnel. Each DIC are designed for economical operations with a small staff while at the same time enabling technologically appropriate maintenance and management.

⑥ High-risk wastewater from the AI blocks of the DIC Medan and DIC Lampung and from all facilities of DIC Subang will undergo high-pressure sterilization. For DIC Subang, wastewater from the whole facility including the AI sections will be subjected to environmentally appropriate treatment before being discharged through soil infiltration.

⑦ The Project facilities will be designed to ensure the safety not only of the personnel involved in examination and diagnosis, but also of the surrounding population.

2) Equipment plan

① The equipment plan will ensure that the three DICs are capable of fulfilling the purpose of this Project by performing their designated role at the forefront of Indonesia's measures for combating AI and other strategic animal diseases.

② For existing facilities, the number of personnel involved in examination and diagnosis, technological level, funding capabilities, and management and maintenance capabilities will be reviewed so as to ensure that the equipment plan enables self-sustainable development of the facilities from both technological and financial perspectives.

③ AVRs will be provided for equipment that are vulnerable to damage from voltage fluctuations.

④ Six months of consumables will be provided in accordance with the time required by Indonesia to commence local procurement.

⑤ A procurement plan composed mainly of equipment from Japanese or third country manufacturers has been drafted. Priority has been placed on availability of local or neighbouring country servicing capability.

⑥ Relatively inexpensive consumables that Indonesia can procure through its own efforts and consumables for periods beyond the first six months are not included in the Project.

⑦ Operation manuals for the equipment will be in English.

⑧ The Project will provide equipment not duplicated by other donor countries and assistance agencies.

(2) Physical Environment Policy

1) Temperature and humidity

Indonesia straddles the Equator, with Northern Sumatra, Kalimantan, Sulawesi and other islands to the north, and South Sumatra, Java, and Lesser Sunda Islands including Bali and Lombok to the south, and also includes the western part of New Guinea. The country is situated in the tropical monsoon zone, with little significant fluctuation in temperature throughout the year.
Subang lies about 120 km east of Jakarta and about 40 km inland from the Java Sea coast at an altitude of approximately 100 m. About 20 km south of Subang is a mountain range rising to about 1,800 m. mean maximum temperature is 31.2 °C, and mean minimum 24.9 °C. Average humidity is relatively low at 70.1%, but rises to 85% and above outside the dry season of May to October, a high level of humidity that makes air conditioning a vital requirement for examination and diagnosis facilities.

Temperature (°C)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
27.0	27.0	28.0	28.0	28.0	27.5	27.5	28.0	29.0	29.0	28.5	28.0	27.9 ℃

Source: Indonesia Statistical Yearbook 2006 Edition

Medan is located about 20 km inland from the Strait of Malacca in North Sumatra at an altitude of 35 m. Mean maximum temperature is 32.8 ºC, and mean minimum 23.8 ºC. The lack of distinct wet and dry seasons in this region means that Medan is hot and humid throughout the year, making air conditioning a vital requirement for examination and diagnosis facilities.

Temperature (°C)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
26.8	27.1	27.6	27.4	27.8	27.7	27.4	27.4	26.8	26.5	26.8	26.5	27.2 ℃

Source: Polonia Airport Meteorological Station 2002-2006

Humidity (%)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
85.2	84.8	82.2	84.7	83.0	83.1	83.5	82.4	84.6	86.9	85.7	87.0	84.4%

Source: Polonia Airport Meteorological Station 2002-2006

Lampung is a port city at Sumatra's southern tip facing the Sunda Strait. Its DIC is located in the outskirts 3 km inland from the city center. Mean maximum temperature is 31.5 ºC, and mean minimum 22.5 ºC, with little significant fluctuation in temperature throughout the year. Although humidity drops slightly between July and December, average humidity is high at 80.4%, making air conditioning a vital requirement for examination and diagnosis facilities.

Temperature (°C)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
26.5	27.0	27.0	27.0	26.5	26.5	26.5	27.0	27.0	27.5	27.5	27.0	26.9 ℃

Source: Indonesia Statistical Yearbook 2006 Edition

Humidity (%)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
83.0	84.0	84.0	87.0	85.0	81.0	79.0	73.0	69.0	-	-	79.0	80.4%

2) Rainfall

Owing to seasonal winds, regions of Indonesia to the north of the Equator generally experience a wet season from May to October, while south of the Equator, south-westerly seasonal winds bring rain between November and April. One of the three construction locations for this project, Medan, lies north of the Equator, while the other two—Lampung and Subang—lie south of the Equator, and share the same seasonal rainfall pattern.

Subang receives annual rainfall of 1,655.9 mm, which is incidentally similar to Tokyo (1,450 mm). Rain falls mainly as heavy squalls during the rainy season between November and April, when daily average rainfall is 8-9.5 mm. Since total rainfall is not much higher than Japan, slightly strengthened Japanese roof drain design criteria will be employed. Roof and balcony drains, wastewater pipes and outside gutters of a size and capacity that can accommodate local rainfall conditions will be provided.

Rainfall (mm)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
274.1	245.3	244.6	194.5	77.9	55.8	17.3	7.9	18.7	75.9	198.9	245.0	1655.9

Medan receives 1,762.1 mm of rain annually. While rainfall rises slightly in September and October, Medan is notable for the high amount of rain it experiences year round. To accommodate this high rainfall, strengthened Japanese roof design criteria will be employed Roof and balcony drains, wastewater pipes and outside gutters of an appropriate size and capacity will be provided.

Rainfall (mm)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
150.0	115.0	146.0	190.0	212.0	206.0	210.0	199.0	426.0	320.0	152.0	253.0	2579.0

Lampung receives 1,286.7 mm of rain annually, which is relatively low for Indonesia. The rainy season is from November to April. Japanese criteria for selecting roof will be employed and balcony drains, wastewater pipes and outside gutters of an appropriate size and capacity will be provided.

Rainfall (mm)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
207.0	203.8	165.7	107.5	73.0	47.1	59.3	38.0	50.2	59.0	118.8	157.3	1286.7

3) Wind direction and strength

The examination and diagnosis sections of the three facilities covered by the Project will be provided with air conditioning, but communal areas and various equipment and other rooms will rely on mechanical or natural ventilation. Accordingly, building layout and location of openings etc. will be designed to make the most of prevailing winds.

Wind direction and strength (m) (Medan)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
SE	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	SW	WSW	SE
3.2	3.5	3.6	3.4	3.5	3.6	3.7	3.9	4.0	4.1	3.7	4.2	3.7

4) Sunlight, UV light and salt damage

Medan is located in northern Sumatra, 20 km inland from the Strait of Malacca at a latitude of 3° 30´ N, and while it does not suffer salt damage, it is exposed to strong sunlight and UV rays. Accordingly roof slabs will be provided with external insulation to reduce the heat load. The plan for the DIC Medan AI block will also be designed to reduce the impact of afternoon sun on the building.

DIC Lampung is located in southern Sumatra 10 km inland from the coast of the Sunda Strait between Sumatra and Java at a latitude of 5° 27´ S. Like DIC Medan, it does not suffer salt damage, but is exposed to strong sunlight and UV rays, and the roof will be provided with external insulation to reduce the heat load, and the AI block will be designed to reduce the impact of afternoon sun on the building.

Subang lies in western Java about 40 km inland from the Java Sea coast at latitude of 6° 33´ S and an altitude of approximately 100 m. Like the DIC Medan, it will not suffer salt damage, but will be exposed to strong sunlight and UV rays. Accordingly the roof will be provided with external insulation to reduce the heat load, and the AI block will be designed to reduce the impact of afternoon sun on the building.

5) Historical Disasters

Indonesia lies in the vicinity of two of the world's three major earthquake zones, and experiences both underwater earthquakes and volcanic activity. Indonesia uses a system of seismic design standards and permits that is modelled after Japan, but is applied only to DKI Jakarta. Though these standards are not applied to the three locations of this project, the design will comply with the Jakarta seismic design standards.

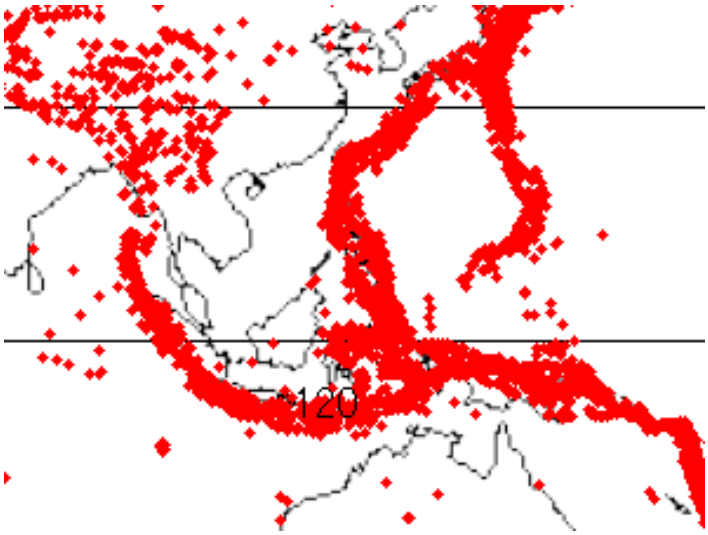


Figure 2-1 Earthquake Distribution

According to the Geographical Survey Institute, no significant wind damage has been reported for Indonesia, and no records of flood damage exist for the three locations concerned. The Subang site lies on a plateau about 8 m higher than surrounding rivers and has no record of past flooding. The site has an incline of about 1/50 and observed good drainage.

The city of Medan has poor drainage properties, and accordingly suffers localized flooding, but although the DIC Medan is within the city limits, it is located in an area that poses little risk of flooding.

As with Medan, Lampung has poor drainage properties, and accordingly suffers localized flooding after squalls, but the DIC Lampung is located in an area that poses little risk of flooding.

(3) Socioeconomic Policy

Although Indonesia has a per capita GNP of US$ 1,140 (2004) and is striving to join the ranks of developed nations, it is still unable to allocate sufficient budget for healthcare fields and related sectors. Particularly in the field of improvement under Japanese Grant Aid of livestock hygiene laboratories for control of AI and other strategic animal diseases, attention needs to be paid to ensuring the sustainability of the labs through planning that takes account of technological levels and the need to reduce running costs of the facilities and equipment.

(4) Construction and Procurement, Industry Circumstances and Business Practices

Indonesia has a generally vibrant construction industry. Working hours in private sector businesses are 8.00-13.00 and then 15.00-17.00 from Mondays to Fridays, with Saturdays and Sundays off. However, government agencies have a half-day on Fridays, also.

(5) Local Contractor Policy

The construction of the proposed facilities for the examination and diagnosis of viruses and other pathogens involves work of considerable complexity. While local contractors have grown in size, they lack the technical expertise to carry out the construction of examination facilities to the required high standards. Consequently a Japanese contractor will oversee the project and use local subcontractors. There are many local construction companies with experience in Japanese ODA-related work, and contractors with proven track records will be chosen.

(6) Management and Maintenance Capabilities of the Implementing Agency

1) Facility plan

Mechanical and electrical equipment and systems appropriate to the maintenance and management capabilities of the Indonesian side will be selected in the facility planning. Priority will be placed wherever possible on the local procurement of materials and building services systems requiring maintenance, and to select items that help to reduce running costs. Priority will be placed on selection of materials and equipment that can be procured locally to ensure easy periodical refurbishing and renovation of the facilities.

2) Equipment plan

For this project, maintenance costs will be reduced by selecting equipment that can be maintained without problem at current Indonesian skill levels, and that require as few consumables as possible.

(7) Facility and Equipment Grade Policy

1) Facility plan

While rudimentary regulations regarding building-to-land ratio, floor area ratio and so forth exist, there are no architectural standards applicable in the three project locations. DKI Jakarta standards are used in lieu of local standards for general purposes. For items not covered by DKI Jakarta standards, Japanese standards for fireproofing, safety, evacuation and such like will be applied. Facility plans that incorporate local customs in terms of size and required facilities will also follow Japanese research and diagnosis facility design standards where applicable. The design will be functional with minimum ornamentation. Materials and fittings for exterior and interior facings, window frames and other fittings will be selected that are durable and require as little maintenance as possible, and can be repaired easily at local skill levels.

2) Equipment Procurement Plan

The grade of equipment will be set at a level that matches the technical skills of current DIC personnel. According to our investigation of the locations, the voltage of the electricity provided by local power companies fluctuates significantly enough to cause damage to

certain equipment, and such items will be provided with AVRs. The city water is also very hard, and autoclaves, water distillers and the like will be provided with water softeners to prevent degradation of their inner parts and to prolong useful life..

(8) Construction and Procurement Methods and Construction Period

1) Construction methods

Almost all materials to be used for the foundation, main frame and finish can be procured locally. Materials of a quality that meets Japanese, Australian and American standards are available locally, and while special materials will be procured in Japan or third countries, it is unlikely that any procurement problems serious enough to affect construction period will be encountered.

2) Procurement methods

Excluding pass boxes and small items such as door locks and fittings, almost all construction materials can be procured locally. However the quality of certain Indonesian cements, aggregates, bricks, masonry, tiles and such are not acceptable. As such, priority will be placed on selection of locally available materials to ensure ease of maintenance and reduction of running costs, along with careful considerations of quality, performance and durability of the facilities over the long term,

Equipment items of the required quality are not available in Indonesia, and will be procured from a third country or Japan. Third country procurement from European and American equipment for which regular maintenance is critical or which is expensive to transport from Japan will also be considered.

3) Construction schedule

Construction materials and equipment for bio-hazard area such as wall and ceiling interior facings, gaskets for ensuring the hermetic sealing of doors, and pass boxes require a level of quality that is not available in Indonesia, and such products will accordingly be imported from Japan or a third country. A construction schedule will be drafted that takes into account the time required for transport and customs procedures for these items as well as actual construction.

Furthermore, to ensure the smooth progress of this project in line with Japan’s grant aid program schedule, It is vital to gain assurance that Indonesia completes all preparatory works such as the required demolition of existing facilities at Medan and Lampung and land levelling prior to the scheduled commencement of construction works, and that electricity and water supply works are carried out without delay in line with construction schedule for Japanese funded works. To this end, Japan’s schedule will be explained thoroughly to the Indonesian authorities, and Indonesian side schedule will be reviewed for implementing the required works, including the allocation of necessary budget.

2-2-2 Basic Plan

2-2-2-1 Overall Project Description (Study of the Request)

(1) History of Request for Cooperation

1) Facility

Based on a study entitled National Strategic Planning for the Control and the Suppression of Avian Influenza announced by the Indonesian government in December 2005, the Ministry of Agriculture announced National Strategic Work Plan for the Proactive Eradication of HPAI in Animals, which contained policies for the strengthening of administrative measures for the prevention of infectious diseases in domesticated animals, including a February 2006 request to the Japanese government for Grant Aid assistance. In response to this request, the Japanese government conducted a preliminary study in September and October 2006, followed by discussion with the Indonesian government to define the scope of the request. Based on these results, following a basic design study in February 2007, the Indonesian government finalized the scope of the request. The following is a summary of the history of the scope of the request.

	Request of February 2006	Request following Preliminary Study of February 2006	Final Request Items
National Veterinary Drug Analysis Laboratory (NVDAL)	Refurbishment area Diagnosis Laboratories：450 ㎡ Related area：370 ㎡ Water Supply Facility	Refurbishment area Diagnosis Laboratories Related area Water Supply Facility	Deleted from Project
Disease Investigation Center DIC Subang	Facility Diagnosis Laboratories： Diagnosis Lab: 850 ㎡ Administration: 500 ㎡ Lecture: 300 ㎡ Staff Housing: 900 ㎡ Total 2,350 ㎡ Animal House: 300 ㎡ Small Animal House: 300 ㎡ Generator, Incinerator: 300 ㎡ Equipment for above activities	Same as left	Facility Diagnosis Laboratories: Pathology, Virology (incl, AI Diagnosis), Bacteriology, Epidemiology, Parasitology, Necropsy Administration: Animal House: Poultry House, Small Animal House Building Services：Power Supply , Generator, Water Supply, Drainage, Sewage (incl, Sterilization) Equipment for above activities
DIC Medan	Facility AI Diagnosis La: 390 ㎡ Poultry House, Small Animal House, Garage Equipment for above activities	Facility AI Diagnosis Lab Incinerator, Generator, Water Supply Facility, Garage Equipment for above activities	Facility AI Diagnosis La: AI Diagnosis Lab, Necropsy, PCR Diagnosis Lab, Poultry House Water Supply Facility Equipment for above activities
DIC Lampung	Facility AI Diagnosis La: 536 ㎡ Equipment for above activities	Facility AI Diagnosis Lab Incinerator, Generator, Poultry House, Garage Equipment for above activities	Facility AI Diagnosis La: AI Diagnosis Lab, Necropsy, PCR Diagnosis Lab, Poultry House Water Supply Facility Equipment for above activities

2) Equipment

Changes made to items requested in the October 2006 preliminary study follow below.

On checking the individual details of requested equipment, we reviewed the list with the Indonesian authorities, and have removed items already purchased by themselves and items whose role can be performed by other equipment, and items whose requirement for AI diagnosis are low. We have also removed inexpensive items and

animal health-related items that have only a tenuous relation with AI and that we feel the Indonesian authorities should be able to procure through their own efforts.

Table 2-2 Items removed from the DIC Subang equipment list

No.	Name of Equipment	Reason for removal
2	Cell preparation Microscope	Overlaps with inverted microscope.
22	Gas Chromatograph	Equipment for Veterinary Public Health unrelated to AI diagnosis
23	HPLC	Ditto
24	Glassware	Can be provided by Indonesian budget.
25	Microplate	Nondurables do not qualify for grant aid.
30	Refrigerator	Commercially available item that we feel Indonesia itself can supply
35	Operational Vehicle	Ditto
36	Desktop Computer	Ditto
37	Notebook Computer	Ditto
38	LCD Projector	Ditto
40	DNA Sequencer	Operation and maintenance unfeasible at current skill level and maintenance budget

Table 2-3 Items removed from the DIC Medan equipment list

No.	Name of Equipment	Reason for removal
13	Ice Chamber	Judged unnecessary, since specimens are normally stored in ordinary refrigerators, freezers or deep freezers.
16	Automatic Staining Apparatus	Already procured with Indonesian budget for 2006
21	Reagent for PCR	Reagents do not qualify for grant aid.
22	Reagent for RT-PCR	Reagents do not qualify for grant aid.
23	Ambulator Car	Specially outfitted cars are not required, and locally manufactured cars will suffice.

Table 2-4 Items removed from the DIC Lampung equipment list

No.	Name of Equipment	Reason for removal
4	Paraffin Oven	Existing equipment is still usable.
10	Tissue Embedding Apparatus	Already procured with Indonesian budget for 2006
12	Pathology Workstation	Judged that existing shelves etc. will suffice.
22	Pressure/Vacuum Pump	Inexpensive item that we feel Indonesia itself can supply
26	Polypropylene Plate	Nondurables do not qualify for grant aid.
31	Stainless Steel Work Table	Judged that existing work tables will suffice.
32	DNA Sequencer	Operation and maintenance unfeasible at current skill levels and maintenance budget
37	PCR Workstation	Already procured with Indonesian budget for 2007
39	Evaporator	Animal health equipment unrelated to AI diagnosis
42	Water Bath	Existing equipment is still usable.
43	Homogenizer	We judged this item to be unnecessary for the preparation of specimens (internal organs).
45	Glassware	We feel that Indonesia itself can supply this item.
46	Ambulator Car	Specially outfitted cars are not required, and locally manufactured cars will suffice.

Indonesia has requested the following additional equipment for countering AI and other major animal diseases that was not included in the list submitted on the occasion of the preliminary study.

Table 2-5 DIC Subang : Additional requested equipment

No.	Name of Equipment	Reason for request
43	Real Time PCR	Used to conduct speedy quantitative PCR diagnosis
44	Image Acquisition for Electrophoresis Application	Used in PCR diagnosis
45	Egg Incubator	Used for preparing the embryonic eggs employed in virus isolation
46	Ultrasonic Cleaner	Used to clean glassware
47	Freezer -20°C	Used to store blood serum for tests, etc.
48	Water Distiller	Used to produce the distilled water emplyed in preparing medium and rinsing glassware
49	Hot Air Sterilizer	Used to dry and sterilize equipment
50	Liquid Nitrogen Tank	Required for storing AI viruses, cells
51	Necropsy Table	Used to dissect chickens
52	Automatic Staining Apparatus	Used in histopathological examinations
53	Tissue Embedding Apparatus	Ditto
54	Freezing Microtome	Ditto
55	Paraffin Oven	Ditto
56	Section Flotation Bath	Ditto
57	Multi Block Embedding Set	Ditto
59	Slide Cabinet/Block Cabinet	Required for storing AI histopathology specimens for five years
60	Wax Dispenser	Used in histopathological examinations
61	Cover slipper	Ditto
62	Blood Analyzer	Used in chicken blood analysis
63	Magnetic Stirrer	Used to prepare reagents, etc.
64	PCR Workstation	Used in PCR diagnosis
65	Dry Block Bath	Used to dry samples
66	Shaking Water Bath	Used to shake and adjust temperature of medium, etc.
67	Vortex Mixer	Used in various test procedures
68	Pipette Washer	Used to wash pipettes
69	Freezer -50°C	Used to freeze specimens and samples prior to deep freezer at -80oC
70	Immuno Staining Apparatus	Used in immuno-histochemistry analysis
71	Binocular Microscope w/Camera	Used to record histopathology results
72	Dark field Microscope	Required for investigating AI/leptospirosis relationship
73	Hematocrit Centrifuge	Used to measure chicken hematocrit
74	Biochemistry Analyzer	Used to investigate overall body condition of chickens
75	Spectrophotometer	Used to quantify extracted RNA/DNA

Table 2-6 DIC Medan : Additional requested equipment

No.	Name of Equipment	Reason for request
27	UV Transilluminator w/ Polaroid Camera	Used to photograph gels
28	Centrifuge (A)	Required for preparation of specimens, etc.
29	Microplate Centrifuge	Required for PCR diagnosis processes
30	Microplate Washer	Used in ELISA tests
31	Electronic Balance	Required for reagent preparation
32	Stereoscopic Microscope	Used in isolating specimens for histopathology, etc.
33	pH Meter	Required for preparing reagents, etc.
34	Liquid Nitrogen Tank	Required for storing AI viruses, cells
35	Dark field Microscope	Required for investigating AI/leptospirosis relationship

36	Binocular Microscope w/Camera	Used to record histopathology results
37	Freezer -50°C	Used to freeze specimens and samples prior to deep freezing at-80ºC
38	Immuno Staining Apparatus	Used in immuno-histochemistry analysis
39	Slide Cabinet/Block Cabinet	Required for storing AI histopathology specimens for five years
40	Necropsy Table	Used to dissect chickens
41	Dry Block Bath	Used to dry samples
42	Shaking Water Bath	Used to shake and adjust temperature of medium, etc.
43	Hot Air Sterilizer	Used to dry and sterilize equipment
44	Freeze Dryer	Used to freeze dry specimens for long-term storage or sending overseas
45	Flake Ice Maker Machine	Used to make the ice required for electrophoresis

Table 2-7 DIC Lampung : Additional requested equipment

No.	Name of Equipment	Reason for request
47	Dark field Microscope	Required for investigating AI/leptospirosis relationship
48	Spectrophotometer	Used to quantify extracted RNA/DNA
49	Liquid Nitrogen Tank	Required for storing AI viruses, cells
50	Magnetic Stirrer	Used to prepare reagents, etc.
51	Fluorescent Microscope	Used for immunofluorescence assays
52	Electronic Balance	Required for reagent preparation
53	Automatic Tissue Processor	Used in histopathological examinations
54	Cover slipper	Ditto
55	Blood Analyzer	Used in chicken blood tests
56	Hematocrit Centrifuge	Used to measure chicken hematocrit
57	Biochemistry Analyzer	Used to investigate overall body condition of chickens
58	Freezing Microtome	Used in histopathology examinations
59	Stereoscopic Microscope	Used in isolating specimens for histopathology, etc.
60	Micropipette	Used for various test procedures
61	Immuno Staining Apparatus	Used in immuno-histochemistry analysis
62	Circulation Water Bath	Used to prepare reagents
63	Dry Block Bath	Used to dry samples
64	Shaking Water Bath	Used to shake and adjust temperature of medium, etc.
65	Flake Ice Maker Machine	Used to make the ice required for electrophoresis

(2) Analysis of Contents of Request

1) National Veterinary Drugs Assay Laboratory (NVDAL)

The original request from the Indonesian government contained provisions for the construction of a BSL3 level vaccine inspection facility as a part of NVDAL, but preliminary study by the Japanese government uncovered the following concerns regarding the construction of this facility.

① The difficulty of sustainable finding and financing salaries for personnel qualified to maintain a BSL3 level facility.

② The difficulty of obtaining the understanding and approval of the local community for the construction of a BSL3 level facility handling highly pathogenic disease agents..

③ Although the objective of the planned facility is to confirm the efficacy of vaccines through viral attack testing, it was learned that in 2007 the Indonesian government plans to build a BSL3 level inspection facility as a part of a domestic animal sanitation laboratory (Balai Pelitian Veteriner: Balitvet).

④ Testing of vaccines would be possible at the planned facility described in item 3 above, should that facility be built.

For the above reasons, it was decided to eliminate the construction of a BSL3 level facility at the NVDAL, and the Indonesian government accepted this decision after hearing an explanation given during the basic design study.

2) DIC Subang

The Indonesian government wishes to build a new DIC in Subang for the following reasons.

① Indonesia is comprised of a great number of islands, and the diagnosis of infectious diseases, including AI, among domesticated animals is performed at seven DIC located throughout the nation. In spite of the fact that 46% of the population and more than 70% of the domesticated chickens exposed to AI are kept on the island of Java, there is only one DIC located in the center of the island in Yogyakarta.

② The island of Java extends for nearly 1000 km from east to west, but with Yogyakarta located in the center of the island, diagnosis on the western side of the island, where there is a high concentration of both people and poultry, is not yet sufficient, and there is an urgent need for a DIC on the western side of the island to carry out diagnosis of infectious diseases, including AI.

③ Currently, inspection and diagnosis of major diseases, including AI, accommodates only 20% of the total need on Java, and this percentage suffers in comparison with 50% at DIC Medan or 60% at DIC Lampung.

④ Since the DIC in Yogyakarta is presently unable to accommodate all requests for inspection and diagnosis, the Bogor Domesticated Animal Sanitation Laboratory is currently providing support as an emergency measure.

Based on the above conditions, the construction of a DIC in Subang—close to the center of the densely populated western region, which includes the capital city of Jakarta—is expected to help strengthen implementation of measures for the control of AI and other infectious diseases among the many domesticated animals in 24 prefectures in western Java that are currently served by the Yogyakarta DIC.

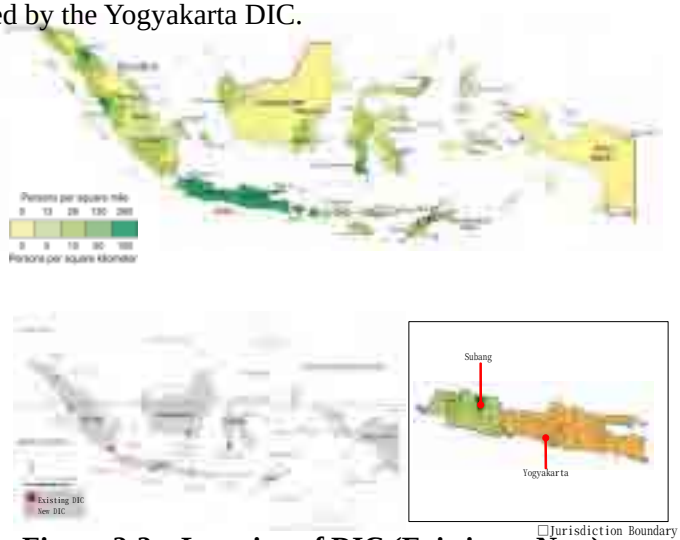


Figure 2-2 Location of DIC (Existing + New)

Scope of Facility

The contents of the request for a new DIC facility are as follows:

① Facilities for the diagnosis of AI and other major infectious diseases of domesticated animals, ② Administrative offices, ③ Lecture halls, ④ Poultry house and small animal house, ⑤ Electrical generator and incinerator, ⑥ Staff residences, ⑦ Garage

① Disease diagnosis facilities

Facilities requested as a part of this project include those for pathology, viral diagnosis, microbes, epidemiology and parasites. Each of these is a part of the standard layout for all other DIC. In addition, this project includes an AI inspection facility for the inspection and diagnosis of major diseases such as avian influenza. The scope of this request represents the minimum needed to function as a DIC, and is therefore considered a reasonable request for facilities for molecular virus level inspection and diagnosis of AI and other major animal diseases. Since it is essential that each of these facilities be independent of all others, it is also essential that each have its own independent air conditioning system. Thus the layout must include a machinery room and other rooms to accommodate the needs of facility supervisors and staff.
Although the size of the DIC staff for this new facility has yet to be determined, DGLS has agreed to employ staff members as shown in the table below. The nucleus of the new staff will be formed by experienced veterinarians and their assistants, who will be transferred from existing DIC.

	Veterinarian	Technician	Other Staff	Total
No. of personnel	9	19	33	61

② Administrative offices

Facilities necessary for administrative, accounting, and general affairs personnel are included in this project.

③ Lecture halls

Existing DIC are equipped with lecture halls for use in the training of Indonesian employees and volunteers who participate in epidemiological surveys by experts from international agencies, and are therefore required for this project.

④ Poultry house and small animal house

A request was made for pens in which to keep mice, rats, and other small animals as well as a chicken coop for egg-laying chickens, all of which are necessary for inspection and diagnosis, and are therefore required for this project.

⑤ Electrical generator and incinerator

Highly pathogenic disease agents will be handled at the planned DIC, but the supply of electrical power in the Subang region is unstable, with frequent outages, and an electrical generator is considered necessary to supply emergency power to certain rooms. The facilities will have a public water supply, but will require water of a high quality for inspection and diagnosis, and a water purification facility is considered necessary. Furthermore, wastewater from the facility must be chemically disinfected and discharged to the local watershed, and a water treatment facility is considered necessary. Accordingly, all these facilities are required for the project.

⑥ Staff residences

Although a total of 8 housing units for staff members were requested for this DIC, the Japanese government does not ordinarily provide Grant Aid assistance for residences. This was explained to the Indonesian government, which will construct these facilities as the project progresses under own budget.

⑦ Garage

Although garage facilities for vehicles used to transport test specimens were requested for this DIC, the facilities at existing DIC were not of any specialized design, and the

Japanese government does not ordinarily provide Grant Aid assistance for non-specialized facilities. This was explained to the Indonesian government, which will construct these facilities under its own funding as the project progresses.

3) DIC Medan

The DIC Medan is not presently equipped with facilities for the diagnosis of AI, and modification of a portion of the existing viral inspection and diagnosis facility for this purpose was necessitated. The situation poses a grave risk not only to staff members involved in inspection and diagnosis but to the local community, as well. Given this situation, a facility suitable for the inspection and diagnosis of AI and other strategic infectious diseases of domesticated animals will be constructed as a part of this project. PCR diagnosis and cell culturing facilities were not a part of the initial request. However FAO and USAID have introduced a single PCR diagnostic unit, which is currently being operated in a temporary laboratory fashioned out of a former storage space. Since PCR diagnosis and cell culturing are indispensable to AI diagnosis, the construction of these facilities as a part of this project has been deemed reasonable.

① Project Site

In early studies, the area labelled A in the figure below was deemed suitable for the expansion, but on-site inspection revealed that this area is currently the site of underground facilities for treating wastewater from the main facility as well as a soak pit for the disposal of wastewater. Since this area was not suitable, the areas labelled B and C were chosen for consideration. However B also turned out to be problematic, and finally C was chosen as the building site. Part of site C is occupied by a small Veterinary Public Health (VHP) facility, and cross contamination with any adjacent AI diagnosis facility is a concern. Thus, it will be necessary during the detail design stage to give careful consideration to the prevention of cross contamination.

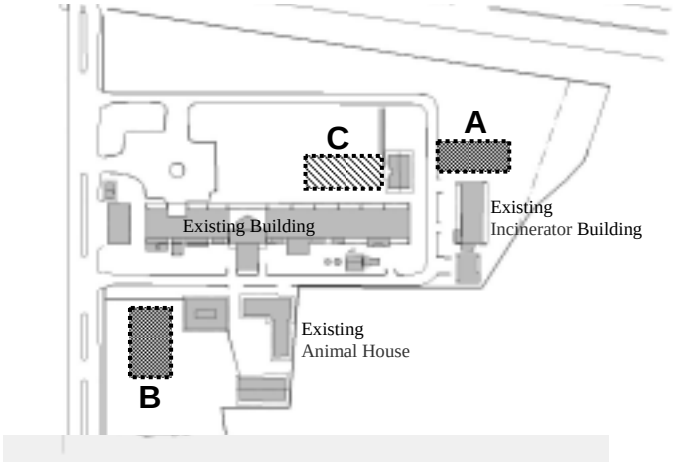


Figure 2-3 Medan Site Analysis

② AI diagnosis facility

This project includes plans for the construction inside existing buildings of facilities for inspection and diagnosis that require the handling of viruses that cause highly infectious diseases such as avian influenza. These will require an epidemiology department for the acceptance of test tubes containing blood samples and specimens, a dissection facility, an AI diagnosis facility, as well as locker room and disinfecting facilities for the staff. This project also includes the aforementioned PCR diagnosis unit and cell culturing facilities.

③ Poultry house

This project includes the construction of poultry house for housing 200 chickens for use in raising hen eggs for use in the isolation of viruses.

④ Water treatment facilities

The existing water treatment facilities are decrepit and no longer function. A water treatment system with a filtering unit for the water supply to the AI facility is an essential element of this project.

⑤ Electrical generator facility

Although preliminary surveys did include a request for an electrical generator, on-site inspection revealed that the Indonesian government had independently completed an upgrade from 50 to 100 KVA diesel generator. An emergency generator facility has been eliminated from this project on the premise that the existing facility has the capacity to provide sufficient power and that the necessary power can be provided by the Indonesian government.

⑥ Garage

The request included vehicles for the transport of specimens as well as a garage for these vehicles. Two vehicles for that purpose were provided to this facility in 2006 by the World Organization for Animal Health (OIE), but both are mass market vehicles with no specialized design, and the request was eliminated from this project in accordance with the principles of Grant Aid assistance. Vehicles used to transport specimens, however, do need to be disinfected by fumigation or other method, and this project does include provisions for the construction of an area for such a facility with drainage and wastewater treatment on a road near the garage.

4) DIC Lampung

The DIC Lampung is not presently equipped with facilities for the diagnosis of AI, and modification of a portion of the viral inspection and diagnosis facility for this purpose was necessitated. This situation same as at DIC Medan, poses a grave risk not only to staff members involved in inspection and diagnosis but to the local community, as well. Given this situation, a facility suitable for the inspection and diagnosis of AI and other major infectious diseases of domesticated animals will be constructed as a part of this project. Cell culturing facilities were not a part of the initial request. However FAO and USAID are introducing PCR diagnostic equipment and since cell culturing is indispensable to AI diagnosis, the construction of these facilities as a part of this project has been deemed reasonable.

① Project Site

In early studies, the area labelled A in the figure below was deemed suitable for the expansion, but a request from the Indonesian government, saying that the relationship with the PCR diagnosis facility in an existing facility made B a more desirable location, led to further study. It was then found that an existing building in area B houses a lecture hall that is often visited by ordinary students, and the potential for cross contamination in proximity to the AI department made this choice untenable. Thus, the original choice of area A was chosen as the building site.

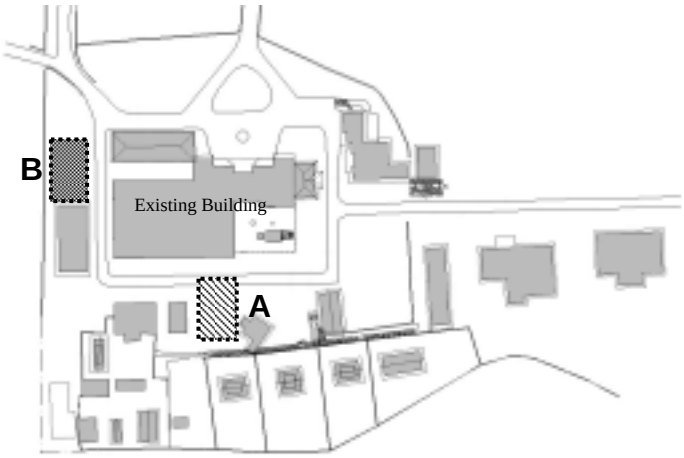


Figure 2-4 Lampung Site Analysis

② AI diagnosis facility

This project includes plans for the construction inside existing buildings of facilities for inspection and diagnosis that require the handling of viruses that cause highly infectious diseases such as avian influenza. These will require an epidemiology department for the acceptance of test tubes containing blood samples and specimens, a dissection facility, an AI diagnosis facility, as well as locker room and disinfecting facilities for the staff. This project also includes the aforementioned PCR diagnosis unit and cell culturing facilities.

③ Poultry house

This project includes the construction of poultry house for housing 200 chickens for use in raising hen eggs for use in the isolation of viruses.

④ Water treatment facilities

The existing water treatment facilities are decrepit and no longer functional. A water treatment system with a filtering unit for the water supply to the AI facility is an essential element of this project.

⑤ Electrical generator facility

Although there was a request for an electrical generator for this facility, the Indonesian government has completed its own upgrade at Medan, and we requested that they do so for this site as well. Thus, the electrical generator facility has been eliminated from this project on the premise that the existing facility has the capacity to provide sufficient power and that the necessary power can be provided by the Indonesian government.

⑥ Garage

The request included vehicles for the transport of specimens as well as a garage for these vehicles. The garage itself, however, included no specialized design, and the request was eliminated from this project in accordance with the principles of Grant Aid assistance. Vehicles used to transport specimens, however, do need to be disinfected by fumigation or other method, and this project will include provisions for the construction of an area for such a facility with drainage and wastewater treatment on a road near the garage.

5) Equipment Plan

The Table 2-8 below shows the final equipment requested for each facility, and quantity of each item listed.

Table 2-8 Final list of equipment requested

No.	Name of Equipment	Priority	Requested Quantity
DIC Subang			
1	Binocular Microscope	A	3
2	Cell preparation Microscope	C	-
3	Fluorescent Microscope	A	1
4	Inverted Microscope	A	4
5	Incubator	A	5
6	CO2 Incubator	A	3
7	Biosafety Cabinet	A	5
8	Refrigerated Centrifuge	A	3
9-1	Centrifuge (A)	A	2
9-2	Centrifuge (B)	A	1
10	Ultracentrifuge	B	1
11	Dionized Water Apparatus	A	1
12	Automatic Tissue Processor	A	1
13	Microtome	A	1
14	PCR Thermal Cycler	A	1
15	UV Transilluminator w/Polaroid Camera	A	1
16	Microplate Centrifuge	A	1
17	Electrophoresis Apparatus	A	1
18	Flake Ice Maker Machine	A	1
19	ELISA Machine/ELISA Washer	A	1
20	Necropsy Instrument Set for Large Animal	A	3
21	Necropsy Instrument Set for Small Animal	A	3
22	Gas Chromatograph	C	-
23	HPLC	C	-
24	Glassware	C	-
25	Microplate 96 wells	C	-
26	Water Bath (A)	A	8
27	Micropipettes	A	9
28	Microplate Shaker	A	3
29-1	Laminar Flow (A)	A	1
29-2	Laminar Flow (B)	A	1
30	Refrigerator	C	-
31-1	Deep Freezer -80°C, Vertical	A	4
31-2	Deep Freezer -80°C, Horizontal	A	1
32	Stereoscopic Microscope	B	1
33	pH Meter	A	4
34	Electronic Balance	A	5
35	Operational Vehicle	C	-
36	Desktop Computer	C	-
37	Notebook Computer	C	-
38	LCD Projector	C	-
39	Freeze Dryer	A	1
40	DNA Sequencer	C	-
41-1	Autoclave (A)	A	2
41-2	Autoclave (B)	A	5
41-3	Autoclave (C)	A	1
42	Animal Carrier with Clean Box	B	1
43	Real Time PCR	B	1
44	Image Acquisition for Electrophoresis Application	B	1

No.	Name of Equipment	Priority	Requested Quantity
45	Egg Incubator	B	3
46	Ultrasonic Cleaner	B	2
47	Freezer -20°C	B	3
48	Water Distiller	B	1
49	Hot Air Sterilizer	B	3
50	Liquid Nitrogen Tank	B	1
51	Necropsy Table	B	1
52	Automatic Staining Apparatus	B	1
53	Tissue Embedding Apparatus	B	1
54	Freezing Microtome	B	1
55	Paraffin Oven	B	1
56	Section Flotation Bath	B	1
57	Multi Block Embedding Set	B	1
59	Slide Cabinet/Block Cabinet	B	1
60	Wax Dispenser	B	1
61	Cover slipper	B	1
62	Blood Analyzer	B	1
63	Magnetic Stirrer	B	6
64	PCR Workstation	B	2
65	Dry Block Bath	B	1
66	Shaking Water Bath	B	2
67	Vortex Mixer	B	7
68	Pipette Washer	B	2
69	Freezer -50°C	B	1
70	Immuno Staining Apparatus	B	1
71	Binocular Microscope w/Camera	B	1
72	Dark field Microscope	B	1
73	Hematocrit Centrifuge	B	1
74	Biochemistry Analyzer	B	1
75-1	Spectrophotometer	B	1
75-2	Spectrophotometer	B	1
DIC Medan			
1-1	Autoclave (A)	A	2
1-2	Autoclave (B)	A	5
2	PCR Workstation	A	2
3	Egg Incubator	A	1
4	Deionized Water Apparatus	A	1
5	Pipette Washer	A	2
6	Ultrasonic Cleaner	A	2
7	CO2 Incubator	A	3
8	Binocular Microscope	A	3
9	Inverted Microscope	A	3
10	Incubator	A	4
11	Water Bath	A	3
12	Micropipettes	A	7
13	Ice Chamber	C	-
14	Freezing Microtome	A	1
15	Microplate Shaker	A	2
16	Automatic Staining Apparatus	C	-
17	Cover slipper	B	1
18	Necropsy Instrument Set for Large Animal	A	5
19	Necropsy Instrument Set for Small Animal	A	5
20	Biosafety Cabinet	A	5
21	Reagent for PCR	C	-
22	Reagent for RT-PCR	C	-
23	Magnetic Stirrer	A	5
24	Freezer -20°C	A	2

No.	Name of Equipment	Priority	Requested Quantity
25-1	Deep Freezer -80°C, Vertical	A	4
25-2	Deep Freezer -80°C, Horizontal	A	1
26	Ambulator Car	C	-
27	UV Transilluminator w/ Polaroid Camera	B	1
28	Centrifuge (A)	B	2
29	Microplate Centrifuge	B	1
30	Microplate Washer	B	1
31	Electronic Balance	B	3
32	Stereoscopic Microscope	B	1
33	pH Meter	B	4
34	Liquid Nitrogen Tank	B	1
35	Dark field Microscope	B	1
36	Binocular Microscope w/Camera	B	1
37	Freezer -50°C	B	1
38	Immuno Staining Apparatus	B	1
39	Slide Cabinet/Block Cabinet	B	1
40	Necropsy Table	B	1
41	Dry Block Bath	B	1
42	Shaking Water Bath	B	2
43	Hot Air Sterilizer	B	2
44	Freeze Dryer	B	1
45	Flake Ice Maker Machine	B	1
DIC Lampung			
1	Necropsy Instrument Set for Large Animal	A	5
2	Necropsy Instrument Set for Small Animal	A	5
3	Binocular Microscope w/Camera	A	1
4	Paraffin Oven	C	-
5	Automatic Staining Apparatus	A	1
6	Multi Block Embedding Set	B	1
7	Microtome	A	1
8	Section Flotation Bath	A	1
9	Paraffin Block Cabinet	B	1
10	Tissue Embedding Apparatus	C	-
11	Slide Cabinet/Block Cabinet	A	1
12	Pathology Workstation	C	-
13	Necropsy Table	A	1
14	Wax Dispenser	A	1
15	Biosafety Cabinet	A	5
16	Drying Hot Plate	A	1
17	Egg Incubator	A	2
18-1	Deep Freezer -80°C, Vertical	A	4
18-2	Deep Freezer -80°C, Horizontal	A	1
19	Freezer -50°C	A	1
20-1	Autoclave (A)	A	2
20-2	Autoclave (B)	A	5
21	Incubator	A	4
22	Pressure/Vacuum Pump	C	-
23	Refractometer	A	1
24	Vortex Mixer	A	4
25	Microplate Shaker	A	2
26	Polypropylene Plate	C	-
27-1	Centrifuge (A)	A	2
27-2	Centrifuge (B)	A	1
27-3	Centrifuge (C)	A	1
27-4	Centrifuge (D)	A	1
28	Dionized Water Apparatus	A	1
29	Pipette Washer	A	2

No.	Name of Equipment	Priority	Requested Quantity
30	Hotplate Magnetic Stirrer	A	1
31	Stainless Steel Work Table	C	-
32	DNA Sequencer	C	-
33	Freezer -20°C	A	2
34	CO2 Incubator	A	3
35	Ultracentrifuge	B	1
36	Freeze Dryer	A	1
37	PCR Workstation	C	-
38	Inverted Microscope	A	3
39	Evaporator	C	-
40	Ultrasonic Cleaner	A	2
41	Hot Air Sterilizer	A	2
42	Water Bath	C	-
43	Homogenizer	C	-
44	Binocular Microscope	A	1
45	Glassware	C	-
46	Ambulator Car	C	-
47	Dark field Microscope	B	1
48	Spectrophotometer	B	1
49	Liquid Nitrogen Tank	B	1
50	Magnetic Stirrer	B	4
51	Fluorescent Microscope	B	1
52	Electronic Balance	B	4
53	Automatic Tissue Processor	B	1
54	Cover slipper	B	1
55	Blood Analyzer	B	1
56	Hematocrit Centrifuge	B	1
57	Biochemistry Analyzer	B	1
58	Freezing Microtome	B	1
59	Stereoscopic Microscope	B	1
60	Micropipettes	B	7
61	Immuno Staining Apparatus	B	1
62	Circulation Water Bath	B	1
63	Dry Block Bath	B	1
64	Shaking Water Bath	B	1
65	Flake Ice Maker Machine	B	1

The Project will select the minimum equipment required for diagnosing major animal diseases for each facility with priority on the following items.

- Equipment that can contribute to the diagnosis of major animal diseases, and particularly AI.
- Supply the minimum equipment required for Indonesia to provide its planned animal disease diagnosis and monitoring services in accordance with existing technician numbers and skill levels at the DIC Medan and DIC Lampung, and planned personnel at the DIC Subang .
- Selection of equipment that can be operated and maintained on the budgets allocated to each facility.
- Limiting equipment to the minimum requirements so as not to impede Indonesia's own efforts.
- Careful selection to avoid duplication of equipment provided by other donor countries and international organizations.

Equipment for the DIC Subang

①Necropsy equipment

- One each of the following items is required: autoclave (A), (autoclave (B), necropsy table and ultrasonic cleaner. Five sets each of large and small animal necropsy instruments were requested, but it was found that two sets of large animal necropsy instruments will suffice. Two of the five small animal necropsy instrument sets will be for the Necropsy Room, and the other three for the ambulator (lab) carts to be provided by Indonesia. The name is changed from "Necropsy instrument set for large animals" to "Necropsy instrument set for medium animals" to signify the use of these instrument sets for poultry, goats, sheep, dogs and other medium-sized animals. A biosafety cabinet for necropsies of chickens and other animals is also included.
- The horizontal -80oC deep freezer for temporary storage of infected materials is deleted since autoclaving materials to be disposed and then placing them in sturdy plastic bags and storing them in a refrigerator is a more appropriate temporary storage method. Indonesia will supply the necessary refrigerator.

②AI diagnosis equipment

- One each of the following items is required: autoclave (A), autoclave (B), ultrasonic cleaner and hot air sterilizer to clean necropsy instruments. Two biosafety cabinets are required respectively for inoculating embryonic eggs and for preparing specimens and both will be provided.
- One each of the following items is required for diagnosing AI and other major animal diseases: inverted microscope, fluorescence microscope, refrigerated centrifuge (A), -80oC deep freezer, incubator, CO2 incubator, egg incubator, microplate shaker, magnetic stirrer, electronic balance, pH meter, vortex mixer, liquid nitrogen tank, and water bath. Because two veterinarians are to be posted to the DIC Subang, two micropipette sets will be provided.
- The -50oC freezer is deleted since the -20oC freezer and -80oC deep freezer will suffice.
- The shaking water bath is deleted since there is no great need for it.

③PCR diagnosis equipment

- One each of the following items is required for PCR diagnosis: autoclave (A), refrigerated microcentrifuge, PCR thermal cycler, real-time PCR, dry-block bath, electrophoresis apparatus, image acquisition for electrophoresis application , vortex mixer, and spectrophotometer (A). Two each of the following items are also required: -20ºC freezers for the Reagent Preparation and Amplification Rooms, and PCR workstations for the Reagent Preparation Room and RNA Extraction/Sample Preparation Room. Two micropipette sets are required respectively for the Reagent Preparation Room and RNA Extraction/Sample Preparation Room. To prevent contamination, these micropipette sets must be used separately.
- One biosafety cabinet has been requested, but only non-infectious samples prepared in the AI Diagnosis Room are to be brought into the PCR Diagnosis Section and this biosafety cabinet is deleted.

④Cell preparation equipment

- One each of the following items is required: autoclave (B), inverted microscope, refrigerated centrifuge (A), , incubator, CO2 incubator, laminar flow cabinet, fume extractor, magnetic stirrer, electronic balance, pH meter, vortex mixer and water bath. It is also consider appropriate to supply two micropipette sets respectively for cell preparation. The -20oC freezer will initially use equipment for other labs and Indonesia will provide additional units as the demand grows.

⑤Virology equipment

- The following items will be provided as the minimum virology-related equipment required for commencing operations at the new facility: biosafety cabinet, autoclave (B), inverted microscope, refrigerated centrifuge, high-speed refrigerated centrifuge, -80oC deep freezer, incubator, CO2 incubator, micropipette set , microplate washer, microplate reader, magnetic stirrer, electronic balance, pH meter, vortex meter and water bath. One each of the above items

will be provided, with Indonesia to supply additional items through its own efforts as circumstances require once operations commence.

⑥Pathology (including clinical pathology) equipment

- As with equipment for the Virology Room, one each of the following items will be provided as the minimum histopathology and clinical pathology equipment required for commencing operations at the new facility, with Indonesia to supply additional items as future circumstances require: autoclave (B), section flotation bath, wax dispenser, tissue embedder, slide glass cabinet, drying hot plate, rotary microtome, freezing microtome, automatic staining apparatus , automatic tissue processor, binocular microscopes (A, B and C), tabletop centrifuge), hematocrit centrifuge, magnetic stirrer, vortex mixer, spectrophotometer (B) and water bath.
- The immuno-staining apparatus and cover slipper requested by Indonesia for immuno-histochemistry procedures will be removed for reasons of poor cost-effectiveness and lack of real need.

⑦Bacteriology equipment

- One each of the following items will be provided, with Indonesia to supply additional items as future circumstances require: biosafety cabinet, autoclave (B), binocular microscope (A), inverted microscope, tabletop centrifuge, incubator, micropipette set, magnetic stirrer, ph meter, vortex mixer and water bath. Other equipment will be provided by Indonesia as future requirements arise.

⑧Parasitology equipment

- One each of the following items will be provided for the Parasitology Room: binocular microscope (A) and stereoscopic microscope. Other equipment will be provided by Indonesia as future requirements arise.

⑨Other items

- The number of egg incubators required have been calculated on the basis of an estimated average of 20 tests/day. If three 9-11-day eggs are used for each test, 60 embryonic eggs are required each day. To supply maintain daily supply of 60 embryonic eggs incubated for ten days requires an incubation capacity of 600 or more. Taking into account the possibility of equipment malfunction, it would be advisable to supply two egg incubators with a capacity of 300-400 eggs each rather than a single larger incubator.
- Autoclave (C) Common use equipment for all labs
- The animal carrier with clean box is deleted since it is specialized equipment not covered by grant aid project provisions.
- The freeze dryer is deleted from the list since there is no problem with the method currently employed for sending samples overseas, and that the three -80oC deep freezers to be provided under this Project will suffice for long-term storage. Another reason is that there is a risk in using freeze drying to preserve samples that viruses might escape and infect lab technicians during the process of capping.

<u>Equipment for the DIC Medan</u>

①Necropsy equipment

- Two necropsy instrument sets for large animals and three sets for small animals are provided for the same reasons as the DIC Subang. The name is changed from “Necropsy instrument set for large animals” to “Necropsy instrument set for medium animals” to signify the use of these instrument sets for poultry, goats, sheep, dogs and other medium-sized animals.
- The horizontal -80oC deep freezer for temporary storage of infected materials is deleted from the list for the same reasons as DIC Subang. Indonesia will supply the refrigerator that will take its place.

②AI diagnosis equipment

- As with the Necropsy Room instruments, one each of the following items is required: enclosed autoclave (A) to sterilize infected materials prior to moving them out of the Necropsy Room, autoclave (B) to sterilize necropsy instruments after cleaning them, and ultrasonic cleaner and hot air sterilizer to clean necropsy instruments. Two biosafety cabinets are required respectively for inoculating embryonic eggs and for preparing specimens, but only one is provided and an existing cabinet will be relocated to serve as the other.
- One each of the following items is required for diagnosing AI and other major animal diseases: inverted microscope, refrigerated centrifuge (A), -80oC deep freezer, incubator, CO_2 incubator, egg incubator, microplate washer, microplate shaker, magnetic stirrer, electronic balance, pH meter, liquid nitrogen tank, and water bath. Because two veterinarians carry out AI diagnosis at the DIC Medan, two micropipette sets will be provided.
- The -50oC freezer and shaking water bath are deleted from the list for the same reasons as DIC Subang.

③PCR diagnosis equipment

- Indonesia has already procured certain key items for PCR diagnosis such as a PCR thermal cycler and real-time PCR, but the following items are still lacking and will be provided by this Project: autoclave (B) and -20oC freezer for the Reagent Preparation and PCR/Electrophoresis Rooms, PCR workstation for the Reagent Preparation and RNA Extraction/Sample Preparation Rooms, dry block bath, spectrophotometer (A), and three micropipette sets.
- Image acquisition for electrophoresis application s have come into widespread use recently, reducing the need for UV transilluminators w/polaroid camera. Moreover, image acquisition for electrophoresis applications can serve the same purpose as UV transilluminators. Therefore the latter item will be deleted from the list. The microplate centrifuge is also deleted since there is little need for it.

④Cell preparation equipment

- One each of the following items is required for the Cell preparation Room: autoclave (B), inverted microscope, incubator, CO_2 incubator, laminar flow cabinet, micropipette set, magnetic stirrer, pH meter and water bath.

⑤Virology equipment

- Some of the Virology Room equipment is obsolete, adversely affecting procedures. One each of the following items will be provided to enable more efficient execution of virology-related work: autoclave (B), inverted microscope, -80oC deep freezer, incubator, CO2 incubator, micropipette set, microplate shaker, magnetic stirrer and water bath.

⑥Histopathology and clinical pathology equipment

- Indonesia has already procured certain histopathology items such as an automatic tissue processor and automatic staining apparatus . Supply of the following items will enable speedier and more reliable execution of AI and other histopathology-related work: slide glass cabinet, binocular microscopes (A, B and C), stereoscopic microscope, electronic balance and pH meter. A freezing microtome is also required to enable the immuno-histochemistry analysis that Indonesia is planning to implement.
- The immuno-staining apparatus and cover slipper requested by Indonesia for immuno-histochemistry procedures will be removed for reasons of poor cost-effectiveness and lack of real need.

⑦Washing and Equipment Room equipment

- Supplying one each of the following items for shared use throughout the DIC Medan will boost examination and diagnosis capabilities: autoclave (B), pipette washer, ultrasonic cleaner, flake ice maker machine and -80oC deep freezer.

⑧Other items

- Two centrifuges (A) have been requested, but an international agency is scheduled to supply one unit before yearend. Only one will be provided under this Project.
- Five biosafety cabinets have been requested for the Necropsy Room (1), AI Diagnosis Room (2), PCR Diagnosis Room (1) and Cell Culture Room (1). The Equipment Plan for this Project delineates that the AI Diagnosis Room biosafety cabinet be used for preparing specimens for PCI diagnosis, and not to supply a biosafety cabinet for the PCI Diagnosis section. Since is has also been decided that a laminar flow cabinet would be more suitable for the Cell preparation Room, a total of three biosafety cabinets are required—one for the Necropsy Room and two for the AI Diagnosis Room. However, since a biosafety cabinet currently housed in the PCR Diagnosis Room and another to be provided by an international agency before yearend can be relocated to the new facility, only one biosafety cabinet will be provided under the Project to DIC Medan .
- Two hot air sterilizers have been requested−one for the AI Diagnosis Room, and one for common use by the whole facility. However a large hot air sterilizer procured by Indonesia in 2007 can continue to be used as the shared sterilizer. Only one unit will be provided.
- The freeze dryer is deleted from the list since there is no problem with the current method for sending samples overseas, and that the three -80oC deep freezers to be provided by the Project will suffice for long-term storage. Also, there is a risk in using freeze drying to preserve samples that viruses might escape and infect lab technicians during the process of capping.
- The de-ionized water apparatus is deleted from the DIC Medan list since an international agency will supply one before yearend.

Equipment for the DIC Lampung

①Necropsy equipment

- As with DIC Medan , one each of the following items is required: autoclave (A), (autoclave (B), necropsy table and ultrasonic cleaner. For the same reasons as the DIC Medan, Two necropsy instrument sets for large animals, and three for small animals will be provided. The name is changed from “Necropsy instrument set for large animals” to “Necropsy instrument set for medium animals” for the same reasons as DIC Medan
- The horizontal -80oC deep freezer for temporary storage of infected materials from the list for the same reasons as DIC Medan. Indonesia supply the refrigerator that will take its place.

②AI diagnosis equipment

- One each of the following items is required as with DIC Medan: autoclave (A), autoclave (B), and ultrasonic cleaner and hot air sterilizer to clean necropsy instruments. Two biosafety cabinets are required respectively for inoculating embryonic eggs and for preparing specimens, and we will supply both.
- One each of the following items is required for diagnosing AI and other major animal diseases: inverted microscope, refrigerated centrifuge (A), -80oC deep freezer, incubator, CO2 incubator, microplate washer, microplate shaker, magnetic stirrer, electronic balance, pH meter, vortex mixer, liquid nitrogen tank, and water bath. Two egg incubators were requested, but a 200-egg incubator currently being used can continue to be used and one additional 400-egg incubator should suffice. Because two or more veterinarians carry out AI diagnosis at the DIC Lampung, two micropipette sets are provided.
- The -50oC freezer and shaking water bath are deleted from the list since there is no real need for them in AI diagnosis.

③PCR diagnosis equipment

- Indonesia has already procured certain key items for PCR diagnosis such as a PCR thermal cycler and real-time PCR, but the following items will be provided in the Project since they are still lacking: autoclave (B) and -20 o C freezer for the Reagent Preparation and

PCR/Electrophoresis Rooms, dry block bath, spectrophotometer (A), and three micropipette sets. The microplate centrifuge is deleted for the same reason as DIC Medan.

④Cell preparation equipment

- One each of the following items is required for the Cell preparation Room: autoclave (B), inverted microscope, refrigerated centrifuge (A), incubator, CO2 incubator, laminar flow cabinet, micropipette set, magnetic stirrer, electronic balance, vortex mixer and water bath.

⑤Virology equipment

- Some of the Virology Room equipment is obsolete, adversely affecting procedures. One each of the following items will be provided to enable more efficient execution of virology-related work: autoclave (B), inverted microscope, -80oC deep freezer, incubator, CO2 incubator, micropipette set, microplate shaker, magnetic stirrer, pH meter, vortex mixer and water bath.

⑥Histopathology and clinical pathology equipment

- Indonesia has already replaced certain histopathology equipment items, including a tissue embedder and mammal blood analyzer, that were obsolete and adversely affecting procedures, but has been able to replace others for lack of budget. Supply of one each of the following items will enable speedier and more reliable execution of AI and other histopathology-related work: section flotation bath, wax dispenser, slide glass cabinet, drying hot plate, freezing microtome, automatic staining apparatus , automatic tissue processor, binocular microscopes (B and C), tabletop centrifuge, hematocrit centrifuge, magnetic stirrer, vortex mixer, refractometer (B), and spectrophotometer (B).
- The immuno-staining apparatus and cover slipper requested by Indonesia for immuno-histochemistry procedures will be removed for reasons of poor cost-effectiveness and lack of real need.

⑦Washing and Equipment Room equipment

- Supplying one each of the following items for shared use throughout DIC Lampung will enhance examination and diagnosis capabilities: autoclave (B), hot air sterilizer, pipette washer, ultrasonic cleaner, flake ice maker machine, de-ionized water apparatus (pure water apparatus) and -80ºC deep freezer.

⑧Other items

- Five biosafety cabinets have been requested for the Necropsy Room (1), AI Diagnosis Room (2), PCR Diagnosis Room (1) and Cell preparation Room (1), but a laminar flow cabinet would be more suitable for the Cell preparation Room. Therefore, only four biosafety cabinets are required. Furthermore, since a biosafety cabinet currently housed in the PCR Diagnosis Room and another procured in 2006 can be relocated to the new facility. Two biosafety cabinets will be provided under this Project to DIC Lampung.
- The freeze dryer is deleted from the list since there is no problem with the current method for sending samples overseas, and that the three -80oC deep freezers to be provided under this Project will suffice for long-term storage. The risk of virus escape and infection of lab technicians during capping process of freeze drying is another reason.

The following equipment shown in Table 2-9 below require coordination with building construction and the delivery installation works need to adjusted with construction schedule. Its was decided that these equipment will be included as part of the facility portion.

Table 2-9 Equipment to be included in Facility Portion & Reasons

Equipment	Nos	Main Reason for Inclusion in Facility Portion
Autoclave (C)	1	Requires coordination with plumbing, ventilation and power supply. Procurement and installation must be synchronized with construction schedule

Equipment	Nos	Main Reason for Inclusion in Facility Portion
Draft Chamber	1	Requires coordination with ventilation ducts in ceiling plenum. Procurement and installation must be synchronized with construction schedule
Necropsy Table	3	Equipped with built in sink and requires coordination with plumbing, special drainage and power supply. Advisable to include in Facility portion.

Based on the aforementioned review of requested equipment, the equipment selection criteria shown below was employed to asses the need and suitability of requested equipment in further detail.

① Is item required for the examination and diagnosis of major animal diseases and particularly AI?
- ○ Essential for examination and diagnosis of major animal diseases and particularly AI
- △ Required, but used only infrequently, and other equipment could suffice
- × Not really essential for examination and diagnosis of major animal diseases

② Does item match the skill levels of the facility technicians?
- ○ Matches current and planned technician skill levels
- △ Can be used at current and planned technician skill levels if training is provided before use
- × Use would be difficult at current technician skill levels

③ Can item be maintained properly?
- ○ Can be maintained under current maintenance structure and budget
- △ Can be maintained if improvements are made to the current maintenance structure and maintenance contract is exchanged with dealer
- × Maintenance judged to be too expensive to be feasible under current circumstances

(Overall assessment)
- ○ Equipment whose procurement is judged to be justified for this Project
- × Equipment to be deleted from procurement list for this Project

The results of this review are shown in Table 2-10.

Table 2-10 DIC Subang - Result of Study of Requested Equipment

No.	Req. No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			overall Evaluation	Plan-ned Q'ty	Remarks
					①	②	③			
1	42	Animal Carrier with Clean Box	B	1	△	○	○	×	0	Difficult to supply under Grant Aid. Chicken corpses are normally placed in sturdy plastic bags or sealed containers etc. for transport.
2	41-1	Autoclave (A)	A	2	○	△	○	○	2	Can be used if training is provided before use.
3	41-2	Autoclave (B)	A	5	○	△	○	○	7	One each required for AI Diagnosis, Necropsy, Medium Preparation, Virology, Bacteriology, Histopathology, PCR Diagnosis Rooms
4	41-3	Autoclave (C)	A	1	○	△	○	○	1	Can be used if training is provided before use.
5	56	Section Flotation Bath	B	1	○	○	○	○	1	
6	55	Paraffin Oven	B	1	△	○	○	×	0	Wax dispenser will suffice.
7	60	Wax Dispenser	B	1	○	○	○	○	1	
8	57	Multi Block Embedding Set	B	1	△	○	○	×	0	This is an accessory item.
9	53	Tissue Embedding Apparatus	B	1	○	△	○	○	1	Can be used if training is provided before use.
10	59	Slide Cabinet/Block Cabinet	B	1	○	○	○	○	1	

No.	Req. No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			overall Evaluation	Plan-ned Q'ty	Remarks
					①	②	③			
11	13	Microtome	A	1	○	△	○	○	1	Can be used if training is provided before use.
12	70	Immuno Staining Apparatus	B	1	△	○	○	×	0	Immuno-histochemistry analysis can be accomplished without this apparatus.
13	54	Freezing Microtome	B	1	○	△	○	○	1	Can be used if training is provided before use
14	52	Automatic Staining Apparatus	B	1	○	△	○	○	1	Ditto
15	12	Automatic Tissue Processor	A	1	○	△	○	○	1	Ditto
16	61	Coverslipper	B	1	△	○	○	×	0	Can be done manually since cover slipping is not frequently required.
17	1	Binocular Microscope (A)	A	3	○	○	○	○	3	Biological binocular microscope
18	71	Binocular Microscope (B)	B	1	○	○	○	○	1	Binocular microscope w/camera
19	72	Binocular Microscope (C)	B	1	○	○	○	○	1	Dark-field microscope
20	4	Inverted Microscope	A	4	○	○	○	○	4	
21	3	Fluorescence Microscope	A	1	○	△	○	○	1	Can be used if training is provided before use.
22	32	Stereoscopic Microscope	B	1	○	○	○	○	1	
23	8	Refrigerated Centrifuge（A）	A	3	○	△	○	○	3	Can be used if training is provided before use.
24	9-1	Centrifuge (A) (Table-top Type Centrifuge)	A	2	○	△	○	○	2	Ditto
25	9-2	Centrifuge (B) (Refrigerated Microcentrifuge)	A	1	○	△	○	○	1	Ditto
26	16	Microplate Centrifuge (Refrigerated Centrifuge(B))	A	1	△	○	○	×	0	Low need. Manual methods will suffice.
27	10	Ultracentrifuge	B	1	○	△	○	○	1	Will supply high-speed refrigerated centrifuge as alternative. Can be used if training is provided before use.
28	73	Hematocrit Centrifuge	B	1	○	○	○	○	1	
29	47	Freezer -20°C	B	3	○	○	○	○	3	
30	69	Freezer -50°C	B	1	△	○	○	×	0	-20oC freezer and -80oC deep freezer will suffice.
31	31-2	Deep Freezer -80°C, Horizontal	A	1	△	○	○	×	0	Refrigerator will suffice.
32	31-1	Deep Freezer -80°C, Vertical	A	4	○	○	○	○	3	One each for the Virology and AI Diagnosis Rooms, and one for common use will suffice.
33	5	Incubator	A	5	○	○	○	○	4	One each for AI Diagnosis, Medium Preparation, Virology and Bacteriology Rooms
34	6	CO2 Incubator	A	3	○	△	○	○	3	Can be used if training is provided before use.
35	45	Egg Incubator	B	3	○	○	○	○	3	
36	7	Biosafety Cabinet	A	5	○	△	○	○	5	Can be used if training is provided before use.
37	29-1	Laminar Flow Cabinet (A)	A	1	○	△	○	○	1	Ditto
38	29-2	Laminar Flow Cabinet (B)	A	1	○	△	○	○	1	Fume extractor would be preferable. Can be used if training is provided before use.
39	64	PCR Workstation	B	2	○	△	○	○	2	Can be used if training is provided before use.
40	14	PCR Thermal Cycler	A	1	○	△	○	○	1	Ditto
41	43	Real Time PCR	B	1	○	△	○	○	1	Ditto
42	65	Dry Block Bath	B	1	○	△	○	○	1	Ditto
43	17	Electrophoresis Apparatus	A	1	○	△	○	○	1	Ditto
44	44	Image Acquisition for Electrophoresis Application	B	1	○	△	○	○	1	Ditto

No.	Req. No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			overall Evalua tion	Plan-ned Q'ty	Remarks
					①	②	③			
45	15	UV Transilluminator w/ Polaroid Camera	A	1	△	○	○	×	0	Image Acquisition for Electrophoresis Application will suffice.
46	19	Elisa Machine/Elisa Washer	A	1	○	△	○	○	1	Can be used if training is provided before use.
47	51	Necropsy Table	B	1	○	○	○	○	1	
48	20	Necropsy Instrument Set for Large Animal	A	3	○	○	○	○	2	Two sets should suffice initially.
49	21	Necropsy Instrument Set for Small Animal	A	3	○	○	○	○	3	
50	27	Micropipette	A	9	○	○	○	○	9	
51	28	Microplate Shaker	A	3	○	○	○	○	2	One each for AI Diagnosis and Virology Rooms
52	49	Hot Air Sterilizer	B	3	○	○	○	○	3	
53	63	Magnetic Stirrer	B	6	○	○	○	○	5	One each for AI Diagnosis, Medium Preparation, Virology, Bacteriology and Histopathology Rooms
54	34	Electronic Balance	A	5	○	○	○	○	4	One each for AI Diagnosis, Medium Preparation, and Virology Rooms, and one to be shared for bacteriology, histopathology, clinical pathology, etc.
55	33	pH Meter	A	4	○	○	○	○	4	
56	67	Vortex Mixer	B	7	○	○	○	○	6	One each for AI Diagnosis, PCR Diagnosis, Medium Preparation, Virology, Clinical Pathology and Bacteriology Rooms
57	75-1	Spectrophotometer (A)	B	1	○	△	○	○	1	Can be used if training is provided before use.
58	75-2	Spectrophotometer (B)	B	1	○	△	○	○	1	Ditto
59	74	Biochemistry Analyzer	B	1	△	△	△	×	0	Difficult to maintain. Will supply one spectrophotometer (B) in its place.
60	62	Blood Analyzer	B	1	△	△	△	×	0	Difficult to procure
61	39	Freeze Dryer	A	1	△	△	○	×	0	See above section on need and suitability of requested equipment.
62	50	Liquid Nitrogen Tank	B	1	○	○	○	○	1	
63	26	Water Bath (A)	A	8	○	○	○	○	5	One each for AI Diagnosis, Medium Culture, Histopathology, Virology and Bacteriology Rooms
64	66	Shaking Water Bath	B	2	△	○	○	×	0	Low need
65	18	Flake Ice Maker Machine	A	1	○	△	○	○	1	Can be used if training is provided before use.
66	68	Pipette Washer	B	2	○	○	○	○	1	Will supply one for shared use throughout the facility
67	46	Ultrasonic Cleaner	B	2	○	○	○	○	3	Required for AI Diagnosis, Necropsy and Washing Room, one provided.
68	48	Water Distiller	B	1	○	△	○	○	1	Can be used if training is provided before use.
69	11	Dionized Water Apparatus	A	1	○	△	○	△	1	Will check with Indonesia on feasibility of securing maintenance costs.

Table 2-11 DIC Medan - Result of Study of Requested Equipment

No.	Req. No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			Evalua-tion	Plan-ned Q'ty	Remarks
					①	②	③			
1	1-1	Autoclave (A)	A	2	○	○	○	○	2	
2	1-2	Autoclave (B)	A	5	○	○	○	○	6	One each required for Necropsy, AI Diagnosis, Cell preparation, Virology, PCR Diagnosis, Washing Rooms
3	39	Slide Cabinet/Block Cabinet	B	1	○	○	○	○	1	
4	38	Immuno Staining Apparatus	B	1	△	○	○	×	0	Immuno-histology can be carried out without this apparatus.

No.	Req. No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			Evalua-tion	Plan-ned Q'ty	Remarks
					①	②	③			
5	14	Freezing Microtome	A	1	○	△	○	○	1	Can be used if training is provided before use.
6	17	Coverslipper	B	1	△	○	○	×	0	Can be done manually since cover slipping is not frequently required.
7	8	Binocular Microscope (A)	A	3	○	○	○	○	3	Biological binocular microscope
8	36	Binocular Microscope (B)	B	1	○	○	○	○	1	Binocular microscope w/camera
9	35	Binocular Microscope (C)	B	1	○	○	○	○	1	Dark-field microscope
10	9	Inverted Microscope	A	3	○	○	○	○	3	
11	32	Stereoscopic Microscope	B	1	○	○	○	○	1	Use for both histopathology and parasitology
12	28	Centrifuge (A)	B	2	○	○	○	○	1	One unit promised by international agency
13	29	Microplate Centrifuge	B	1	△	○	○	×	0	Low need. Manual methods will suffice.
14	24	Freezer -20°C	A	2	○	○	○	○	2	
15	37	Freezer -50°C	B	1	△	○	○	×	0	-20oC freezer and -80oC deep freezer will suffice.
16	25-2	Deep Freezer -80°C, Horizontal	A	1	△	○	○	×	0	Refrigerator will suffice.
17	25-1	Deep Freezer -80°C, Vertical	A	4	○	○	○	○	3	One each for Virology and AI Diagnosis Rooms, and common use
18	10	Incubator	A	4	○	○	○	○	3	One each for Virology, AI Diagnosis and Cell preparation Rooms
19	7	CO_2 Incubator	A	3	○	○	○	○	3	
20	3	Egg Incubator	A	1	○	○	○	○	1	
21	20	Biosafety Cabinet	A	5	○	○	△	○	1	Regarding number, see above section on need and suitability of requested equipment. One laminar flow cabinet to be provided as substitute.
22	2	PCR Workstation	A	2	○	○	○	○	2	
23	41	Dry Block Bath	B	1	○	○	○	○	1	
24	27	UV Transilluminator w/ Polaroid Camera	B	1	△	○	○	×	0	Image Acquisition for Electrophoresis Application will suffice
25	40	Necropsy Table	B	1	○	○	○	○	1	
26	18	Necropsy Instrument Set for Large Animal	A	5	○	○	○	○	2	Two sets for common use in both Necropsy Room and field
27	19	Necropsy Instrument Set for Small Animal	A	5	○	○	○	○	5	
28	12	Micropipette	A	7	○	○	○	○	7	
29	15	Microplate Shaker	A	2	○	○	○	○	2	
30	30	Microplate Washer	B	1	○	○	○	○	1	
31	43	Hot Air Sterilizer	B	2	○	○	○	○	1	Large capacity sterilizer procured in 2007 can continue to be used.
32	23	Magnetic Stirrer	A	5	○	○	○	○	3	One each for AI Diagnosis, Cell preparation and Virology Rooms
33	31	Electronic Balance	B	3	○	○	○	○	2	One each for AI Diagnosis and Histopathology Rooms
34	33	pH Meter	B	4	○	○	○	○	3	One each for AI Diagnosis, Cell preparation and Histopathology Rooms
35	44	Freeze Dryer	B	1	△	○	○	×	0	See above section on need and suitability of requested equipment.
36	34	Liquid Nitrogen Tank	B	1	○	○	○	○	1	
37	11	Water Bath	A	3	○	○	○	○	3	
38	42	Shaking Water Bath	B	2	△	○	○	×	0	Low need
39	45	Flake Ice Maker Machine	B	1	○	○	○	○	1	
40	5	Pipette Washer	A	2	○	○	○	○	1	Will supply one washer for common use throughout the facility.
41	6	Ultrasonic Cleaner	A	2	○	○	○	○	3	One each required for AI Diagnosis, Necropsy and Washing Rooms, and so we have added one.
42	4	Dionized Water Apparatus	A	1	△	○	○	×	0	One unit promised by international agency

Table 2-12 DIC Lampung - Result of Study of Requested Equipment

No.	Req. No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			Evalu ation	Plan-ned Q'ty	Remarks
					①	②	③			
1	20-1	Autoclave (A)	A	2	○	○	○	○	2	
2	20-2	Autoclave (B)	A	5	○	○	○	○	6	One each required for Necropsy, AI Diagnosis, Cell preparation, Virology, PCR Diagnosis and Washing Rooms
3	8	Section Flotation Bath	A	1	○	○	○	○	1	
4	14	Wax Dispenser	A	1	○	○	○	○	1	
5	9	Paraffin Block Cabinet	B	1	△	○	○	×	0	Slide glass cabinet can be used.
6	6	Multi Block Embedding Set	B	1	△	○	○	×	0	This is an accessory item.
7	11	Slide Cabinet/Block Cabinet	A	1	○	○	○	○	1	
8	16	Drying Hot Plate	A	1	○	○	○	○	1	
9	7	Microtome	A	1	×	○	○	×	0	Existing equipment can continue to be used.
10	61	Immuno Staining Apparatus	B	1	△	○	○	×	0	Immuno-histochemistry analysis can be accomplished without this apparatus.
11	58	Freezing Microtome	B	1	○	△	○	○	1	Can be used if training is provided before use.
12	5	Automatic Staining Apparatus	A	1	○	○	○	○	1	
13	53	Automatic Tissue Processor	B	1	○	○	○	○	1	
14	54	Coverslipper	B	1	△	○	○	×	0	Can be done manually since cover slipping is not frequently required.
15	44	Binocular Microscope (A)	A	1	△	○	○	×	0	Existing biological binocular microscope can continue to be used.
16	3	Binocular Microscope (B)	A	1	○	○	○	○	1	Binocular microscope w/camera
17	47	Binocular Microscope (C)	B	1	○	○	○	○	1	Dark-field microscope
18	38	Inverted Microscope	A	3	○	○	○	○	3	
19	51	Fluorescence Microscope	B	1	○	○	○	○	1	
20	59	Stereoscopic Microscope	B	1	△	○	○	×	0	Existing equipment can continue to be used.
21	27-1	Centrifuge (A)	A	2	○	○	○	○	2	
22	27-2	Centrifuge (B) (Refrigerated Microcentrifuge)	A	1	×	○	○	×	0	Existing equipment can continue to be used.
23	27-3	Centrifuge (C) (Table-top Type Centrifuge)	A	1	○	○	○	○	1	
24	27-4	Centrifuge (D) (Microplate Centrifuge)	A	1	△	○	○	×	0	Low need. Manual methods will suffice.
25	35	Ultracentrifuge	B	1	△	○	○	×	0	Existing high-speed refrigerated centrifuge will suffice.
26	56	Hematocrit Centrifuge	B	1	○	○	○	○	1	
27	33	Freezer -20°C	A	2	○	○	○	○	2	
28	19	Freezer -50°C	A	1	△	○	○	×	0	-20oC freezer and -80oC deep freezer will suffice.
29	18-2	Deep Freezer -80°C, Horizontal	A	1	△	○	○	×	0	Refrigerator will suffice.
30	18-1	Deep Freezer -80°C, Vertical	A	4	○	○	○	○	3	One each for Virology and AI Diagnosis Rooms and one for common use will be sufficient.
31	21	Incubator	A	4	○	○	○	○	3	One each for Virology, AI Diagnosis, and Cell preparation Rooms will be sufficient.
32	34	CO_2 Incubator	A	3	○	○	○	○	3	
33	17	Egg Incubator	A	2	○	○	○	○	1	One 400-egg incubator will suffice.
34	15	Biosafety Cabinet	A	5	○	○	○	○	2	Regarding number, see above section on need and suitability of requested equipment. One laminar flow cabinet to be provided as substitute.
35	63	Dry Block Bath	B	1	○	○	○	○	1	
36	13	Necropsy Table	A	1	○	○	○	○	1	

No.	Req. No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			Evalu ation	Plan-ned Q'ty	Remarks
					①	②	③			
37	1	Necropsy Instrument Set for Large Animal	A	5	○	○	○	○	2	Two sets for common use in both Necropsy Room and field
38	2	Necropsy Instrument Set for Small Animal	A	5	○	○	○	○	5	
39	60	Micropipette	B	7	○	○	○	○	7	
40	25	Microplate Shaker	A	2	○	○	○	○	2	
41	41	Hot Air Sterilizer	A	2	○	○	○	○	2	
42	50	Magnetic Stirrer	A	4	○	○	○	○	4	
43	30	Hot Plate Magnetic Stirrer	A	1	△	○	○	×	0	Magnetic stirrer listed above can be used.
44	52	Electronic Balance	B	4	○	○	○	○	2	One each for AI Diagnosis and Cell preparation Rooms
45	24	Vortex Mixer	A	4	○	○	○	○	4	
46	23	Refractometer	A	1	○	○	○	○	1	
47	48	Spectrophotometer (A)	B	1	○	○	○	○	1	
48	57	Biochemistry Analyzer	B	1	△	○	○	×	0	Difficult to maintain. Will supply one spectrophotometer (B) in its place.
49	55	Blood Analyzer	B	1	△	○	○	×	0	Difficult to procure
50	36	Freeze Dryer	A	1	△	○	○	×	0	See above section on need and suitability of requested equipment.
51	49	Liquid Nitrogen Tank	B	1	○	○	○	○	1	
52	62	Circulation Water Bath	B	1	△	○	○	○	3	One each required for AI Diagnosis, Cell preparation and Virology Rooms
53	64	Shaking Water Bath	B	1	△	○	○	×	0	Low need
54	65	Flake Ice Maker Machine	B	1	○	○	○	○	1	
55	29	Pipette Cleaner	A	2	○	○	○	○	1	Will supply one for use throughout facility.
56	40	Ultrasonic Cleaner	A	2	○	○	○	○	3	Required for AI Diagnosis, Necropsy and Washing Rooms, so we will add one.
57	28	Dionized Water Apparatus	A	1	○	○	○	○	1	

2-2-2-2 Site Plan

(1) DIC Subang

1) Site Shape and Soil Properties

The planned location is in a corner of an agricultural research station about 3km from Subang, situated approximately 500 meters from the national road linking Subang and Jakarta. The site has an area of approximately 4.0 hectares and is currently unoccupied. A road to a nearby residential area runs along the north side of the site. Most of the site is level, but there is a downward inclination of about 3 meters from the northeast corner to the west side. An internal road of the agricultural research station runs along the east side. A small river runs 8 meters below along the south and west side and there appears to be no danger of flooding. The top soil layer is volcanic loam. The loam layer is around 20 to 30 meters deep, and is supported by a gravel layer below.

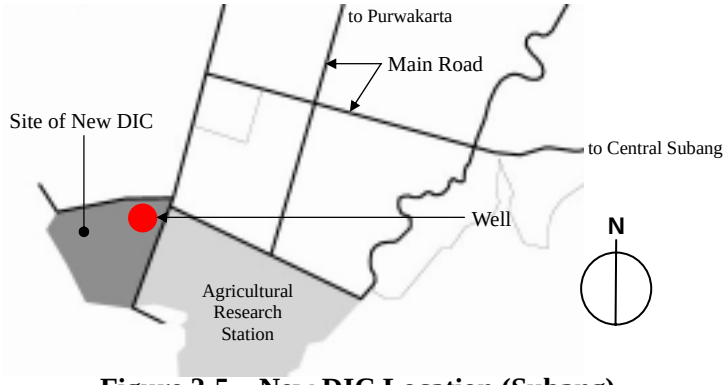


Figure 2-5 New DIC Location (Subang)

2) Existing Facilities and Infrastructure Conditions

The site is not currently being used as an agricultural research station, but there is one well on the property. However, in order to obtain stable quantity and quality of water needed for the new DIC, it will be necessary to connect city water to the site, which will require laying a pipe approximately 500 meters from the main pipeline under the national road.
Since there is no sewage facility, a soil soaking disposal system will be used.

3) Facilities Layout Plan

The facilities for examination and diagnostics will be located in the center of the new DIC site, with the poultry and small animal houses situated away from residential areas and near the waterway. Since the road on the north side of the site is an access road to the nearby residential area, the staff housing for this DIC will be located along this road to serve as a buffer zone between the DIC facilities and residential area. Construction of the staff housing will be performed by Indonesia.

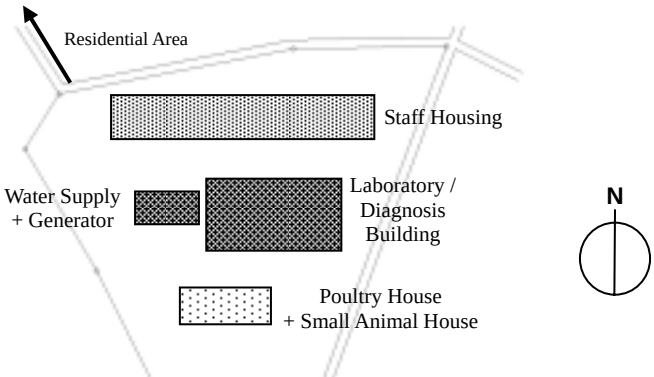


Figure 2-6 New DIC Facilities Layout (Subang)

(2) DIC Medan

1) Site Shape and Soil Properties

The planned location is 3km from the Medan city center on the main Gatot Subroto highway. The area was given as 3.0 hectares in the preliminary survey document, but that includes the staff housing area. The scope of this project is limited to the area of 1.5 hectares inside the dotted line in the figure below. The site is mostly level, and the soil has a deep supporting stratum at 15 meters. The site is accessed from the road to the state livestock bureau on the west side.

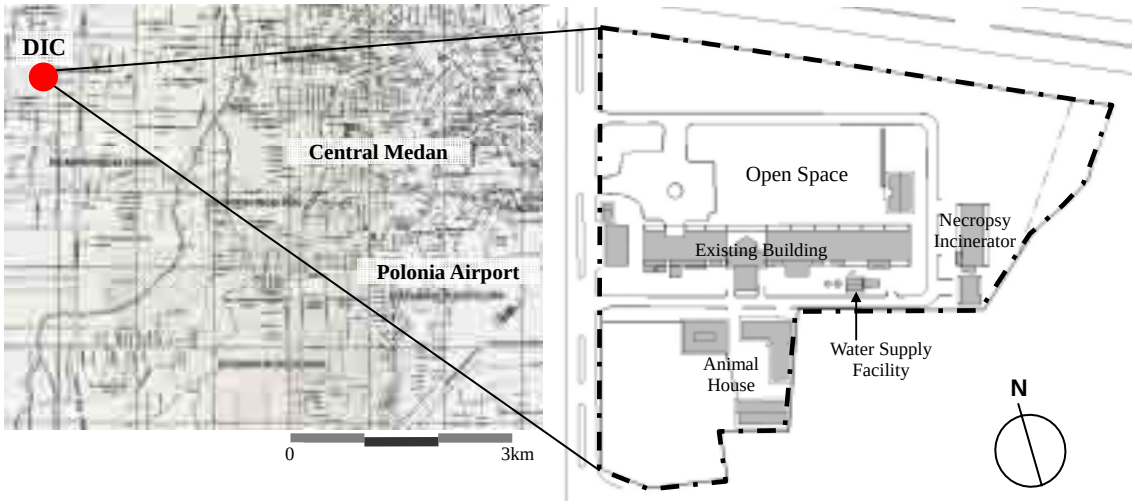


Figure 2-7 DIC Location (Medan)

2) Existing Facilities and Infrastructure Conditions

The existing DIC was built by Japan 29 years ago as a Grant Aid project. The facilities include an administration wing with a reception area (currently used by the epidemiology section), hall, and office on the first floor and a large conference room and director's office on the second floor; a wing with separate laboratories for pathology, parasitology, bacteriology and virology separated by security doors, as well as necropsy and incinerator facilities, animal houses and others. While the buildings are in need of painting and other exterior repair, structurally the walls and frames are in relatively good condition. The interiors have been kept in repair by the Indonesians, and they appear to be well maintained. There is a tree-lined open area in front of the existing building. There are also open areas on the east and south; but are used by waste water treatment system as soak pits for the subsurface disposal system used by the facilities. Drinking water is city water piped from the water main under the highway fronting the site, and processed in water treatment equipment between the examination wing and interior road. These facilities are currently in disrepair, with structural and waterproofing problems, and a pumping system that must be operated manually because the automatic control equipment is broken and the pump used to pump water from the underground tank to filtering equipment is barely functional. Some of the animal houses have deteriorated considerably, the poultry house in particular being far from suitable for growing fertilized eggs.

3) Facilities Layout Plan

The site of the new AI diagnosis facility is parallel to the laboratory section in front of the existing building, and will be accessible via a new passageway built by converting the warehouse next to the virology laboratory of the existing building into a connecting corridor. The DIC examination and diagnostics facilities will be located in the center of the site, while the poultry house will be situated in the south part of the site. Note that there is a veterinary public health laboratory on the east part of the proposed site (approximately 60 square meters). It will be necessary to provide for separate or time staggered access for the new

AI diagnosis facility due to the high possibility of cross-contamination between infected materials carried in and out of the AI diagnosis facility. A circulation plan that addresses such issues will be drawn up, ensuring that no cross-contamination occurs. The new water supply facility will be built next to the no longer fully functional existing facility, and will be switched over upon completion. The poultry house is to be built inside the existing animal houses compound.

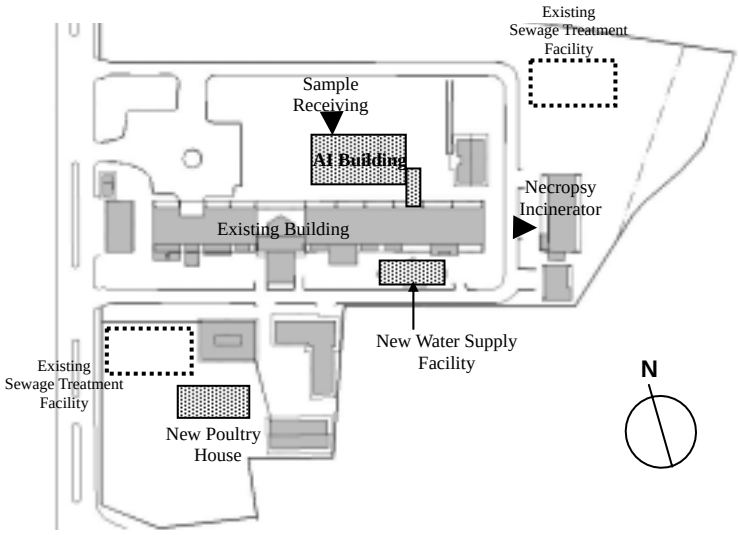


Figure 2-8 New DIC Facilities Layout (Medan)

(3) Lampung DIC3

1) Site Shape and Soil Properties

The Lampung DIC site is accessed from a major road 3 km from the city center. It covers an area of 2 hectares, and the existing building is on the east side. There is a downward incline of about 2 meters on the south side. Around the existing building are recent additions built for veterinary public health testing, PCR examination and library, as a result of which the available space for constructing the AI and other facilities is limited. The soil at the proposed location has been confirmed to be relatively hard.

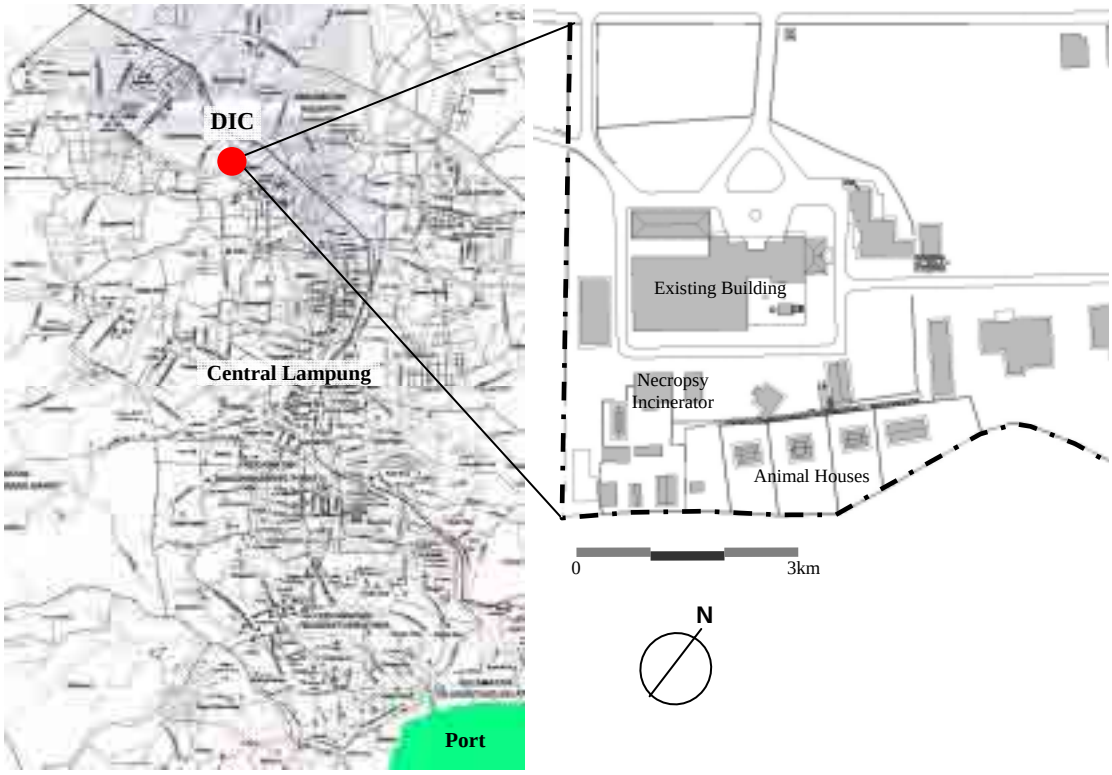


Figure 2-9 DIC Location (Lampung)

2) Existing Facilities and Infrastructure Conditions

The existing DIC was built by Japan 29 years ago as a financial aid project. The single-story buildings include a main building with reception area, hall, director's office, large conference room, administrative offices, and separate laboratories for pathology, parasites, bacteria, and viruses. Around this are a necropsy room and incinerator, animal houses, lecture hall, administrative section, musholla, and garage. More recently a veterinary public health laboratory, PCR examination wing, reference library and other facilities have been built, limiting the available space for new construction. Overall, the buildings have been well maintained by the Indonesians. There is a water supply facility between the rear of the laboratory facility and interior road. This equipment is currently in disrepair, with structural and waterproofing problems, and a pumping system that must be operated manually because the automatic control equipment is broken, in order to pump water from the underground tank to filtering equipment that is barely functional. City water is not available, so well water is used. For waste water, a septic tank is buried in an open area on the east side. There are plans to renew the power generator in the near future by the Indonesian Government. The animal houses are small in size and have deteriorated considerably, the poultry house in particular being far from suitable for growing fertilized eggs.

3) Facilities Layout Plan

The only location available for constructing a new AI diagnosis facility straddles the existing internal road behind the main building. In order to prevent cross-contamination with specimens brought in for epidemiological testing, the epidemiology section is to be moved from the present location in front of the existing facility and the testing is to be conducted on the east side of the AI diagnosis facility. The AI building and existing building are to be connected by a passageway built by converting the storage alongside the virology laboratory to a connecting corridor. A poultry house will be newly built in this project, in a space made available on the south side of the animal housing by tearing down a part of the housing that is no longer in use because of its age. Care will be exercised by the Indonesian Government when undertaking the demolishing of the old facility. The new water supply facility will be built next to the existing facility that is no longer fully functional, and will be switched over upon completion. The poultry house is to be built inside the existing animal houses.

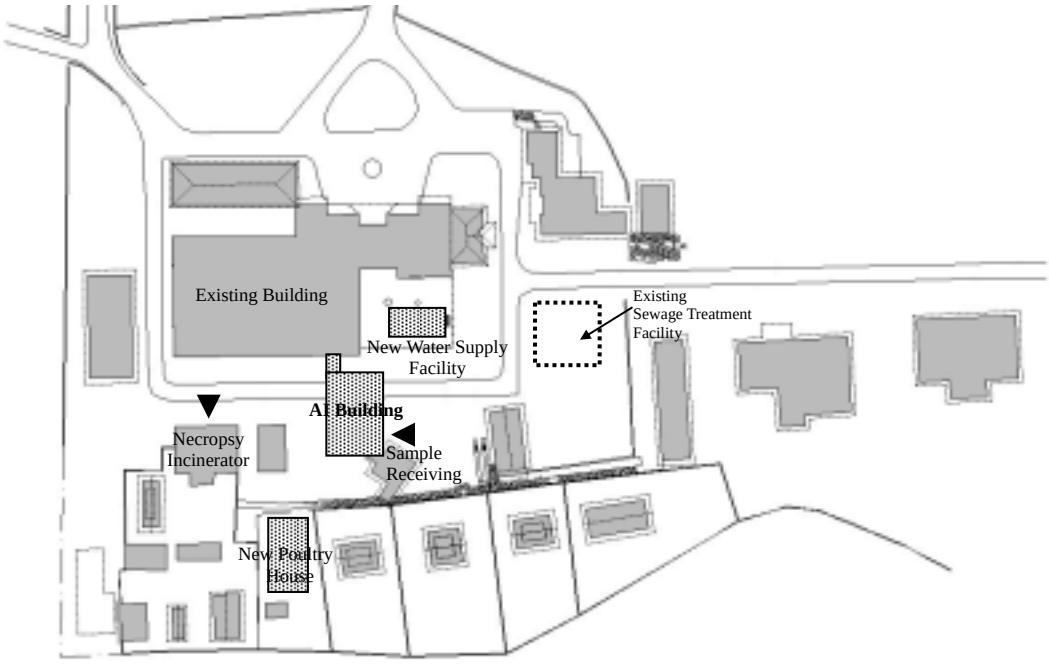


Figure 2-10 New DIC Facilities Layout (Lampung)

2-2-2-3 Architectural Design

(1) Details of the facilities

A detailed flow chart of the AI examination and diagnostic processes that are central to this project is shown below. The rooms necessary for examination and diagnosis include an AI diagnostics room, necropsy room, and rooms for receiving specimens and for epidemiological analysis, etc. Because of the extremely high potential for infection, these rooms must be sealed off as a biohazard (BH) area. Rooms related to these are located around them, including rooms for PCR diagnostics, cell culturing, and pathological examinations. All BH area staff enter and exit through a changing room, anteroom, and high-pressure sterilization room. The movement of specimens and other items between the BH area and related rooms takes place using passboxes.

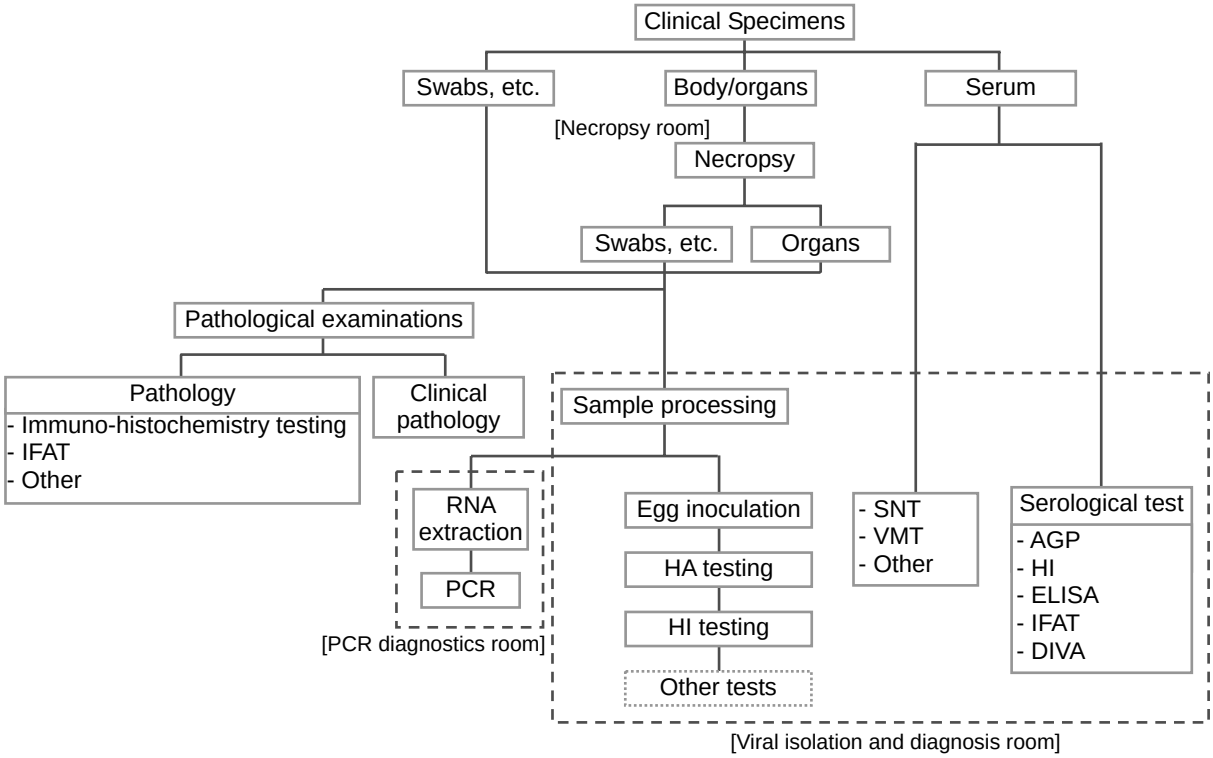


Figure 2-11 AI Examination and Diagnostics Flow Chart

The size of rooms for each section in the DICs being designed in the Project are determined based on the needs for installing the equipment for the types of examination and diagnostics to be conducted in each DIC, the space requirements for the equipment and the number of employees using the rooms, with reference also to the floor space recommendations used for such facilities in Japan (e.g., the design recommendations and guidelines of the Architectural Institute of Japan). In the case of the DICs in Medan and Lampung, which require additions for functionally connecting the BH areas such as the AI diagnostics room, necropsy room, specimen receiving area, etc., where avian influenza (AI) and other disease examination and diagnostics takes place at the viral isolation level, the related parts of existing buildings that require modification are also included in this project.

(2) Approach to architectural planning of BH areas

1) AI diagnosis laboratory

The AI diagnosis laboratory is a place used mainly by the veterinarian in charge of virus examination and diagnostics, medical technicians, and assistants. The floor space and layout are decided as in the figure below, allotting space necessary for installing the various examination and diagnostics equipment as well as space for performing examination and diagnosis with each piece of equipment. Specimens and blood, and other materials are brought into this room from the specimen receiving room and from the necropsy room.

Specimens are also sent to the PCR diagnostics section from this room. After PCR examination and diagnosis, specimens and other similar materials are brought into this room and processed in an autoclave. Samples after PCR diagnosis are likewise processed in an autoclave before being sent to the specimen receiving room and disposed of. All such transfer between rooms takes place using a BH passbox. The air in this room is kept at negative pressure by the air conditioning system. To allow the interior to be sterilized readily in order to maintain the necessary level of cleanliness, the floor is to be given a coated finish, the walls are to be covered with ceramic-coated steel panels, and calcium silicate board with ceramic coating is to be used for the ceiling.

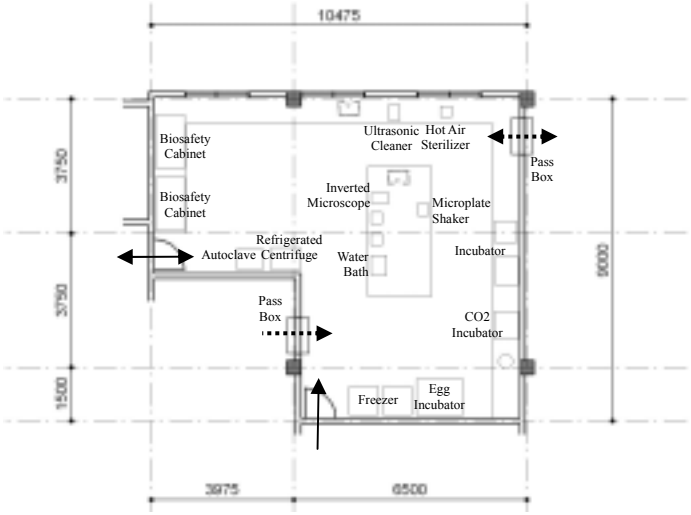


Figure 2-12 Typical AI Diagnosis Laboratory Layout

2) Necropsy room

During use, the necropsy room air is kept at negative pressure by the air conditioning system. The poultry organs and other specimens in sealed state are taken into the necropsy room from the specimen receiving area through a BH passbox. After a necropsy is performed, the specimens are put in sealed containers in a biological safety cabinet inside the necropsy room and sent to the AI diagnostics room. The floor space and layout are decided as in the figure below, allowing space necessary for installing the equipment for specimen pre-processing and for performing work at the necropsy table. The waste materials from a necropsy are processed in an autoclave, then sent to the specimen receiving room through a BH passbox and disposed of. The interior finishing is the same as in the AI diagnosis laboratory.

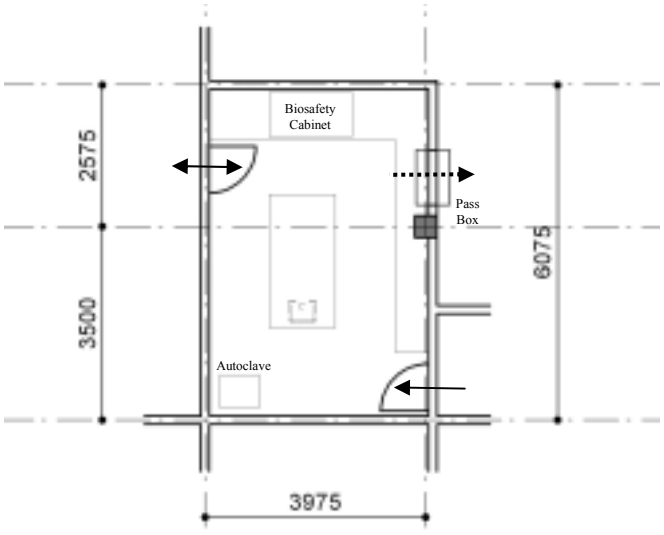


Figure 2-13 Typical Necropsy Room Layout

3) Sterilization room (same for general examinations and AI examination)

After putting on protective clothing and shoe covers in the changing room, staff pass through this room when entering the AI diagnostic room, necropsy room, epidemiological room or other contaminated area. When leaving a contaminated area, staff take off the protective clothing and shoe covers and put them in a sterilizer located in the sterilization room before returning to the changing room.

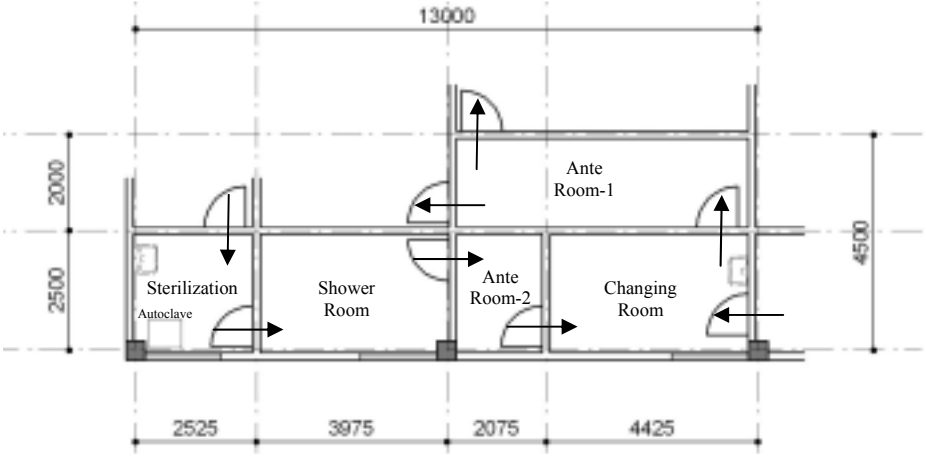


Figure 2-14 Typical Sterilization Laboratory Layout

4) PCR diagnostics room

Following RNA extraction in the AI diagnosis laboratory, specimens are put in sealed containers and taken into the PCR diagnostics room through a BH passbox. The PCR diagnostics room consists of three areas, for preparing test reagents, for RNA extraction, and for PCR amplification and electrophoresis. Since all specimens are handled in containers in these rooms, the PCR room is kept at normal pressure by the air conditioning system. The floor space and layout are designed as in the figure below, allowing space necessary for installing the various examination and diagnostic equipment as well as space for performing examination and diagnostics with each piece of equipment.

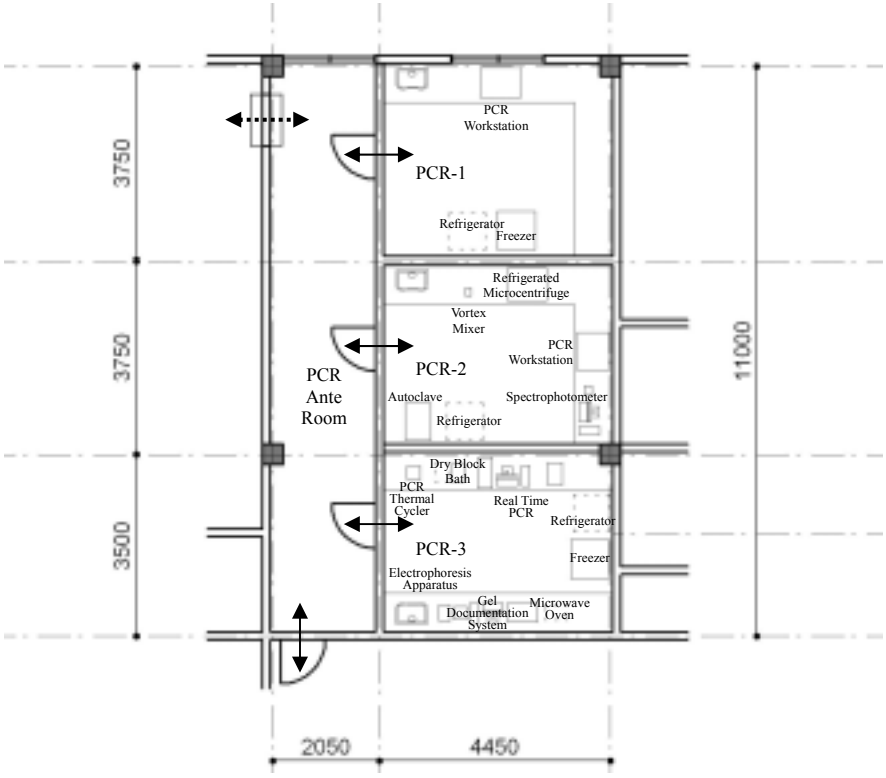


Figure 2-15 Typical PCR Diagnosis Laboratory Layout

5) Cell Preparation Room

Indonesia employs tissue culturing in its DICs as part of its AI examination and diagnostics procedure. The floor space and layout of the Cell Preparation Room are decided as in the figure below, allowing space necessary for installing the various examination and diagnosis equipment as well as space for performing examination and diagnosis with each piece of equipment.

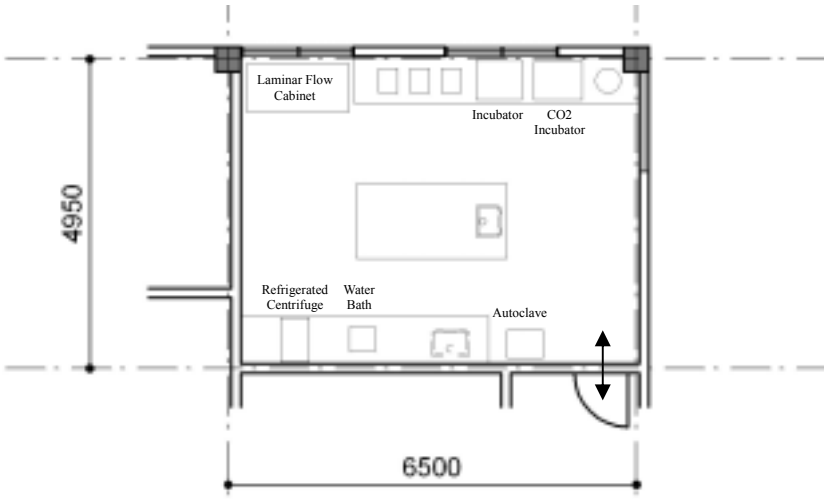


Figure 2-16 Typical Cell Preparation Laboratory Layout

(3) Floor Plan of DIC Subang

The DIC Subang is a facility that will be newly built, requiring that it have the minimum necessary functions for serving as a DIC. In addition to the above-mentioned AI diagnosis laboratory, necropsy room, PCR diagnostics room, Cell Preparation Room and other AI-related rooms, the Project will provide offices and a training section, a general examination and diagnostics section, power generation room, incinerator, water pumping room, and waste water treatment facilities, as well as houses for the poultry and small animals used for examination and diagnostics. The Veterinary Public Health Facility included in the original request has been deleted from Project facilities since they are related to Project objectives.
The following rooms are to be included in the general examination and diagnostics section.

1) Epidemiology laboratory

In an Indonesian DIC, all receiving of specimens takes place in the epidemiology laboratory section. An epidemiology laboratory receives, records and registers not only specimens selected and brought in from remote areas by vehicles belonging to the DIC, but also specimens brought in directly by farmers. It is therefore necessary to provide in this room space both for receiving and for handling and recording data after receiving, as well as records storage facilities. Parking space for around two vehicles and space for temporary placement of specimens are also required.

2) Specimen receiving and storage room (for general examinations and AI examination)

After specimens for general examinations and AI examination specimens have been received at the above epidemiology laboratory section, they are taken to the respective specimen receiving and storage rooms. These receiving rooms will have refrigerators to be installed by the Indonesia, one for temporary storage of items to be sent to the necropsy room or general examination room, and one for temporary storage of items for disposal. Specimens from AI diagnosis are also taken to this room where after items for disposal reach a certain volume, they are to be taken to the incinerator facilities for incineration.

3) Changing room for AI and general examination staff

Entry to and exit to AI diagnosis section must be made via a changing room. Although the Indonesians initially estimated that the changing rooms will be used by 5 persons, the actual numbers in other DICs is 10 or more. The room size will therefore be designed based on the larger number. A toilet and shower room will be installed next to each changing room.

4) Pathology laboratory

Plans for the pathology laboratory will assume a staff of 7 members, and will be based on requirements for equipment installation space and work space for the examination and diagnostic work of the DIC Yogyakarta, which closely resembles these plans.

5) Bacteriology laboratory

Plans for the bacteriology laboratory will assume a staff of 9 members, and will be based on requirements for equipment installation space and work space for the examination and diagnostic work of the DIC Yogyakarta, which closely resembles these plans.

6) Parasitology laboratory

Plans for the parasitology laboratory will assume a staff of 7 members, and will be based on requirements for equipment installation space and work space for the examination and diagnostic work of the DIC Yogyakarta, which closely resembles these plans.

7) Lecture hall

Seminars and training sessions take place in Indonesian DICs every week, including those offered by experts from international organizations such as FAO and USAID. Although most are attended by around 30 persons, including veterinarians and medical technicians, there should be enough space so that all DIC employees can be seated if needed.

8) General laboratories

A general necropsy room is planned for microbe and parasite examinations and other animal necropsy examinations. The size of the necropsy room will be the same as the AI section necropsy room noted earlier, but ordinary tile is to be used for the interior finishing.

9) Poultry house

A poultry house for 200 chickens is planned, for producing the fertilized eggs required in this AI wing.

10) Small Animal Houses

Housing is planned for the mice, rats and other small animals required in this AI wing.

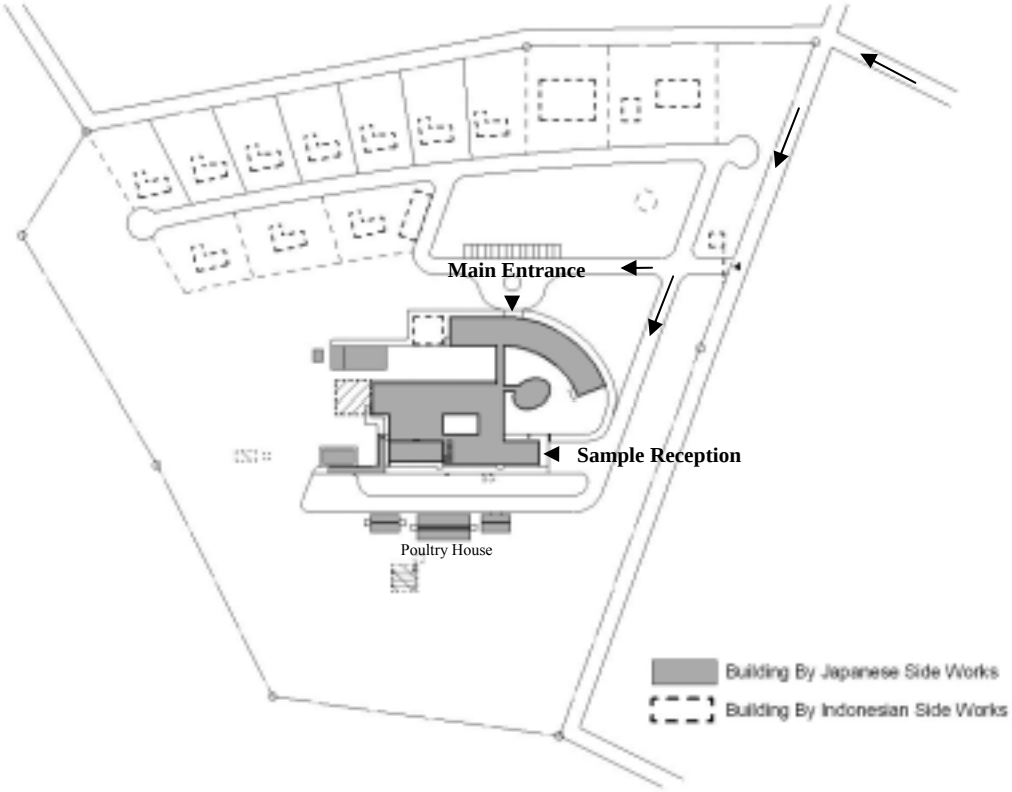


Figure 2-17 DIC Subang Site Plan

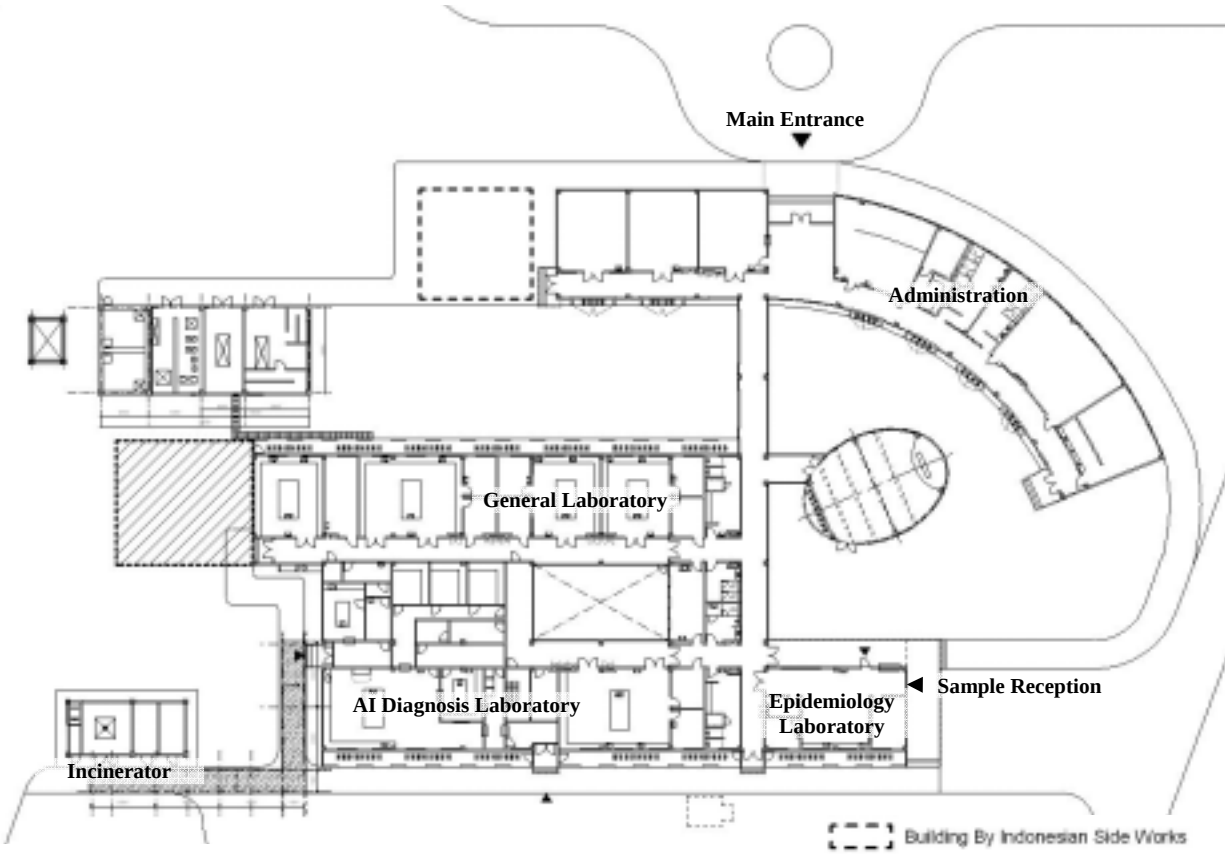


Figure 2-18 DIC Subang Site Plan

Details of the DIC Subang facilities are given below.

Table 2-13 DIC Subang Facility List

Department	Room name	Floor Area	Staff No.	Notes
Analysis Diagnosis	Epidemiology Lab	69.7	5	
	Section Chief Room Staff Room	29.1	5	
	Equipment Room	7.1		To be adjusted for equipment layout and required work space.
	Bacteriology Lab	51.4	9	To be adjusted for equipment layout and required work space.
	Section Chief Room Staff Room	25.7	9	
	Parasitology Lab	51.4	7	To be adjusted for equipment layout and required work space.
	Section Chief Room Staff Room	25.7	7	
	Pathology Lab	77	7	To be adjusted for equipment layout and required work space.
	Section Chief Room Staff Room	25.7	7	
	Washing Room	25.7		To be adjusted for equipment layout and required work space.
	Cell Preparation Lab	52.9		To be adjusted for equipment layout and required work space.
	Virology Lab	82.9	10	To be adjusted for equipment layout and required work space.
	Section Chief Room Staff Room	25.7	10	
	AI Sample Receiving Room Storage	27.5		Stock refrigerator (out / in)
	Virology Lab	98.5	10	To be adjusted for equipment layout and required work space.
	AI Necropsy Room	22		To be adjusted for equipment layout and required work space.
	AI Changing Room	19.3		Lockers, Caps, Over coat, Shoe cover, Cabinet.
	AI Sterilization Room	19.3		To be adjusted for equipment layout and required work space.
	PCR Diagnosis Lab	69.2		To be adjusted for equipment layout and required work space.
	General Receiving Room	12.9		Stock refrigerator.
	General Necropsy Room	22.9		To be adjusted for equipment layout and required work space.
	General Sterilization Room	10.2		To be adjusted for equipment layout and required work space.
	General Changing Room	12.5		Lockers, Caps, Over coat, Shoe cover, Cabinet.
Training	Lecture Room	112.8		For max.65 persons.
Administration	Office	28.8		
	Director Room	52.9		Core staff meeting.
	Reference Room	68.4		
	Meeting Room	83		For max.65 persons.
	Poultry House	152.5		Fertilized egg supply.
	Small Animal House	46.1		
	Animal Staff Office	46.1		
Mechanical Room	Pump Room / Fan Room	189.9		
	Generator Room	84.5		
	Incinerator	61.6		
Common	Common Use Room	1,174.40		
	Total	2,965.3		

(4) Floor Plan of DIC Medan

The AI wing will be built in the open area in front of the existing facility after clearing by Indonesian side.
Included in plans for the new AI wing are the AI diagnosis laboratory, necropsy room, PCR diagnostics room, and Cell Preparation Room noted in (2) BH area planning. The size of each of the AI rooms is the same as for Subang. An appropriate distance between the adjoining existing veterinary public health block will be maintained and a separate air conditioning environment will be planned.

1) Construction on existing facilities side

A connecting corridor will be built between the existing facility and AI wing, by constructing a dividing wall to the refrigerator area (for storing samples) by the existing room used to prepare the culture medium for cell culturing. A security door will be installed between the AI wing and existing facility, and entry control will be applied. The present refrigerator area will be moved to the store room at the east end of the existing facility (currently the temporary location of a PCR diagnostics system).

2) Poultry house

A poultry house will be built in an empty lot within the existing animal compound. A poultry house for 200 chickens is planned, for producing the embryonated eggs required in this AI wing.

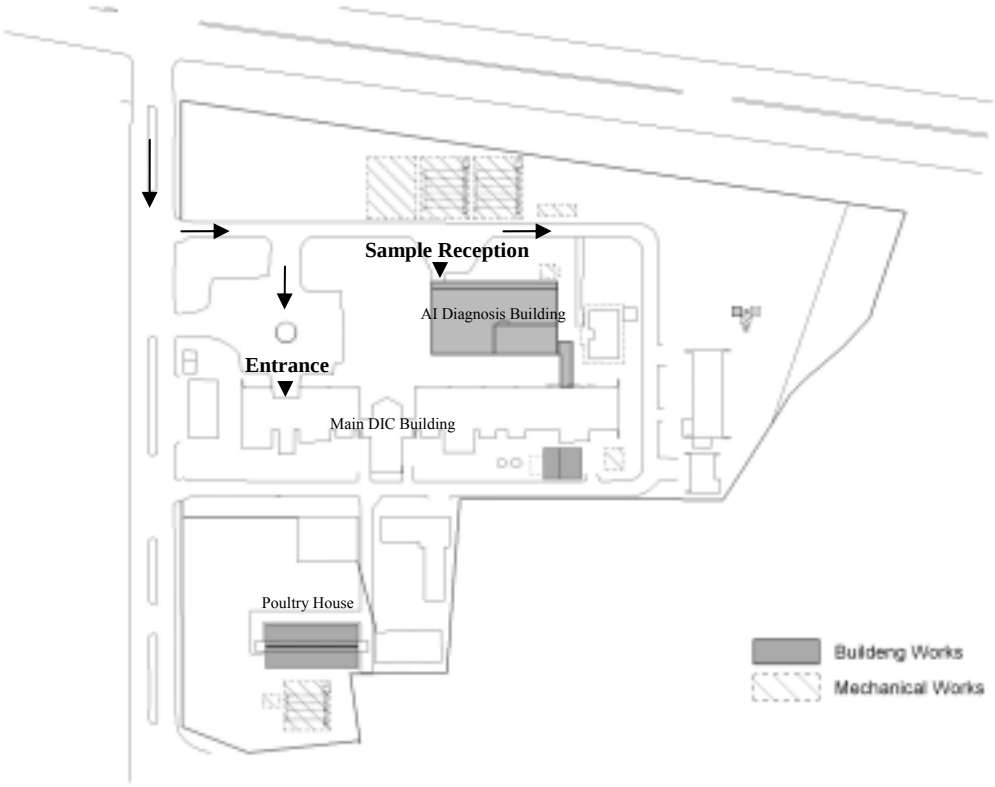


Figure 2-19 DIC Medan Layout

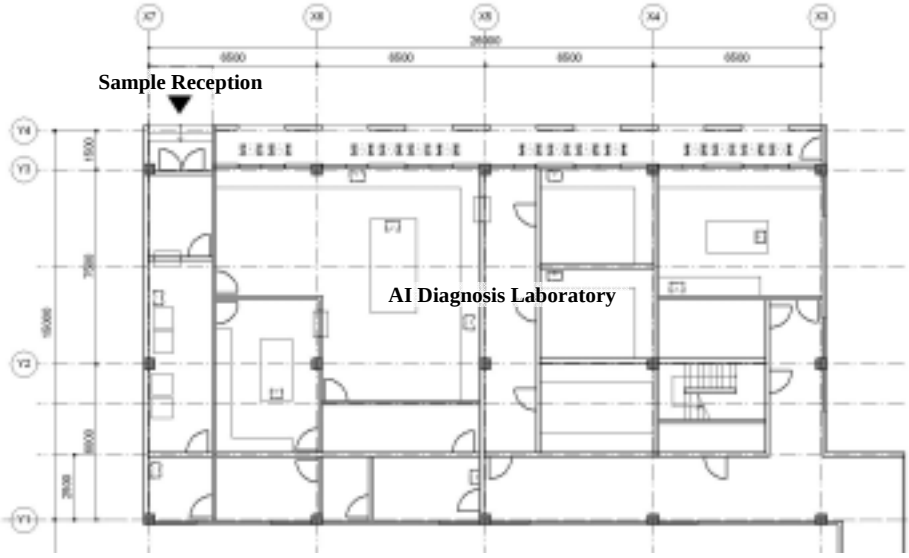


Figure 2-20 DIC Medan Floor Plan

Details of the DIC Medan facilities are given below.

Table 2-14 Details of DIC Medan Facilities

Department	Room name	Floor Area	Staff No.	Notes
Analysis Diagnosis	AI Sample Receiving Room Storage	9.2		
	Epidemiology Lab	20.0	5	
	Virology Lab	79.5	10	To be adjusted for equipment layout and required work space.
	AI Necropsy Room	26.4		To be adjusted for equipment layout and required work space.
	AI Changing Room	40.1		
	AI Sterilization Room	7.0		To be adjusted for equipment layout and required work space.
	PCR Diagnosis Lab	76.1		To be adjusted for equipment layout and required work space.
	Cell Preparation Room	34.0		
	Poultry House	152.5		
Mechanical Room	Pump Room / Fan Room	137.0		
Common	Common Use Room	271.8		
	Total	853.6		

(5) Floor Plan of DIC Lampung

Included in plans for the new AI wing are the AI diagnosis laboratory, necropsy room, and Cell Preparation Room noted in (2) BH area planning. The size of each of the AI rooms is the same as for Subang.

Passage between the existing wing and new AI wing will be via a connecting corridor to be newly built. This corridor will be formed by constructing a dividing wall in the store room (a storage room next to the former refrigeration room, which has already stopped functioning) by the existing virology laboratory. A security door will be installed in this corridor and entry control will be applied. The movement of specimens from the AI wing to the existing PCR diagnostics room will pass near the common toilet adjoining the existing parasitology laboratory. To ensure smooth diagnostics, a circulation plan that shortens this traffic will be necessary. To this end, a new passageway will be created outside the staff room of the pathology laboratory. Simple modifications such as the installing of outside doors will be included in the Project.

The following facilities are also planned.

1) Poultry house

A poultry house will be built in an empty lot by the existing animal quarters. A poultry house for 200 chickens is planned, for producing the fertilized eggs required in the AI wing.

2) Water purification pump room

In order to achieve the water quality needed for this DIC from city water, a water purification system, ground-level water tank and pumping equipment are planned for the machine room.

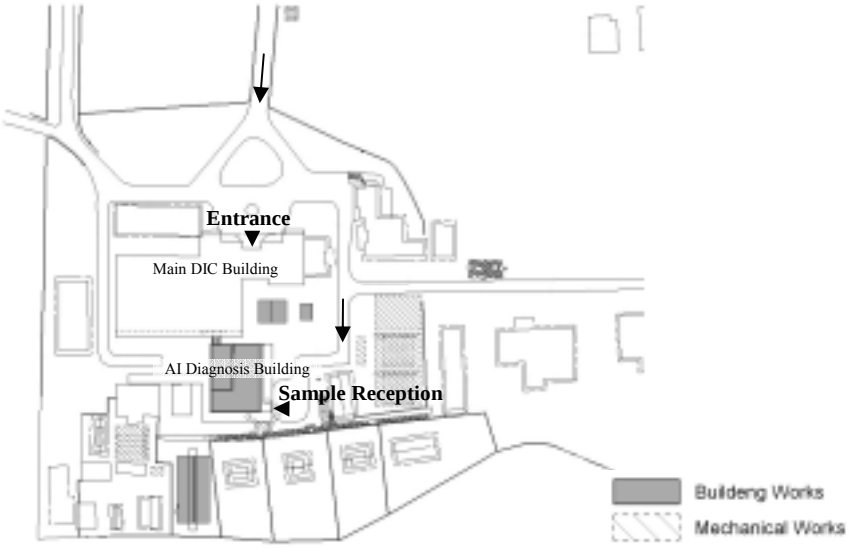


Figure 2-21 DIC Lampung Layout

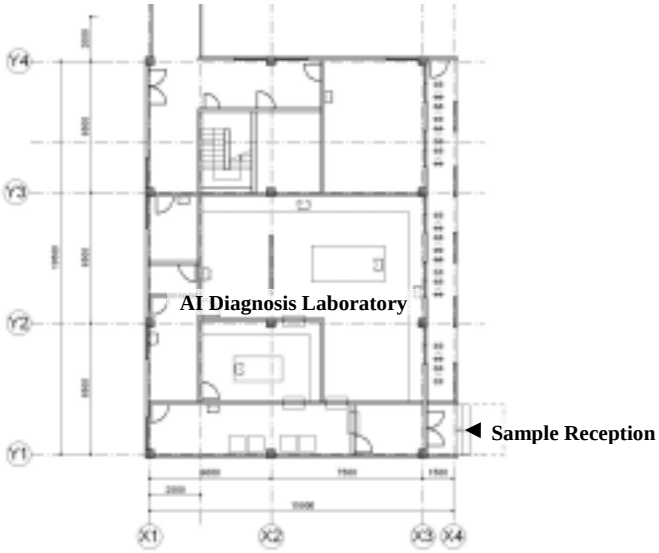


Figure 2-22 DIC Lampung Floor Plan

Details of the DIC Lampung facilities are given below.

Table 2-15 Details of DIC Lampung Facilities

Department	Room name	Floor Area	Staff No.	Notes
Analysis Diagnosis	AI Sample Receiving Room Storage	24.1		
	Epidemiology Lab	27.4	5	
	Virology Lab	71.2	10	To be adjusted for equipment layout and required work space.
	AI Necropsy Room	31.0		To be adjusted for equipment layout and required work space.
	AI Changing Room	14.3		
	AI Sterilization Room	14.8		To be adjusted for equipment layout and required work space.
	Cell Preparation Room	35.3		
	Poultry House	152.5		
Mechanical Room	Pump Room / Fan Room	120.7		
Common	Common Use Room	242.2		
	Total	733.5		

(6) Sectional Design

The facilities in the Project for the three DICs will have structural design based on the quake-proofing design standards of Indonesia. The facilities are all single-story buildings except for the rooftop machine room above a part of the AI examination and diagnostics section. The main structural elements are steel reinforced concrete columns, beams, and slabs. The buildings will have flat roofs covered with waterproof material and pressed concrete, with a roof incline of 1/50 and a shape that avoids water accumulation on the roof, so as to prevent building deterioration over time. Since the buildings are close to the equator, waterproof insulation will be used for protection from direct overhead sunlight.

Air conditioning equipment is to be installed in all the AI examination and diagnostics rooms to maintain the necessary examination environment.

Rooms without air conditioning in the new wing will not have ceilings, for a larger air volume, and will have windows with screens, jalousies and the like to allow sufficient ventilation for natural cooling.

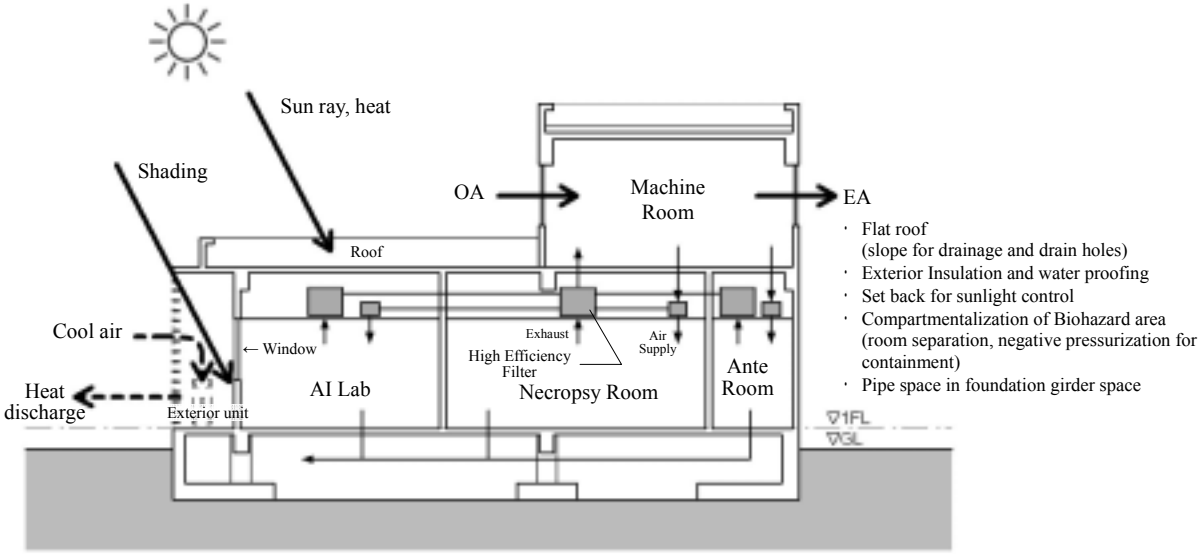


Figure 2-23 Cross-Section View of New AI Wing

2-2-2-4 Structural Design

The main facilities in this project are laboratories for diagnosis of AI. Careful attention will be paid to design facilities for sufficient structural strength and safety. The proposed construction sites are located in (1) Subang in eastern Java, (2) Medan in northern Sumatra, and Lampung in southern Sumatra. A new DIC is to be constructed in Subang, whereas in Medan and Lampung, AI laboratory facilities are to be built within the existing DIC grounds.

(1) Soil Characteristics at Proposed Construction Sites

1) DIC Subang

① On Site Inspection Result

As the soil characteristics were unknown, due to the absence of other buildings in the vicinity of the proposed site that could serve as a reference for this project a soil investigation was carried out to obtain reference soil data. There are embankments on the north and east sides of the site, below which a river flows. Based on the soil properties in the surrounding area and on information learned from local drilling companies, the top layer is assumed to be volcanic loam. Due to the alternating rainy season and dry season in Indonesia and highly changeable weather conditions, the soil is likely to undergo severe dry shrinkage and cannot be expected to offer much in the way of bearing capacity. Based on the boring survey it was concluded that a pile foundation would be appropriate.

② Soil Survey (Drilling Survey) Result

The soil composition based on the results of a soil survey at the proposed construction site is as shown in Table 2-16.

Table 2-16 DIC Subang Soil Strata

Depth	Description	N value
GL± 0.0～GL－12.0m	Silty clay	2－7
GL－12.0～GL－17.0m	Silty sand	2－40
GL－17.0～GL－20.0m	Silty clay	7－15
＞GL－20.0m	Sand	＞50

2) DIC Medan

① On Site Inspection Results

The type of foundation of the existing buildings remains unknown, since there are no structural design drawings. A visual check on site of the existing building floors and frames found almost no cracking, but there are signs that the beams, columns and walls have recently been repainted. Based on the soil properties in the surrounding area and on information learned from local drilling companies, the top layer is assumed to be volcanic loam. Due to the alternating rainy season and dry season in Indonesia and highly changeable weather conditions, the soil is likely to undergo severe dry shrinkage and cannot be expected to offer much in the way of bearing capacity. Based on the boring survey it was concluded that a pile foundation would be appropriate.

② Soil Survey (Drilling Survey) Result

The soil composition based on the results of a soil survey at the proposed construction site is as shown in Table 2-17. The foundation proposal recommended by the soil survey company is a pile foundation, with a sand layer at a depth below GL -22.0m as the supporting layer, due to liquefaction concerns.
During the rainy season when the drilling survey took place, the groundwater level was GL -0.82m; accordingly, a design water level of GL -0.7m is adopted.

Table 2-17 DIC Medan Soil Strata

Depth	Description	N value
GL±0.0 to GL-3.5m	Silty clay	3-4
GL-3.5 to GL-30.0m	Sand	9-25
GL-30.0 to GL-36.5m	Sand	28-38
GL-36.5 to GL-40.0m	Silty clay	21-24

3) DIC Lampung

① On Site Inspection Result

The type of foundation of the existing buildings remains unknown, since there are no structural design drawings. A visual check of the existing building floors and frames found cracking in various places. Based on the soil properties in the surrounding area and on information learned from local drilling companies, the top layer is assumed to be volcanic loam. Due to the alternating rainy season and dry season in Indonesia and highly changeable weather conditions, the upper soil is likely to undergo severe dry shrinkage and cannot be expected to offer much in the way of bearing capacity. Based on the boring survey it was concluded that a pile foundation would be appropriate.

② Soil Survey (Drilling Survey) Result

The soil composition based on the results of a soil survey at the proposed construction site is as shown in Table 2-18. The foundation proposal recommended by the soil survey company is a pile foundation, with a sand layer at a depth below GL-6.0m, due to liquefaction concerns.
During the rainy season when the drilling survey took place, the groundwater level was GL-1.35m; accordingly, a design water level of GL-1.1m is adopted.

Table 2-18 DIC Lampung Soil Strata

Depth	Description	N value
GL±0.0 to GL-3.5m	Silty Clay	5-19
GL-3.5 to GL-6.0m	Silty Sand	20-28
GL-6.0 to GL-10.0m	Sand	25-50
GL-10.0 to GL-13.0m	Silty Sand	＞50
GL-13.0 to GL-20.0m	Rock (Andesite)	＞50

(2) Summary of Structural Design

1) DIC Subang

At Subang, in addition to avian influenza facilities the full DIC itself is to be newly built. The facilities in this project therefore include the DIC main building, poultry house, small animal quarters, animal stall quarters, machinery block, elevated water tank, incineration facility, connecting corridor, and wastewater treatment system. Staff Housing, Veterinary Public Health Laboratory and other ancillary structures are to be built by the Indonesian side. Considering local economic factors and construction practices, a simple framed structure of reinforced concrete is to be adopted. Non-bearing walls of brick are to be used for the exterior and for inner walls, as is common in the local region. The roofs are to be made of reinforced concrete with built-up asphalt for waterproofing. The foundations, due to the soft subsoil and liquefaction concerns, are to be pile foundations with the sand layer at GL-30.0m serving as the supporting layer.

① DIC main building

The DIC main building will have three wings, the AI diagnostics wing, administrative wing, and lecture hall wing, with connecting corridors running between the AI diagnostics wing and administrative wing, and between the AI diagnostics wing and lecture hall wing. Each of these connecting corridors is to be integrated with the administrative wing and lecture hall wing, respectively. Expansion joints are to be built into the connecting corridor on the AI diagnostics wing side at the dividing point, so that structurally the building consists of three wings.

a) AI diagnostics wing

This will be a two-story building; but the second-story part, above the AI-related labs only, will be used to house the air conditioning systems. The span size is basically 6.5m×7.5m, with 2.5m spans in the corridor portion, for a nearly rectangular planar shape. A simple frame structure of reinforced concrete is to be used, with non-bearing block walls inside and out. Since a pile foundation is to be adopted, a hollow pit with concrete sub-slab will be provided under the first floor for service conduit use.

b) Administrative wing

This is to be a single-story building. There are to be 9 spans of 6.5m on the long side, and 2 spaces of 7.5m and 2.5m on the short side, forming a plan that combines a rectangle and fan shape. A simple frame structure of reinforced concrete is to be used, with non-bearing block walls inside and out. Since a pile foundation is to be adopted, a hollow pit with concrete sub-slab will be provided under the first floor for service conduit use. The corridor connecting this wing to the AI diagnostics wing is to be an integral part of the administrative wing.

c) Lecture hall wing

This is to be a single-story building. It will have an oval plan, of 2 spans by 3 spans. A simple frame structure of reinforced concrete is adopted, with non-bearing block walls on the outside. A pile foundation will be used.

② Poultry house

This is to be a single-story building. It will have a rectangular plan, with three spans of 3.0m+1.5m+3.0m on the short side and 3 spans of 6.0m on the long side. A simple frame structure of reinforced concrete is adopted, with non-bearing block walls on the outside. A pile foundation will be used. The 1.5m span roof will be an open non-bearing wooden roof, for ventilation.

③ Small animal quarters

This is to be a single-story building. It will have a rectangular plan, with 1 span of 4.5m on the short side and 2 spans of 4.5m on the long side. A simple frame structure of reinforced concrete is adopted, with non-bearing block walls on the outside. A pile foundation will be used.

④ Animal keeper quarters

This is to be a single-story building. It will have a rectangular plan, with 1 span of 4.5m on the short side and 2 spans of 4.5m on the long side. A simple frame structure of reinforced concrete is adopted, with non-bearing block walls on the outside. A pile foundation will be used.

⑤ Machinery Block

The machinery block, consisting of a water reservoir tank and electrical room, is to be made of reinforced concrete. Bearing walls are to be used only around the reservoir tank, with the other outside and inside walls being non-bearing block walls.

⑥ Elevated water tank

A braced steel structure consisting of H-steel girders will be constructed to hold a 4 cubic meter water tank at the 15m high portion. A pile foundation will be used, with foundation footings of a weight to prevent toppling from an earthquake or other lateral force.

⑦ Incinerator

This is to be a steel structure.

⑧ Connecting corridor

The corridor connecting the AI diagnostics wing and incineration facility is to be a steel structure. Columns are to be spaced at 6.0m intervals. The roof will be cantilevered. The plan will be an L shape.

⑨ Wastewater treatment system

A septic tank will be buried below the ground, and will be made of reinforced concrete.

2) DIC Medan

Medan has an existing DIC, on the grounds of which the new AI laboratory facility is to be built. The facilities in the project include an AI diagnostics wing, poultry house, machinery block, elevated water tank, and wastewater treatment system. Considering local economic factors and construction practices, a simple framed structure of reinforced concrete is to be adopted. Non-bearing walls of block are to be used for the exterior and for inner walls, as is common in the local region. Generally, the roofs are to be made of reinforced concrete with a layer of asphalt for waterproofing. The foundations, due to the soft subsoil and liquefaction concerns, are in principle to be pile foundations, having a pile length of 14m to take advantage of the frictional force of the sand layer around the piles.

① AI diagnostics wing

This will be a two-story building; but the second-story part, above the AI-related labs only, will be used to house the air conditioning systems. The span size is 6.5m×7.5m, with 2.5m spans in the corridor portion, for a nearly rectangular plan. A simple framed structure of reinforced concrete is to be used, with non-bearing block walls inside and out. Since a pile foundation is to be adopted, a hollow pit with concrete sub-slab will be provided under the first floor for service conduit use.

② Poultry house

This is to be a single-story building. It will have a rectangular plan, with three spans of 3.0m+1.5m+3.0m on the short side and 3 spans of 6.0m on the long side. A simple framed structure of reinforced concrete is adopted, with non-bearing block walls on the outside. A pile foundation will be used. The 1.5m span roof will be an open non-bearing wooden roof, for ventilation.

③ Machinery block

The machinery block, consisting of a water reservoir tank and electrical room, is to be made of reinforced concrete. Bearing walls are to be used only around the reservoir tank, with the other outside and inside walls being non-bearing block walls.

④ Elevated water tank

A braced steel structure consisting of H-steel girders will be constructed to hold a 4 cubic meter water tank at the 15m high portion. A pile foundation will be used, with foundation footings of a weight to prevent toppling from an earthquake or other lateral force.

⑤ Wastewater treatment system

A septic tank will be buried below the ground, and will be made of reinforced concrete.

⑥ DIC main building modifications

A short section of the exterior wall will need to be taken down for building a connecting corridor to the AI diagnostics wing. No modifications will be made to the columns, beams or other parts of the main frame.

3) DIC Lampung

Lampung has an existing DIC, on the grounds of which a new AI laboratory facility is to be built. The facilities in the project include an AI diagnostics wing, poultry house, machinery block, elevated water tank, and wastewater treatment system. Considering local economic factors and construction practices, a simple framed structure of reinforced concrete is to be adopted. Non-bearing walls of brick are to be used for the exterior and for inner walls, as is common in the local region. The roofs are to be made of reinforced concrete with a layer of asphalt for waterproofing. The foundations, due to the soft subsoil and liquefaction concerns, are to be pile foundations with the sandy layer at GL-8.0m serving as the supporting layer.

① AI diagnostics wing

This will be a two-story building; but the second-story part, above the AI-related labs only, will be used to house the air conditioning systems. The span size is generally 6.5m×7.5m, with 2.5m spans in the corridor portion, for a nearly rectangular planar shape. A simple frame structure of reinforced concrete is to be used, with non-bearing block walls inside and out. Since a pile foundation is to be adopted, a hollow pit with concrete sub-slab will be provided under the first floor for service conduit use.

② Poultry house

This is to be a single-story building. It will have a rectangular plan, with three spans of 3.0m+1.5m+3.0m on the short side and 3 spans of 6.0m on the long side. A simple framed structure of reinforced concrete is adopted, with non-bearing block walls on the outside. A pile foundation will be used. The 1.5m span roof will be an open non-bearing wooden roof, for ventilation.

③ Machinery block

The machinery block, consisting of a water reservoir tank and electrical room, is to be made of reinforced concrete. Bearing walls are to be used only around the reservoir tank, with the other outside and inside walls being non-bearing block walls.

④ Elevated water tank

A braced steel structure consisting of H-steel girders will be constructed to hold a 4 cubic meter water tank at the 15m high portion. A pile foundation will be used, with foundation footings of a weight to prevent toppling from an earthquake or other lateral force.

⑤ Wastewater treatment system

A septic tank will be buried below the ground, and will be made of reinforced concrete.

⑥ DIC main building modifications

A short section of the exterior wall will need to be taken down for building a connecting corridor to the AI diagnostics wing. No modifications will be made to the columns, beams or other parts of the main frame.

(3) Basic Policies on Structural Design

1) Structural design policies

The structural design will in principle conform to Indonesian building codes; but the seismic standards in Indonesia having been devised with reference to quake-resistant engineering in Japan, and the seismic design will also conform to Japanese standards.

2) Design load

① Fixed load

Fixed load is calculated based on the weight of the main finishing materials and structural materials. The weight of each material is as indicated in "SKBI (Standar Konstruksi Bangunan Indonesia)-1.3.53.1987 UDC:624.042." The density of the main materials is shown in Table 2-19.

Table 2-19 Density of Main Materials

Construction Materials	Density
Concrete	2200kg/m^3 → 22.0kN/m^3
Reinforced concrete	2400kg/m^3 → 24.0kN/m^3
Steel	7850kg/m^3 → 78.5kN/m^3

② Dead weight

Dead weight values based on the purpose for which a room is used are taken from "SKBI (Standar Konstruksi Bangunan Indonesia)-1.3.53.1987 UDC:624.042" and given in Table 2-20. Based on these values, the dead weight values to be applied to structural design, with reference to the values set for government buildings in Japan, are given in Table 2-21.

Table 2-20 Main Dead Weight Values

Room	Dead Weight
Office, lecture room	250kg/m^3 → 2,500N/m^2
Corridor	300kg/m^3 → 2,900N/m^2
Conference hall, musholla	400kg/m^3 → 3,900N/m^2
Work space, warehouse, laboratory	400kg/m^3 → 3,900N/m^2

Table 2-21 Dead Weight Values Applied to Design

Room	Dead Weight (in N/m^2)		
	For floors and beams	For columns and girders	For earthquake use
Laboratory	4,900	3,900	2,500
Office	2,900	1,800	800
Lecture room	2,900	2,100	1,100
Corridor	2,900	1,800	800
Rooftop	1,000	600	400
Machine room	4,900	2,400	1,300
Warehouse	4,900	3,900	2,500

③ Wind load

Wind load is calculated from "SKBI (Standar Konstruksi Bangunan Indonesia)-1.3.53.1987 UDC: 624.042." Wind load P<kg/m^2> is calculated using the equation P = V2/16 (V: wind velocity <m/s>). For the purposes of this project, structural design assumes a wind velocity of 40m/s and wind force of 100kg/m^2 based on meteorological data. Wind pressure coefficient is decided in accordance with the building shape, but will be the same as in the Japanese building code.

④ Earthquake load

The seismic design code in Indonesia was revised in 2002. Earthquake load is to be calculated based on the new code, "SNI (Standar Nasional Indonesia) 03-1726-2002."
The new code is essentially similar to the previous code, SNI 03-1726-1989; but one important change is that in evaluating base shear for earthquake design, strength design is performed using the response modification coefficient R of the NEHRP (National Earthquake Hazards Reduction Program) provisions. Seismic design load applies to earthquakes over a 500-year recurrence interval, using the NEHRP provisions as reference. Seismic design load is calculated by classifying all of Indonesia into six seismic zones, setting three soil conditions in each of these zones and assigning an acceleration response spectrum as in Figure 2-24. From the seismic zone map in Figure 2-24, it can be seen that the project sites in Subang and Medan are in seismic zone (3), while Lampung is in seismic zone (5). Earthquake load is calculated based on these conditions.

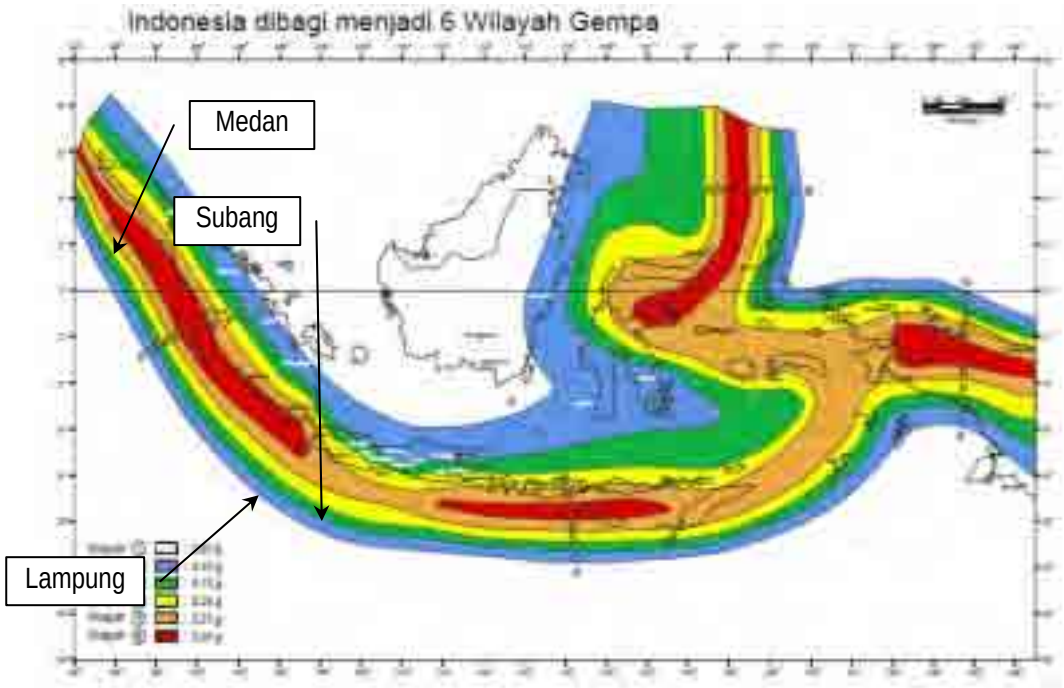


Figure 2-24 Seismic Zone Map

3) Construction Materials

① Concrete

Ordinary concrete is to be used. Ready-mixed concrete plants are readily available. The plants in the vicinity of the project sites use river sand for their concrete, and crushed stone from nearby mountains as gravel. The strength class is indicated by K ratings in Indonesia, with the main classes of this generally used concrete corresponding to the FC ratings used in Japan as shown in Table 2-22. In this project, K-300 corresponding to FC24 is to be used.

Table 2-22 Concrete Strength Equivalent

Indonesian Marking	JIS Standard Marking
K-225	FC18
K-300	FC24
K-325	FC27

② Reinforcing steel

Deformed bars are to be used for reinforcing steel. As steel strengths, SD295 or SD345, the same as in JIS standards, are generally used. Generally used diameters are D10 to D25, also similar to the JIS standards, and larger diameters of D29 or D32 are also apparently used. In this project, SD295 is to be used for diameters of D10 to D16, and SD345 for diameters of D19 to D29.

③ Steel frame

The JIS standard SS400 steel frame is apparently available locally. JIS-standard sizes for the H-steel line up are manufactured. In this project, JIS standard SS400 H-steel product is to be used.

2-2-2-5 Mechanical and Electrical (M/E) Systems

(1) DIC Subang

1) Electrical Systems

① Power Supply System

Power for the project site will be supplied by the electric company PLN from a nearby distribution substation, via a transformer where it will be stepped down to 380V/220V. The power required for the facilities in this project is estimated to be 300kVA. The Indonesians will be responsible for the primary system installation work, for carrying power from PLN to the terminal connections on the main distribution board via the main circuit breaker and transformer, while Japan will perform the installation work from the main distribution board to the secondary system. Considering the local power situation and the need for uninterrupted power for AI and other examination and diagnostics, an emergency power generator will be installed as a backup in case of power outages. Japan will be responsible for installing the backup generator and for distribution and wiring from the point of the generator. The emergency power to be supplied by the backup generator is estimated to be 100kVA based on the needs for operating the building systems, disaster prevention systems, and minimum necessary equipment mainly in the examination and diagnostics areas of this project.

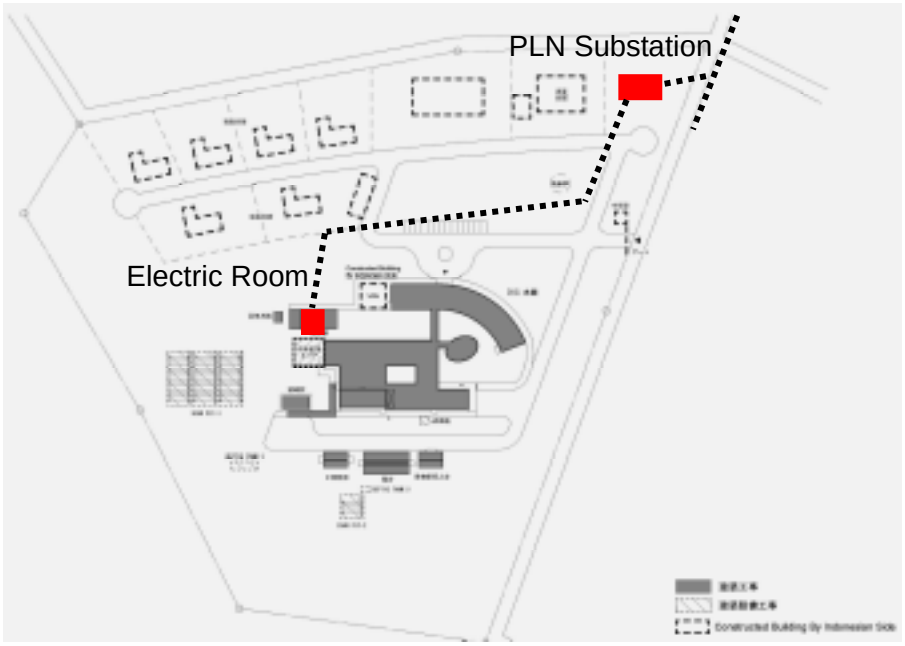


Figure 2-25 Diagram of Route of Electric Power Supply

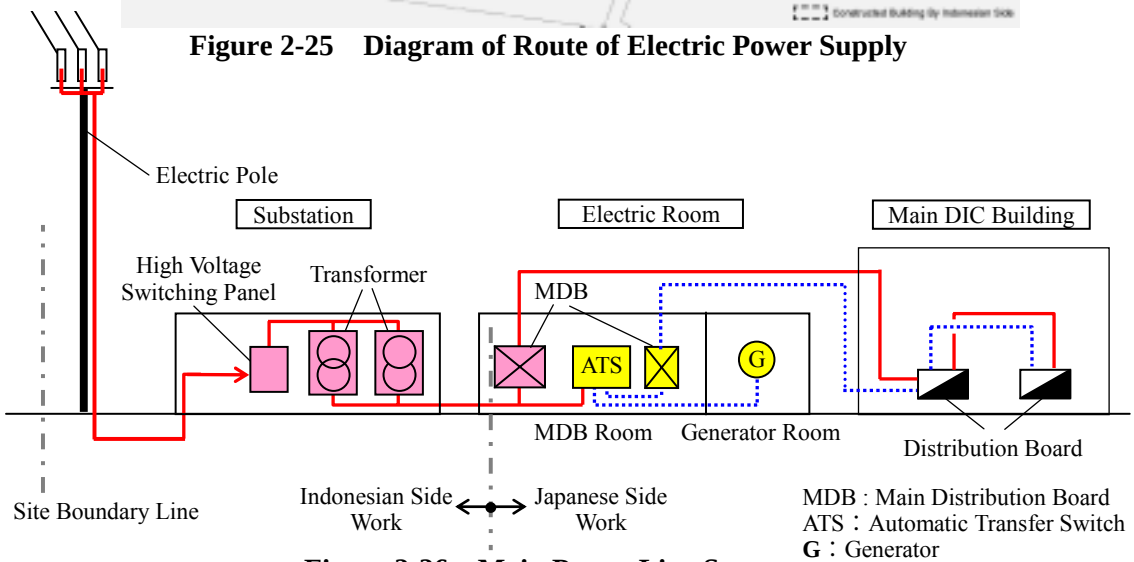


Figure 2-26 Main Power Line System

② Lighting and Power Outlet Systems

The lighting plan for the facilities makes use mainly of fluorescent lights. In view of the illumination settings in existing Indonesian DIC facilities, the plans for this project will use a setting of around 60 to 70 percent of the JIS standards for illumination. Some of the lights, power outlets and laboratory equipment will be powered by the generator, as a power outage measure. Lights and guide lamps with built-in battery will be installed to facilitate emergency evacuation.
Power outlets will mostly be the two-prong grounded type.

③ Telephone System

The telephone system for this project will be built as a PABX system. The project facilities are assumed to require 5 outside lines and 30 extensions. The Indonesians will handle telephone line installation up to the MDF, while Japan will install the secondary wiring inside the buildings beyond the MDF.

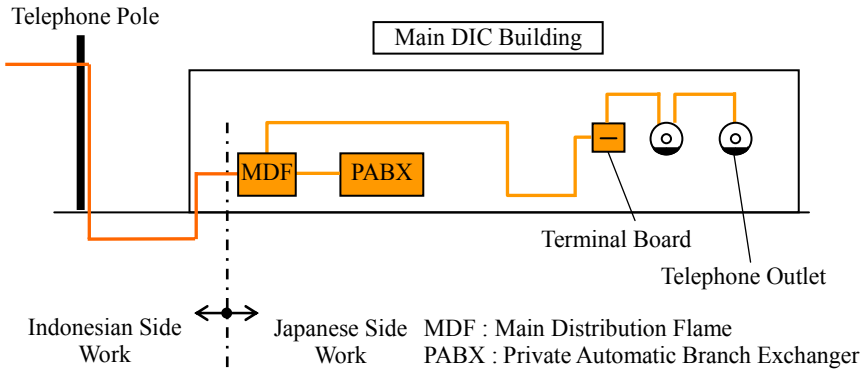


Figure 2-27 Telephone System Scheme

④ Fire Alarm System

Installation of fire alarms and the like will conform to Indonesian regulations in principle, but will follow Japanese regulations for matters not covered by the Indonesian regulations. Both pushbutton fire alarms and automatic fire alarms including heat detectors will be installed in this project.

⑤ Communication System

A LAN cable rack and conduit will be installed for configuring a computer network in the project facilities. Indonesia will be responsible for the server and communication system installation and the wiring work.

⑥ Lightning Arrester and Earth Systems

Lightning arresters will be installed in this project to protect the buildings from lightning.
Precision equipment, electrical equipment and the like will be protected by grounding.

⑦ Security Systems

Security systems requiring keypad entry will be installed for security purposes on doors for entry and exit in the general examination section and at the general specimen receiving area, and on doors for entry and exit in the AI examination section and at the AI specimen receiving area.

2) Mechanical Systems

① Water Supply System

Water for this project will come from a supply line branched from the water main of the national waterworks company (PDAM) running under the nearby national road. The water will be received in a reservoir in the project, pumped up to an elevated water tank, and supplied from there to each of the facilities. The volume of water used in the project is estimated to be around 80 m^3/day. The capacity of the reservoir will be large enough to include water used by fire hydrants. The reservoir will be built above ground to prevent contamination from infiltrating exterior water. The Indonesians will handle the supply line installation from the water main under the national road to the reservoir.

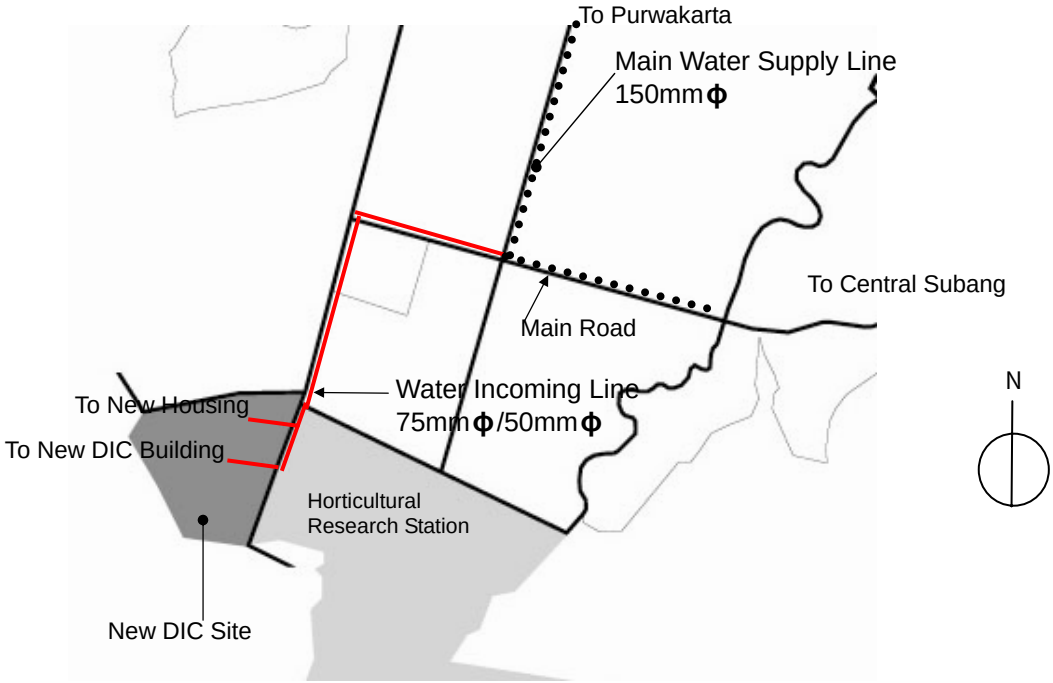


Figure 2-28 Plan for Water Supply Line to the New DIC

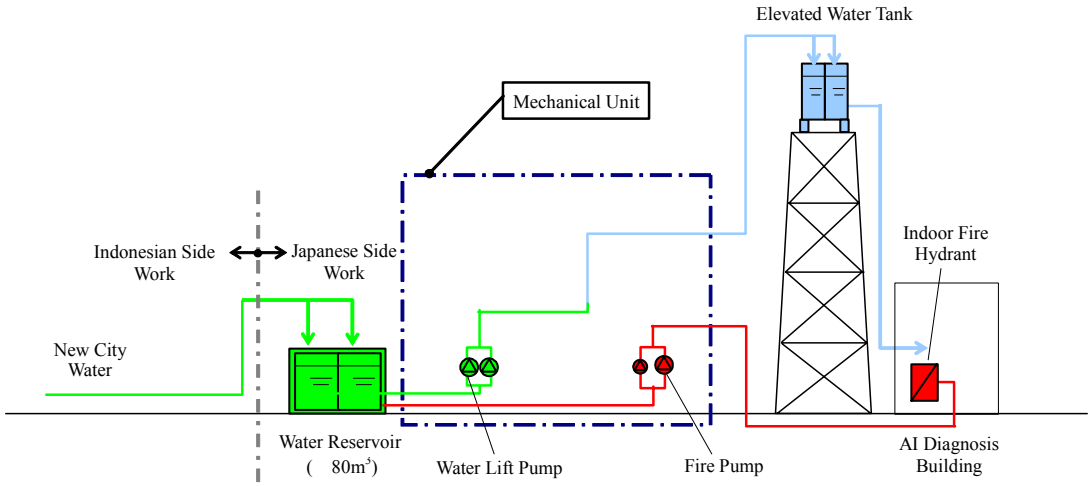


Figure 2-29 Water Supply System

② Waste Water System

Ordinary wastewater from the project facilities and wastewater from general examinations will go to a newly installed septic tank directly, while wastewater from the necropsy rooms and AI diagnosis laboratory will go the septic tank via a disinfectant tank. After disinfection in these tanks, the water will be processed by subsurface infiltration. Rainwater from roofs and the site grounds will be released directly to the nearest storm-water drainage ditches.

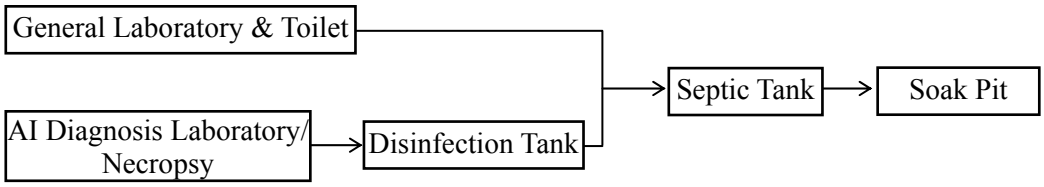


Figure 2-30 Wastewater Flow

③ Hot Water Supply

Hot water will be supplied individually by electric hot water heaters where needed.

④ Gas

Propane gas tanks will be used to supply gas to the examination rooms.

⑤ Fire Extinguishing System

Installation of fire extinguishing systems will conform to Indonesian regulations in principle, but will follow Japanese regulations for matters not covered by the Indonesian regulations. Indoor fire hydrant and fire extinguishers will be installed in the project facilities. The installed fire extinguishers will be the dry powder type.

⑥ Incinerator

Animal carcasses and infectious waste materials from the necropsy rooms and AI labs will be burned in an incineration facility to be newly built. The facility will have a capacity of around 100 kg per day, and will use two oil-fired burners.

⑦ Air Conditioning Systems

As a rule, individual air conditioners will be installed only in rooms with a functional need for cooling. Generally these will be separate-type wall-mounted air conditioners. Since the necropsy rooms and AI labs must be kept at negative pressure, a semi-central air conditioning system will be used in these rooms.
Mechanical ventilation will be provided in rooms that use air conditioning and in rooms where odors or heat are produced.

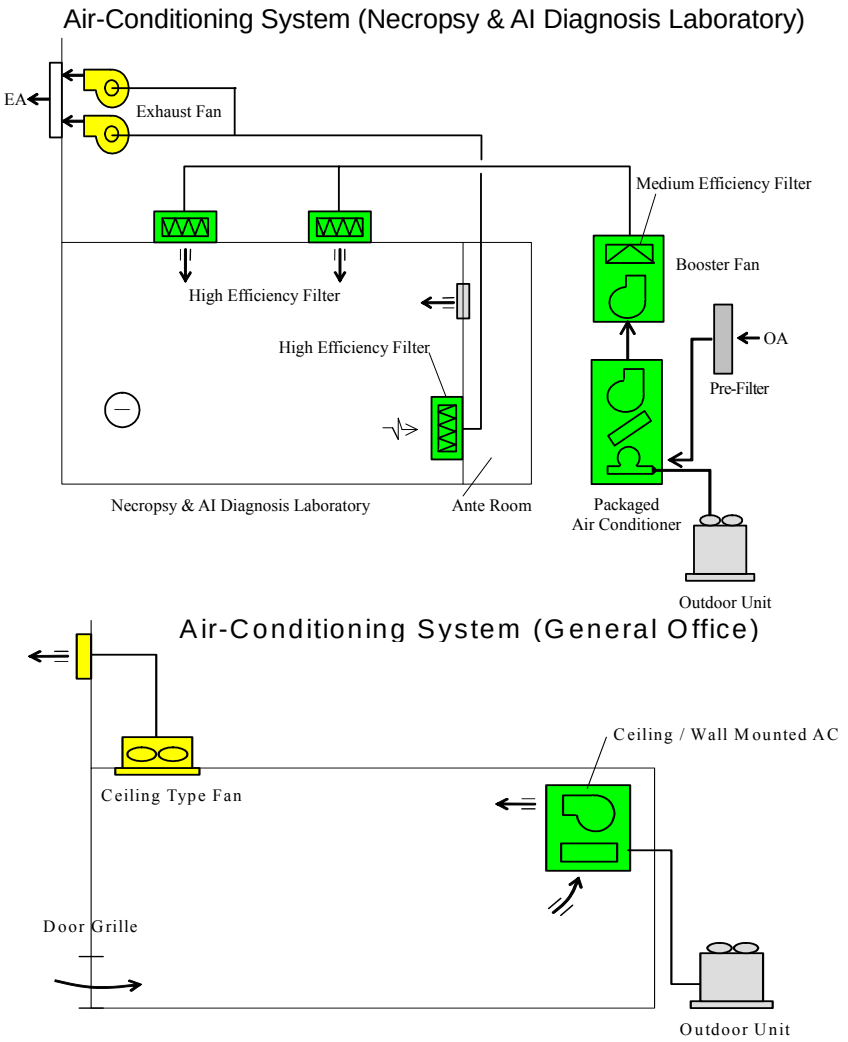


Figure 2-31 Air Conditioning Flow Diagram

Table 2-23 Air Conditioning Systems

Room Name	Air Conditioning	Mechanical Ventilation	Room Pressure	Semi central
AI Diagnosis Laboratory	○	○	⊖	○
Necropsy	○	○	⊖	○
Sterilization	○	○	⊖	○
Pathology Laboratory	○	○		
Virology Laboratory	○	○		
PCR Laboratory	○	○		
Bacteriology	○	○		
Epidemiology	○	○		
Parasitology	○	○		
Cell Preparation	○	○		
Lecture Room	○	○		
General Office	○	○		
Library	○	○		
Maintenance Room	○	○		
Poultry House		○		
Electrical Room		○		
Generator Room		○		

(2) DIC Medan

1) Electrical Systems

① Power Supply System

Electric power for the AI diagnostics wing to be built in this project will be supplied as 380V/220V low-voltage power from the existing transformer room on the Indonesian side. The power required for the facilities in this project is estimated to be 100kVA. As a backup in case of power outages, emergency power will be supplied from the power generator installed by the Indonesians. The emergency power required for this project is estimated to be 50kVA.

Japan will be responsible for installation work on the secondary side from the main distribution board in the AI diagnostics wing. Installation work for emergency power supply from the existing generator to the main distribution board terminals in this project will be performed by the Indonesians.

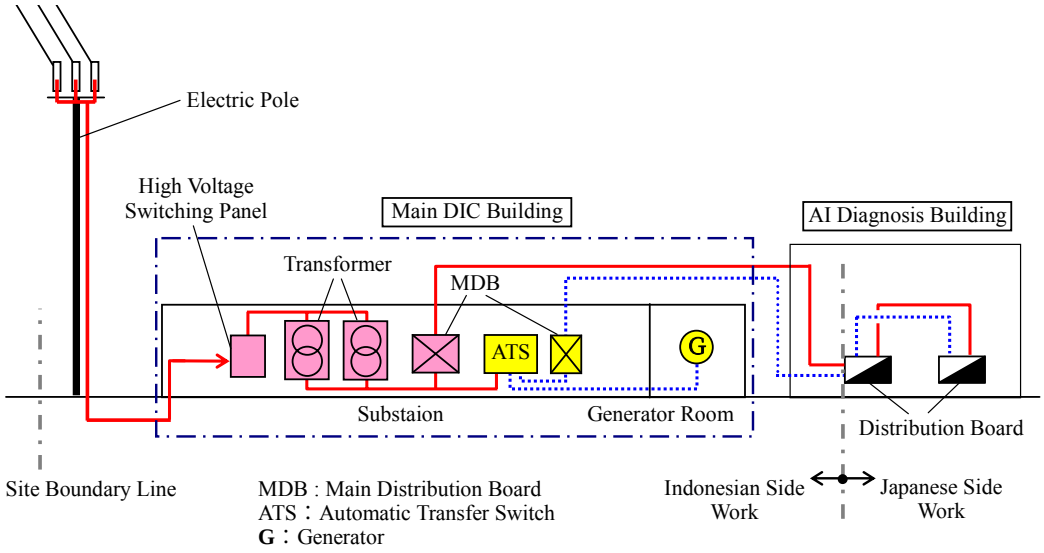


Figure 2-32 Main Power Line System

② Lighting and Power Outlet Systems

The lighting plan for the facilities makes use mainly of fluorescent lights. In view of the illumination settings in existing Indonesian DIC facilities, the plans for this project will use a setting of around 60 to 70 percent of the JIS standards for illumination. Some of the lights, power outlets and testing equipment will be powered by the generator, as a power outage measure. Lights and guide lamps with built-in battery will be installed to facilitate emergency evacuation.

Power outlets will mostly be the two-prong grounded type.

③ Telephone System

The telephone system in the AI diagnostics wing will be built as part of the new PABX system to be installed in the DIC main building by the Indonesians. 15 extension lines are estimated to be required in the project facilities.

The installation of a terminal board in the project facilities, and of conduit and wiring to telephones in the buildings, will be carried out in this project. Wiring from the MDF to the terminal board will be the responsibility of the Indonesians.

A combined total of 5 outside lines are estimated to be needed in the DIC main building and in the project facilities. This will require running 3 more lines in addition to the existing 2, work that will be handled by the Indonesians.

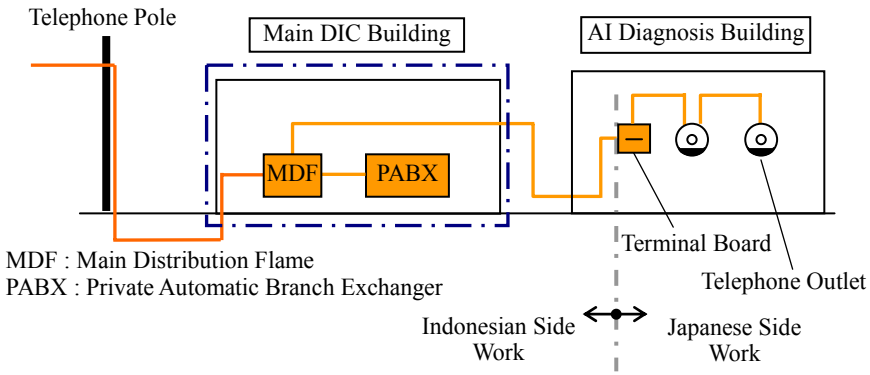


Figure 2-33 Telephone System Scheme

④ Fire Alarm System

Installation of fire alarms and the like will conform to Indonesian regulations in principle, but will follow Japanese regulations for matters not covered by the Indonesian regulations.
The fire alarm system in the project facilities will be built as part of the system in the DIC main building. Both pushbutton fire alarms and automatic fire alarms will be installed in the project facilities, and terminals for output of alarms to the outside will be provided.

⑤ Communication System

A LAN cable rack and conduit will be installed for configuring a computer network in the project facilities. The Indonesians will handle the server and communication system installation and the wiring work.

⑥ Lightning Arrester and Earth Systems

Lightning arresters will be installed in this project to protect the buildings from lightning. Precision equipment, electrical equipment and the like will be protected by grounding.

⑦ Security Systems

Security systems requiring keypad entry will be installed for security purposes on doors for entry and exit in the general examination section and at the general specimen receiving area, and on doors for entry and exit in the AI examination section and at the AI specimen receiving area.

2) Mechanical Systems

① Water Supply System

Water in this project will be supplied by the national waterworks company (PDAM). The water will be received in a reservoir in the project, pumped up to an elevated water tank, and supplied from there to each of the facilities. The volume of water used in the project is estimated to be around 20 m^3/day. The capacity of the reservoir will be large enough to include water used by fire hydrants. The reservoir will be built above ground to prevent contamination from infiltrating ground water.
The Indonesians will perform the installation for bringing water to the reservoir. If pipe connections to existing facilities or changes to piping in existing facilities are necessary, the Indonesians will perform this work as well.

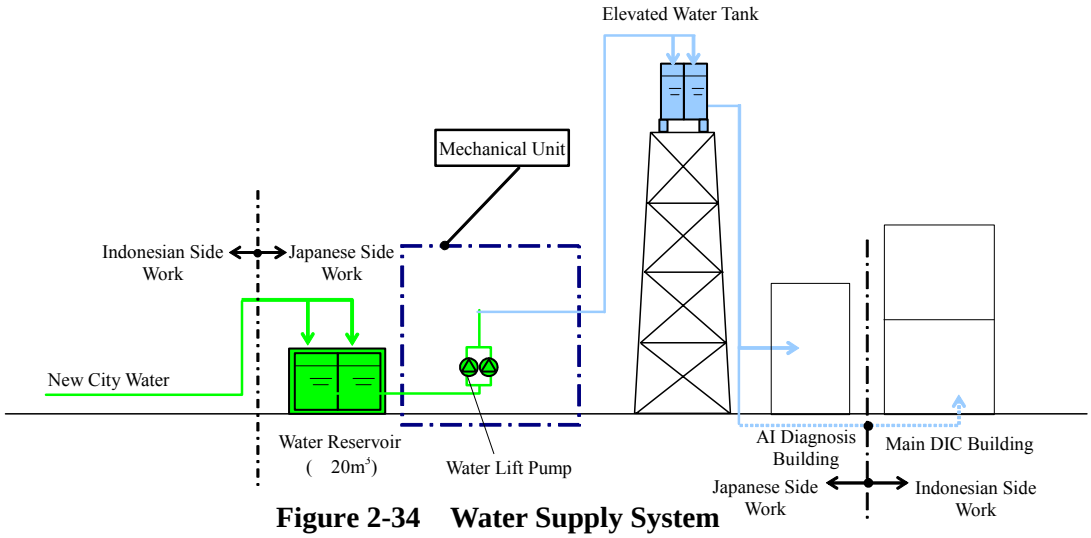


Figure 2-34 Water Supply System

② Waste Water System

Ordinary wastewater from the project facilities and wastewater from general examinations will go to a newly installed septic tank directly, while wastewater from the necropsy rooms and AI diagnosis laboratory will go the septic tank via a disinfectant tank. After disinfection in these tanks, the water will be processed by subsurface infiltration. Rainwater from roofs and the site grounds will be released directly to the nearest storm-water drainage ditches.

③ Hot Water Supply

Hot water will be supplied individually by electric hot water heaters where needed.

④ Gas

Propane gas tanks will be used to supply gas to the examination rooms.

⑤ Fire Extinguishing System

Installation of fire extinguishing systems will conform to Indonesian regulations in principle, but will follow Japanese regulations for matters not covered by the Indonesian regulations. Fire extinguishers will be installed in the project facilities.

⑥ Waste Disposal

Animal carcasses and infectious waste materials from the necropsy rooms and AI labs will be burned in the existing incineration facility.

⑦ Air Conditioning Systems

Individual air conditioners will be installed only in rooms with a functional need for cooling. Generally these will be separate-type wall-mounted air conditioners. Since the necropsy rooms and AI labs must be kept at negative pressure, a semi-central air conditioning system will be used in these rooms.
Mechanical ventilation will be provided in rooms that use air conditioning and in rooms where odors or heat are produced.

Table 2-24 Air Conditioning Systems

Room Name	Air Conditioning	Mechanical Ventilation	Room Pressure	Semi Central
AI Diagnosis Laboratory	○	○	⊖	○
Necropsy	○	○	⊖	○
Sterilization	○	○	⊖	○
Sample Reception	○	○		
PCR Laboratory	○	○		
Cell Preparation	○	○		
Veterinary Public Health	○	○		

(3) DIC Lampung

1) Electrical Systems

① Power Supply System

Electric power for the AI diagnostics wing to be built in this project will be supplied as 380V/220V low-voltage power from the existing transformer room on the Indonesian side. The power required for the facilities in this project is estimated to be 100kVA. As a backup in case of power outages, emergency power will be supplied from the power generator installed by the Indonesians. The emergency power required for this project is estimated to be 50kVA.
Japan will be responsible for installation work on the secondary side from the main distribution board in the AI diagnostics wing. Installation work for emergency power supply from the existing generator to the main distribution board terminals in this project will be performed by the Indonesians.

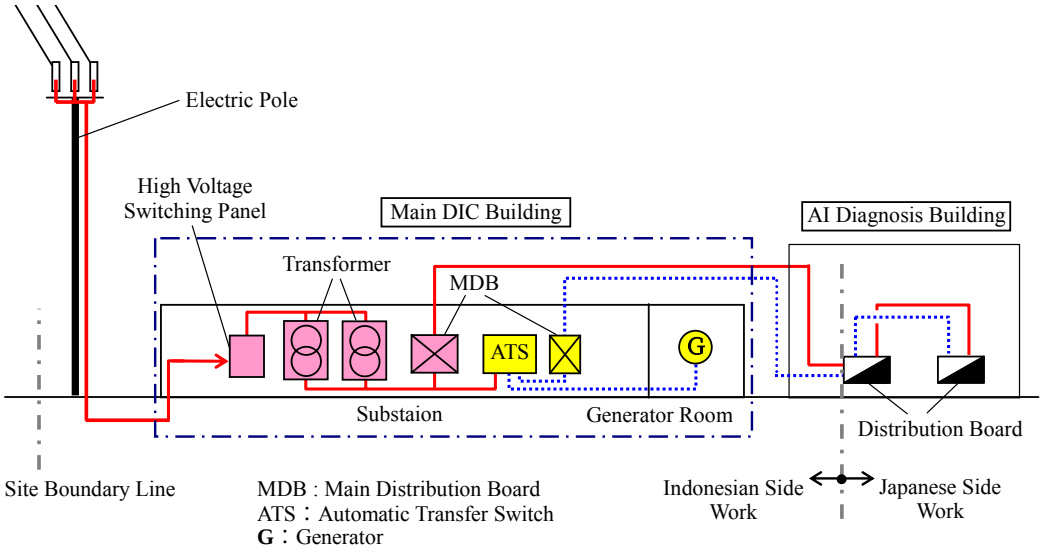


Figure 2-35 Main Power Line System

② Lighting and Power Outlet Systems

The lighting plan for the facilities makes use mainly of fluorescent lights. A setting of around 60 to 70 percent of the JIS standards will be used for illumination. Some of the lights, power outlets and testing equipment will be powered by the generator, as a power outage measure. Lights and guide lamps with built-in battery will be installed to facilitate emergency evacuation.
Power outlets will mostly be the two-prong grounded type.

③ Telephone System

The telephone system in the AI diagnostics wing will be built as part of the PABX system provided in the DIC main building by the Indonesians. 15 extension lines are estimated to be required in the project facilities.
The installation of a terminal board in the project facilities, and of conduit and wiring to telephones in the buildings, will be carried out in this project. Wiring from the MDF to the terminal board will be the responsibility of the Indonesians.
A combined total of 5 outside lines are estimated to be needed in the DIC main building and in the project facilities. This will require running 2 more lines in addition to the existing 3, work that will be handled by the Indonesians.

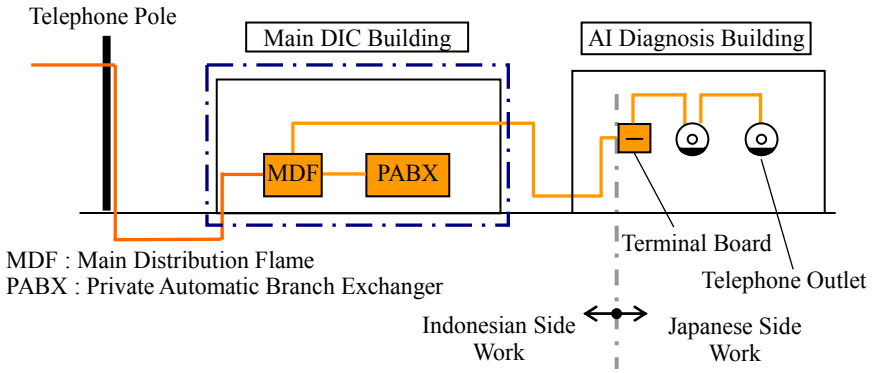


Figure 2-36 Telephone System Scheme

④ Fire Alarm System

Installation of fire alarms and the like will conform to Indonesian regulations in principle, but will follow Japanese regulations for matters not covered by the Indonesian regulations.
The fire alarm system in the project facilities will be built as part of the system in the DIC main building. Both pushbutton fire alarms and automatic fire alarms will be installed in the project facilities, and terminals for output of alarms to the outside will be provided.

⑤ Communication System

A LAN cable rack and conduit will be installed for configuring a computer network in the project facilities. The Indonesians will handle the server and communication system installation and the wiring work.

⑥ Lightning Arrester and Earth Systems

Lightning arresters will be installed in this project to protect the buildings from lightning.
Precision equipment, electrical equipment and the like will be protected by grounding.

⑦ Security System

Security systems requiring keypad entry will be installed for security purposes on doors for entry and exit in the general examination section and at the general specimen receiving area, and on doors for entry and exit in the AI examination section and at the AI specimen receiving area.

2) Mechanical Systems

① Water Supply System

A well will be newly built in this project. Water from the well will be received in a reservoir, pumped up to an elevated water tank, and supplied from there to each of the facilities. The volume of water used in the project is estimated to be around 20 m^3/day. Since well water quality tests show more than the allowed values for turbidity, evaporation residue, iron, and manganese levels, the water will be treated by a sand separator, iron filter, manganese filter, and activated carbon filter.
If pipe connections to existing facilities or changes to piping in existing facilities are necessary, the Indonesians will perform this work.

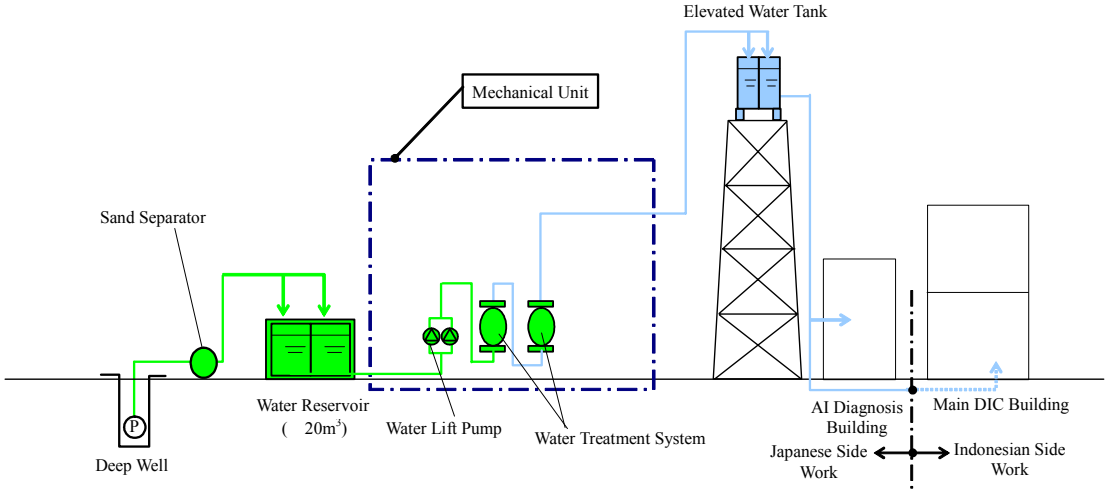


Figure 2-37 Water Supply System

② Waste Water System

Ordinary wastewater from the project facilities and wastewater from general examinations will go to a newly installed septic tank directly, while wastewater from the necropsy rooms and AI diagnosis laboratory will go the septic tank via a disinfectant tank. After disinfection in these tanks, the water will be processed by subsurface infiltration. Rainwater from roofs and the site grounds will be released directly to the nearest storm-water drainage ditches.

③ Hot Water Supply

Hot water will be supplied individually by electric hot water heaters where needed.

④ Gas

Propane gas tanks will be used to supply gas to the examination rooms.

⑤ Fire Extinguishing System

Installation of fire extinguishing systems will conform to Indonesian regulations in principle, but will follow Japanese regulations for matters not covered by the Indonesian regulations. Fire extinguishers will be installed in the project facilities.

⑥ Waste Disposal

Animal carcasses and infectious waste materials from the necropsy rooms and AI labs will be burned in the existing incineration facility.

⑦ Air Conditioning Systems

Individual air conditioners will be installed only in rooms with a functional need for cooling. Generally these will be separate-type wall-mounted air conditioners. Since the necropsy rooms and AI labs must be kept at negative pressure, a semi-central air conditioning system will be used in these rooms.
Mechanical ventilation will be provided in rooms that use air conditioning and in rooms where odors or heat are produced.

Table 2-25 Air Conditioning Systems

Room Name	Air Conditioning	Mechanical Ventilation	Room Pressure	Semi Central
AI Diagnosis Laboratory	○	○	⊖	○
Necropsy	○	○	⊖	○
Sterilization	○	○	⊖	○
Sample Reception	○	○		
Cell Preparation	○	○		

2-2-2-6 Construction Material plan

In selecting construction materials, preference will be given to materials and construction methods well established in Indonesia, in order to facilitate maintenance by the Indonesians. The basic considerations to be made in materials selection are indicated below.

(1) Exterior finishing materials

1) Roofing

Asphalt waterproofing will be used for the rooftops of the examination and diagnostics wings and machine rooms of the three DICs, and for the roofs of connecting corridors to be attached to existing wings of the Medan DIC and DIC Lampung. The roof slabs are to have an incline of 1/50 or greater to prevent deterioration of the waterproofing layer due to water accumulation on the roof surface, and will have a concrete layer to protect the waterproofing layer from deterioration due to ultraviolet light. External insulation will be used to achieve insulation on the roof surface. Because roof tiles are prone to leaking in the project regions, the roof tiles used for the poultry houses at the three DICs and for the small animal quarters and connecting corridors at the DIC Subang will have roofing and sheathing roof board under the tiles.

2) Exterior wall finishing

The reinforced concrete or concrete blocks used for exterior walls and for columns and beams will be surfaced with trowelled mortar and given a sprayed paint finish.

(2) RC frame

There are concrete plants within 20 or 30 minutes from each of the three sites, enabling the necessary concrete to be supplied as the projects proceed.

(3) Interior finishing materials

1) Floors

The following flooring materials will be used based on the use of each room and required performance, etc.

① The AI examination and diagnostics rooms, autopsy rooms, high-pressure sterilization rooms, specimen receiving area and other biohazard areas will have polyurethane poured floors for ease of cleaning and sterilization.

② Other examination rooms and related rooms will have tiled flooring for ease of cleaning and maintaining cleanliness and for durability.

③ Machine rooms, etc. will have trowelled mortar floors with dustproof paint finish.

2) Walls

Walls in wet areas such as toilets, cleaning rooms and showers, where contaminated matter may adhere to the wall surface, as well as walls in outside corridors and the like subject to wind and rain and which are relatively likely to become dirty, will be covered with tile for ease of wiping clean. Other general areas will have painted mortar wall finishing.
The walls in biohazard areas such as AI examination and diagnostics rooms will use inorganic glazed calcium silicate veneer over light grade steel panels, for ease of cleaning and maintaining cleanliness.
Corner guards will be affixed to corridor walls, interior walls, extruding corners of columns and other places that people may contact.

3) Ceilings

The following ceiling materials will be used based on the use of each room and required performance, etc.

① Examination rooms, diagnostic rooms and other air conditioned rooms

System ceilings like those common in the region will be used, consisting of low-cost T-bar light gauge steel frames and square rock wool acoustic tiles, for improved air conditioning efficiency.

② Other rooms

Instead of a ceiling, the underside of the concrete roof will be painted.

4) Fittings and fixtures

In places where weatherproofing is a concern, aluminium sash will be used.
Interior fixtures especially in biohazard areas where air tightness is mandatory will be procured from Japan. Aluminium fittings will be used for outside doors where rain falls, and steel fittings for the rest.
Aluminium sash will be procured locally, since Japanese manufacturers also have factories in Indonesia and product quality is not a problem.
The above choices of finishing materials and their construction methods are summarized in Table 2-26.

Table 2-26 Finishing Materials and Construction Methods

Place	Local methods (including those used in existing buildings)	Methods to be used	Reason for use
Roofs	Sloped roof (roof tiles on wood)	Flat roof: RC + asphalt waterproofing Sloped roof: Local tiles over asphalt waterproofing and pressed concrete finish	Concrete finish is relatively easy to maintain. Concrete slab is adopted as the base layer for waterproofing.
Outside walls	Paint on mortar	Exterior paint on mortar	This method is in general use locally, and local workers are familiar with maintenance of such walls.
Floors	Tile	Tile Painted floors	Tile is in general use locally and is relatively easy to clean and maintain. Painted floors are used to prevent contamination.
Inside walls	Tile Paint	Title Interior paint	In general use locally; relatively easy to maintain.
Ceilings	Paint Acoustic tile	Paint Acoustic tile	In general use locally; relatively easy to maintain.
Fittings	Aluminum sash Steel	Aluminum sash Steel	In general use locally; relatively easy to maintain.

(4) Equipment included in Facility Portion

The following equipment shown in Table 2-27 below require coordination with plumbing, ventilation and large power demands. They will be included in facility potion to allow adjustment with facility side and construction schedule.

Table 2-27 Equipment to be included in Facility Portion & Reasons

List No.	Equipment	Nos	Planned numbers			Total Numbers
			DIC Medan	DIC Lampung	DIC Subang	
1	Autoclave (C)	1	-	-	1	1
2	Draft Chamber	1	-	-	1	1
3	Necropsy Table	3	1	1	1	3

The specifications and purpose of the equipment included in facility are shown in Table 2-28 below;

Table 2-28 Specifications and Purpose of Equipment

No.	Name	Nos.	Specification	Purpose
3	Autoclave (C)	1	Type: w/electric boiler & water softener Capacity: 220l Sterilization temperature: over121℃	Sterilization of glassware etc
35	Draft Chamber	1	Exterior dimensions: 1500^{W}x 750^{D} x 2000^{H} Work area finish: Chemical Resistant Accessories: Exhaust fan, water tap, gas outlet, power outlet, lighting	Preparation of reagents
44	Necropsy Table	3	Table top dimensions: 1500^{W} x 750^{D} Material: Stainless steel Accessories: sink	Necropsy of poultry

2-2-2-7 Equipment Plan

The following are the proposed equipment list, technical specifications and purposes of use of the major equipment.

Table 2-29 Equipment List for Equipment Plan

No.	Name of Equipment	Quantity by DIC			Total Quantity
		Medan DIC	DIC Lampung	Subang DIC	
1	Autoclave (A)	2	2	2	6
2	Autoclave (B)	6	6	7	19
3	Section Flotation Bath	-	1	1	2
4	Wax Dispenser	-	1	1	2
5	Tissue Embedding Apparatus	-	-	1	1
6	Slide Glass Cabinet	1	1	1	3
7	Drying Hot Plate	-	1	1	2
8	Rotary Microtome	-	-	1	1
9	Freezing Microtome	1	1	1	3
10	Automatic Staining Apparatus	-	1	1	2
11	Automatic Tissue Processor	-	1	1	2
12	Binocular Microscope (A)	3	-	3	6
13	Binocular Microscope (B)	1	1	1	3
14	Binocular Microscope (C)	1	1	1	3
15	Inverted Microscope	3	3	4	10
16	Fluorescence Microscope	-	1	1	2
17	Stereoscopic Microscope	1	-	1	2
18	Refrigerated Centrifuge	1	2	3	6
19	Refrigerated Microcentrifuge	-	-	1	1
20	Table-top Type Centrifuge	-	1	2	3
21	High-Speed Refrigerated Centrifuge	-	-	1	1
22	Hematocrit Centrifuge	-	1	1	2
23	Freezer -20°C	2	2	3	7
24	Deep Freezer -80°C	3	3	3	9
25	Incubator	3	3	4	10
26	CO_2 Incubator	3	3	3	9
27	Egg Incubator	1	1	3	5
28	Biosafety Cabinet	1	2	5	8
29	Laminar Flow Cabinet	1	1	1	3
30	PCR Workstation	2	-	2	4
31	PCR Thermal Cycler	-	-	1	1
32	Real Time PCR	-	-	1	1
33	Dry Block Bath	1	1	1	3
34	Electrophoresis Apparatus	-	-	1	1
35	Gel Documentation System	-	-	1	1
36	Microplate Reader	-	-	1	1
37	Microplate Washer	1	-	1	2
38	Necropsy Instrument Set for Medium Animal	2	2	2	6
39	Necropsy Instrument Set for Small Animal	5	5	3	13
40	Micropipette	7	7	9	23

No.	Name of Equipment	Quantity by DIC			Total Quantity
		Medan DIC	DIC Lampung	Subang DIC	
41	Microplate Shaker	2	2	2	6
42	Hot Air Sterilizer	1	2	3	6
43	Magnetic Stirrer	3	4	5	12
44	Electronic Balance	2	2	4	8
45	pH Meter	3	2	4	9
46	Vortex Mixer	-	4	6	10
47	Refractometer	-	1	-	1
48	Spectrophotometer (A)	1	1	1	3
49	Spectrophotometer (B)	-	1	1	2
50	Liquid Nitrogen Tank	1	1	1	3
51	Water Bath	3	3	5	11
52	Flake Ice Maker Machine	1	1	1	3
53	Pipette Washer	1	1	1	3
54	Ultrasonic Cleaner	3	3	3	9
55	Water Distiller	-	-	1	1
56	Pure Water Apparatus	-	1	1	2

Table 2-30 Technical Specifications of Major Equipment

No.	Name of Equipment	Q'ty	Specifications	Purpose
5	Tissue Embedding Apparatus	1	Type: desk-top type Component: embedding module and cold plate module Temperature for embedding module: approx. 50 to 70°C Temperature for cold plate module: approx.-5°C to 0°C	Tissue preparation for histopathology
9	Freezing Microtome	3	Component: microtome and refrigeration Sectioning drive: manual hand wheel driven Specimen size: diam. 25 to 55mm, 1 to 60μm approx. Cryochamber operating temperature: approx. -30°C to 0°C	Tissue preparation for rapid histopathological diagnosis and immuno-histochemistry analysis
10	Automatic Staining Apparatus	2	Slide capacity per basket: approx. 30 slides/basket Process: staining - washing - drying	Staining of tissue for histopathology
11	Automatic Tissue Processor	2	Type: rotary type Number of reagent baths: approx. 10 Capacity of tissue basket: 60 cassettes or more×2 baskets	Used during paraffin embedding in histopathology
16	Fluorescence Microscope	2	Magnification: 40x to 1,000x or more Objective lens: 5 types Illumination system: halogen lamp and mercury lamp Fluorescent filter: blue, green, etc.	For immunofluorescence assay for avian influenza diagnosis, etc.
18	Refrigerated Centrifuge	6	Maximum speed: approx. 10,000rpm Maximum RCF: approx. 11,000×g Temperature range: approx. -9°C to 40°C Rotor: swing rotor 15mL×40 tubes approx. Type: biosafety type	Preparation of samples for avian influenza diagnosis, etc.

No.	Name of Equipment	Q'ty	Specifications	Purpose
19	Refrigerated Microcentrifuge	1	Maximum speed: approx. 14,000rpm Maximum RCF: approx. 20,000×g Temperature setting: approx. -9°C to 40°C Rotor: for PCR 0.2mL, angle rotor	PCR diagnosis
21	High-Speed Refrigerated Centrifuge	1	Maximum speed: approx. 20,000 rpm Maximum RCF: approx. 51,000xg Temperature setting: approx. -8°C to 40°C Rotors etc: angle rotor, swing rotor, adopters	Preparation of antigen and antisera
24	Deep Freezer -80°C	9	Capacity: approx. 500L Temperature setting: approx. -86 to -65°C	Storage of samples of avian influenza, etc.
26	CO_2 Incubator	9	Type: water jacket type Capacity: approx. 160L Operating temperature: room temp. +5°C to 50°C approx.	Incubation of virus, etc.
27	Egg Incubator	5	Type: rolling egg type Egg capacity: approx. 400 eggs Temperature and humidity: adjustable	Making embryonic eggs for inoculation and incubation of post-inoculated eggs
28	Biosafety Cabinet	8	Class II type A2 at NSF Std. Filter efficiency: 99.99% efficient for 0.3μm particle External dimensions: approx. 1,500(W)×780(D)×2,200(H)mm	Handling of specimens infected with avian influenza virus, etc.
29	Laminar Flow Cabinet	3	Type: bio-clean bench Cleanliness of working space: class 100 or ISO5 Filter efficiency: 99.99% efficient for 0.3μm particle External dimensions: approx. 1,500(W)×800(D)×1,800(H)mm	For tissue culture, etc.
32	Real Time PCR	1	Composition: main unit, data processing hardware and software Sample capacity: 96 wells Sample volume: approx. 20 to 100μL Temperature range: approx. 4 to 99°C	Making PCR quantitative diagnosis
35	Gel Documentation System	1	Composition: main unit, data processing hardware and software CCD camera: resolution approx.768x494 pixels Excitation source: 254, 302, 365nm approx.	For PCR diagnosis of avian influenza, etc.
36	Microplate Reader	1	Wavelength range: approx. 400 to 700 nm OD range: 0 to 3.5 OD Light source: halogen lamp Printed: equipped	For serum antibody test in avian influenza diagnosis, etc.
37	Microplate Washer	2	Type: automatic Plate type: 96 wells Wash heads: 8-way Dispensing volume: approx. 50 to 900μl	For serum antibody test in avian influenza diagnosis, etc.
39	Necropsy Instrument Set for Small Animal	13	Scissors, forceps, knives, sterilization can, etc. total 40 items approx.	For dissection of animals such as chicken, etc.

No.	Name of Equipment	Q'ty	Specifications	Purpose
48	Spectrophoto-meter (A)	3	Composition: main unit, data processing hardware and software Type: sample to be pipetted directly onto the measurement Sample size: approx. 1μl Wavelength range: approx. 220 to 750nm Measurement cycle: approx. 10 sec.	Quantitation of RNA/DNA in PCR diagnosis
49	Spectrophoto-meter (B)	2	Wavelength range: approx. 325～1,100 nm Spectrum bandwidth: 8 nm or less Cell holder: 1 cell sample Printer: equipped	Analysis of minerals such as Ca, Mg, P, etc. in chicken, etc.
55	Water Distiller	1	Type: barnstead type Distilled water capacity: approx. 15 liters/hr. Material: stainless steel Water softener: equipped	Production of distilled water for rising glassware, etc.

Note regarding spare parts and consumables for project equipment:

Since much of the equipment to be procured for this project is similar to existing equipment and funds for operation and maintenance of the equipment are believed to be available, spare parts for the project equipment are not included in this project. As a rule, the only reagents and consumables included in this project are those for use in trial operation by the Japanese vendors and for operation and maintenance training after the materials shipped with the products have run out. This project does, however, include consumables other than reagents, such as fuses, lamps, and recording paper, meeting needs for a period of six months, the amount of time estimated for obtaining the consumables after internal procedures and ordering in each facility. Everything else is to be procured by the Indonesians.

2-2-2-8 Environmental Considerations

(1) Handling of avian influenza viruses, bacteria, etc.

The facilities in this project are for examining and diagnosing major livestock diseases including avian influenza, and must handle bacteria, parasites and viruses. It is therefore vital that these be handled in such a way as to prevent them from escaping to the surrounding area. To this end, it will be necessary for each DIC to exercise complete control over room air conditioning systems, wastewater treatment systems, waste emission, disposal and incineration, etc.

a. All specimens and serum, etc. sent to the DIC shall be carried in sealed containers by pre-processing.
b. In particular, movement of avian influenza viruses and other such specimens in the DIC shall be done using fully sealed containers, which shall be opened only in biological safety cabinets and never in the rooms.
c. Rooms handling avian influenza viruses and the like are biohazard zones. Each of these rooms shall be set to negative pressure by their air conditioning systems, and maintained in a state such that their air does not flow to other rooms. High-performance filters and the like shall be installed on the exhaust side of the room air conditioners and contaminants shall be prevented from leaving the facility.
d. Staff handling avian influenza viruses and the like in the DIC shall wear fully protective clothing and shoes, etc. when performing examination and diagnostics. Upon completion of a task, all specimens and containers, etc. used in the task shall be sterilized in autoclaves.
e. Except when power stoppage is short, staff working in BH areas will place specimens, etc. in autoclaves and evacuate the BH area after placing over garments, etc. in autoclaves in sterilization room

(2) Wastewater

Sewage and ordinary drainage water from the facilities shall be disposed of by subsurface infiltration after passing through a wastewater treatment tank. Waste from AI and other biohazard areas shall be treated by high-pressure steam sterilization in an autoclave. Wastewater from washing of instruments and the like used in the examinations and diagnostics shall be piped to a sterilization tank outside the building, sterilized there by chemical treatment, and then disposed of by subsurface infiltration. Vehicles used to transport AI and other such specimens shall be disinfected for sterilization in a dedicated parking space.

(3) Incineration

Waste materials following AI examination shall be sterilized in autoclaves, and then incinerated on each DIC site under staff supervision.

(4) Noise and vibration from facilities

The DIC Subang includes an electric power generation system likely to produce noise and vibration. Consideration for the surrounding environment is being made by locating the power generator on the south side of the site, away from the residential areas to the north and northwest of the large 4.5 ha site; by installing sound absorbing chambers on the intake and outlet, which are a source of noise, greatly reducing the noise level; and by installing apparatus on the generator system itself for absorbing mechanical vibration. Similar measures were suggested to the Indonesian side as they carry out their modification of existing facilities in Medan and Lampung.

(5) Handling of dust after incineration

In the existing facilities in Medan and Lampung, ash and other such waste materials following incineration were disposed of on the site. Currently the amount of waste material from facilities is small enough so as not to be a problem, but the Indonesian side will need to bury the waste in a publicly managed place.

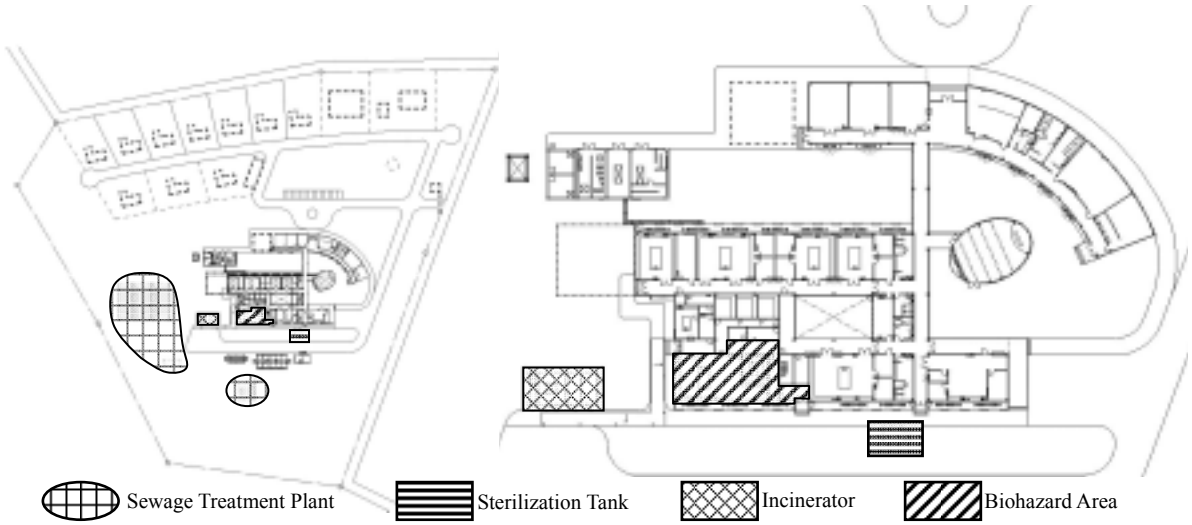


Figure 2-38 DIC Subang Facilities

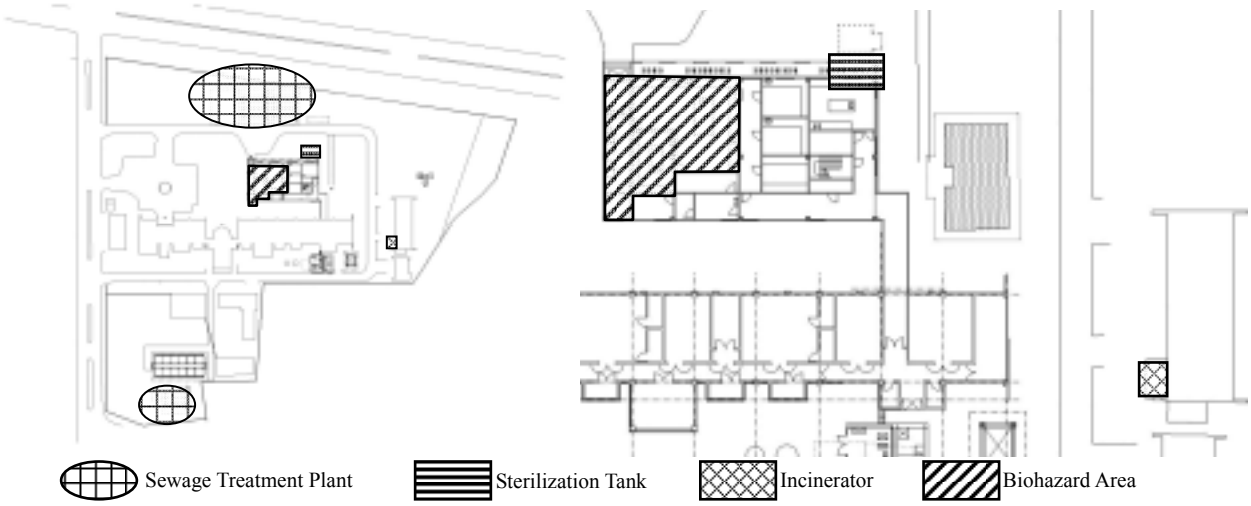


Figure 2-39 Medan DIC Facilities

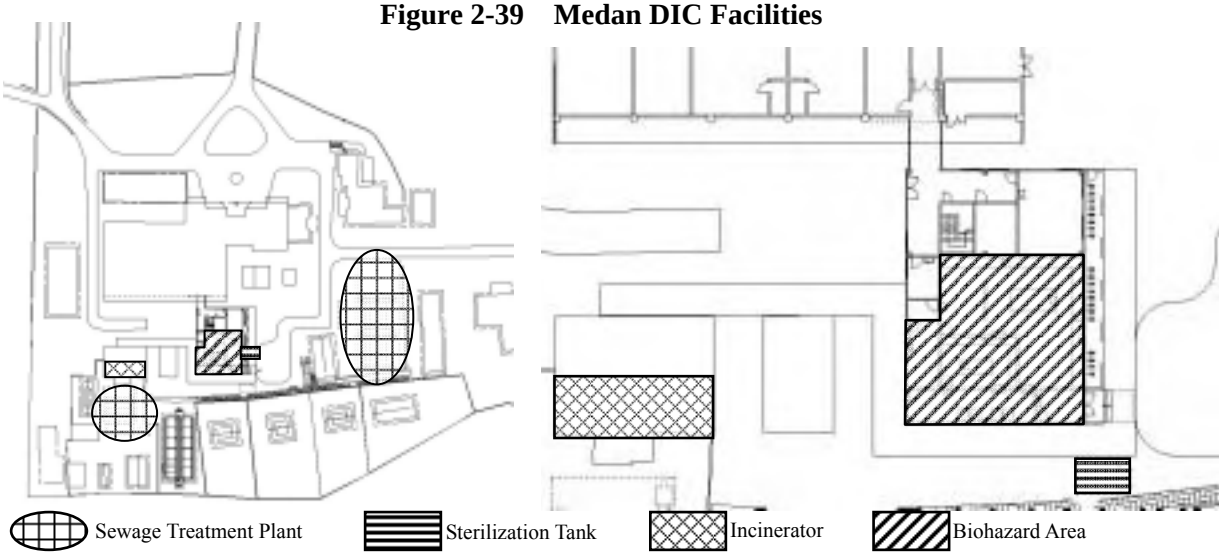


Figure 2-40 DIC Lampung Facilities

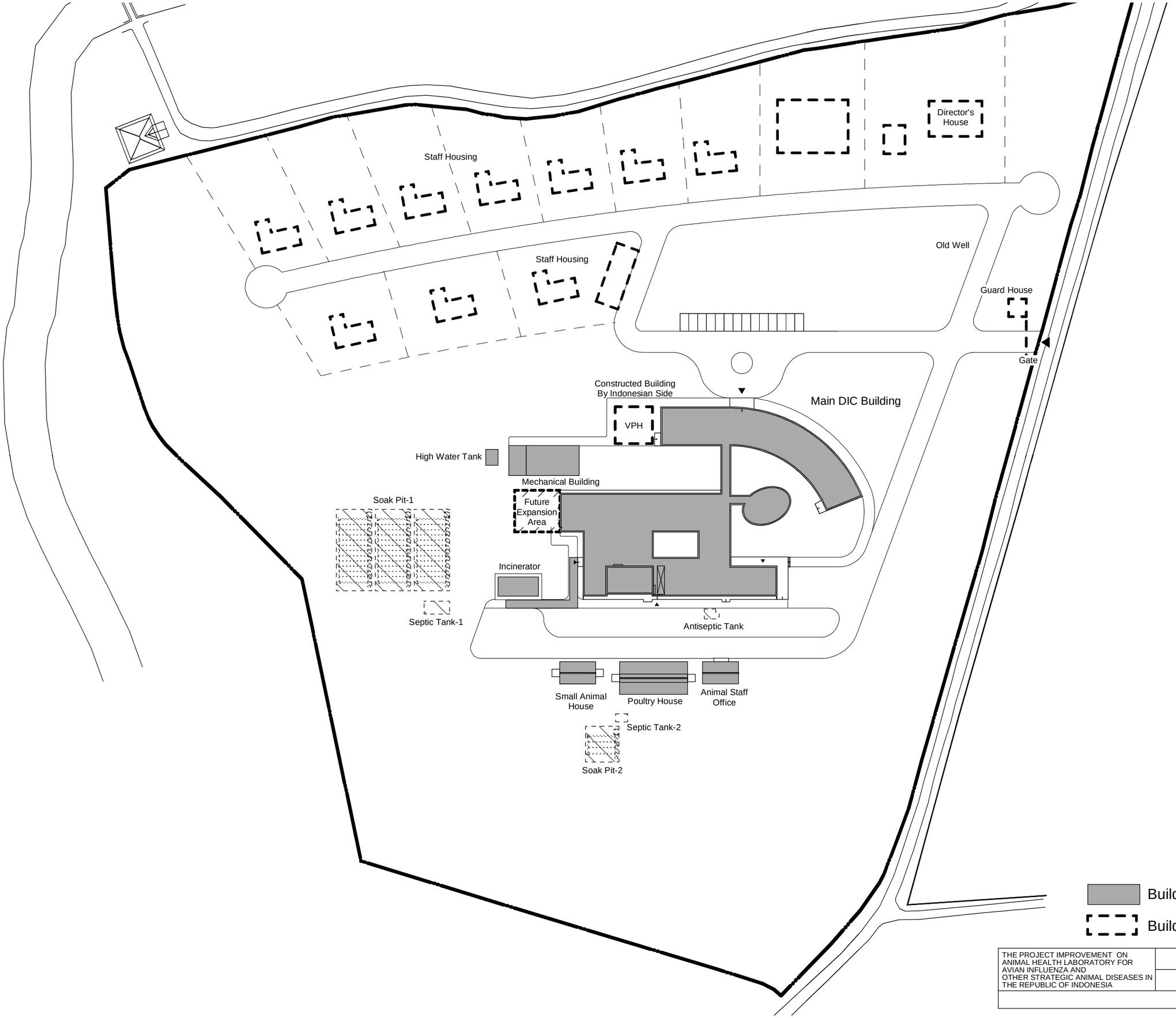
(6) Maintaining wastewater treatment levels

Although there are no standards for wastewater from the three DIC facilities, environmental considerations will need to be made for the sake of surrounding residents due to the nature of the project facilities. It will therefore be necessary to have the water quality checked periodically by third-party water testing.

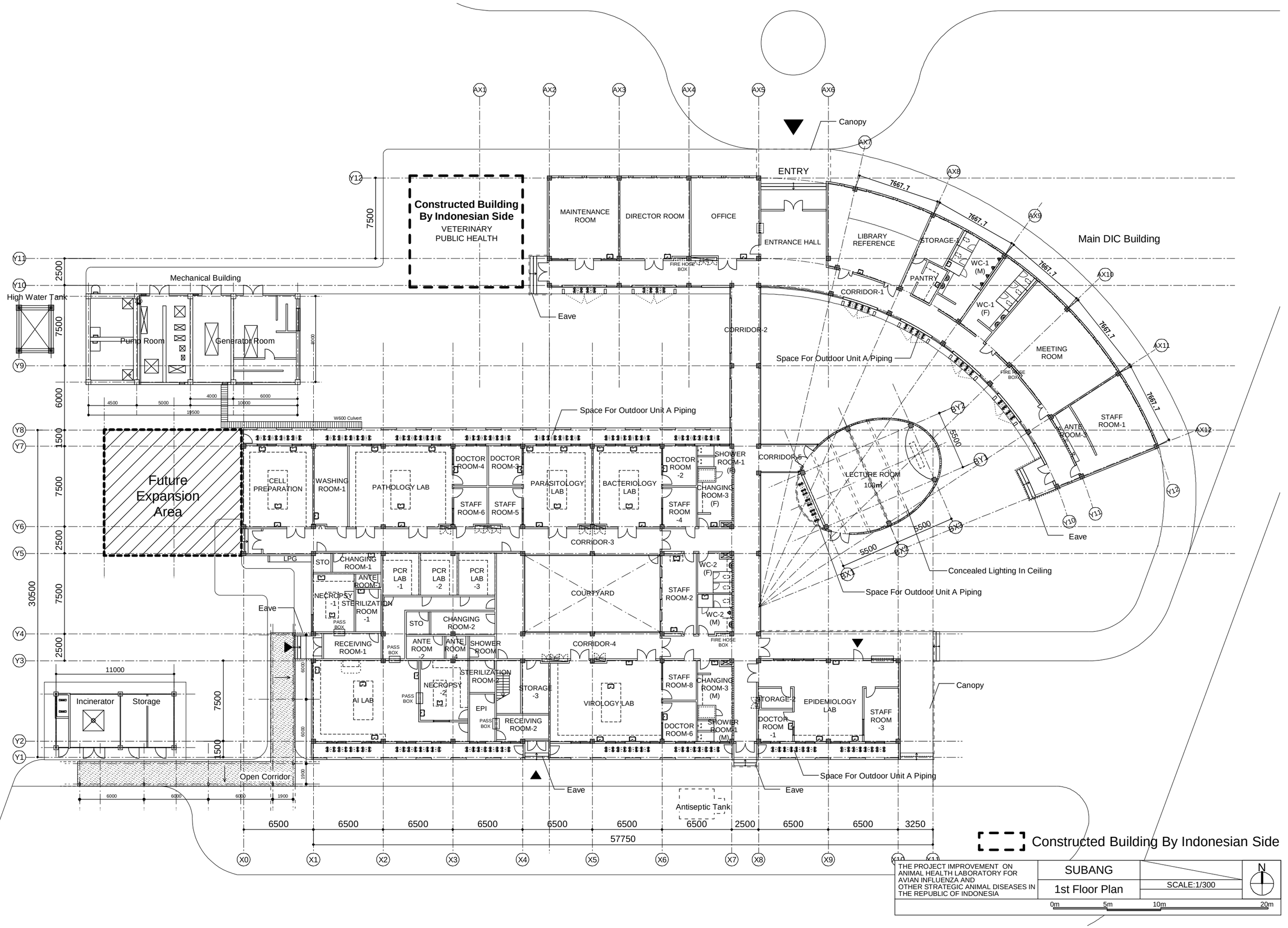
2-2-3 Basic Design Drawings

Table 2-31 List of drawings

	Facility	Drawing Title	Scale
1	DIC Subang	Site Plan	1/1000
2		1st Floor Plan	1/300
3		2nd Floor Plan	1/300
4		Elevation / Section-1	1/200
5		Elevation / Section-2	1/200
6		Elevation / Section-3	1/200
7		Poultry House Small Animal House Animal Staff Office	1/200
8	DIC Medan	Site Plan	1/600
9		1st Floor Plan	1/200
10		2nd Floor Plan	1/200
11		Elevation / Section	1/200
12	DIC Lampung	Site Plan	1/600
13		1st Floor Plan	1/200
14		2nd Floor Plan	1/200
15		Elevation / Section	1/200



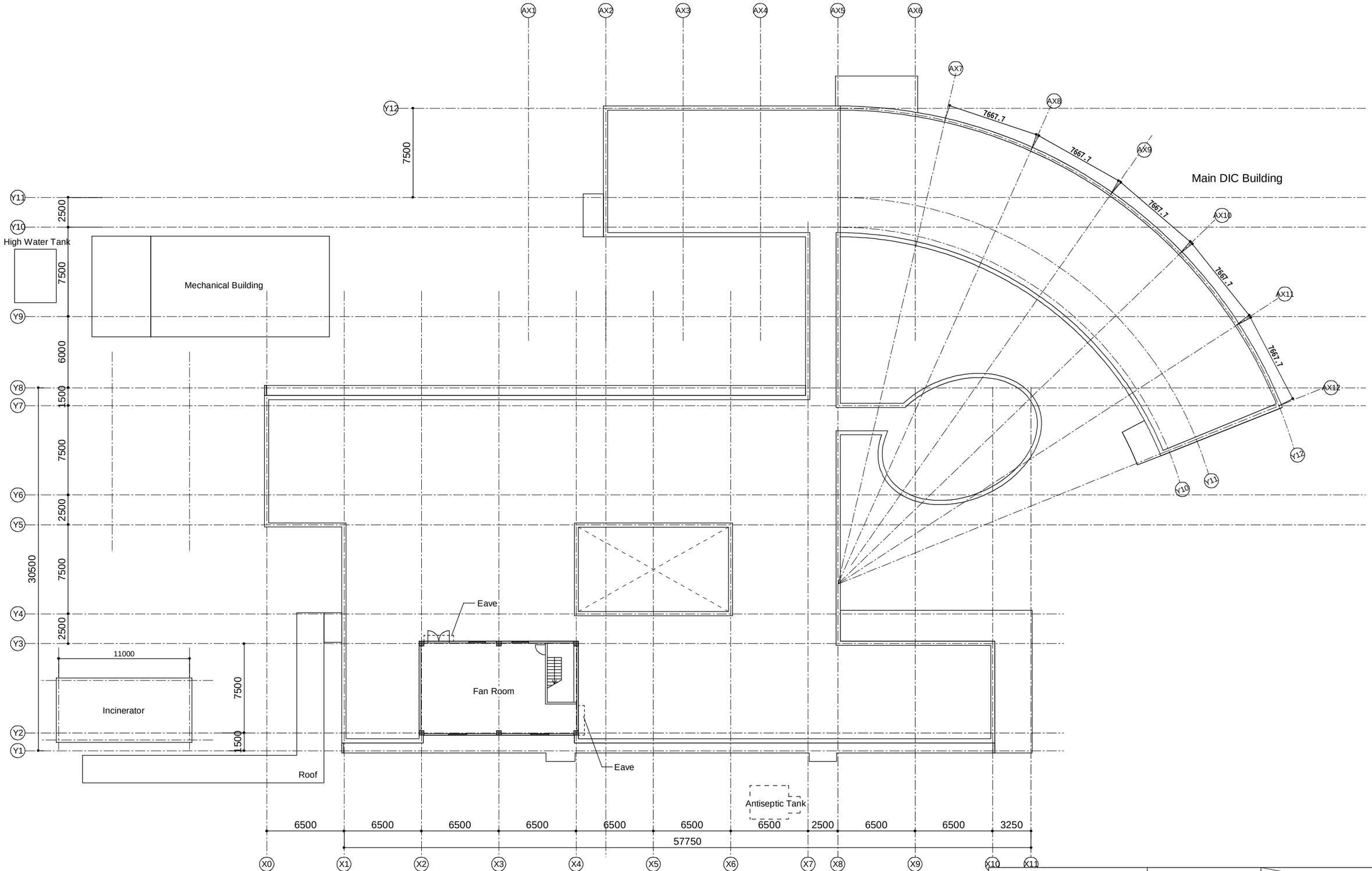
THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA	SUBANG		N
	Site Plan	SCALE:1/1000	
		0m 20m 60m	



Constructed Building By Indonesian Side

THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA	SUBANG	N
	1st Floor Plan	SCALE:1/300

0m 5m 10m 20m



THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA

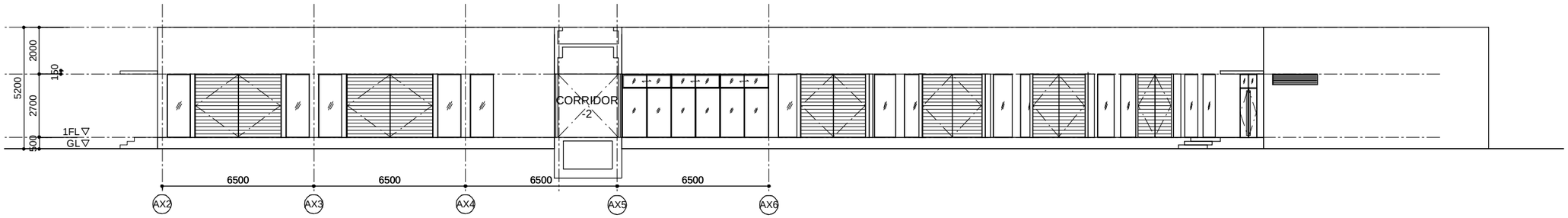
SUBANG

2nd Floor Plan

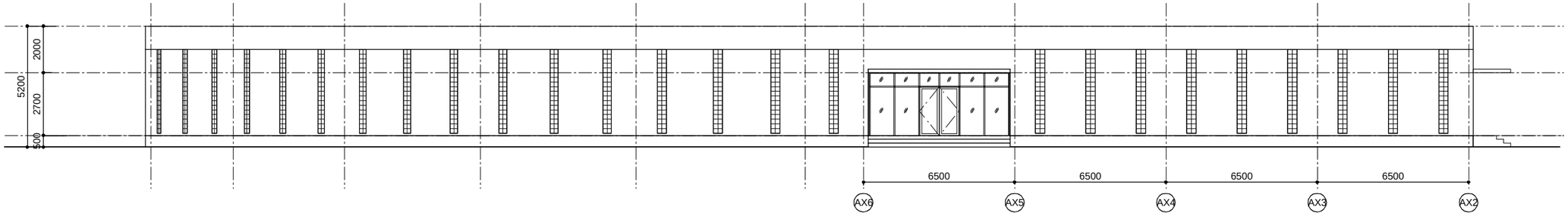
SCALE:1/300

N

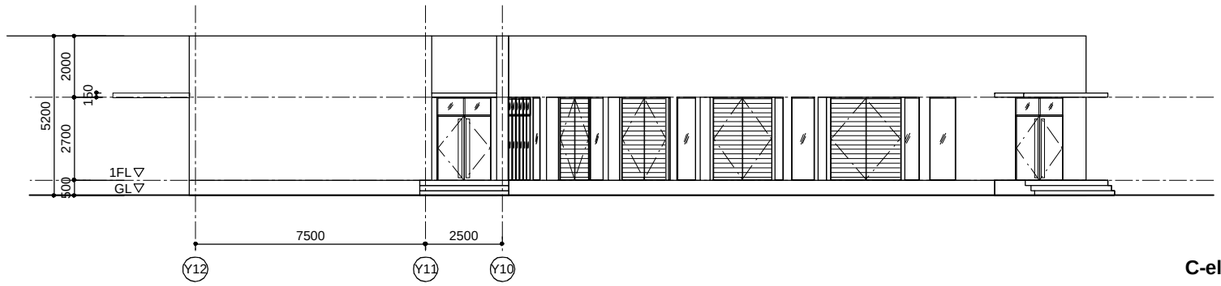
0m 5m 10m 20m



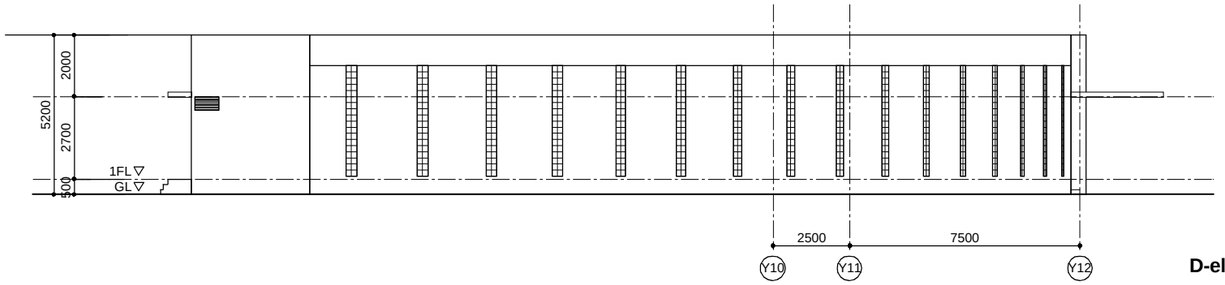
A-elevation



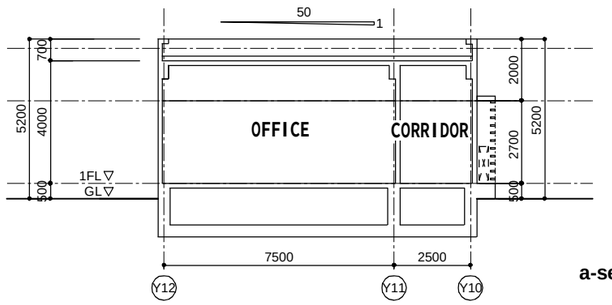
B-elevation



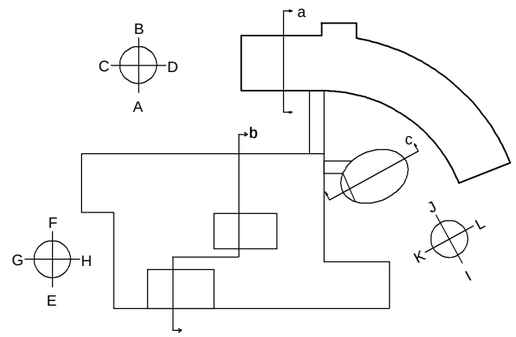
C-elevation



D-elevation

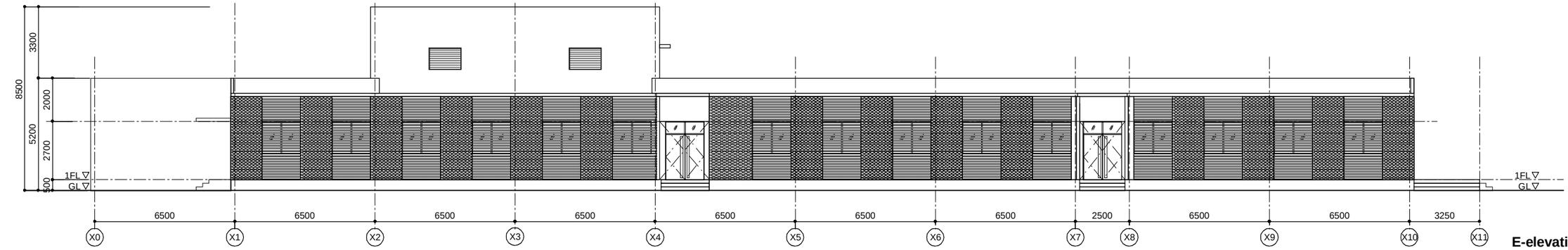


a-section

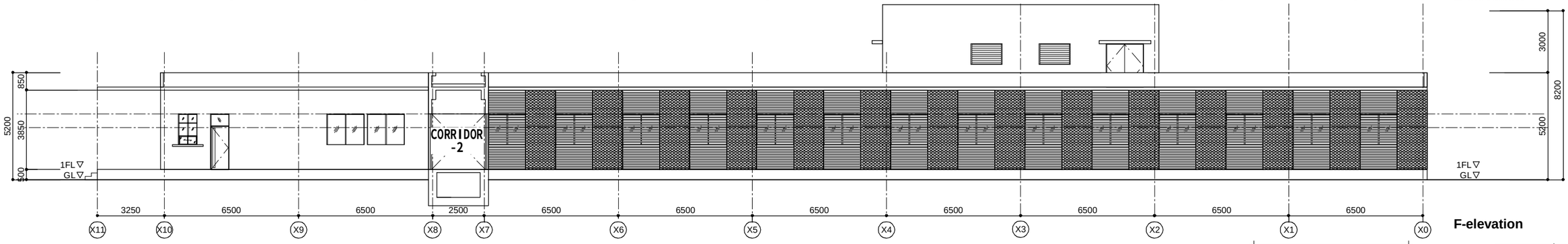


THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA	SUBANG		N
	Elevations-1 / Section-1	SCALE:1/200	

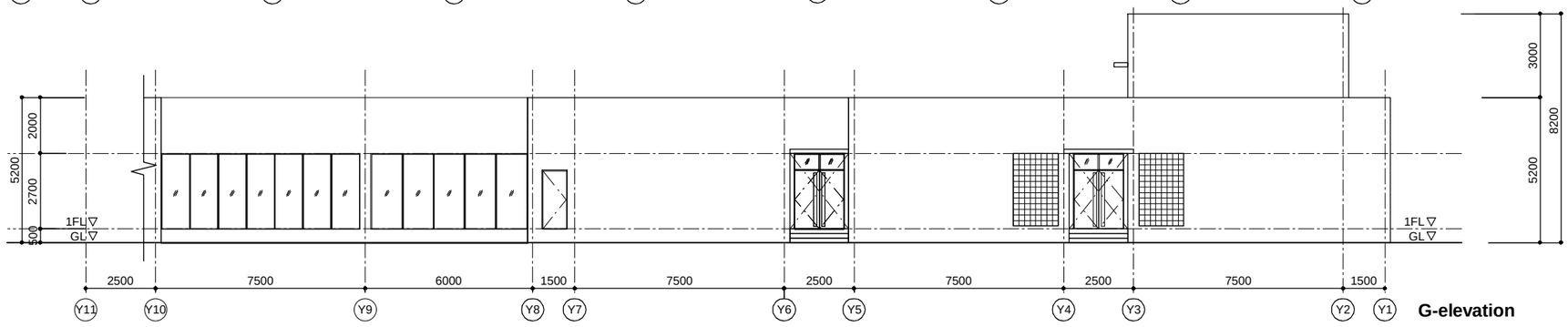
0m 5m 10m 20m



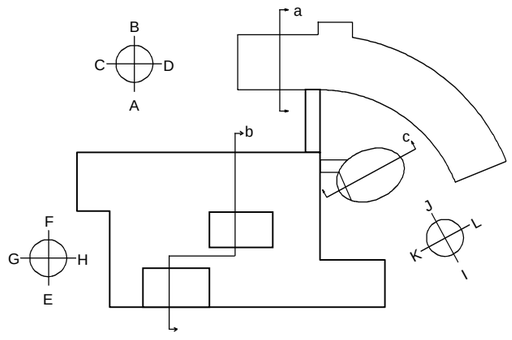
E-elevation

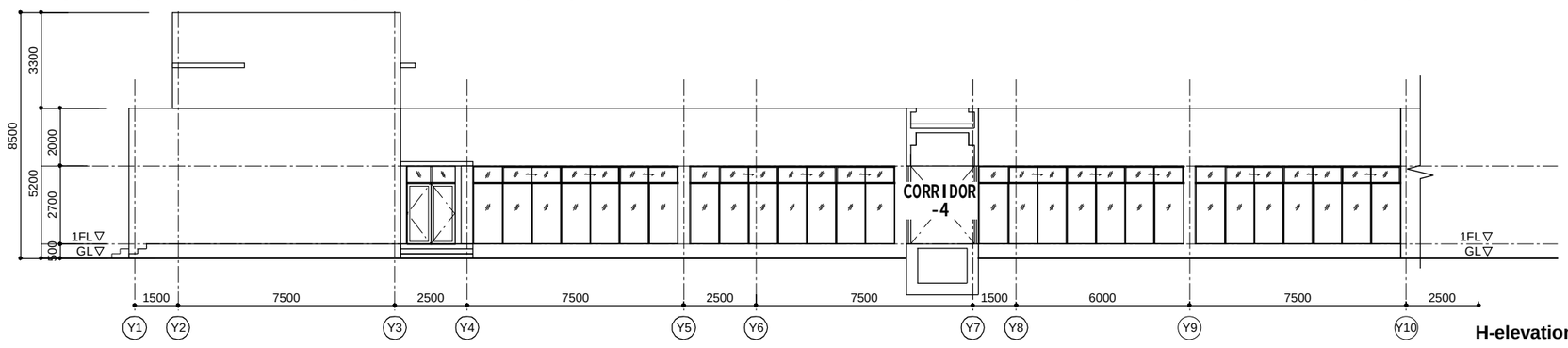


F-elevation

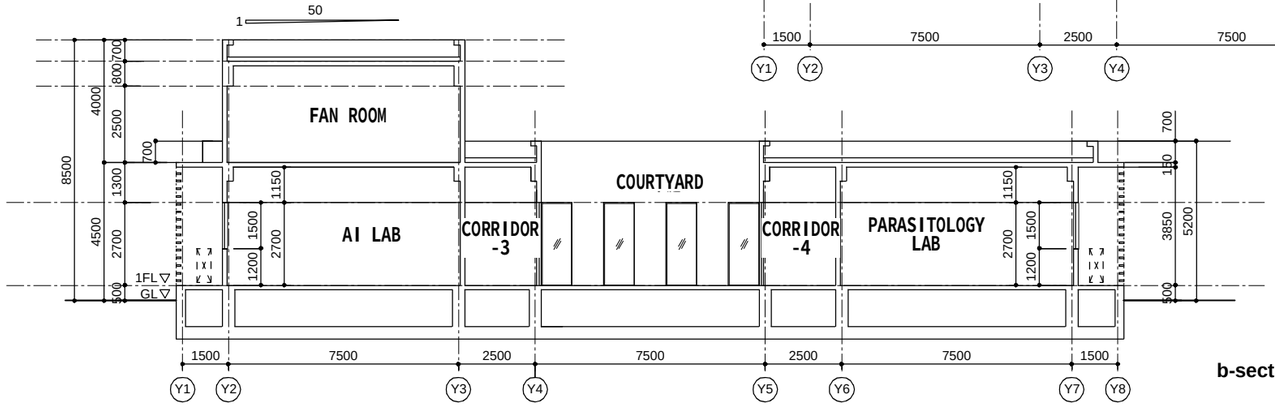


G-elevation





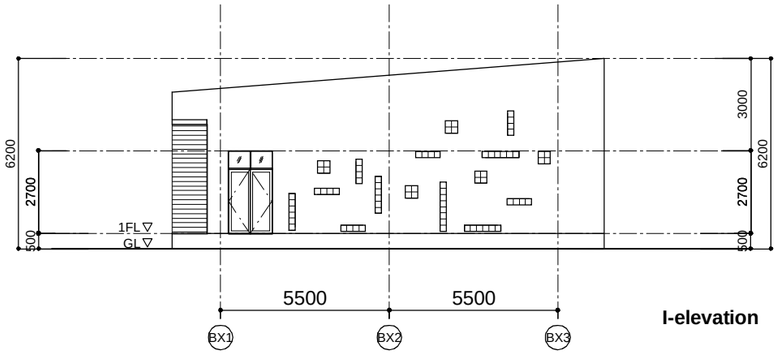
H-elevation



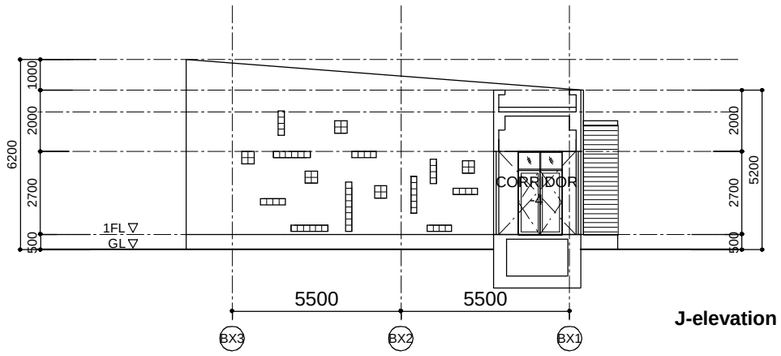
b-section

THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA	SUBANG	N
	Elevations-2 / Section-2	SCALE:1/200

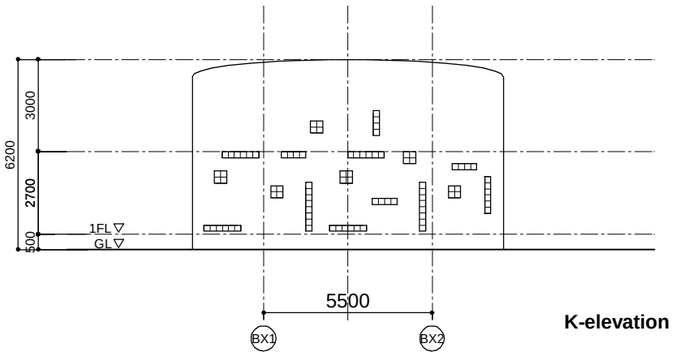
0m 5m 10m 20m



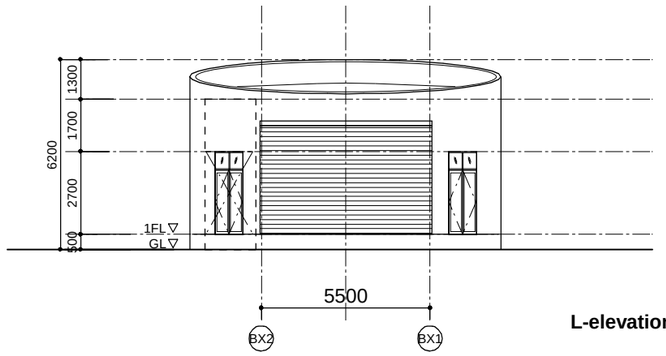
I-elevation



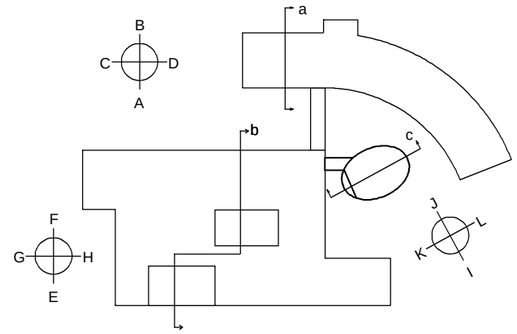
J-elevation

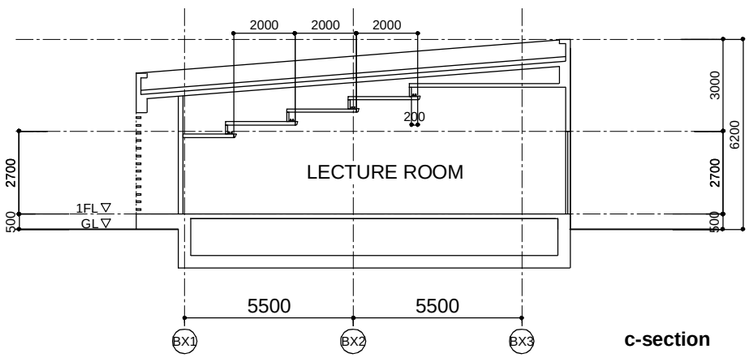


K-elevation



L-elevation

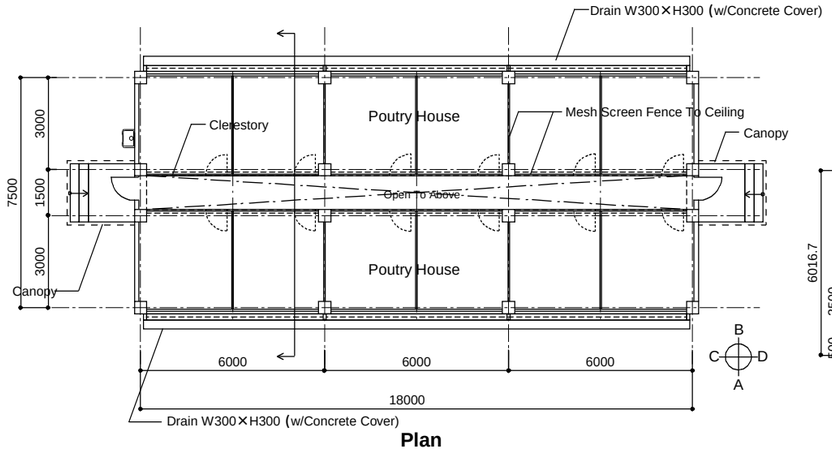




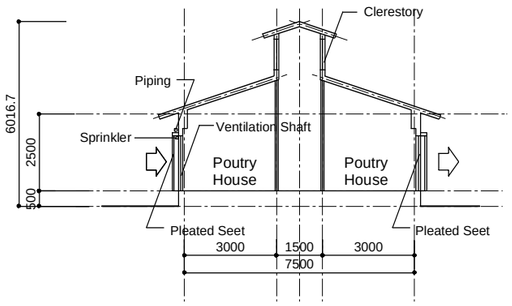
c-section

THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA	SUBANG		N
	Elevations-3 / Sction-3	SCALE:1/200	

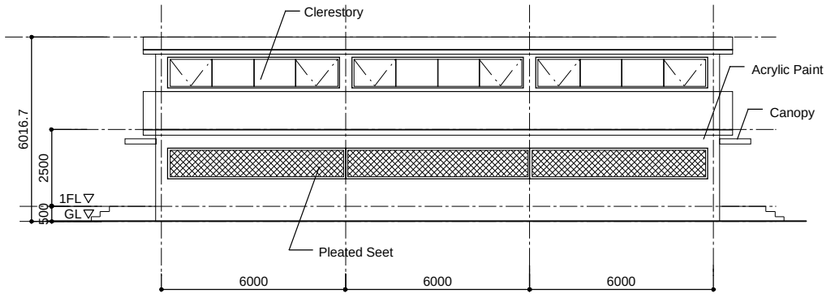
0m 5m 10m 20m



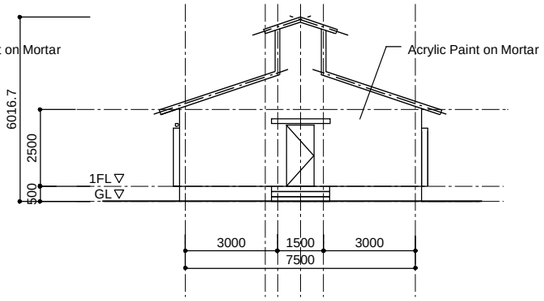
Plan



Section

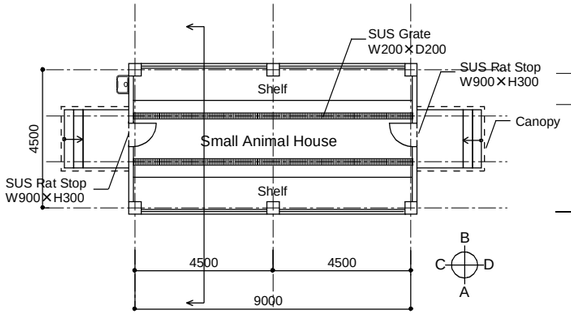


A B-elevation

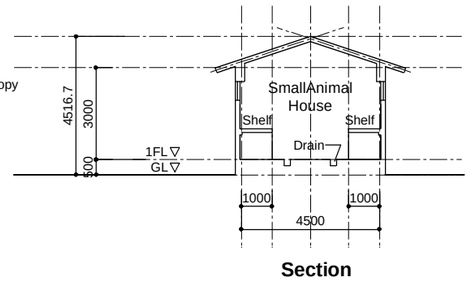


C D-elevation

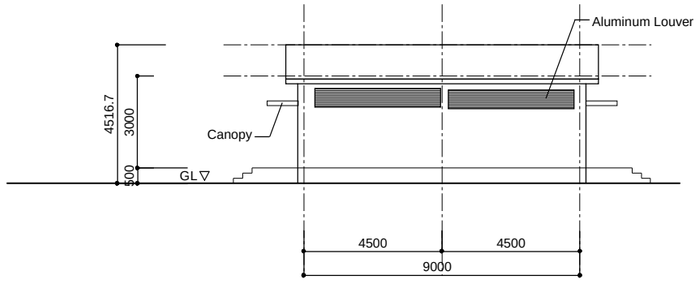
Poutry House



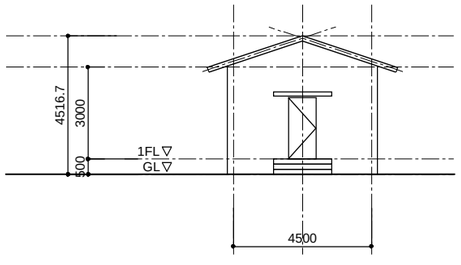
Plan



Section

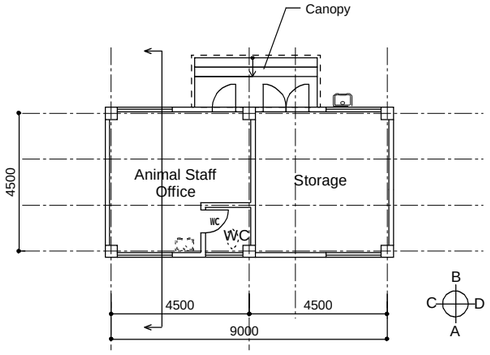


A B-elevation

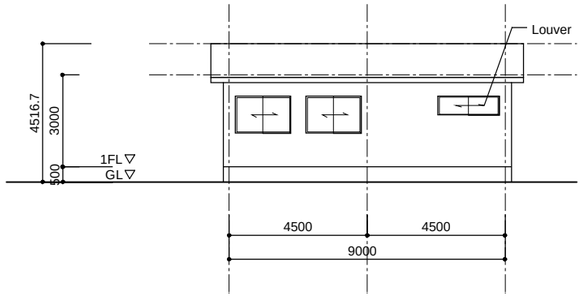


C D-elevation

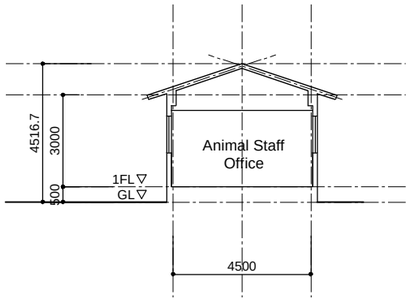
Small Animal House



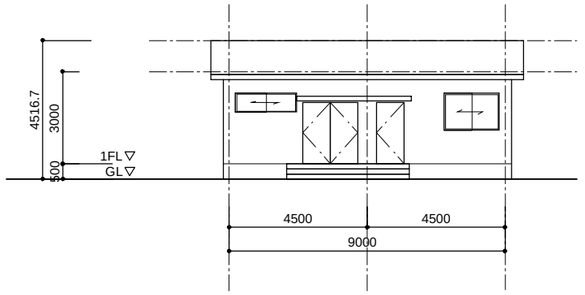
Plan



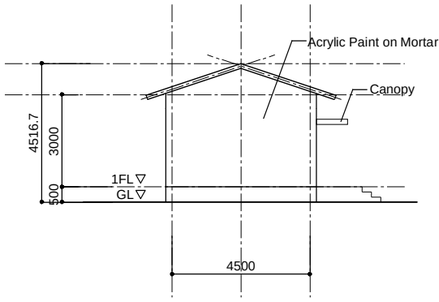
A-elevation



Section



B-elevation



C D-elevation

Animal staff Office

THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA	SUBANG		N
	Poutry House Small Animal House Animal Staff Office	SCALE:1/200	

0m 5m 10m 20m

Jabin Gatot Subroto

SOAK PIT-1

Future Expansion Area

SEPTIC TANK-1

12000

DRAINAGE

High Water Tank

Antiseptic Tank

Mechanical Building

Veterinary Public Health

SEPTICTANK

AI Diagnosis Building

Main DIC Building

exp.j

Storage

Incinerator

Necropsy

Canteen

Small Animal House

Administration

Poultry House

Existing Poultry House

SOAK PIT-2

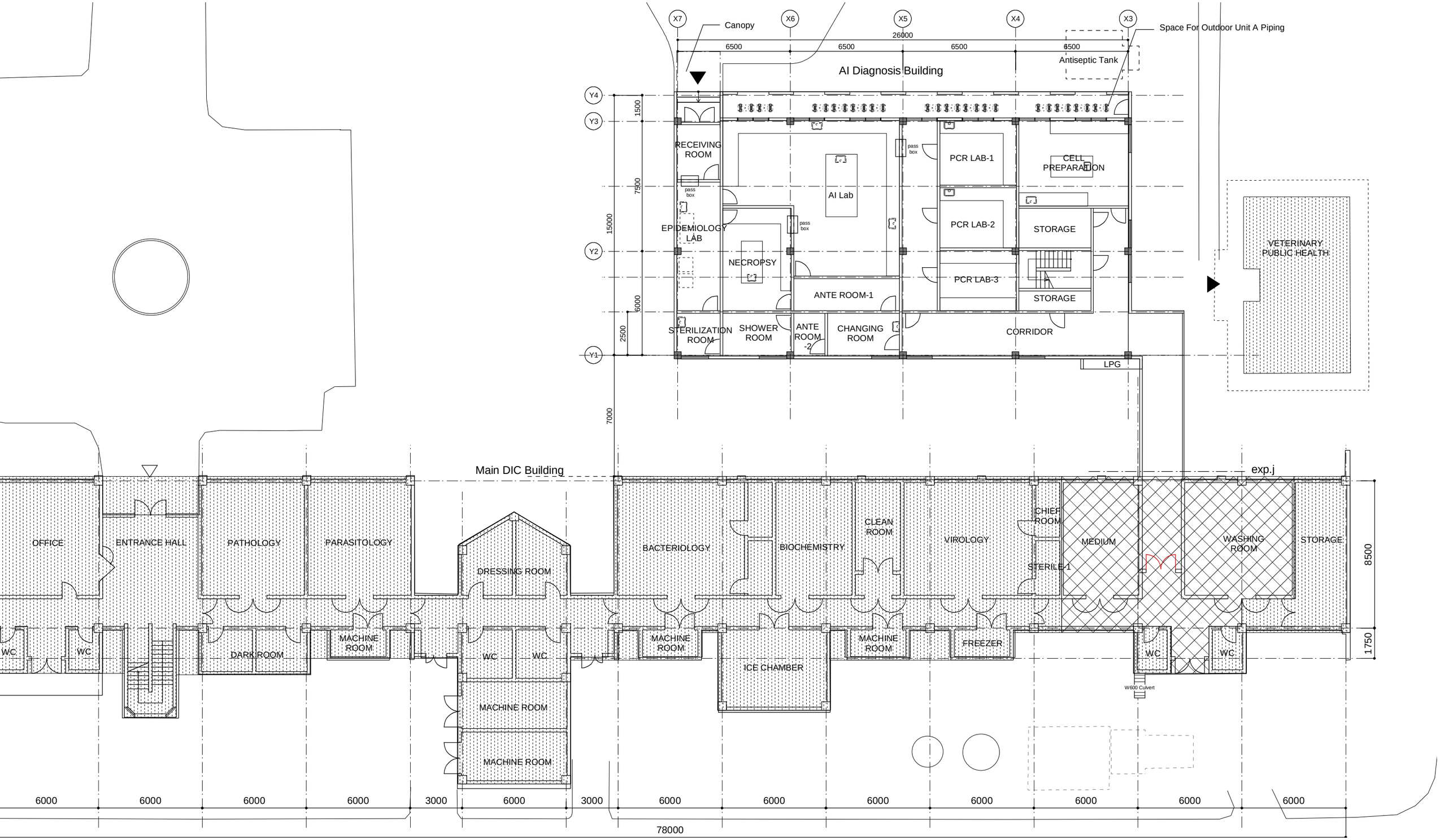
SEPTIC TANK-2

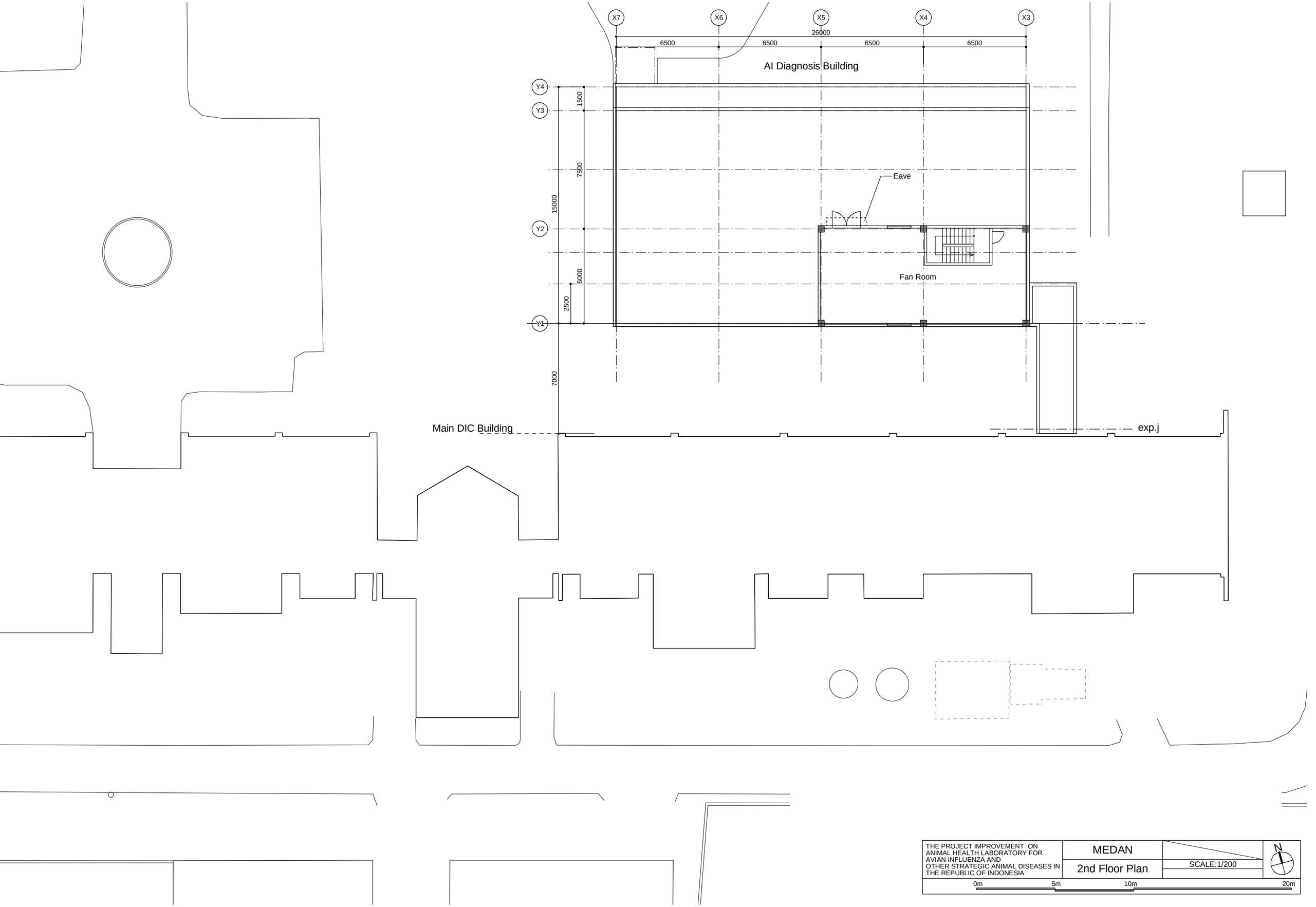
Buildeng Works

Mechanical Works

THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA	MEDAN		N
	Site Plan	SCALE:1/600	

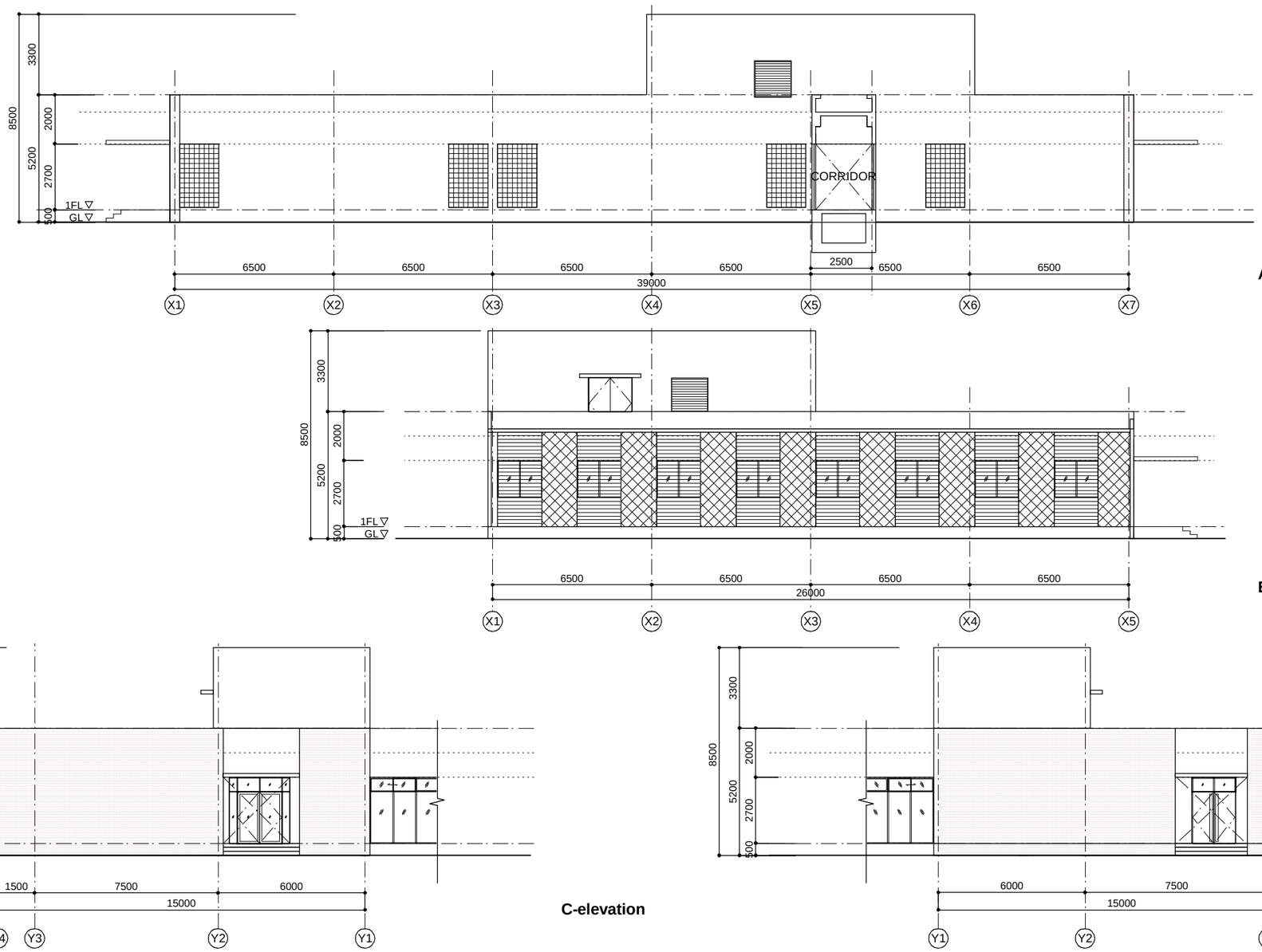
0m 20m 60m


X7
X6
X5
X4
X3
Canopy
Space For Outdoor Unit A Piping
26000
6500
6500
6500
6500
Antiseptic Tank
AI Diagnosis Building
Y4
Y3
Y2
Y1
1500
7500
15000
6000
2500
7000
RECEIVING ROOM
pass box
EPIDEMIOLOGY LAB
NECROPSY
AI Lab
pass box
pass box
ANTE ROOM-1
STERILIZATION ROOM
SHOWER ROOM
ANTE ROOM -2
CHANGING ROOM
PCR LAB-1
PCR LAB-2
PCR LAB-3
CELL PREPARATION
STORAGE
STORAGE
CORRIDOR
LPG
VETERINARY PUBLIC HEALTH
Main DIC Building
exp.j
OFFICE
ENTRANCE HALL
PATHOLOGY
PARASITOLOGY
DRESSING ROOM
BACTERIOLOGY
BIOCHEMISTRY
CLEAN ROOM
VIROLOGY
CHIEF ROOM
STERILE-1
MEDIUM
WASHING ROOM
STORAGE
8500
1750
WC
WC
DARK ROOM
MACHINE ROOM
WC
WC
MACHINE ROOM
MACHINE ROOM
MACHINE ROOM
ICE CHAMBER
MACHINE ROOM
FREEZER
WC
WC
W600 Culvert
6000
6000
6000
6000
6000
3000
6000
3000
6000
6000
6000
6000
6000
6000
6000
6000
78000
Existing Building
Renovated Area
New Building By Japanese Side
THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA
MEDAN
1st Floor Plan
SCALE:1/200
N
0m
5m
10m
20m



THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA	MEDAN	N
	2nd Floor Plan	SCALE:1/200

0m 5m 10m 20m

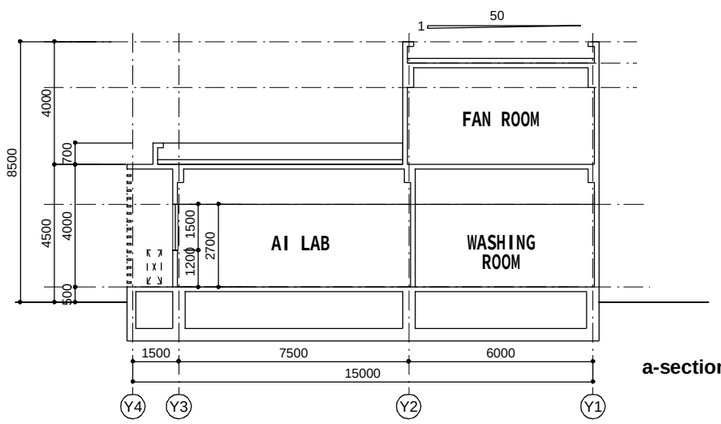


A-elevation

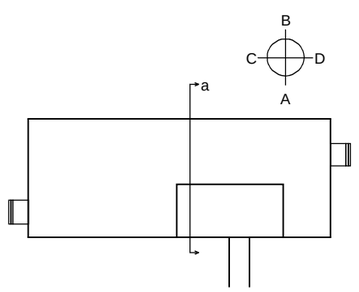
B-elevation

C-elevation

D-elevation

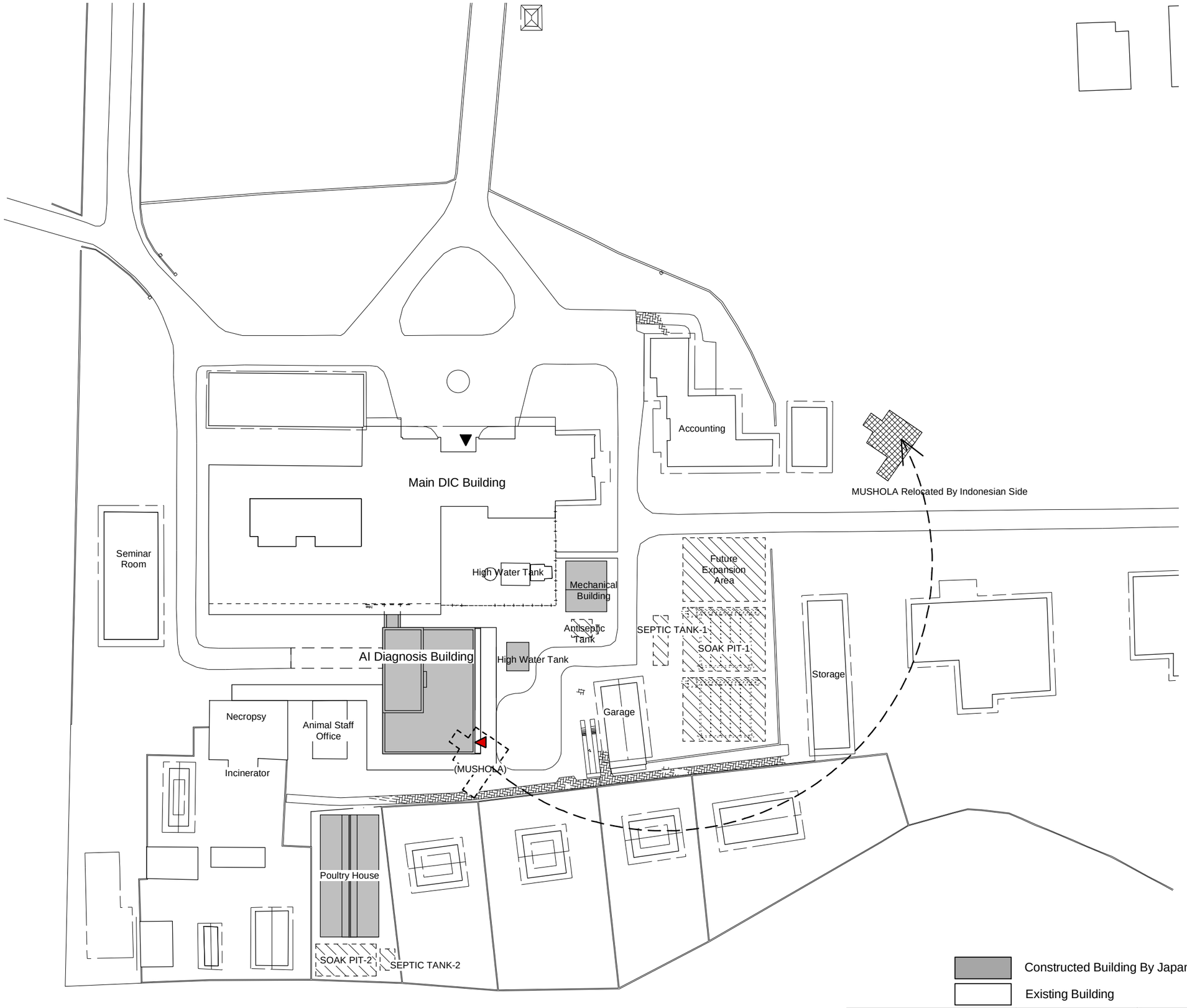


a-section



THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA	MEDAN	
	Elevations / Section	SCALE:1/200

0m 5m 10m 20m


Accounting
Main DIC Building
MUSHOLA Relocated By Indonesian Side
Seminar Room
High Water Tank
Mechanical Building
Future Expansion Area
Antiseptic Tank
SEPTIC TANK-1
SOAK PIT-1
AI Diagnosis Building
High Water Tank
Storage
Necropsy
Animal Staff Office
Garage
Incinerator
(MUSHOLA)
Poultry House
SOAK PIT-2
SEPTIC TANK-2
Constructed Building By Japanses Side
Existing Building
THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA
LAMPUNG
Site Plan
SCALE:1/600
0m
20m
60m

PATHOLOGY
SPECIMEN ROOM
DARK ROOM
ENTRANCE HALL
OFFICE
STAFF ROOM
CONFERENCE ROOM
LIBRARY
FOOD INSPECTION ROOM
Lab
PARASITOLOGY
COURT YARD
MACHINE ROOM
SERVICE ROOM
MACHINE ROOM
WC
WC
WC
WC
DRESSING ROOM
DRESSING ROOM
STAFF ROOM
STAFF ROOM
WC
WC
MACHINE ROOM
WASHING
STORAGE
BACTERIOLOGY
VIROLOGY
CHIEF ROOM
CHIEF ROOM
STAFF ROOM
ELECTRIC ROOM
GENERATOR ROOM
exp.j
Main DIC Building
6000
3000
3000
4500
7500
3000
Pump Room
Mechanical Building
Space For Outdoor Unit A Piping
Antiseptic Tank
High Water Tank
Garage
CORRIDOR
CELL PREPARATION
STORAGE
CHANGING ROOM
ANTE ROOM -2
AI Lab
ANTE ROOM -2
pass box
NECROPSY
SHOWER ROOM
STERILIZATION ROOM
EPIDEMIOLOGY LAB
RECEIVING ROOM
AI Diagnosis Building
Necropsy
Animal Staff Office
(MUSHOLA)
LPG
Y4
Y3
Y2
Y1
X1
X2
X3
X4
2000
6500
6500
6500
19500
6000
7500
1500
2500
15000
13000
5000
8500
2000
Existing Building
Renovated Area
New Building By Japanese Side
0m
5m
10m
20m

THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA	LAMPUNG	
	1st Floor Plan	SCALE:1/200

Main DIC Building

Fah Room

AI Diagnosis Building

Y4
Y3
Y2
Y1

X1
X2
X3
X4

2000
6500
6500
6500
19500

6000
7500
1500
2500
15000

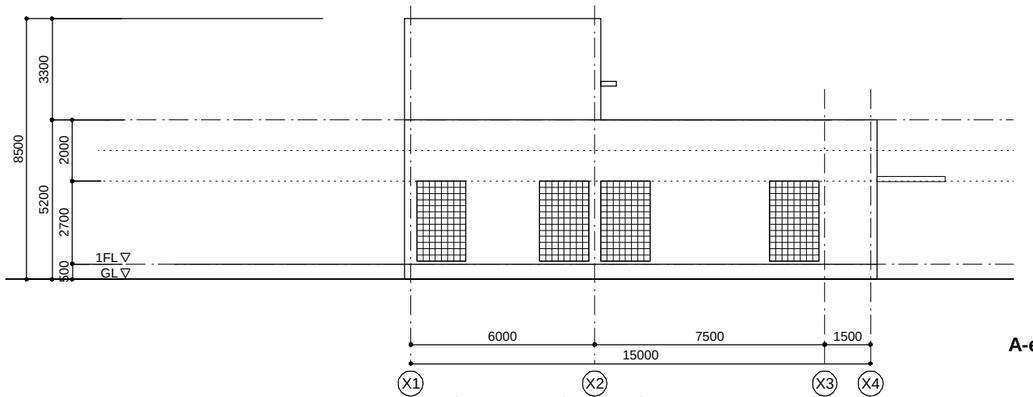
THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA

LAMPUNG

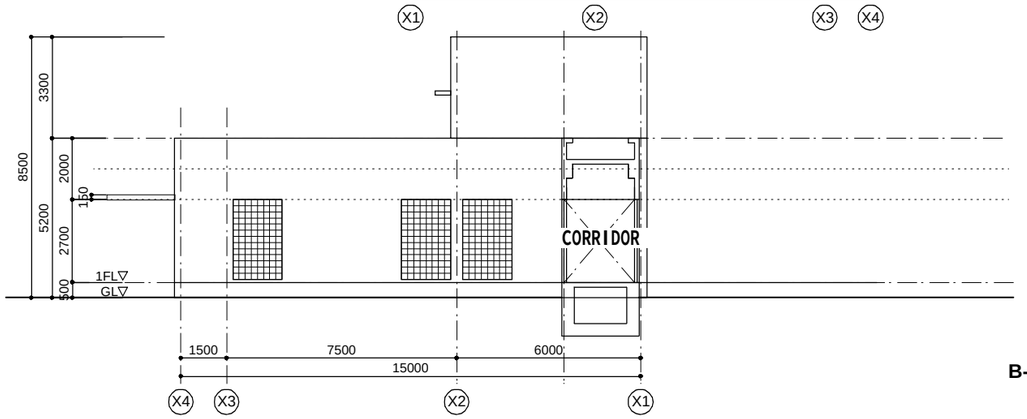
2nd Floor Plan

SCALE:1/200

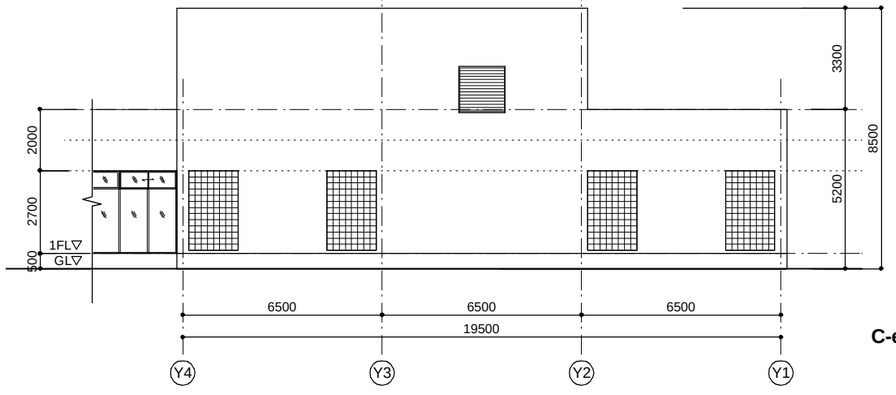
0m 5m 10m 20m



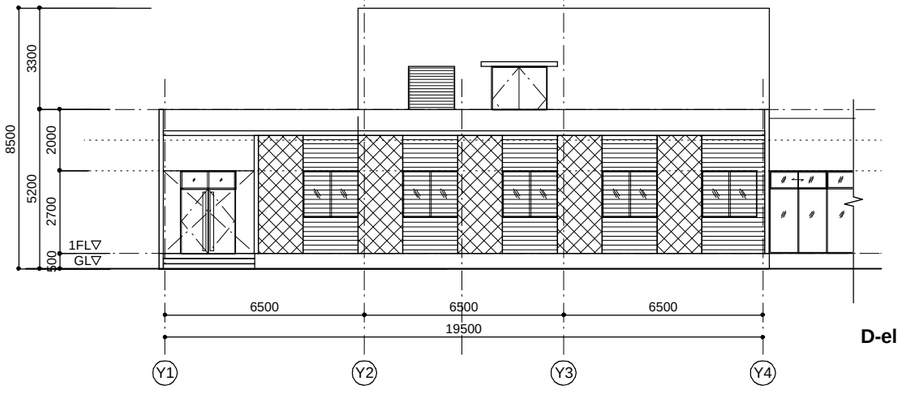
A-elevation



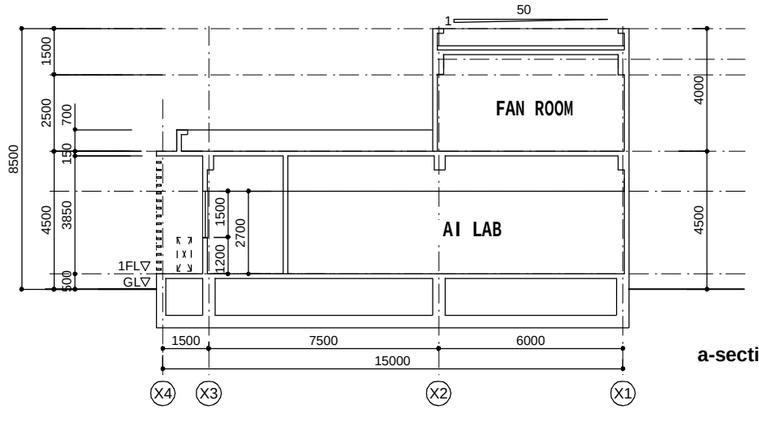
B-elevation



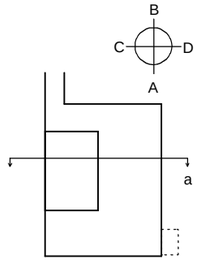
C-elevation



D-elevation



a-section



THE PROJECT IMPROVEMENT ON ANIMAL HEALTH LABORATORY FOR AVIAN INFLUENZA AND OTHER STRATEGIC ANIMAL DISEASES IN THE REPUBLIC OF INDONESIA	LAMPUNG Elevations / Section	SCALE:1/200

0m 5m 10m 20m

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

(1) Organization for project implementation

The Directorate of General Livestock Services (DGLS) is the responsible organization for Project implementation, while DIC Subang, DIC Medan, and DIC Lampung are the benefiting organizations. The DGLS oversees planning, design and construction activities performed by each DIC and concludes consulting and other service contracts. Contracts are signed in the name of the assistant director general (including those appointed by the director general).

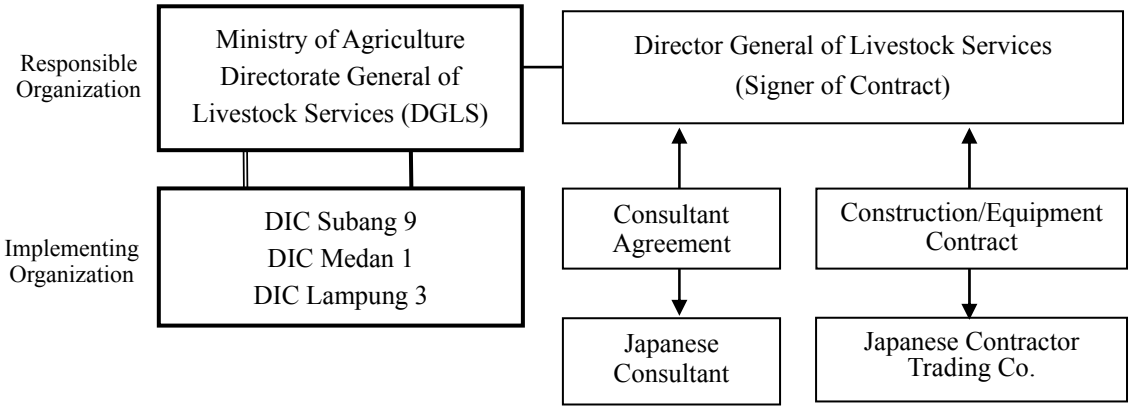


Figure 2-41 Project Implementation Organization Diagram

Oversight and approval for documents occurring after official Exchange of Notes (E/N) will occur according to the following process:

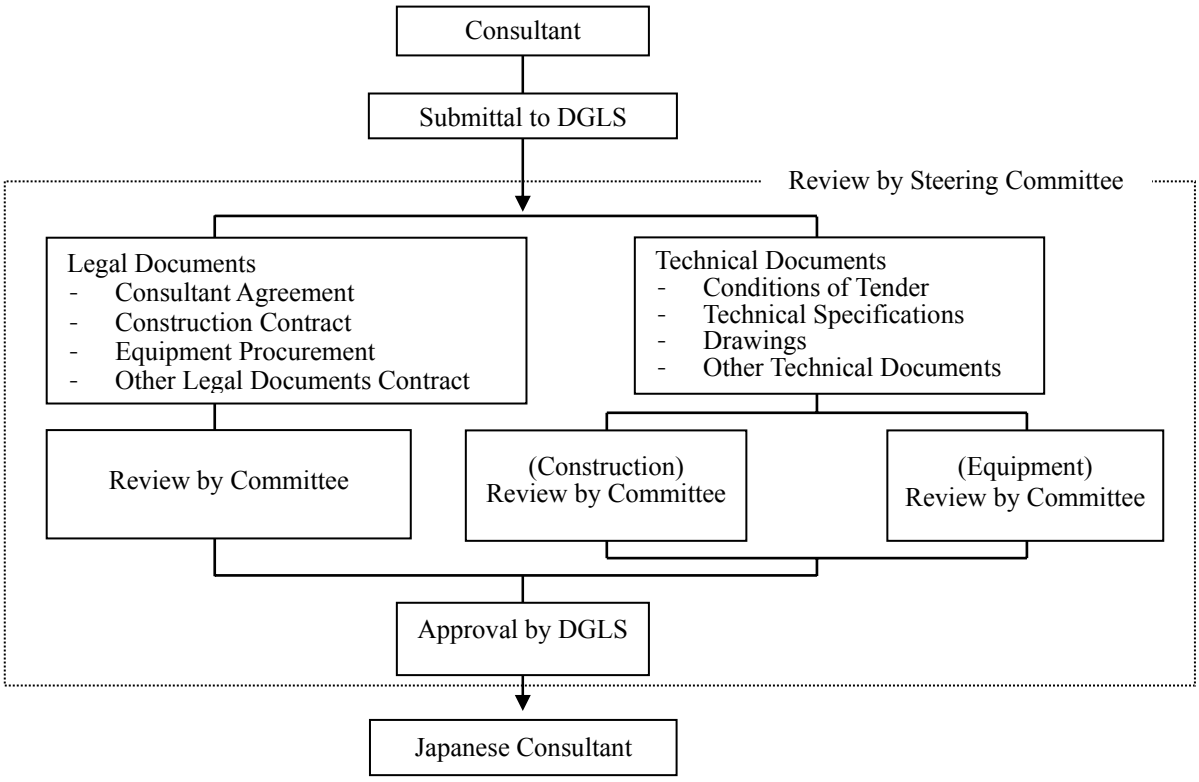


Figure 2-42 Procedures for Approval of Construction Document Approval

The DGLS has plans for a steering committee consisting of the members shown below in order to expedite project implementation.

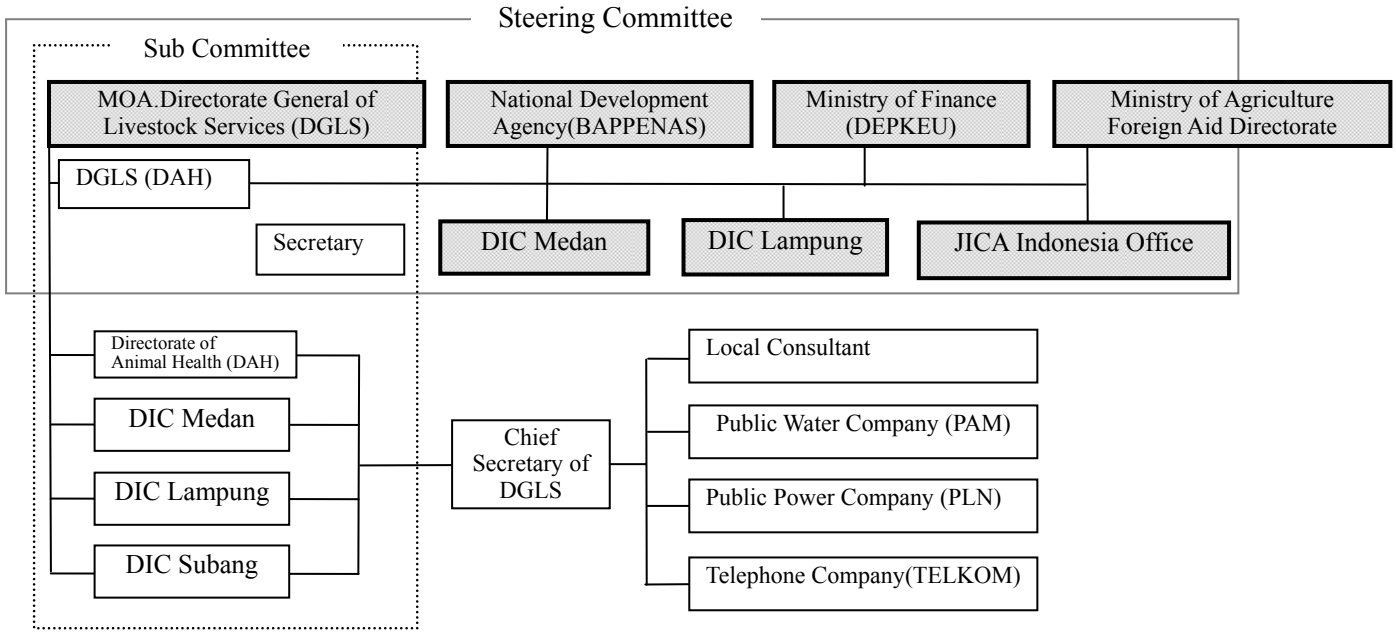


Figure 2-43 Organization Chart of Steering Committee

Following are main members of the steering committee (proposed):

- Chair: DGLS minister
- Vice-Chair: DGLS vice-minister
- Members:

Director General of National Development Planning Agency (BAPPENAS)
Director General of Water Resources
Ministry of Finance (DEPKEU)
Ministry of Agriculture Directorate of Foreign Aid
DIC 1 Medan director
DIC 3 Lampung director
JICA Indonesia office chief

Main steering committee functions

Project implementation oversight, including contract signatories
Bank contract and payment procedures (including fees)
Application for architectural and other permissions
Port and all other domestic import approvals
Securing duty exemptions at ports of discharge
Other duties necessary for expediting project plans

(2) Consultants

After concluding the E/N, the Indonesian Department of Agriculture will conclude a consulting contract, to be approved by the Japanese government, with a Japanese consulting firm for detailed designs and construction supervision of the project. It is important to conclude the consulting contract soon after the E/N to ensure smooth progress on the project.
After the consulting contract has been finalized, the consultant will confer with DGLS and produce detailed design documents (bidding documents) based on basic design study report. These documents will then be approved by DGLS according to the process outlined above. Bidding and construction supervision will be based on these detailed design documents.

(3) Construction Contractor

Construction for the current project involves construction of the facility themselves and procurement/installation of various equipment. Contractors for the former will be selected from qualified Japanese corporations according to a general competitive bidding process with certain participation requirements.
DGLS will conclude construction contracts, to be approved by the Japanese government, with contractors selected through this process.

(4) Local Consultants

Japanese person(s) stationed on-site as well as local architectural specialists will be used for construction supervision. The fact that the project involves construction of a veterinary health testing facility means that greater demands will be placed on machine and electrical construction than for normal buildings, with higher cleanliness requirements as well. For these reasons facility specialists will be particularly crucial to success.

(5) Construction Companies and Dispatched Specialists

According to public data showing the size of various construction companies in Indonesia, there are many companies large enough for the current project. However, there are virtually no companies with construction and facility installation experience required for construction of facilities intended for testing and diagnosing highly contaminative veterinary samples. For this reason, Japanese construction companies will hire local architectural specialists to work under Japanese specialists. Local construction companies will be utilized on a subcontractor basis and will undergo strict oversight and guidance in terms of process, quality, safety management, and other facets of construction.
The current project represents a highly technologically advanced facility from the perspective of Indonesia. AI and necropsy lab construction will require a very high level of quality control. For this reason, technical guidance and construction supervision by Japanese specialists with extensive experience in the field is absolutely required for success. It is also necessary to plan for dispatching of specialists from Japan and other countries to oversee testing of diagnostic materials and equipment.

(6) Operation and Maintenance Capabilities

1) Operation and Maintenance

DIC Subang
The staff for diagnosis facility and equipment as well as facility maintenance at DIC Subang will be newly organized. The diagnosis process are the same as for the other DICs.
Some regular maintenance operations for the air conditioning and plumbing systems such as cleaning filters, washing, replenishing liquids and chemicals, can be done by laypersons. However, replacement of comsumables of air conditioning and electrical equipment, regular performance testing will be conducted by assigned techincians with the relevant knowledge and technical know-how. Especially, the AI laboratoies handling HPAI virus and other pathogenic agents are BSL2 facilities. Air conditioning equipment and ventilator fans with high performance filters must be maintained by staff knowledgeable not only in their physical operations, but also trained and conversant in techniques and operational know-how to prevent AI contamination prevention and containment.
Indonesia fully realizes this necessesity for equipment maintenance and has agreed to secure the necessary staff. The maintenance department will be required to prepare and maintain an equipment ledger, procure consumables and spare parts and regular inspectiona nd light repairs to basic equipment. The bio-safety cabinets and real-time PCR equipment in particular require maintenance under maintenance contracts with agents and maitenance companies. The maintenance structure in Indonesia is illustrated below;
The present budget for equipment maintenance is Rp. 479 million annualy (approximately J¥6 million) and the stimated increase in equipment maintenance of Rp 240 million

(approximately J¥3million) will be added to the budget requiring a large 50% increase. The DGLS will secure the necessary budget.

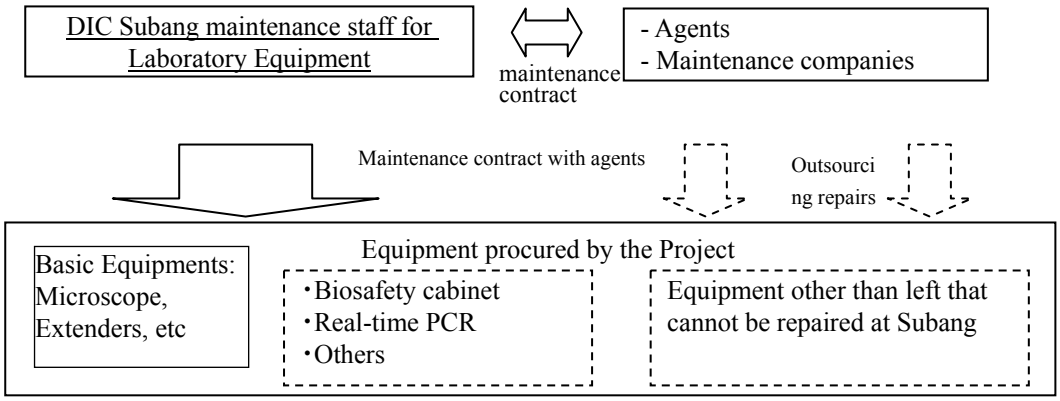


Figure 2-44 DIC Subang Operation and Maintenance of Equipment

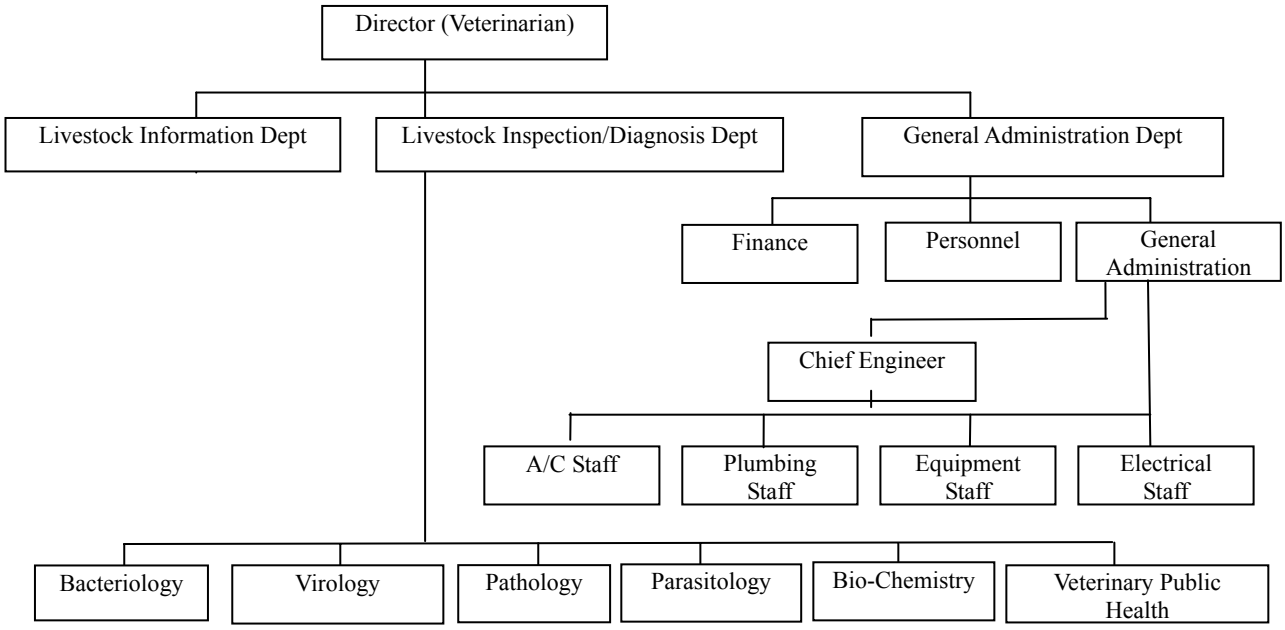


Figure 2-45 DIC Subang Operation & Maintenance Organization Diagram

DIC Medan

According to present organization diagram for DIC Medan, maintenance is conducted by one electrical engineer and one equipment (including facility) engineer staff in General Affairs Department. The electrical engineer was one of the original engineers during constructionand has been at his present maintenance position for over 30 years since completion in 1978. the equipment maintenance staff doubles as facility maintenance engineer and repairs are outsourced. The air conditioning and plumbing are presently maintained by a electrical engineer and not a trainned engineer in the appropriate field. Only limited numbers of as-built drawings and other reference data required for maintenance are available. No operational records of equipment are kept and base data for maintenance are not adequate. The project facilities will require complete protective measures against AI, et al and full contaiment procedures. Technical staff with the relevant knowledge and know-how will be assigned to in addition to the present staff.

The existing equipment are past replacement period, but are well maintained except for a few which have difficulty in procuring spare parts. Annual inspection and adjutment of autoclaves and incubators are contracted out to respective agents. Malfunctions and repairs are contracted to agents for repairs. Equipment procured under the Project will specify operation and maintenance training by supplier's technician as part of procurement. Major equipment such as bio-safety cabinets will require annnual maintenance contratcs with supplier and agents.
The present budget for equipment maintenance is Rp. 479 million annualy (approximately J¥6 million) and the stimated increase in equipment maintenance of Rp 240 million (approximately J¥3million) will be added to the budget requiring a large 50% increase. The DGLS will secure the necessary budget.

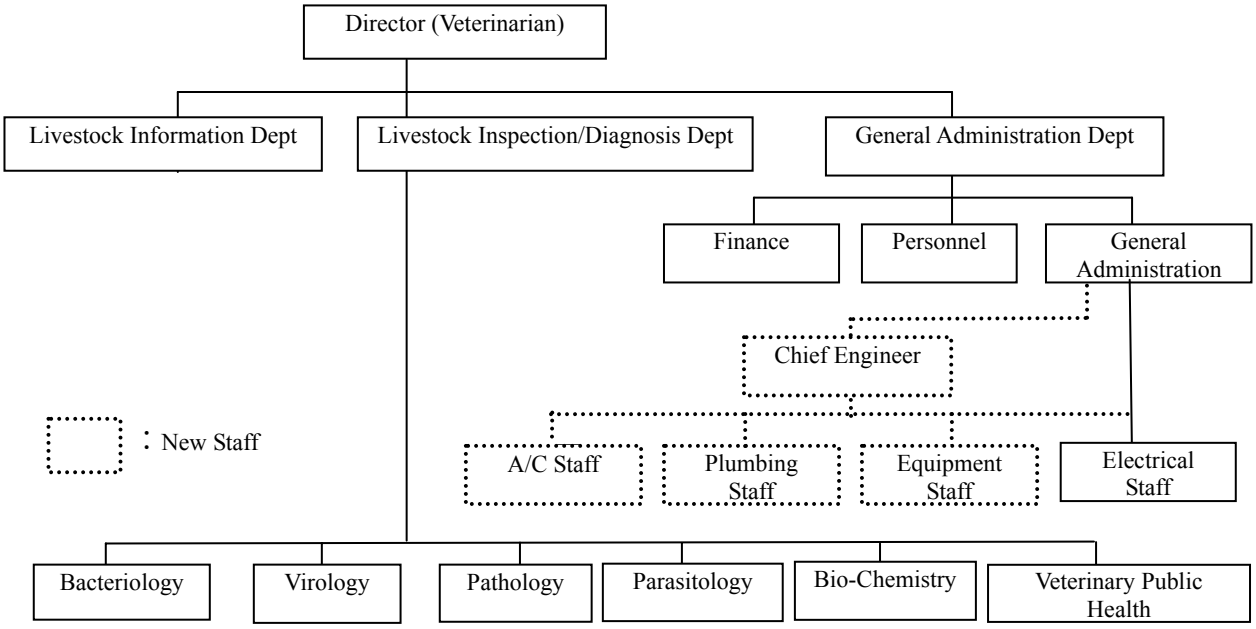


Figure 2-46 DIC Medan Operation & Maintenance Organization Diagram

DIC Lampung
According to present organization diagram for DIC Medan, maintenance is conducted by one electrical engineer and one equipment (including facility) engineer staff in General Affairs Department. However, the position for the equipment engineer is presently vacant.
The electrical engineer is well maintaining the aging equipmentand operations are still automatic.the facility and air conditiooning and plumbing are the responsibilty of the maintenance staff but repairs are all contracted out.
Only limited numbers of as-built drawings and other reference data required for maintenance are available. No operational records of equipment are kept and base data for maintenance are not adequate. The project facilities will require complete protective measures against AI, et al and full contaiment procedures. Technical staff with the relevant knowledge and know-how will be assigned to in addition to the present staff.
The existing equipment are well maintained as at DIC Medan. Equipment procured under the Project will specify operation and maintenance training by supplier's technician as part of procurement. Major equipment such as bio-safety cabinets will require annnual maintenance contracts with supplier and agents.
The present budget for equipment maintenance is Rp. 479 million annualy (approximately J¥6 million) and the stimated increase in equipment maintenance of Rp 240 million (approximately J¥3million) will be added to the budget requiring a large 50% increase. The DGLS will secure the necessary budget.

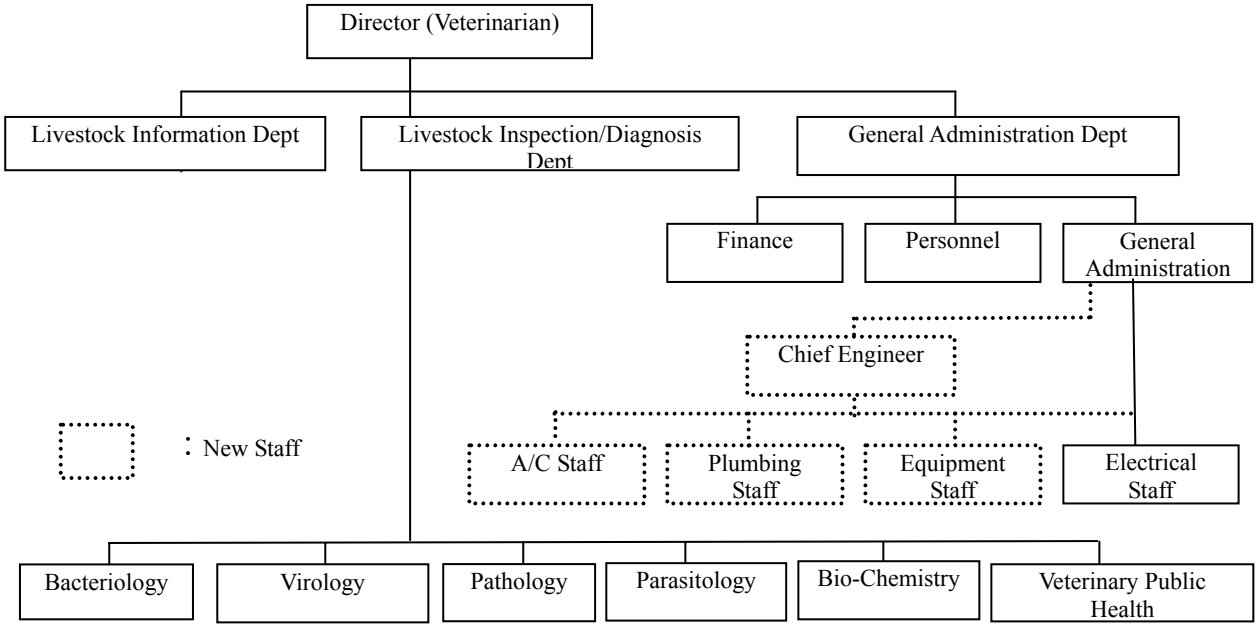


Figure 2-47 DIC Lampung Operation & Maintenance Organization Diagram

2-2-4-2 Implementation Conditions

(1) Important Considerations for Construction

1) DIC Subang

The parcel of land slated for development for the current project is an approximately 4.5 hectare vacant plot in the southwest corner of a large experimental agricultural facility in the outskirts of Subang. There are two access roads from highways, both of which are about 6 m wide and large enough for construction traffic, although with not a great deal of room to spare. The first road, on the north side, carries daily traffic to the village of Wera (population 2,500) to the west, while the second road on the east passes through a military residential area. The Indonesian government has expressed a preference that the latter road be used primarily for construction, since it involves fewer complications on their part. Further, because the topsoil at the site contains volcanic ash, provisional plans are necessary to ensure that this does not flow into the stream that the village of Wera uses for its daily water. Corrugated iron sheets will be used to surround the construction site to prevent trespassing, which could lead to accidents or other forms of harm, and to generally secure the site. Guardhouses will be erected to control access to the site, with particular attention paid to third-party safety.

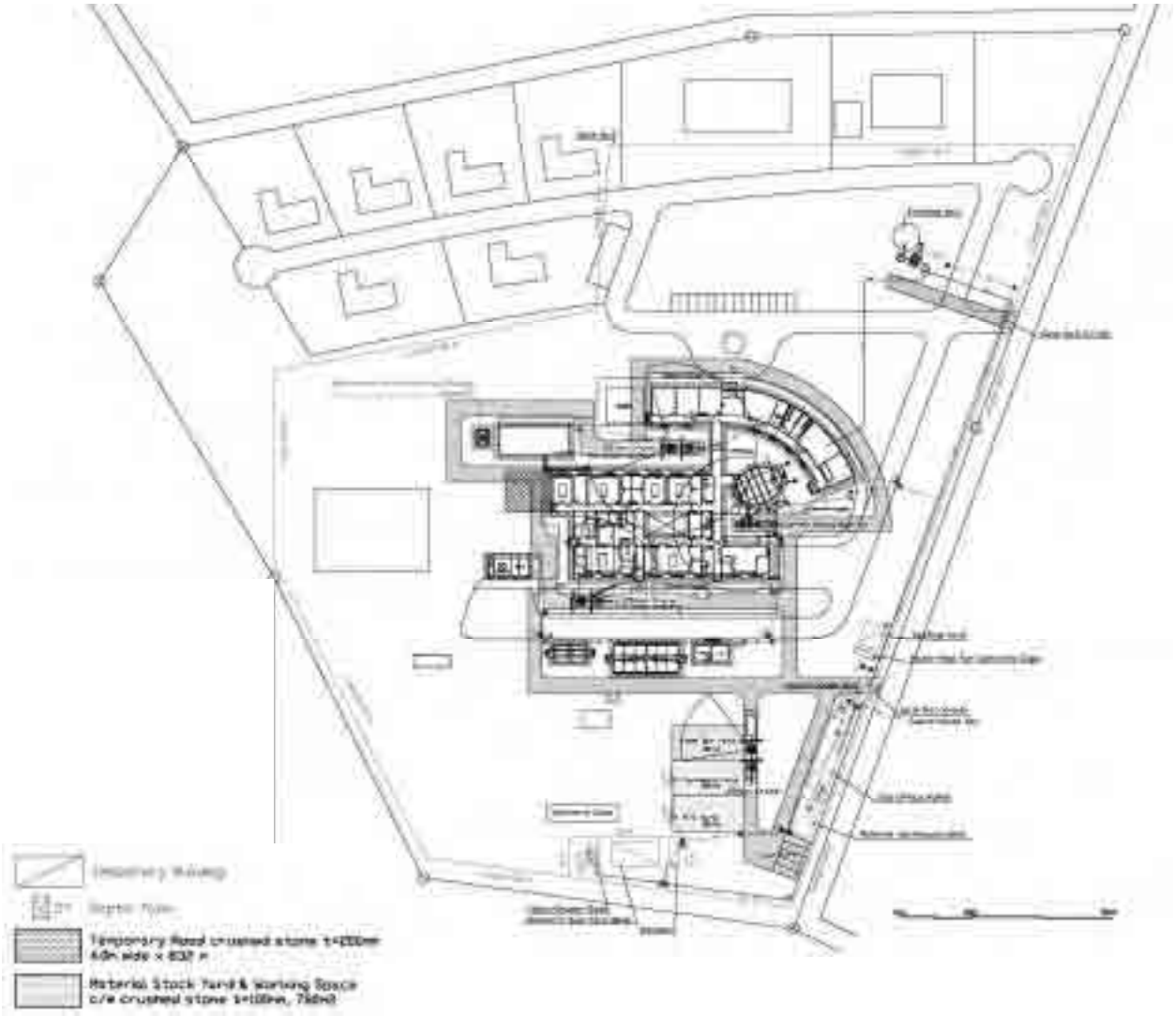


Figure 2-48 Temporary Works Plan for DIC Subang Construction

2) DIC Medan

Construction sites for the current project include parcels of land directly in front of and behind the current DIC main building. Roads behind the main building will be primarily used for construction to minimize interference from construction on DIC activity, and corrugated iron sheets will be used to surround the construction site to prevent trespassing, which could lead to accidents or other forms of harm, and to generally secure the site. Guardhouses will be erected to control access to the site, with particular attention paid to third party safety. Efforts will also be made to ensure road cleanliness and pedestrian safety because of the frequent traffic between the main building and the necropsy lab, incinerator, cafeteria, and animal housing.

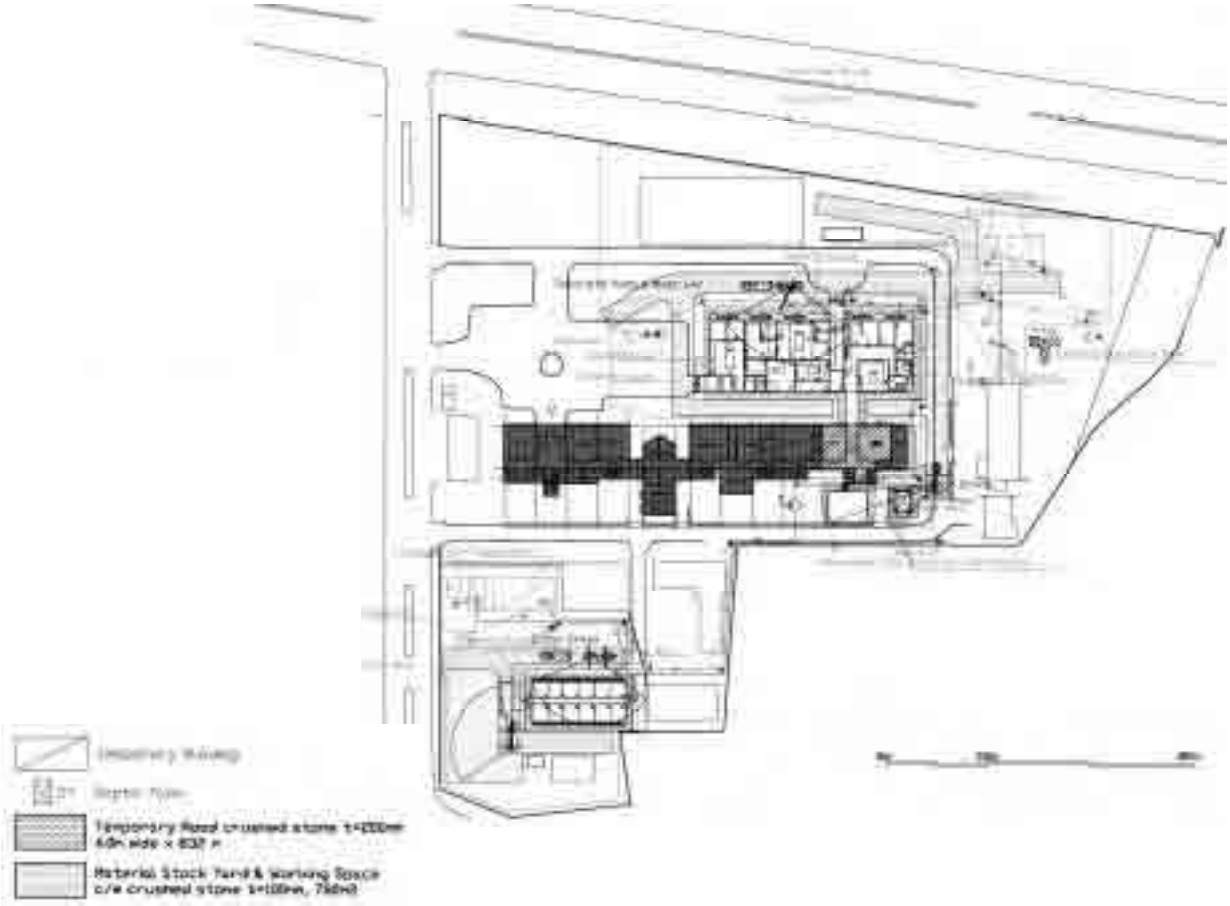


Figure 2-49 Temporary Works Plan for DIC Medan Construction

3) DIC Lampung

The parcel of land slated for the current project is a plot behind the current main DIC building that is vacant after existing buildings are removed by Indonesian authorities. Roads behind the main building will be primarily used for construction to minimize interference from construction on DIC activity, and corrugated iron sheets will be used to surround the construction site to prevent trespassing, which could lead to accidents or other forms of harm, and to generally secure the site. Guardhouses will be erected to control access to the site, with particular attention paid to third party safety. Efforts will also be made to ensure road cleanliness and pedestrian safety because of the frequent traffic between the main building and the necropsy lab, incinerator, cafeteria, and animal housing.

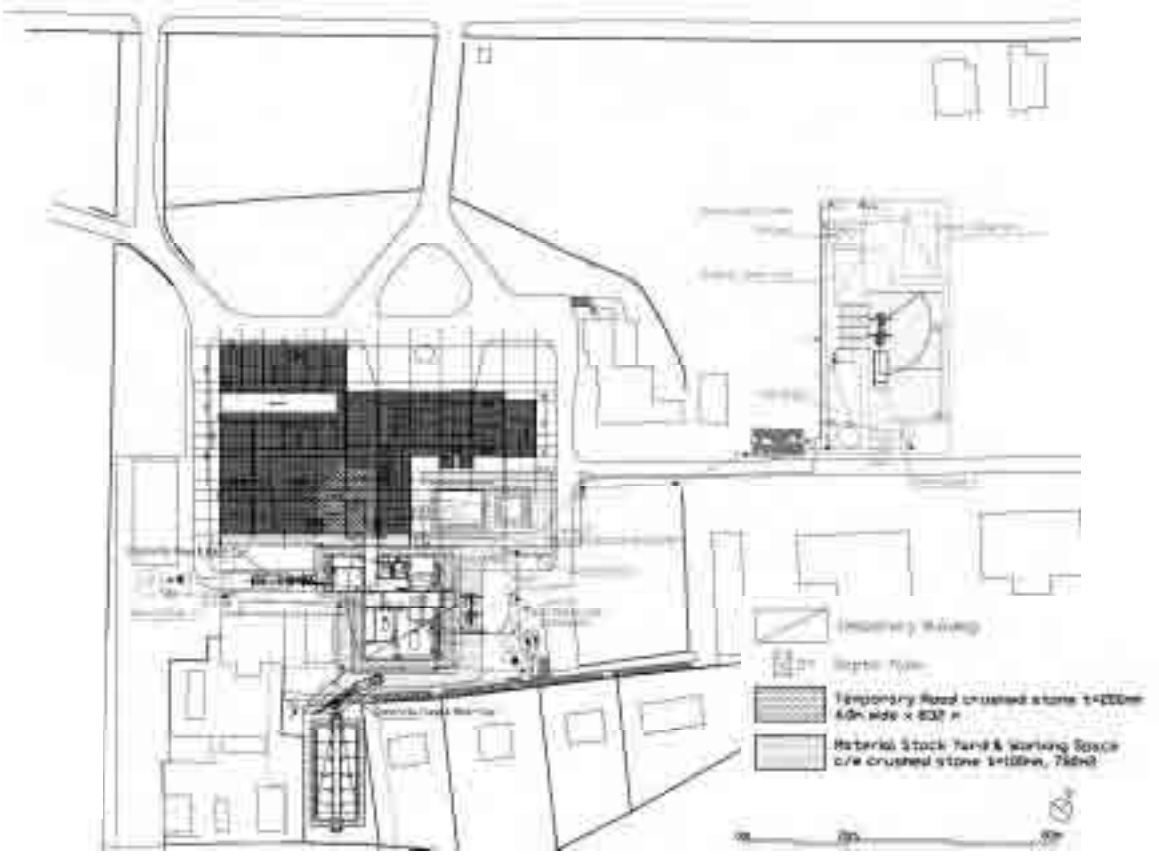


Figure 2-50 Temporary Works Plan for DIC Lampung Construction

(2) Important Points for Procurement

1) DIC Subang

Nearly all of the construction equipment and materials used for the project will be procured locally in Indonesia, but equipment key to ensuring facility performance will be imported from Japan or third countries. Indonesian parties will be responsible for associated duty payments and other procedural formalities, but Japanese and Indonesian parties will work together closely to ensure that required goods reach the construction site in a timely fashion. To this end construction personnel will closely monitor progress and inform Indonesian parties of requirements as soon as possible.

2) DIC Medan

Procurement requirements are fundamentally the same as for DIC Subang above, but the majority of equipment and materials will be procured from Java. For goods imported from Japan or third countries, Japan and Indonesian parties will work together closely to ensure timely arrival at the construction site. To this end construction personnel will closely monitor progress and inform Indonesian parties of any requirements as soon as possible.

3) DIC Lampung

Basically the same as for DIC Medan above.

2-2-4-3 Scope of Works

Responsibility for various facets of construction are delineated below to ensure smooth cooperation between Japan and Indonesia.

Table 2-32 Construction and Installation Responsibility Chart

Japanese Scope of Works	Indonesian Scope of Works
	Secure site for DIC Subang clear site for new facility at DIC Medan + DIC Lampung
	Site and construction space (at three sites) 1) Removal of existing structures in site on construction area. 2) Removal of existing power cables, telephone lines from construction area. 3) Removal of existing water supply pipes and closure of unused wells in site. 4)
	Construction of fence around site and guard house.
Exterior works in site 1) Pathways, vehicle circulation, parking indications (white line only) sterilization space 2) Drains, storm sewer pipes	Exterior works out of site 1) All landscaping and planting other then included in Japanese scope of works
Facility construction 1) Architectural Works New DIC building in Subang AI diagnosis and VPH buildings in Medan AI diagnosis buildings in Lampung Poultry House (three sites) Small Animal House (Subang only) Pump Room (three sites) Incinerator (Subang only) 2) Electrical Works Secondary power supply, Secondary telephone system, Secondary intercom system, Fire alarm system, 3) Mechanical Works Water supply system, Sewage system, Hot water supply system, Sanitary fixture, Fire fighting system, Air conditioning system, Ventilation system 4) Other Utilities LPG system, Incinerator (Subang only) Sewage treatment plant system	Other Facilities 1) Architectural Works Veterinary Public Health Laboratory (Subang only)
To provide facilities for the distribution of electricity, telephone services, water supply, drainage and others 1) Electricity a. All piping and cabling after receiving panel (including distribution panel) (three sites) b. Generator system (Subang only) 2) Telephone service a. All piping and cabling after connection panel in project site (three sites) 3) Water supply a. Water supply system in site (three sites) 4) Drainage a. Drainage system in site (three sites) 5) Furniture and Equipment a. Curtain rail b. Procurement and installations Project Equipment	To provide facilities for the distribution of electricity, telephone services, water supply, drainage and others 1) Electricity a. Inlet line up to main circuit breakers in building b. Main breakers and transformer (Subang only) c. Generator system (Lampung only) d. Primary distribution power supply up to connection panel in project facilities (Medan + Lampung only) 2) Telephone service a. PABX b. Primary distribution piping and cabling up to connection panel in project facilities 3) Water supply a. Distribution inlet to site 4) Drainage a. All drainage outside of site 5) Furniture, Furnishings & equipment a. Curtain rail b. General furniture c. Moving and installation of Existing Equipment d. Any equipment not included in Japanese scope of works

2-2-4-4 Consultant Supervision

The Japanese consultant shall conclude a consulting agreement with the Ministry of Agriculture's Directorate General of Livestock Services (DGLS) to carry out the detailed design of this Grant Aid project (preparation of tender documents, etc.) as well as to conduct the tender and supervise the work. The object of such supervision is to ensure that contractual obligations are properly fulfilled, including ascertaining whether construction is executed in conformance with drawings and specifications. The consultant shall ensure quality and schedule management, providing contractors with guidance, advice and coordination throughout the work period. Supervision of work consists of the following tasks:

(1) Support for Tendering and Contracts

The consultant shall provide advice and support for tender activities performed by DGLS including: preparation of the tender documents necessary to determine contractors for construction and equipment work, making public notice of the tender, accepting applications for tendering, examining applicant qualifications, holding a tender explanation meeting, distributing tender documents, and accepting and evaluating tenders. In addition, the consultant shall advise DGLS concerning its contracts with contractors whose tenders are successful.

(2) Guidance, Advice and Coordination for Contractors

The consultant shall review work progress, work plans, construction material procurement plans and equipment procurement and installation plans, providing contractors with guidance, advice and coordination.

(3) Inspection and Approval of Working and Production Drawings

The consultant shall review working drawings, production drawings and other documents submitted by contractors, approving them after providing necessary direction.

(4) Confirmation of Construction Materials and Equipment

The consultant shall confirm conformity between contract documents and the construction materials and equipment that contractors wish to procure.

(5) Inspection

The consultant shall, as necessary, attend inspection and testing carried out at plants where construction materials and equipment are manufactured in order to verify that quality and performance requirements are met.

(6) Reporting on Progress of Work

The consultant shall monitor work progress and work sites and provide construction progress reports to concerned parties in both countries. Furthermore, in the event that unavoidable circumstances lead to changes during the course of work, the consultant shall proceed after receiving confirmation from Japan and DGLS approval.

(7) Completion Inspection and Trial Run

The consultant shall perform completion inspections and trial-run inspections of construction, machinery, electrical facilities and equipment, confirm that performance conforms to contract documents, and submit inspection reports to DGLS.

(8) Consultant Supervision System

The consultant shall assign one resident supervisor to carry out the duties described above. The resident advisor shall be stationed in Jakarta and supervise work in three locations. Moreover, the consultant shall dispatch experts from relevant areas to work in the field as the progress of work demands to conduct any necessary discussions, inspections, guidance and coordination. At the

same time, the consultant shall also establish a system for backup and liaison duties by assigning responsible experts in Japan. In addition, the consultant shall provide related Japanese governmental organizations with reports on necessary information related to the progress of this Grant Aid project, payment procedures, and completion and delivery.
The consultant supervision system is outlined in Figure 2-51 below.

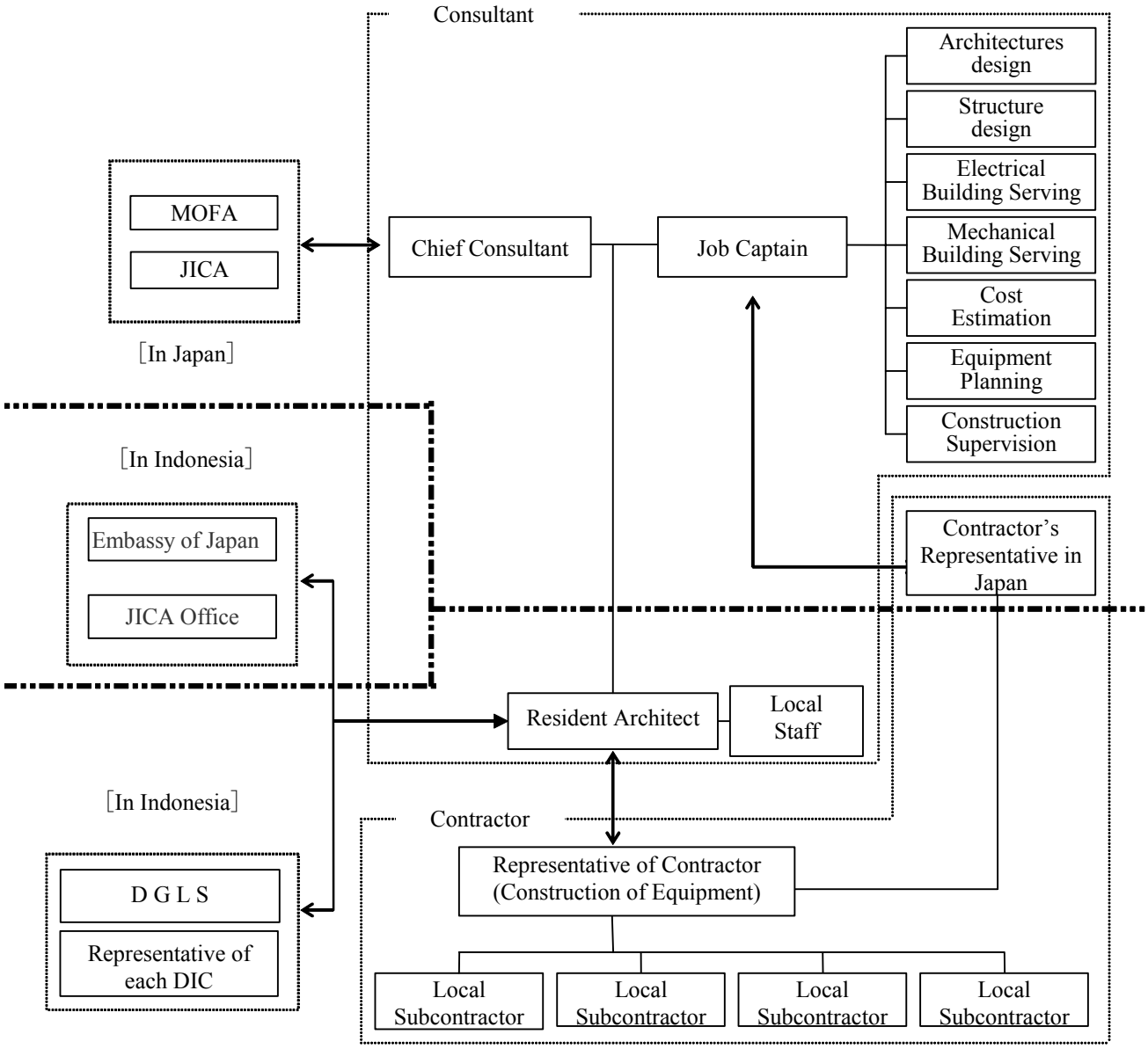


Figure 2-51 Construction Supervision Organization Chart

2-2-4-5 Quality Control Plan

(1) Concrete

Quality control for concrete will be conducted according to methods generally followed in Indonesia, although methods described in the Japan Architectural Standard Specification for Reinforced Concrete Work (JASS5) shall also be applied as needed.
Since actual structural strength values tend to exceed values for the strength of specimens cured by the standard method, the quality standard strength shall be set at "design strength + 3N/mm^2" in accordance with the JASS5 standard. The strength of mixed concrete shall be determined by test mixing. 28-day control compression strength tests shall be conducted on test pieces to confirm that the quality standard strength is exceeded. For this work, x-R control charts shall be developed.
Compression tests of test specimens shall, in principle, be carried out by a third party organization, with testing conducted daily when pouring work is conducted and once for each 150m^3 of concrete poured. In light of local work conditions and the anticipated frequency of pouring work, third party compression tests would probably be conducted once every 50m^3.
Tests on the chloride content of fresh concrete shall be conducted according to methods generally followed in Japan, with content confirmed not to exceed 0.3kg/m^3.

(2) Rooftop Waterproofing

Facilities rooftops are flat with asphalt waterproofing over concrete slabs. Because rooftop waterproofing is closely related to facilities durability and structural lifespan, quality control is important and shall be conducted in accordance with the Japan Architectural Standard Specification for Waterproofing and Sealing (JASS9). Waterproofing performance shall be confirmed to ensure that there are no leaks after completion of the work, including conduct of a post-waterproofing leak test lasting at least 48 hours.

(3) Interior of "Dirty" Areas

Project facilities include so-called "dirty" rooms where AI is handled; because such areas must be maintained at negative air pressure, each individual room must remain sealed. Therefore, finished interior surfaces, and joints between materials, must be constructed to prevent air from escaping and must be well fitted. It would be preferable that such rooms not have openings but where installation is unavoidable these should be minimized as much as possible; doors for entering and leaving should be confirmed to be of a fit and material to ensure air-tightness.

2-2-4-6 Procurement Plan

(1) Construction Materials and Equipment

This cooperation project consists of the construction of laboratories; in accordance with the purpose of these facilities, items that are durable and easy both to clean and keep clean shall be selected when procuring material and equipment. Materials shall be selected such that the Indonesian side will be fully capable of maintaining the facilities following their completion. Procurement policies are described below.

1) Local Procurement

Almost all building materials for structural materials concrete blocks, waterproofing agents, wooden materials, glass, glass blocks, paints, materials for exterior work, and tile can be procured locally. Japanese-made goods will be used for materials that require airtightness, product precision and durability (airtight metal doors, windows and other fittings, electric locks, pass boxes, special paints, etc.), as well as for special items like medical sinks. In addition, almost all the construction machinery to be used can be procured locally.

2) Overseas Procurement

Procurement of products made in Japan or third countries will be considered when local materials and equipment are difficult to procure or fail to meet required quality criteria, when local supplies are deemed unstable, or when materials require product precision and durability. Importation and customs clearance for overseas procurements from Japan or third countries are the responsibility of the Indonesian side but contractors should coordinate closely with the Indonesian government to facilitate these procedures to ensure the smooth receipt of such materials and equipment. If the "price + packing and transportation cost" of procurement from Japan or third countries is found to be lower than the price of local procurement, overseas procurement must be considered. However, maintenance and repair for such material and equipment must be easily available.
As a general tendency, manufactured products that require precision or quality shall be procured from overseas.

3) Transportation Plan

The Project is planned for three sites on Java and Sumatra. Materials and equipment procured from Japan or third countries will be shipped by sea to Tanjuk Priok Harbor (Jakarta) in Indonesia, where they will clear customs before being sent on to project sites. Items bound for Subang will be transported by land, those for Medan will be unloaded at Belewan Harbor 25km to the north and then be transported by land, and those for Lampung will be unloaded at the local harbor.
Because there is a risk that the performance of some materials and equipment may be adversely affected by exposure to impact, high humidity or high temperature, packaging must enable such items to withstand long transport periods.

(2) Procurement Plan

The table below lists major construction materials and equipment to be procured for the Project—categorized by whether they are to be procured locally, from Japan or from third countries—and the reasons for selecting said source.

Table 2-33 Procurement Plan for Major Construction Materials and Equipment

Work Category	Material and Equipment	Procurement Source			Notes
		Local	Japan	Third Country	
Reinforced Concrete Work	Portland cement	○			Local products are satisfactory.
	Aggregate	○			Local products are satisfactory.
	Deformed bars	○			Local products are satisfactory.
	Forms	○			Local products are satisfactory.
Masonry	Concrete blocks	○			Local products are satisfactory.
Waterproofing Work	Asphalt waterproofing	○			Local products are satisfactory.
	Polysulfide and silicon sealants (tie-ins, decorative grout for exterior walls, etc.)	○			Local products are satisfactory.
Plaster Work	Cement mortar	○			Local products are satisfactory.
Tile Work	Homogenous ceramic tiles (295x295、195x195、95x95)	○			Local products are satisfactory.
Stone Work	Stone material (granite, marble)	○			Local products are satisfactory.
Carpentry	Wood for fittings	○			Local products are satisfactory.
Roof Work	Roof tiles	○			Local products are satisfactory.
Metal Work	Light-weight ceiling substrate (T-bar)	○			Local products are satisfactory.
	Light-weight ceiling substrate (calcium silicate board)		○		For rooms where cleanliness must be ensured, Japanese products are procured.
	Stainless steel floor pit cover, frames, aluminium ceiling access door		○		For rooms where cleanliness must be ensured, Japanese products are procured.
Wooden Window & Doors Work	Doors and frames	○			Local products are satisfactory.
Metal Windows Doors	Aluminum steel doors	○			Local products are satisfactory.
	Steel doors	○	○		Special doors, with semi-airtight, electric locks are procured from Japan
Glass Work	Glas, glass blocks	○			Local products are satisfactory.
Painting Work	Interior painting	○			Local products are satisfactory.
	Exterior paints	○			Local products are satisfactory.
	Board finishing	○			Local products are satisfactory.
Interior Finish Work	Laboratory floors		○		Local materials lack durability; procure in Japan to ensure quality.
	Calcium silicate board with mineral glaze		○		Local materials lack durability; procure in Japan to ensure quality.
	Sinks	○			Local products are satisfactory.
	Steel Partition	○			Local products are satisfactory.
	Signage		○		Signage to be procured in Japan to ensure quality.

Work Category	Material and Equipment	Procurement Source			Notes
		Local	Japan	Third Country	
Mechanical Work	Air conditioners		○		No local products; procure in Japan.
	Fans		○		No local products; procure in Japan.
	Air intake and exhaust		○		No local products; procure in Japan.
	Duct material	○			Local products are satisfactory.
	Pumps		○		Local materials lack durability; procure in Japan to ensure quality.
	Sanitary fixtures	○			Local products are satisfactory.
	FRP panel tanks		○		No local products; price. Procure in Japan due to quality comparison.
	Piping	○			Local products are satisfactory.
	Insulation	○			Local procurement of imported materials. Be attentive to quality.
	Fire extinguishers	○			Local procurement of imported materials, in accordance with local standards.
Electrical Work	Boards	○			Local products are satisfactory.
	Electrical conduits	○			Local products are satisfactory.
	Electrical wires	○			Local products are satisfactory.
	Cables	○	○		Procured locally or in Japan depending on properties.
	Lighting equipment	○	○		Procured locally or in Japan depending on properties.
	Wiring devices	○			Local products are satisfactory.
	Telephone equipment	○			Local products are satisfactory.
	Automatic fire alarm	○			Local products are satisfactory.
	Security equipment		○		Local materials lack durability; procure in Japan to ensure quality.
	Lightning protection equipment	○			Local products are satisfactory.
	Generator System	○			Local procurement of imported manufacture

(3) Procurement of Laboratory Equipment

Appropriate maintenance and repair is important in order to ensure that the equipment procured under the project obtains the stable and accurate laboratory results that diagnosis and research demand. In addition, technicians with specialized knowledge are required to perform periodic inspections and replace parts. It is important, therefore, that equipment be procured from manufacturers (and their agents) that have technicians in Indonesia.
In addition, procurement from third countries may be sought for products when consideration of Japanese products alone would make a proper competitive tender impossible or when the use of products from Japanese manufacturers that lack local agents would make maintenance difficult. Sources for major medical equipment are indicated in Table 2-34.

Table 2-34 Procurement Plan for Major Equipment

Group	Name of Equipment	Indonesia	Japan	Third Countries (DAC)
Autoclaves, Incubators	Autoclave（A）（B）（C）, Hot Air Sterilizer, Incubator, CO2 Incubator, Egg Incubator		○	○
Microscopes	Binocular Microscope（A）（B）（C）, Inverted Microscope, Fluorescence Microscope, Stereoscopic Microscope		○	○
Centrifuges	Refrigerated Centrifuge, Refrigerated Microcentrifuge, Table-top Type Centrifuge, High-Speed Refrigerated Centrifuge, Hematocrit Centrifuge		○	○
Equipment for Histopathology	Section Flotation Bath, Wax Dispenser, Tissue Embedding Apparatus, Drying Hot Plate, Rotary Microtome, Freezing Microtome, Automatic Staining Apparatus, Automatic Tissue Processor, Slide Glass Cabinet, Water Bath		○	○
Equipment for PCR	PCR Workstation, PCR Thermal Cycler, Real Time PCR, Electrophoresis Apparatus, Dry Block Bath, Gel Documentation System, Vortex Mixer, Spectrophotometer (A)		○	○
Other Related Equipment	Biosafety Cabinet, Laminar Flow Cabinet, Fume Extractor, Microplate Reader, Microplate Washer, Microplate Shaker, Magnetic Stirrer, Electronic Balance, Refractometer, Spectrophotometer (B), Freezer -20°C, Deep Freezer -80°C, Necropsy Table, Necropsy Instrument Set for Medium Animal, Necropsy Instrument Set for Small Animal, Micropipette, pH Meter, Liquid Nitrogen Tank, Flake Ice Maker Machine, Pipette Washer, Ultrasonic Cleaner, Water Distiller, Pure Water Apparatus		○	○

2-2-4-7 Soft Component (Technical Assistance) Plan

(1) Background of Soft Component Planning

The Project proposes to improve the Disease Investigation Centers (DIC) carrying out examination and diagnosis of avian influenza and other major animal diseases. The Project will undertake construction of a new DIC in Subang, West Java, and extensions to the existing DICs in Medan and Lampung on Sumatra to provide AI related laboratory facilities and to procure and install minimum required equipment capable of virus examination and diagnosis at molecular biological level for avian influenza and other highly dangerous pathogens. The examination and diagnosis of AI and other highly pathogenic disease agents should be handled under containment in principle and the Soft Component addresses the issue of organizing a structure to reliably contain the virus against human infection. Presently, there are no existing facilities, building systems and their operational know-how for such appropriate examinations and diagnosis in Indonesia and since there are no alternatives, the examination and diagnosis of AI are conducted in existing DICs under highly dangerous conditions. Against this background, it is proposed to dispatch a team of Japanese experts in this field to Indonesia to provide guidance and training to the entire relative staff of the three DICs to impart knowledge, operational skills, and technical expertise.

Since the operation of the facilities and equipment under this Project will commence immediately after completion of construction and the Soft Component works must be completed within the effective date of the E/N, it is planned to implement the practical training under Soft Component as early as possible at the facility which will be completed the earliest among the three sites.

Especially, the staff for the new DIC at Subang must be identified by the time that construction is started. It is also important to have periodic monitoring to confirm that the operations are being appropriately carried out after the completion of the Soft Component. To this end, the Long Term JICA Expert (Agricultural Policy Advisor) attached to DGLS will coordinate the Grant Aid Assistance and Soft Component with the entire scope of assistance in the veterinary field.

(2) Objectives of Soft Component

Facilities for molecular level examination of highly pathogenic viruses of strategic animal diseases, especially HPAI are contained in the facilities to be constructed under the Grant Aid Project. These areas are designed as BSL-2 (P2) facilities.

According to the plan, it is required that Indonesian side DIC staff immediately begin appropriate operations and sustainable maintenance after the completion of the three facilities and equipment. Therefore, this Soft Component requires experts who excel in the handling of highly communicable pathogens such as HPAI and who are capable of providing appropriate advice and instructions in all aspects of handling including pre-processing procedures prior to arrival at the DICs, operational procedures in facilities and disposal. Also, facility and equipment engineers who are well versed in the operation and maintenance of AI related building systems and equipment which are critical for the safety of the facility and surrounding environment will also be dispatched. It is therefore planned that the construction of one AI related facility be expedited and all staff, not only the veterinarians and examination staff but including the building engineers and technicians involved in the operation and maintenance of the facilities and equipment be trained under conditions matching actual operational conditions as closely as possible in order to establish a framework for the appropriate operation and good sustainable maintenance of the facilities and equipment.

As a result of these activities, the immediate effect will be the appropriate operation and maintenance of the facilities and equipment, and this will enable the establishment of a safe environment for examination and diagnosis for the staff as well as create a safe environment for the people living in the surrounding neighbourhood. As a secondary effect, the established procedures for AI examination and diagnosis can be spread to other DICs throughout Indonesia and become the start for improvement in all AI facilities and equipment.

(3) The Output of Soft Component

It is expected that by providing training and guidance to all Indonesian staff of the DIC in the Project under this Soft Component the following results will be realized.

1. Containment of Pathogens" will establish a safe and reliable examination and diagnosis Framework.

2. The application of AI handling procedures will establish a complete framework for handling AI specimens not only within the Project related DICs, but including procedures prior to arrival at DIC to final disposal of contaminated waste.

3. The safety of surrounding neighbourhoods will be improved by the appropriate operations in the DICs that have procedures for mitigating environmental effects.

4. Through the technical knowledge acquired by DIC staff for the appropriate maintenance of the facilities and equipment, the flow information will be standardized and a data base for the record of present state, maintenance records, procurement of consumables, etc will be established. This will enable an efficient maintenance system with breakdown prevention and sustainable operation and maintenance.

(4) Method for confirmation of Results

The results of the Soft Component can be objectively measured by the following items.

Guidance Item	To be Confirmed by
Appropriate handling of Specimens	Can understand appropriate pre-handling and receiving procedures of specimens Can understand appropriate handling of specimens within the facilities Can understand appropriate sterilization and waste disposal procedures to exit facilities Can issue instructions to related parties out side of the facilities
Understanding of entire systems in facility	Can understand structure and flow of AI related building systems Can understand functions of AI related building systems Can understand specifications of BSL-2 level building systems Can understand monitoring and alarm signals Can understand where and how to maintenance
Can operate all systems	Conduct automatic, line and back up of building systems Conduct emergency and accident operations of building systems Can judge appropriate levels of temperature, pressure, differential pressures, flow volume of building systems Can write daily operation report Can operate Monitoring and Alarm Panel
Appropriate maintenance of equipment	Maintenance record book for equipment is maintained The information in the record book is periodically updated Appropriate periodical maintenance and replacement of consumables are carried out

(5) Activities of Soft Component (Input Plan)

The purpose of the AI laboratories, main facilities in the Project, are the diagnosis of veterinary examination and diagnosis of strategic animal diseases including highly pathogenic agents and are BSL-2 level facilities. The following three experts in their fields will be dispatched to enable Indonesian side to correctly and safely operate the facilities and undertake appropriate maintenance

1. Infection Prevention Expert
2. Mechanical or Electrical Engineer in Facility Maintenance for operation of advanced AI related building systems
3. Equipment Maintenance Expert in the field of Contamination Prevention and Operational Guidance of all Equipment including AI wing

Input Plan for Soft Component

	Item	Japanese Side	Indonesian Side	Period
1	Investigation in Indonesia to study existing situation Understanding of plans and systems Guidance for preparing Record Book Equipment Record Book guidance	Infection Prevention Expert: Consultant Engineer: Equipment Maintenance Expert:	Trainee: All Epidemiology, Virology, Pathology Staff in Subang, Medan & Lampung DIC s. All DGLS staff involved in Project	In Japan：0.3M/M In Indonesia：0.75M/M （22days）
2	Confirmation of operation status of each DIC Advice on operations Assistance Maintenance Planning	Infection Prevention Expert: Consultant Engineer: Equipment Maintenance Expert:	Trainee: All staff in Subang, Medan & Lampung DIC s. All DGLS staff	In Japan：0.57M/M （15days） pre activities in Japan：0.3M/M post activities in Japan：0.3M/M

(6) Procurement of Implementation Resources for Soft Component

A plan for guidance and assistance and program schedule will be prepared after agreement with the DGLS and each DIC for the BSL-2 level facilities and technical guidance will be implemented consecutively with evaluation of input and results at each stage. Therefore, it is necessary to dispatch from Japan the Infection Prevention Expert and Equipment Maintenance Engineer currently involved in the NIHE Project in Vietnam and other projects for infection prevention facility and equipment and who have wide experience in their fields.

The input from Indonesian side will be the following staff;

Staff of each DIC	DIC Subang	DIC Medan	DIC Lampung
Veterinarians	8	11	11
Technicians	19	20	31
Other Staff	33	34	2
Total	60	65	44

(7) Implementation Schedule of Soft Component

The Soft Component activities will be implemented in concert with the construction of the facilities that are to be implemented as single year project.

1. First Domestic Work
A Japanese consultant will prepare the safety control explanation material for the assumed safety control system. The Maintenance Expert will prepare presentation material for maintenance system, reference for Maintenance Record Book, maintenance flow chart, and example of other countries on maintenance for the workshop in Indonesia.

2. First Instruction on Site
The Infection Control Expert and Equipment Maintenance Expert will conduct studies of the procedure starting from specimen collection at Yogjakarta, which is relevant to the activities at Medan, Lampung and Subang DICs. They investigate the procedures for specimen collection prior to sending to DICs, and specimen receiving situation and set out the procedures appropriate to conditions in Indonesia. The Consultant Engineer will conduct studies of the

existing building systems maintenance in Medan and Lampung and based on the results will conduct a workshop for all relevant staff. He will school the staff in the complete flow of specimens from collection to final disposal centered on “containment of infectious objects” and the procedures that should be observed by the staff, actions to be taken and the conceptual framework of the building systems.

The Equipment Maintenance Expert for equipment and special equipment will attempt to broaden the horizon of the DIC chiefs and maintenance staff on the need for stronger equipment maintenance, identify the shortcomings of the existing situation and prepare the Final Input Plan.

Workshops will be conducted to emphasize the importance of safety management and equipment maintenance, not only to directly responsible staff but also to all relevant staff. The Consultant Engineer will coordinate with the Equipment Maintenance Expert to provide instruction on the preparation of the Equipment Maintenance Record Book.

At the end of this phase, the facility and equipment installation among the three project DICs completed the earliest will be used for repeated actual simulation of the above procedures.

4. Second Domestic Work

Coordinating with the Resident Supervisor for the Project on site, the progress of DICs activities begun during the First Phase will be monitored and if any matter deemed lacking will be revised and additional information and reference material will be prepared.

5. Second Instruction on Site

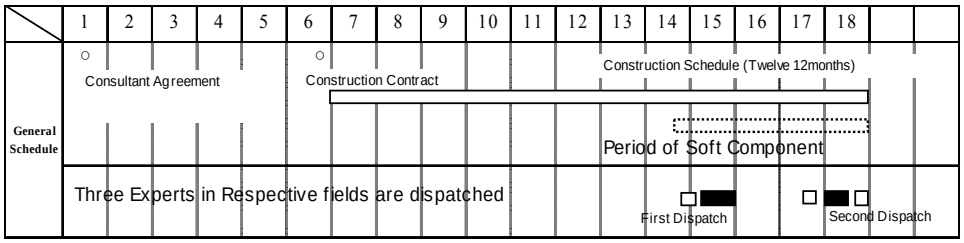
Immediately after the completion of all three DICs, the consultant experts will attend to the initial start up by respective DIC staff and related personnel at each site. Reconfirmation of the instructions on safety management conducted during the First Instructions on Site will be carried out. The results of this instruction will be prepared as the Safety Management Manual and the Experts will provide guidance and oversight for its preparation as needed to the Indonesian staff.

The facility and equipment maintenance experts will confirm the progress on maintenance records using the formats developed during the First Instruction Workshop and the actual maintenance conditions and issue any necessary instructions and provision of technical know how. Final confirmation of instructions issued during Second Instructions on Site will be conducted.

6. Second Report

The Final Report will be prepared and submitted on the Soft Component activities.

Implementation Schedule for Soft Component



Work in Japan prior to First Instructions on Site

Day		Study Content	
		Infection Prevention	Building Systems Operation Engineer
1	Mon	Discuss with facility designer, prepare explanatory material	Prepare explanatory material for Ai related facilities
2	Tue.	Discussion coordination with with FAO,USAID,	Prepare material for Equipment Log Book preaparation
3	Wed	Prepare trainning material	Prepare trainning material for safe operations
4	Thu	Prepare trainning material for pre-processing and final disposal	Prepare site study material
5	Fri	Preparation of material for lectures	Preparation of material for lectures

Detailed Schedule for First Instructions on Site

Day		Schedule	
		Infection Control	Building Systems/Maintenance (Mechanical Engineer)
1	Sun	Narita - Jakarta	
2	Mon	Explanation to DGLS, discussions and confirmation of Schedule	
3	Tue.	Move to Medan,	Explanation to DIC, discussions and confirmation of Schedule
4	Wed	investigations at specimen collection site and sending to DIC conditions	
5	Thu	Discussions on Improvement Methodology,	Trainning for Equipment Log Preparation
6	Fri	Leture on Infection Control	Leture on Operation of BSL2 Laboratory
7	Sat	All participants Workshop (morning)	
8	Sun	Move to Jakarta	
9	Mon	Move to Lampung	Explanation to DIC, discussions and confirmation of Schedule
10	Tue.	Site investigations on specimen collection & delivery conditions	Survey of euipment maintenance records
11	Wed	Discussions on Improvement Methodology,	Lecture on Equipment maintenance
12	Thu	Leture on Infection Control	Leture on Operation of BSL2 Laboratory
13	Fri	All participants Workshop (morning)	
14	Sat	Move Jakarta,	Discussions with JICA long term expert to MOA
15	Sun	Data collation,	
16	Mon	Site Study, lectures and schooling either Medan or Lampung	
17	Tue.	Guidance on specimen collection & delivery	Guidance on equipment maintenance
18	Wed	Guidance on improved methodology using AI laborator	Guidance on equipment maintenance
19	Thu	Confirmation of AI laboratory operations	Workshop for All new staff (afetrnoon)
20	Fri	Explanation to DGLS, report to EOJ & JICA	
21	Sat	Rerport to JICA Expert, Leave Jakarta (night)	

Work in Japan prior to Second Dispatch

Day		Study Content	
		Infection Prevention	Building Systems Operation Engineer
1	Mon	Collect Supplementary & Additional explanatory material	
2	Tue.	Prepare site trainning material	

Detailed Site Schedule for Second Dispatch

Day		Schedule	
		Infection Control Expert	Building Systems Expert (Mechanical Engineer)
1	Sun	Narita- Jakarta	
2	Mon	Explanation to DGLS, discussions and confirmation ofschedule	
3	Tue	Move to Medan	confirm AI laboratory operation
4	Wed	discussion & guidance with AI staff	discussions and guidance with maitenance staff
5	Thu	discussions with Director ofDIC, move to Jakarta	
6	Fri	move to Subang	confirm AI laboratory operation
7	Sat	discussion & guidance with AI staff	discussions and guidance with maitenance staff
8	Sun	Data collation	
9	Mon	discussions with Director ofDIC, move to Jakarta	
10	Tue	Move to Lampung	confirm AI laboratory operation
11	Wed	discussion & guidance with AI staff	discussions and guidance with maitenance staff
12	Thu	discussions with Director ofDIC, move to Jakarta	
13	Fri	discussions with DGLS,	
14	Sat	discussions with JICA Expert	
15	Sun	data collation	Preparation ofFinal Soft Component Report
16	Mon	Report to EOJ, JICA	Lv. Jakarata (night)
17	Tue	(arv.) - Narita	

Work in Japan after Second Dispatch

Day		Study Schedule
1	Mon	Submit Final Soft Component Report

(8) Outputs of Soft Component

The following outputs will be submitted for confirming the implementation of the Activities.
Outputs of Soft Component

Outputs of Soft Component

1 Safety Inspection Manuals

Deliverable	Person in Charge	Participants
Facility-specific Daily Safety Inspection Manuals.	Viral Testings and Diagnostics staff.	Staff at Each DIC All equipment maintenance staff. Consultant.

2 Safety Inspection Records

Deliverable	Person in Charge	Participants
Record Books.	Viral Testings and Diagnostics staff.	Staff at Each DIC All equipment maintenance staff. Consultant.

3 Daily Inspections

Equipment-specific Daily Inspection Manuals.	Equipment maintenance staff.	All equipment maintenance staff. Consultant. Suppliers, equipment agents, etc.

4 Equipment and Special Equipment Ledgers

Deliverable	Person in Charge	Participants
Guidelines for Producing Equipment and Special Equipment Ledgers.	People in charge of equipment maintenance.	All equipment maintenance staff. Consultant.

Content: Equipment name, manufacturer name, model, year of manufacture, serial number, location and control number. User contact information: Department, name and telephone number. Date delivered, date discarded. Agent name, contact name, telephone number, presence/absense of annual maintenance contract. Consumables list, spare parts list.

5 Equipment and Special Equipment Maintenance Logs

Deliverable	Person in Charge	Participants
Maintenance Logs (Records date and nature of malfunction or reason for inspection, and explains cause of malfunction.)	Equipment maintenance staff.	Everyone responsible for equipment maintenance. Consultant.

6 Equipment and Special Equipment Maintenance Plans and Budget Plans

Deliverable	Person in Charge	Participants
Yearly Maintenance and Budget Schedule. Purchasing Procedures Flow chart.	Equipment maintenance staff. Procurement staff. Budget and accounting staff. DIC Directors.	DGLS. DIC Directors. Equipment Maintenance staff. Procurement staff. Budget and Accounting staff. Consultant.

(9) Responsibilities of Implementing Agency for Recipient Country

This Soft Component is implemented to ensure the sustainability of the Project in Indonesia. Therefore, the instructors for each activity above should take measures that are conducive to encourage sustainable actions on the Indonesian side. It follows that the full understanding and cooperation of DGLS and implementation agency of each DIC is required. The most important matter is securing the staff who will undertake the operation and maintenance of the Project facilities. Therefore, the Japanese side has requested the securing of the staff the during course of the Basic Design Study. In response to this request, the Indonesian side has agreed to secure at least one staff each for maintenance of electrical and mechanical building systems, who are to have sufficient technical capabilities in addition to veterinarians and examination technicians. These staff will receive training and technical guidance during the implementation of the Soft Component. Furthermore, during and after the implementation of the Soft Component, it will be required that all responsible staff including DGLS, directors of DICs, must receive periodical training on maintenance and facility management.

In addition, DGLS and each DIC will undertake periodical monitoring to ensure that the results of the technical instructions of the Soft Component are assimilated. It is proposed that a periodical report (for instance, once a year) a report is submitted to JICA Indonesia Office on the operation and maintenance status after completion of the Soft Component.

2-2-4-8 Implementation Schedule

The Project demands the greatest speed possible in view of the urgent nature of plans to improve Veterinary laboratories for domestic animals at risk of contracting avian influenza and other major animal diseases. It is therefore appropriate to establish the project as a single year plan, the speediest, within the framework of Japanese Grant Aid Scheme. In addition, because the Project entails construction at three sites including one DIC, it is desirable within the framework of Grant Aid Scheme that facilities and equipment be turned over to the Indonesian side to begin their operation as soon as each is complete. The schedule for implementation of the Project following the conclusion of the Exchange of Notes is shown in the figure below. The work to be done consists of the consultant's detailed design, tendering, and construction work under consultant supervision.

(1) Detailed Design

The Japanese consultant company shall conclude a consulting agreement with DGLS to conduct the detailed design of the Project (preparation of tender documents) and supervise the work; this contract is to be verified by the Japanese government. The consultant then prepares the tender documents in consultation with DGLS based on this basic design study report and has them approved by DGLS.
The detailed design (preparation of tender documents) is expected to take four-and-a-half months.

(2) Tender

Tender work is expected to take three months.

(3) Work by Contractors and Supervision by Consultants

Contractors shall begin their work following the completion of their contracts. Concurrently, the consultant shall begin supervising the work.
Construction is expected to take twelve months.

In addition, in consideration of its scale and the construction schedule, the Project is conducted as a single year plan for fiscal 2007 (detailed design, tender and construction).

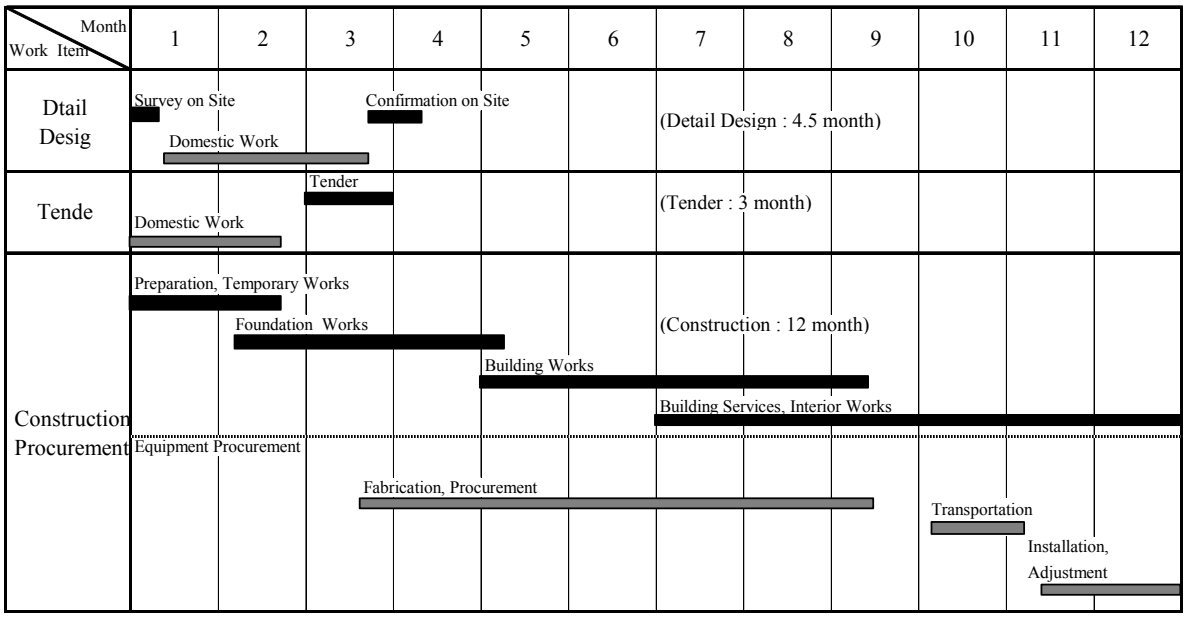


Figure 2-52 Implementation Schedule of the Project

2-3 Obligations of Recipient Country

Following are the primary obligations of the Indonesian side:

(1) Procedural Matters

1) Exemption from all taxes related to this Grant Aid project

Exemption is a basic principle of Grant Aid projects. It has been agreed that the Ministry of Agriculture, as the responsible organization, will work with the relevant authorities to take the necessary steps to ensure exemption from various taxes levied on Japanese corporations, Japanese nationals, construction materials and equipment involved in the project.
The Ministry of Agriculture shall pay all duties related to the importation of materials and equipment from Japan and third countries. Contractors involved in the project shall submit to the Ministry of Agriculture all information and documentation related to such importation, including master lists, packing lists and CIF price, based upon which the Ministry of Agriculture shall conduct importation procedures. Contractors shall receive the materials and equipment at the port or airport in Jakarta and transport them to the sites.
The flow of procedures for applying for exemption from the value-added tax is: Contractor (applicant)・ Ministry of Agriculture・ Ministry of Finance・ Ministry of Agriculture・ Contractor. Tax exemption certificates are issued to the contractors.

2) Application for and acquisition of necessary building permits for this cooperation project.

3) Conduct of the Banking Arrangement (B/A) and payment of commissions associated with issuance of the Authorization to Pay (A/P).

4) Ensure prompt landing of imported material and equipment, procedures for exemption of duties, assurance of customs clearance and prompt domestic transportation.

5) Offer necessary assistance to Japanese nationals entering or residing in Indonesia for the purpose of supplying materials and equipment or performing duties in accordance with certified contracts.

6) Exempt from all domestic Indonesian tariffs and duties those Japanese nationals supplying materials and equipment or performing duties in accordance with certified contracts.

7) Take budgetary steps to ensure the effective operation and maintenance of facilities constructed and equipment procured through the Grant Aid Project.

(2) Related Work

1) Site preparation for project facilities sites.

2) Drawing water supply service to project facilities sites.

3) Drawing electrical service to project facilities sites.

4) Drawing telephone service to project facilities sites.

5) Securing access roads.

6) Installation of permanent walls or fences surrounding project facilities sites.

7) Purchase of general furniture and supplies.

(3) Partial Transfer of Testing and Diagnostic Facilities

1) Advance preparation, briefing and gaining consent of local residents, public relations activities.

2) Transfer and installation of some existing equipment, furniture, fixtures and supplies to project facilities sites.

3) Attendance at practical training for staff at project facilities.

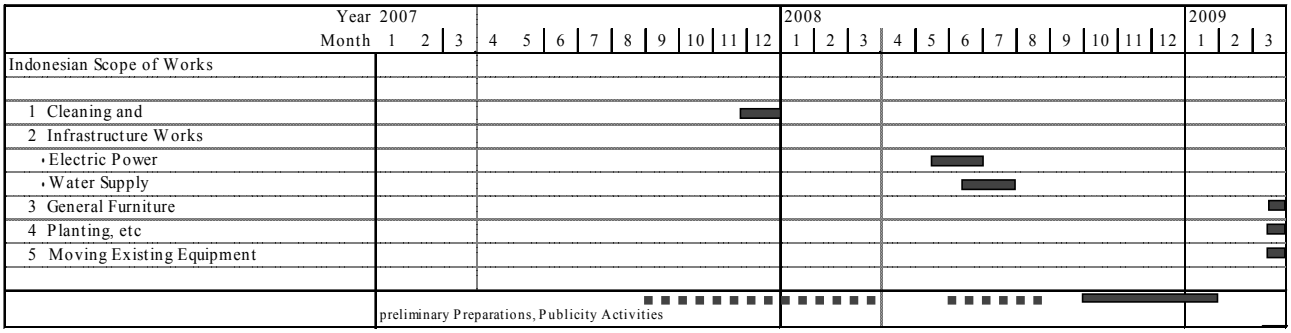
(4) Other

Cost for all items not procured through Grant Aid Cooperation are to be borne by the Indonesian side.

In this regard, Table 2-35 indicates the implementation schedule for the above-mentioned work to be borne by the Indonesian side.

Assumed Schedule

Table 2-35 Construction Schedule for Indonesian Side Scope of Works



(5) Cost of Indonesian Scope of Works

Expenses to be borne by Indonesia are as follows

Table 2-36 Costs of Indonesian Scope of Works

(million Rp)

Cost Item		Estimated Project Costs
Approach road to DIC Subang	1,500 m²	420
Clearing and levelling of the Project sites	2,600 m²	20
Power connection and enlarging to DIC Subang	1 set	240
Water Supply connection to DIC Subang	1 set	217
Telephone extension (Including PBX)	1 set	66
Improvement of Emergency Generator at DIC Lampung	100kVA 1 pc	290
Dismantling & re-erection of Musholla at DIC Lampung Demolishing of Poultry House at DIC Medan	350 m²	1,210
Construction of VPH facilities, Fencing of site, garage, and guard house, Gate, staff housing at DIC Subang	Floor area: 3,300 m² Fence: 800m	9,000
Furniture and furnishings not included in Japanese portion	1 set	1,100
Import tax		6,000
Cost for various applications BA, Application fees, Soft Component attendance costs	1 set	100
Total		18,663 (approx. 268 million Japanese yen)

2-4 Project Operation Plan

2-4-1 Project Operation Plan

(1) Facilities

1) Subang DIC

At the newly constructed Subang DIC, testing and diagnostic staff as well as facilities and equipment maintenance staff shall be newly organized. Testing and diagnostic content at this facility shall be the same as at other DICs.

Building equipment at project facilities is designed for easy automatic control in operation, maintenance and management; building equipment will be pre-programmed to operate automatically. Some processes, such as washing filters periodically with water or replenishing liquids and medical agents, can be performed by the relatively inexperienced; Replacing machinery consumables and conducting periodic inspections, however, requires either staffing technicians with the requisite knowledge and technical expertise or outsourcing to mechanical and facilities professionals. In particular, the AI testing and diagnostic department at the facility handles dangerous pathogens such as avian influenza, making it comparable to a BSL-2 level facility.

In terms of air conditioning equipment, because the system includes air conditioners and exhaust fans with high-performance air filters, maintenance in this area requires the acquisition not only of the minimum necessary knowledge and expertise in operating and maintaining electrical and air conditioning systems but also acquiring expertise in thoroughly guarding against AI to contain it on the building equipment side.

In terms of electrical equipment, because high-voltage power is drawn for low-voltage use, transformers and backup emergency generators for use in case of power outages will be installed. Emergency generators normally operate automatically but there is a need for electricians to periodically confirm that they start, perform inspections and replace parts to maintain trouble-free operating condition. Conducting such tasks periodically requires either staffing technicians with the requisite knowledge and technical expertise or outsourcing to companies that specialize in machinery and equipment.

In terms of plumbing, water will be drawn from two receiving tanks. The water supply and wastewater processing equipment installed will include water tanks, pumps and filters. Periodic maintenance such as cleaning the inside of the tanks, feeding chemicals into the water softening apparatus and cleaning the filters will be required. Conducting such tasks periodically requires either staffing technicians with the requisite knowledge and technical expertise or outsourcing to companies that specialize in machinery and equipment.

2) Medan DIC

According to the Medan DIC organizational chart, responsibility for facilities maintenance falls under the general affairs department, within which there is a manager responsible for general affairs who oversees two technicians, one for electrical and one for equipment (including facilities) matters. The staff electrician participated in the electrical work during construction of the existing facility and has been responsible for electrical equipment and maintenance as a DIC employee for the nearly thirty years since the facility was completed in 1978. The technician responsible for equipment is also responsible for facilities maintenance, outsourcing repairs and improvements. At the same time, responsibility for air conditioning and plumbing maintenance is assigned to the electrical and facilities technicians but the scope of their duties is unclear. It appears that the project facility will also be operated under the existing maintenance framework. In terms of the technical drawings required for facilities and equipment maintenance, some design documents remain but documentation necessary for facilities maintenance such as completion drawings and working drawings were not saved. In addition, the absence of equipment operating records suggests that maintenance has not been properly conducted.

In light of the above circumstances, as with the Subang DIC, air conditioning matters require either the staffing of technicians with the expertise to thoroughly guard against AI and contain it on the building equipment side or outsourcing to mechanical and facilities professionals.

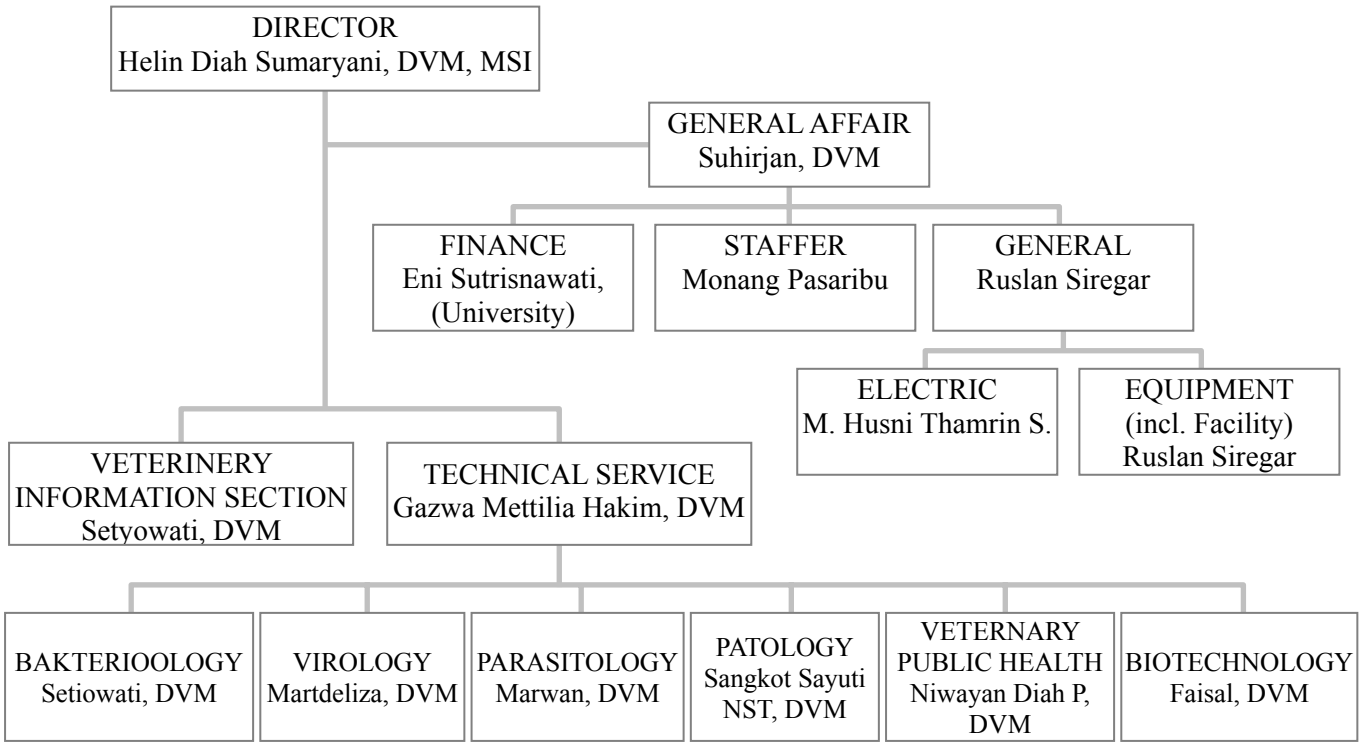


Figure 2-53 Diagram of Existing Maintenance Organization in Medan DIC

3) Lampung DIC

According to the Lampung DIC organizational chart, responsibility for facilities maintenance falls under the general affairs department, within which there is a manager responsible for general affairs who oversees three technicians, one each for electrical, equipment, and maintenance. However, the maintenance technician position is currently unfilled.

The electrician has been careful in using the conspicuously aged generator and has maintained it in such a condition that it will operate automatically even now. Maintenance of facilities, air conditioning and plumbing is the responsibility of the maintenance technician but repairs and improvement are outsourced when needed. Some design documents and operating manuals for electrical and mechanical facilities (air conditioning and plumbing) remain but architectural plans, completion drawings and working drawings were not saved. In addition, the absence of equipment operating records suggests that maintenance has not been properly conducted.

In light of the above circumstances, as with the Subang DIC, air conditioning issues require either the staffing of technicians with the expertise to thoroughly guard against AI and contain it on the building equipment side or outsourcing to mechanical and facilities professionals.

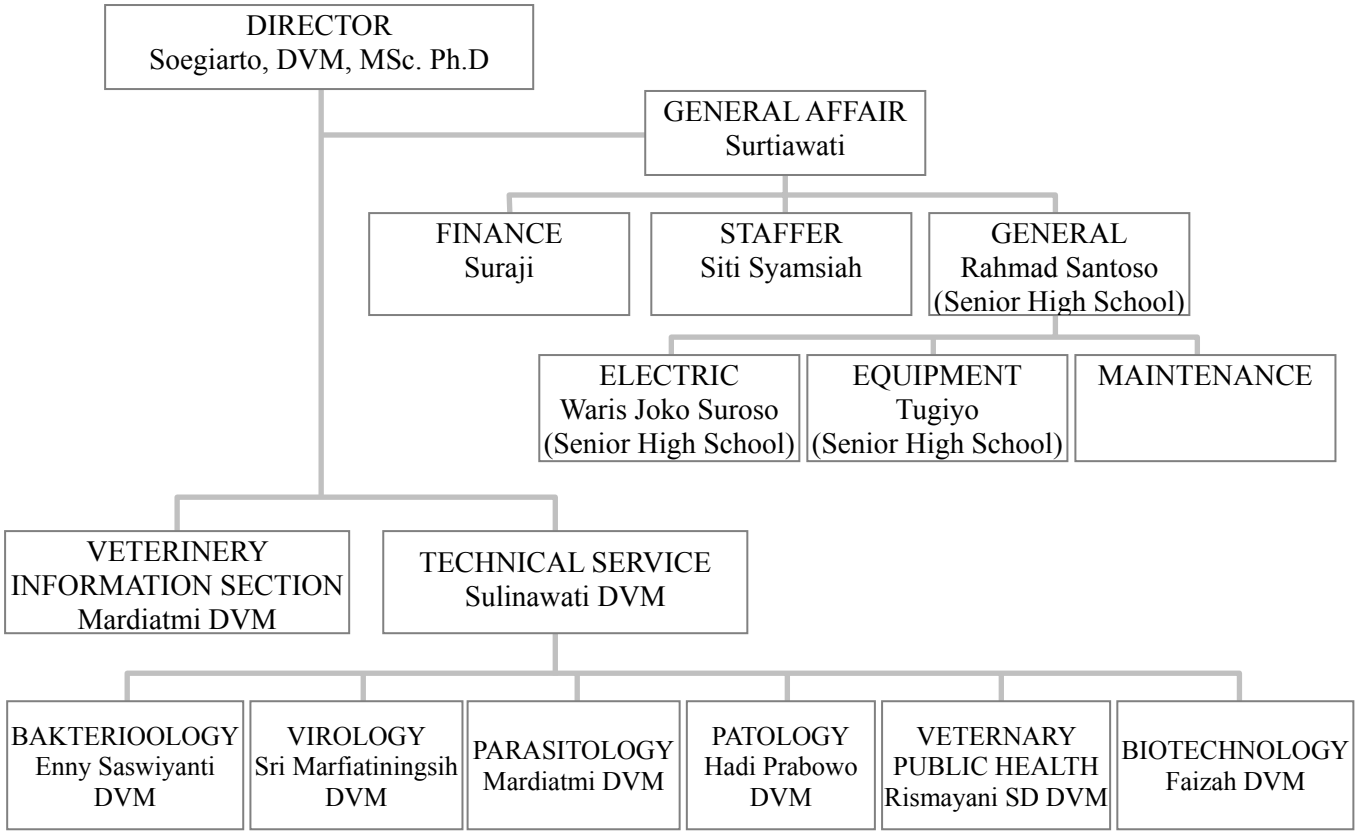


Figure 2-54 Diagram of Existing Maintenance Organization in Lampung DIC

(2) Equipment

1) DIC Medan and DIC Subang

Existing equipment at these facilities has been relatively well maintained, with the exception of some equipment well beyond its useful life for which spare parts are difficult to obtain. Both DIC Medan and DIC Subang outsource the periodic inspection and adjustment of basic equipment such as autoclaves and incubators to Agro Industry Institute、PT Insurindo Inter Services. In addition, the repair of equipment that malfunctions or fails to work properly is outsourced to agents or others parties.
With regard to the following new equipment to be procured through the project, maintenance will be made possible by receiving operational and maintenance training from agent technicians at time of procurement.

New Equipment for DIC Medan

- Freezing Microtome
- Laminar Flow Cabinet
- PCR Workstation
- Dry Block Bath

New Equipment for DIC Subang

- Freezing Microtome
- Automatic Staining Apparatus
- Hematocrit Centrifuge
- Laminar Flow Cabinet
- Dry Block Bath

At the same time, with regard to replacement biosafety cabinets, it is important to conclude a maintenance contract with agents; those responsible on the Indonesian side have committed to take the necessary measures.

2) DIC Subang

Because DIC Subang will be a new facility, it is important to establish an equipment maintenance department from the outset. The Indonesian side understands this and has committed during the site visit to the hiring of maintenance technicians.

- Role of Maintenance Department
  Following the establishment of the maintenance department, maintenance technicians not only draw up equipment ledgers and procure spare parts, reagents and consumables but also conduct periodic inspection and simple repair of basic equipment.

- Maintenance Contracts with Equipment Agents or Maintenance Companies
  At a minimum, it will be necessary to conclude maintenance contracts with agents to maintain biosafety cabinets and real time PCR. The Indonesian side understands this and has committed during the site visit to taking the necessary measures. As with other project facilities, when equipment repair is required it shall be outsourced to agents.

The DIC Subang maintenance system is indicated below.

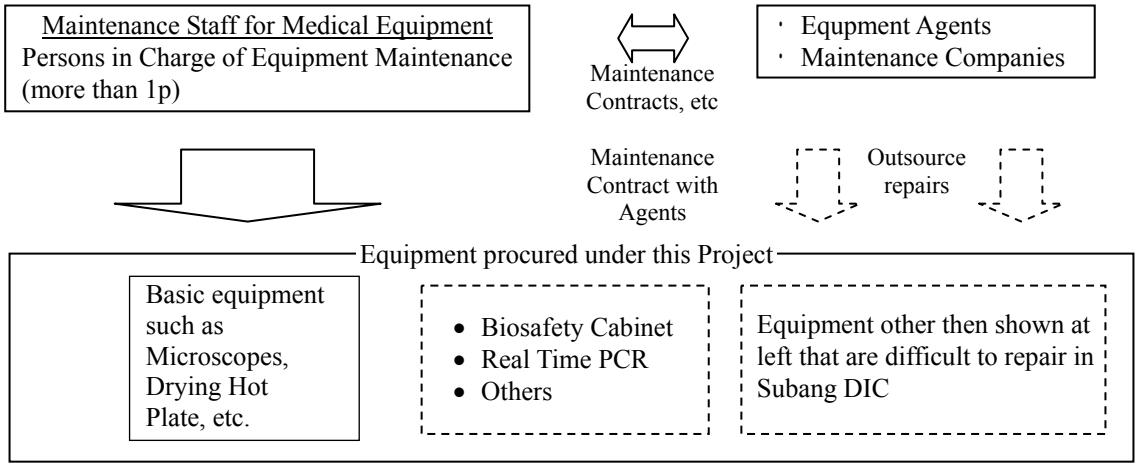


Figure 2-55 Organization for Maintenance of Equipment

2-4-2 Operation and Maintenance Cost

(1) Maintenance Costs

Costs estimated required for operations and maintenance of the planned facilities is listed below. The chart below contains totals for the three facilities of DIC Subang, Medan, and Lampung.

Table 2-37 Estimated Maintenance Costs (Total)

(Unit: Rp)

Expense	First Year	Second Year Forward	Comments
① Electricity	434,232,000	434,232,000	
② Telephone service	43,320,000	43,320,000	
③ Fuel	90,072,000	90,072,000	
④ Water	48,072,000	48,072,000	
⑤ LP GAS	4,080,000	4,080,000	
⑥ Air filter changes	0	124,600,000	Required from second year after completion on
⑦ Building maintenance	0	91,020,000	Required from second year after completion on
①-⑦ subtotal (facilities-related)	619,776,000 (8,862,797 yen)	835,396,000 (11,892,163 yen)	
⑧⑨⑩ subtotal (materials-related)	184,335,664 (2,636,000 yen)	443,346,153 (6,339,850 yen)	
Total	804,111,664 (11,498,797 yen)	1,278,742,153 (17,534,156 yen)	

(Exchange rate: 1 Rp/0.01430 yen)

1) Subang DIC (maintenance costs)

Table 2-38 Estimated Maintenance Costs (Subang DIC)

(Units: Rp)

Expense	First Year	Second Year Forward
① Electricity	260,568,000	260,568,000
② Telephone service	19,140,000	19,140,000
③ Fuel	31,752,000	31,752,000
④ Water	24,072,000	24,072,000
⑤ LP GAS	2,040,000	2,040,000
⑥ Air filter changes	—	62,300,000
⑦ Building maintenance	—	59,300,000
①-⑦ subtotal (facilities-related)	337,572,000 (4,827,280 yen)	459,172,000 (6,566,160 yen)
⑧⑨⑩ subtotal (materials-related)	184,335,664 (2,636,000 yen)	330,118,881 (4,720,700 yen)
Total	521,907,664 (7,463,280 yen)	789,290,881 (11,286,860 yen)

①Electricity····· 260,568,000 Rp/year

Contracted power for the facilities is estimated at 300 kW. Electricity utilized is expected to be 180 kW, or 60% of contracted power on average.

Costs are calculated as follows according to Indonesia's electricity company PLN.

Table 2-39 Electricity

Electricity Fees	Cost Rp	Quantity (kW)	Time (h/day)	Days (days/month)	Monthly Quantity (kWh/month)	Monthly Cost (Rp/month)	Yearly Fee (Rp/year)
Meter fee	6,000	-	-	-	-	6,000	72,000
Base fee	24,600/kW	180	-	-	-	4,428,000	53,136,000
Usage fee	600/kWh	180	8	20	28.800	17,280,000	207,360,000
Total						21,714,000	260,568,000

②Telephone service ····· 19,140,000 Rp/year

Telephone service costs depend on actual telephone usage, but estimates are calculated according to the following assumptions:

Local calls: 3 min/call×40 calls/day
Long-distance calls: 3 min/call×10 calls/day
International calls: 3 min/call×2 calls/day

Line fee	3,000 Rp/line/month
Domestic calls: (local)	250 Rp/3min
Domestic calls: (long-distance, Subang-Jakarta)	1,300 Rp/min
International calls: (Subang-Japan)	5,000 Rp/min

Table 2-40 Telephone Service

Telephone service	Cost (Rp)	No. of Lines	Call Duration (min/call)	Calls: (calls/day)	Days (days/month)	Monthly Cost (Rp/month)	Yearly Cost (Rp/year)
Line fee	3,000/line	5	—	—	—	15,000	180,000
Local	250/3 min	—	3	40	20	200,000	2,400,000
Long-distance	1,300/min	—	3	10	20	780,000	9,360,000
International	5,000/min	—	3	2	20	600,000	7,200,000
Total						1,595,000	19,140,000

③Fuel·····31,752,000 Rp/year

Diesel will be used for emergency power generation and as incinerator fuel.

The emergency power generator is expected to run four hours per month, including test operations. Fuel consumption should average about 27 L per hour based on expected emergency output levels of 100 kVA.

The incinerator is expected to be operated twice weekly, or 8 days each month, with four hours per day in use at about 15 L per hour.

Table 2-41 Generator and Incinerator Fuel

	Price (Rp/L)	Quantity (L/h)	Hours (h/month)	Monthly Quantity (L/month)	Monthly Cost (Rp/month)	Yearly Fee (Rp/year)
Generator use	4,500	27	4	108	486,000	5,832,000
Incinerator use	4,500	15	32	480	2,160,000	25,920,000
Total	-	-	-	588	2,646,000	31,752,000

④Water·····24,072,000 Rp/year

The facilities are estimated to require about 20 m^3 water/day. Water fees depend on metered amount, but become more expensive beyond 20 $m^{3/}$month at 5,185 Rp/m^3. Therefore, a fixed fee of 5,000 Rp/m^3 is used for calculations. Meter fees of 6,000 Rp also apply.

Table 2-42 Water

	Price (Rp/m^3)	Quantity (m^3/day)	Days (per month)	Monthly Quantity (m^3/month)	Monthly Fee (Rp/month)	Yearly Fee (Rp/year)
Meter fee	-	-	-	-	6,000	72,000
Usage fee	5,000	20	20	400	2,000,000	24,000,000
Total						24,072,000

⑤LP GAS·····2,040,000 Rp/year

LP gas is used in the laboratories and pantries. Usage is estimated at 2 kg/day, or about 40 kg/month.

Table 2-43 LP GAS

Price (Rp/kg)	Quantity (kg/day)	Days (per month)	Monthly Quantity (kg/month)	Monthly Fee (Rp/month)	Yearly Fee (Rp/year)
4,250	2	20	40	170,000	2,040,000

⑥Air filter changes·····62,300,000 Rp/year

(Second year forward)

Air filtering used in the air conditioning systems use both medium and high-performance filters, both of which are disposable. Plans call for 20 of both types. Medium performance filters are changed once every year and high performance filters once every two years.

Table 2-44 Air Filter Changes

Filter Performance	Price (Rp/unit)	Quantity Used (units/year)	Yearly Cost (Rp/year)
Medium performance	2,000,000	20	40,000,000
High-performance	2,230,000	10	22,300,000
Total			62,300,000

⑦Building maintenance ····· 59,300,000 Rp/year
(Second year forward)

Easily maintained materials will be selected for both interior and exterior finishes. For the exterior finish, easily maintained mortar will be used. For the interior, the finish selected will enable low-cost maintenance by requiring simple cleaning alone.
Therefore, building maintenance costs, including interior and exterior finishes, roof waterproofing repair, and repair and expendable parts for electrical, water, and air conditioning systems are expected to be about one-third what would be required in Japan or about 20,000 Rp/m²/year. Total planned area is 2,965 m².

20,000 Rp/m²/year×2,965 m²=59,300,000 Rp/year

⑧Consumable / Reagent (1st year) ····· 177,902,097Rp/per year
Same as above (after 2nd year) ····· 230,804,195Rp/per year

〔Items required from 1st year〕

(1) PCR Thermal Cycler	(Reagent, tubes, etc.)	480	nos. × @	1,250 =	600,000
(2) Real Time PCR	(Reagent, tubes, etc.)	720	nos. × @	2,500 =	1,800,000
	(Plate, film, cap)	1	nos. × @	54,000 =	54,000
	(Spectral calib. kit)	1	nos. × @	90,000 =	90,000

Basis for simple numbers:
2 PCR tests + 3 realtime tests = 5 tests/per day
2 PCR tests × 20 days × 12 months = 480 nos.
3 realtime PCR tests × 20 days × 12 months = 720 nos.

	Consumable / Reagent (1Rp/¥0.01430)			Subtotal	¥2,544,000 Rp177,902,097

〔Items required after 2nd year〕

(1) Autoclave(C)	(Filters)	1	nos. × @	58,500 =	58,500
	(Door packing)	1	nos. × @	30,500 =	30,500
	(Strainer)	1	nos. × @	6,000 =	6,000
	(Recording paper)	1	nos. × @	52,000 =	52,000
	(Resin, etc.)	1	nos. × @	128,000 =	128,000
(2) Binocular Microscope(A)	(Halogen lamp)	3	nos. × @	3,150 =	9,450
	(Oil)	3	nos. × @	2,750 =	8,250
(3) Binocular Microscope (B)	(Halogen lamp)	1	nos. × @	3,000 =	3,000
	(Oil)	1	nos. × @	8,000 =	8,000
(4) Binocular Microscope (C)	(Halogen lamp)	1	nos. × @	3,150 =	3,150
	(Oil)	1	nos. × @	2,750 =	2,750
(5) Inverted Microscope	(Halogen lamp)	4	nos. × @	2,000 =	8,000
	(Oil)	4	nos. × @	2,750 =	11,000
(6) Fluorescence Microscope	(Halogen lamp)	1	nos. × @	3,150 =	3,150
	(Mercury lamp)	1	nos. × @	40,000 =	40,000

	(Oil)	1	nos. ×	@	2,750 =	2,750
(7) Stereoscopic Microscope	(Halogen lamp)	1	nos. ×	@	2,000 =	2,000
(8) Egg Incubator	(Recording paper, etc.)	3	nos. ×	@	17,000 =	51,000
(9) PCR Thermal Cycler	(Reagent, tubes, etc.)	480	nos. ×	@	1,250 =	600,000
(10)Real Time PCR	(Reagent, tubes, etc.)	720	nos. ×	@	2,500 =	1,800,000
	(Plate, film, cap)	1	nos. ×	@	54,000 =	54,000
	(Spectral calib. kit)	1	nos. ×	@	90,000 =	90,000
(11)pH Meter	(pH electrode)	4	nos. ×	@	26,000 =	104,000
	(ORP electrode)	4	nos. ×	@	30,000 =	120,000
	(pH solution)	4	nos. ×	@	3,000 =	12,000
	(Refilling solution)	4	nos. ×	@	1,000 =	4,000
	(ORP solution)	4	nos. ×	@	3,000 =	12,000
(12)Pure Water Apparatus	(Cartridge, filter)	1	nos. ×	@	31,000 =	31,000
	(Element, filter, etc.)	1	nos. ×	@	46,000 =	46,000
	Consumable / Reagent				Subtotal	¥3,300,500
	（1Rp/¥0.01430）					Rp230,804,195

⑨Spare Parts (after 2nd year)……80,993,006Rp/per year

〔Items required after 2nd year〕

(1)Automatic Tissue Processor	(Timer, fuse) *3	1	nos. ×	@	9,250 =	9,250
	(Lamp, regulator) *3	1	nos. ×	@	2,700 =	2,700
	(Beaker) *3	1	nos. ×	@	5,000 =	5,000
(2)Egg Incubator	(Hygrometer, fuse) *3	3	nos. ×	@	3,100 =	9,300
	(Lamp, sensor element) *3	3	nos. ×	@	5,500 =	16,500
	(Tank, tray, etc.) *3	3	nos. ×	@	2,350 =	7,050
(3)Biosafety Cabinet	(HEPA filter) *1	5	nos. ×	@	99,000 =	495,000
	(Fluorescent lamp) *2	5	nos. ×	@	18,000 =	90,000
	(UV lamp) *2	5	nos. ×	@	36,000 =	180,000
(4)Laminar Flow Cabinet	(HEPA filter) *1	1	nos. ×	@	99,000 =	99,000
	(Fluorescent lamp) *2	1	nos. ×	@	18,000 =	18,000
	(UV lamp) *2	1	nos. ×	@	36,000 =	36,000
(5)Fume Extractor	(Fluorescent lamp) *2	1	nos. ×	@	18,000 =	18,000
	(UV lamp) *2	1	nos. ×	@	36,000 =	36,000
(6)PCR Workstation	(HEPA filter) *2	2	nos. ×	@	58,700 =	117,400
	(Fluorescent lamp, etc.)*2	2	nos. ×	@	9,500 =	19,000
	Sapre Parts				Subtotal	¥1,158,200
	（1Rp/¥0.01430）					Rp80,993,006

⑩Maintenance Contract Fee (1st year) ……6,433,566Rp/per year

Maintenance Contract Fee (after 2nd year)……18,321,678Rp/per year

〔Items required from 1st year〕

(1)Real Time PCR	(3 times/year)	1	year ×	@	92,000 =	92,000
	Maintenance Contract Fee				Subtotal	¥92,000
	（1Rp/¥0.01430）					Rp6,433,566

〔Items required after 2nd year〕

(1)Autoclave	(1 time/year)	1	year ×	@	20,000 =	20,000
(2)Biosafety Cabinet 5 unit (¥50,000 per unit, 25,000 per unit for 2nd unit and after)	(1 time/year)	1	year ×	@	150,000 =	150,000
(3)Real Time PCR	(3 times/year)	1	year ×	@	92,000 =	92,000

	Maintenance Contract Fee	Subtotal	¥262,000
		（1Rp/¥0.01430）	Rp18,321,678
〔1st year〕	Equipment Related Fees ⑧＋⑨＋⑩	Subtotal	¥2,636,000
		（1Rp/¥0.01430）	Rp184,335,664
〔After 2nd year〕	Equipment Related Fees⑧＋⑨＋⑩	Subtotal	¥4,720,700
		（1Rp/¥0.01430）	Rp330,118,881

*1 Replace 1 time every other year　　*2 Replace twice per year
*3 Replace every four years

2) Medan DIC

Table 2-45 Estimated Maintenance Costs (Medan DIC)

(Units: Rp)

Expense	First Year	Second Year Forward
① Electricity	86,832,000	86,832,000
② Telephone service	12,828,000	12,828,000
③ Fuel	29,160,000	29,160,000
④ Water	12,000,000	12,000,000
⑤ LP GAS	1,020,000	1,020,000
⑥ Air filter Costs	—	31,150,000
⑦ Building maintenance	—	17,060,000
①-⑦ subtotal (facilities-related)	141,840,000 (2,028,312 yen)	190,050,000 (2,717,715 yen)
⑧⑨⑩ subtotal (materials-related)	0 (0 yen)	53,160,839 (760,200円)
Total	141,840,000 (2,028,312 yen)	243,210,839 (3,477,915 yen)

①Electricity…… 86,832,000 Rp/year
Contracted power for the facilities is estimated at 100 kW. Electricity utilized is expected to be 60 kW, or 60% of contracted power on average.
Costs are calculated as follows according to Indonesia's electricity company PLN.

Table 2-46 Electricity

Electricity Fees	Fees (Rp)	Quantity (kW)	Time (h/day)	Days (per month)	Monthly Quantity (kWh/month)	Monthly Fees (Rp/month)	Yearly Fees (Rp/year)
Meter fee	6,000	-	-	-	-	6,000	72,000
Base fee	24,600/kW	60	-	-	-	1,476,000	17,712,000
Usage fee	600/kWh	60	8	20	9,600	5,760,000	69,120,000
Total						7,236,000	86,832,000

②Telephone service·····12,828,000 Rp/year

Telephone service costs depend on actual telephone usage, but estimates are calculated according to the following assumptions:

Local calls: 3 min/call×20 calls/day
Long-distance calls: 3min/call×5 calls/day
International calls: 3min/call×1 call/day

Line fee	3,000 Rp/line/month
Domestic calls: (local)	250 Rp/3 min
Domestic calls: (long-distance, Medan-Jakarta)	2,200 Rp/min
International calls: (Medan-Japan)	5,000 Rp/min

Table 2-47 Telephone Service

Telephone Service	Cost (Rp)	No. of Lines	Call Duration (min/call)	Calls: (calls/day)	Days (days/month)	Monthly Cost (Rp/month)	Yearly Cost (Rp/year)
Line fee	3,000/line	3	—	—	—	9,000	108,000
Local	250/3 min	—	3	20	20	100,000	1,200,000
Long distance	2,200/min	—	3	5	20	660,000	7,920,000
International	5,000/min	—	3	1	20	300,000	3,600,000
Total						1,069,000	12,828,000

③Fuel·····29,160,000 Rp/year

Diesel will be used for emergency power generation and as incinerator fuel.

The emergency power generator is expected to run four hours per month, including test operations. Fuel consumption should average about 15 L per hour based on expected emergency output levels of 50 kVA.

The incinerator is expected to be operated twice weekly, or 8 days each month, with four hours per day in use at about 15 L per hour.

Table 2-48 Generator and Incinerator Fuel

	Price (Rp/L)	Quantity (L/h)	Hours (h/month)	Monthly Quantity (L/month)	Monthly Fee (Rp/month)	Yearly Fee (Rp/year)
Generator use	4,500	15	4	60	270,000	3,240,000
Incinerator use	4,500	15	32	480	2,160,000	25,920,000
Total	-	-	-	540	2,430,000	29,160,000

④Water·····12,000,000 Rp/year

The facilities are estimated to require about 10 m^3 water/day. Water fees depend on price, but become more expensive beyond 20 m^3/month at 5,185 Rp/m^3. Therefore, a fixed fee of 5,000 Rp/m^3 is used for calculations. Meter fees of 6,000 Rp also apply, but will be paid as part of existing facilities and are not included in the current estimate.

Table 2-49 Water

Price (Rp/m^3)	Quantity (m^3day)	Days (per month)	Monthly Quantity (m^3/month)	Monthly Fee (Rp/month)	Yearly Fee (Rp/year)
5,000	10	20	200	1,000,000	12,000,000

⑤LP GAS ····· 1,020,000 Rp/year

LP gas is used in the laboratories and pantries. Usage is estimated at 1 kg/day, or about 20 kg/month.

Table 2-50 LP Gas

Price (Rp/kg)	Quantity (kg/day)	Days (per month)	Monthly Quantity (kg/month)	Monthly Fee (Rp/month)	Yearly Fee (Rp/year)
4,250	1	20	20	85,000	1,020,000

⑥Air filter changes ····· 31,150,000 Rp/year

(Second year forward)

Air filtering used in the air conditioning systems use both medium and high-performance filters, both of which are disposable. Plans call for 10 of both types. Medium performance filters are changed once every year and high performance filters once every two years.

Table 2-51 Air Filter Changes

Filter Performance	Price (Rp/unit)	Quantity Used (units/year)	Yearly Cost (Rp/year)
Medium performance	2,000,000	10	20,000,000
High-performance	2,230,000	5	11,150,000
Total			31,150,000

⑦Building maintenance ····· 17,060,000 Rp/year

(Second year forward)

Easily maintained materials will be selected for both interior and exterior finishes. For the exterior finish, easily maintained mortar will be used. For the interior, the finish selected will enable low-cost maintenance by requiring simple cleaning alone.

Therefore, building maintenance costs, including interior and exterior finishes, roof waterproofing repair, and repair and expendable parts for electrical, water, and air conditioning systems are expected to be about one-third what would be required in Japan or about 20,000 Rp/m²/year. Total planned area is 853 m².

20,000 Rp/m2/year × 853 m² = 17,060,000 Rp/year

⑧Consumable / Reagent (1st year) ····· 0Rp/per year

Same as above (after 2nd year) ····· 17,961,538Rp/per year

〔Items required from 1st year〕

None

〔Items required alter 2nd year〕

(1)Binocular Microscope(A) (Halogen lamp) 3 nos. × @ 3,150 = 9,450

	(Oil)	3	nos. ×	@	2,750 =	8,250
(2)Binocular Microscope(B)	(Halogen lamp)	1	nos. ×	@	3,000 =	3,000
	(Oil)	1	nos. ×	@	8,000 =	8,000
(3)Binocular Microscope(C)	(Halogen lamp)	1	nos. ×	@	3,150 =	3,150
	(Oil)	1	nos. ×	@	2,750 =	2,750
(4)Inverted Microscope	(Halogen lamp)	3	nos. ×	@	2,000 =	6,000
	(Oil)	3	nos. ×	@	2,750 =	8,250
(5)Stereoscopic Microscope	(Halogen lamp)	1	nos. ×	@	2,000 =	2,000
(6)Egg Incubator	(Recording paper, etc.)	1	nos. ×	@	17,000 =	17,000
(7)pH Meter	(pH electrode)	3	nos. ×	@	26,000 =	78,000
	(ORP electrode)	3	nos. ×	@	30,000 =	90,000
	(pH solution)	3	nos. ×	@	3,000 =	9,000
	(Refilling solution)	3	nos. ×	@	1,000 =	3,000
	(ORP solution)	3	nos. ×	@	3,000 =	9,000

Consumable / Reagent	Subtotal	¥256,850
（1Rp/¥0.01430）		Rp17,961,538

⑨Spare Parts (after 2nd year)……31,702,797Rp/per year

〔Items required after 2nd year〕

(1)Egg Incubator	(Hygrometer, fuse) *3	1	nos. ×	@	3,100 =	3,100
	(Lamp, sensor element) *3	1	nos. ×	@	5,500 =	5,500
	(Tank, tray, etc.) *3	1	nos. ×	@	2,350 =	2,350
(2)Biosafety Cabinet	(HEPA filter) *1	1	nos. ×	@	99,000 =	99,000
	(Fluorescent lamp) *2	1	nos. ×	@	18,000 =	18,000
	(UV lamp) *2	1	nos. ×	@	36,000 =	36,000
(3)Laminar Flow Cabinet	(HEPA filter)*1	1	nos. ×	@	99,000 =	99,000
	(Fluorescent lamp) *2	1	nos. ×	@	18,000 =	18,000
	(UV lamp) *2	1	nos. ×	@	36,000 =	36,000
(4)PCR Workstation	(HEPA filter) *2	2	nos. ×	@	58,700 =	117,400
	(Fluorescent lamp, etc.) *2	2	nos. ×	@	9,500 =	19,000

Sapre Parts	Subtotal	¥453,350
（1Rp/¥0.01430）		Rp31,702,797

⑩Maintenance Contract Fee (1st year) ……0Rp/per year

Maintenance Contract Fee (after 2nd year)……3,496,503Rp/per year

〔Items required from 1st year〕

None

Maintenance Contract Fee	Subtotal	¥0
（1Rp/¥0.01430）		Rp0

〔Items required after 2nd year〕

(1)Biosafety Cabinet 1 unit (¥50,000 per unit, 25,000 per unit for 2nd unit and after)	(1 time/year)	1	year ×	@	50,000 =	50,000

Maintenance Contract Fee	Subtotal	¥50,000
（1Rp/¥0.01430）		Rp3,496,503

〔1st year〕	Equipment Related Fees ⑧＋⑨＋⑩	Subtotal	¥0
	（1Rp/¥0.01430）		Rp0

〔After 2nd year〕	Equipment Related Fees ⑧＋⑨＋⑩	Subtotal	¥760,200
	（1Rp/¥0.01430）		Rp53,160,839

3) Lampung DIC

Table 2-52 Estimated Maintenance Costs (Lampung DIC)

(Units: Rp)

Expense	First Year	Second Year Forward
① Electricity	86,832,000	86,832,000
② Telephone service	11,352,000	11,352,000
③ Fuel	29,160,000	29,160,000
④ Water	12,000,000	12,000,000
⑤ LP GAS	1,020,000	1,020,000
⑥ Air filter Costs	—	31,150,000
⑦ Building maintenance	—	14,660,000
①-⑦ subtotal (facilities-related)	140,364,000 (2,007,205 yen)	186,174,000 (2,662,288 yen)
⑧⑨⑩ subtotal (materials-related)	0 (0 yen)	60,066,433 (858,950 yen)
Total	140,364,000 (2,007,205 yen)	246,240,433 (3,521,238 yen)

①Electricity····· 86,832,000 Rp/year

Contracted power for the facilities is estimated at 100 kW. Electricity utilized is expected to be 60 kW, or 60% of contracted power on average.
Costs are calculated as follows according to Indonesia's electricity company PLN.

Table 2-53 Electricity

Electricity Fees	Cost Rp	Quantity (kW)	Time (h/day)	Days (per month)	Monthly Quantity (kWh/month)	Monthly Fee (Rp/month)	Yearly Fee (Rp/year)
Meter fee	6,000	-	-	-	-	6,000	72,000
Base fee	24,600/kW	60	-	-	-	1,476,000	17,712,000
Usage fee	600/kWh	60	8	20	9,600	5,760,000	69,120,000
Total						7,236,000	86,832,000

②Telephone service ····· 11,352,000 Rp/year

Telephone service costs depend on actual telephone usage, but estimates are calculated according to the following assumptions:
Local calls: 3 min/call×20 calls/day
Long-distance calls: 3 min/call×5 calls/day
International calls: 3 min/call×1 call/day

Line fee	3,000 Rp/line/month
Domestic calls: (local)	250 Rp/3 min
Domestic calls: (long-distance, Lampung-Jakarta)	1,800 Rp/min
International calls: (Lampung-Japan)	5,000 Rp/min

Table 2-54 Telephone Service

Telephone Service	Cost (Rp)	/No. of Lines	Call Duration (min/call)	Calls: (calls/day)	Days (per month)	Monthly Cost (Rp/month)	Yearly Cost (Rp/year)
Line fee	3,000/line	2	—	—	—	6,000	72,000
Local	250/3min	—	3	20	20	100,000	1,200,000
Long-distance	1,800/min	—	3	5	20	540,000	6,480,000
International	5,000/min	—	3	1	20	300,000	3,600,000
Total						946,000	11,352,000

③Fuel·····29,160,000 Rp/year

Diesel will be used for emergency power generation and as incinerator fuel.

The emergency power generator is expected to run four times per month, including test operations. Fuel consumption should average about 15 L per hour based on expected emergency output levels of 50 kVA.

The incinerator is expected to be operated twice weekly, or 8 days each month, with four hours per day in use at about 15 L per hour.

Table 2-55 Generator and Incinerator Fuel

	Price (Rp/L)	Quantity (L/h)	Hours (h/month)	Monthly Quantity (L/month)	Monthly Fee (Rp/month)	Yearly Fee (Rp/year)
Generator use	4,500	15	4	60	270,000	3,240,000
Incinerator use	4,500	15	32	480	2,160,000	25,920,000
Total	-	-	-	540	2,430,000	29,160,000

④Water·····12,000,000 Rp/year

The facilities are estimated to require about 10 m^3 water/day. Water fees depend on price, but become more expensive beyond 20 m^3/month at 5,185 Rp/m^3. Therefore, a fixed fee of 5,000 Rp/m^3 is used for calculations. Meter fees of 6,000 Rp also apply, but will be paid as part of existing facilities and are not included in the current estimate.

Table 2-56 Water

Price (Rp/m^3)	Quantity (m^3/day)	Days (per month)	Monthly Quantity (m^3/month)	Monthly Fee (Rp/month)	Yearly Fee (Rp/year)
5,000	10	20	200	1,000,000	12,000,000

⑤LP GAS·····1,020,000 Rp/year

LP gas is used in the laboratories and pantries. Usage is estimated at 1 kg/day, or about 20 kg/month.

Table 2-57 LP GAS

Price (Rp/kg)	Quantity (kg/day)	Days (per month)	Monthly Quantity (kg/month)	Monthly Fee (Rp/month)	Yearly Fee (Rp/year)
4,250	1	20	20	85,000	1,020,000

⑥Air filter Costs ····· 31,150,000 Rp/year
(Second Year Forward)

Air filtering used in the air conditioning systems use both medium and high-performance filters, both of which are disposable. Plans call for 10 of both types. Medium performance filters are changed once every year and high performance filters once every two years.

Table 2-58 Air Filter Costs

Filter Performance	Price (Rp/unit)	Quantity Used (units/year)	Yearly Cost (Rp/year)
Medium performance	2,000,000	10	20,000,000
High-performance	2,230,000	5	11,150,000
Total			31,150,000

⑦Building maintenance ····· 14,660,000 Rp/year
(Second year forward)

Easily maintained materials will be selected for both interior and exterior finishes. For the exterior finish, easily maintained mortar will be used. For the interior, the finish selected will enable low-cost maintenance by requiring simple cleaning alone.

Therefore, building maintenance costs, including interior and exterior finishes, roof waterproofing repair, and repair and expendable parts for electrical, water, and air conditioning systems are expected to be about one-third what would be required in Japan or about 20,000 Rp/m²/year. Total planned area is 733 m².

20,000 Rp/m2/year × 733 m² = 14,660,000 Rp/year

⑧Consumable / Reagent (1st year) ····· 0Rp/per year
Same as above (after 2nd year) ····· 20,772,727Rp/per year

〔Items required from 1st year〕
None

	Consumable / Reagent (1Rp/¥0.01430)				Subtotal	¥0 Rp0
〔Items required after 2nd year〕						
(1)Binocular Microscope(B)	(Halogen lamp)	1	nos. × @	3,000 =	3,000	
	(Oil)	1	nos. × @	8,000 =	8,000	
(2)Binocular Microscope (C)	(Halogen lamp)	1	nos. × @	3,150 =	3,150	
	(Oil)	1	nos. × @	2,750 =	2,750	
(3)Inverted Microscope	(Halogen lamp)	3	nos. × @	2,000 =	6,000	
	(Oil)	3	nos. × @	2,750 =	8,250	
(4)Fluorescence Microscope	(Halogen lamp)	1	nos. × @	3,150 =	3,150	
	(Mercury lamp)	1	nos. × @	40,000 =	40,000	
	(Oil)	1	nos. × @	2,750 =	2,750	
(5)Egg Incubator	(Recording paper, etc.)	1	nos. × @	17,000 =	17,000	
(6)pH Meter	(pH electrode)	2	nos. × @	26,000 =	52,000	
	(ORP electrode)	2	nos. × @	30,000 =	60,000	
	(pH solution)	2	nos. × @	3,000 =	6,000	
	(Refilling solution)	2	nos. × @	1,000 =	2,000	
	(ORP solution)	2	nos. × @	3,000 =	6,000	
(7)Pure Water Apparatus	(Cartridge, filter)	1	nos. × @	31,000 =	31,000	
	(Element, filter, etc.)	1	nos. × @	46,000 =	46,000	

		Consumable / Reagent			Subtotal	¥297,050
		（1Rp/¥0.01430）				Rp20,772,727

⑨Spare Parts (after 2nd year)……34,048,951Rp/per year

〔Items required after 2nd year〕

(1)Automatic Tissue Processor	(Timer, fuse) *3	1	nos. ×	@	9,250 =	9,250
	(Lamp, regulator) *3	1	nos. ×	@	2,700 =	2,700
	(Beaker) *3	1	nos. ×	@	5,000 =	5,000
(2)Egg Incubator	(Hygrometer, fuse) *3	1	nos. ×	@	3,100 =	3,100
	(Lamp, sensor element) *3	1	nos. ×	@	5,500 =	5,500
	(Tank, tray, etc.) *3	1	nos. ×	@	2,350 =	2,350
(3)Biosafety Cabinet	(HEPA filter) *1	2	nos. ×	@	99,000 =	198,000
	(Fluorescent lamp) *2	2	nos. ×	@	18,000 =	36,000
	(UV lamp) *2	2	nos. ×	@	36,000 =	72,000
(4)Laminar Flow Cabinet	(HEPA filter) *1	1	nos. ×	@	99,000 =	99,000
	(Fluorescent lamp) *2	1	nos. ×	@	18,000 =	18,000
	(UV lamp) *2	1	nos. ×	@	36,000 =	36,000

Sapre Parts	Subtotal	¥486,900
（1Rp/0.01430 円）		Rp34,048,951

⑩Maintenance Contract Fee (1st year) ……0Rp/per year

Maintenance Contract Fee (after 2nd year)……5,244,755Rp/per year

〔Items required from 1st year〕

None

	Maintenance Contract Fee				Subtotal	¥0
	（1Rp/¥0.01430）					Rp0

〔Items required after 2nd year〕

(2)Biosafety Cabinet 2 unit (¥50,000 per unit, 25,000 per unit for 2nd unit and after)	(1 time/year)	1	year ×	@	75,000 =	75,000

Maintenance Contract Fee	Subtotal	¥75,000
（1Rp/¥0.01430）		Rp5,244,755

〔1st year〕	Equipment Related Fees ⑧＋⑨＋⑩	Subtotal	¥0
	（1Rp/¥0.01430）		Rp0

〔After 2nd year〕	Equipment Related Fees ⑧＋⑨＋⑩	Subtotal	¥858,950
	（1Rp/¥0.01430）		Rp60,066,433

Chapter 3 Project Evaluation and Recommendations

CHAPTER 3. Project Evaluation and Recommendations

3-1 Project Effect

(1) Benefits from Total Project

1) Direct Benefits

① When the new DIC Project facilities are completed in Subang in 2009, the numbers of diagnosis of AI infected poultry in West Java will increase by 60% compared with the present average of 12,000 performed annually by Yogyakarta alone.

② The numbers of HPAI diagnosis performed by DIC Medan are approximately 22,000 annually and the numbers for DIC Lampung are approximately 23,000 annually. The numbers will increase by 50% when the new Ai diagnosis facilities and equipment are completed in 2009.

③ Appropriate procedures delivery, pre-processing, diagnosis and disposal will become possible and standard operational procedures for sustained bio-safety will be established.

2) Indirect Benefits

① The procedures for the organization of facility environment necessary for sustained bio-safety will be established and a efficient, sustainable system for the preventive maintenance of equipment and building systems will be established.

② Diagnosis data will be effectively recorded contributing the formulation of policies for the prevention of spread of HPAI and other major veterinary diseases.

③ The completion of facilities and equipment for the diagnosis of HPAI and other major veterinary diseases will remove environmental effects to DIC neighbourhood areas and districts.

(2) Criteria for Evaluation Attainment

The criteria for evaluation of the attainment project objectives will be the increase in numbers of HPAI diagnosis in Java, increase in HPAI diagnosis at DIC Medan and increase in HPAI diagnosis at DIC Lampung. Other criteria will be increase of hospitalization, and increase in numbers of operations. (refer to attached Project Pre-evaluation Plan (at Basic Design)).

3-2 Recommendations

The following recommendations are required to be carried out for the smooth and efficient operation necessary for the above direct and indirect benefits to be realized by the AI diagnosis facilities to be constructed and equipment to be procured in DIC Subang, DIC Medan and DIC Lampung.

(1) The assignment of requisite maintenance staff to ensure the sustained and well maintained operations of the facilities and equipment.

(2) In order to maintain high accuracy in diagnosis made possible by the provision of the Project facilities and equipment, appropriate maintenance organization will be established and activities to improve technical level of staff will be promoted.

(3) The suppliers of equipment will provide technical guidance in the operation of machinery and equipment and provide maintenance manuals, operation manuals, and circuitry diagrams. Furthermore they will provide guidance on good practice of manual usage to promote efficient maintenance.

(4) Equipment ledgers for each unit of equipment will be prepared, listing date of installation, frequency of use, repair records. Spare parts procurement plans and equipment replacement plans will be prepared and long term operation and maintenance budget plan will be worked out.

(5) Annual operation reports will be prepared after the completion of the facilities. This will allow a firm grasp on the operational condition of the facilities and equipment. This will provide essential data for the improvement of facility operation.