Ministry of Health
The Republic of Indonesia

PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR STRENGTHENING THE NATIONAL LABORATORY FOR CONTROLLING THE HIGHLY PATHOGENIC AVIAN INFLUENZA AND OTHER EMERGING AND RE-EMERGING INFECTIOUS DISEASES
IN
THE REPUBLIC OF INDONESIA

March 2013

JAPAN INTERNATIONAL COOPERATION AGENCY

THE CONSORTIUM OF
NIHON SEKKEI MEDICALCORE, INC., NIHON SEKKEI INTERNATIONAL INC., NIHON SEKKEI, INC. AND FUJITA PLANNING CO., LTD.

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to consist of Nihon Sekkei MedicalCore, Inc., Nihon Sekkei International Inc., Nihon Sekkei, Inc. and Fujita Planning Co., Ltd.

The survey team held a series of discussions with the officials concerned of the Government of the Republic of Indonesia, and conducted a field investigations. As a result of further studies in Japan, 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.

Finally, 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 survey team.

March, 2013

Nobuko Kayashima
Director General,
Human Development Department
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Summary

1. Outline of the Country

Indonesia is located in the southern part of Southeast Asia consisting of about 17,000 islands in various sizes including large islands such as the island of Java, the island of Sumatra, the island of Kalimantan, the island of Sulawesi, and the island of New Guinea (Papua). Main islands are located on the equator; thus, almost all portions of the country except in highlands are tropical with hot and humid oceanic climate. Rainy season lasts from October to March and dry season from June to September in the eastern part of the island of Java and the Lesser Sunda Islands. Total land area of Indonesia is about 1.91 million square kilometers which is about 5.5 times larger than Japan, and the population is 242 million people.

Concerning the economy of Indonesia, the GDP in 2011 was 8.466 billion USD, GDP per capita 3,543 USD, economic growth rate 6.5%, and inflation rate 3.8%. The breakdown of GDP in 2011 was 12.7% in primary industry, 40.7% in secondary industry, and 46.6% in tertiary industry. The growth is slowing down mostly in industrialized countries due to economic problems such as the European Debt Crisis, and the economies of developing countries are also slowing down. Yet, the economic growth is favorable in Indonesia.

The private consumption in 2011 was 4.7%, which was higher than 4.6% recorded in 2010, indicating a robust growth. Export was 13.6%, which was slightly lower than 2010 but contributed to the economic growth. Gross domestic fixed capital formation recorded 8.8% increase due to active capital investments by companies. As a result, the economy of Indonesia was driven by the robust private consumption and the all-time high growths of export and investment and recorded the highest growth rate after the Asian Financial Crisis as the real GDP growth rate reached 6.5% which was higher than 6.1% recorded in 2010.

“Master plan for economic development, acceleration, and expansion (MP3EI)” was announced in 2011, and a goal was set to increase the nominal GDP by about six-folds from 2010 by 2025 and become one of the ten largest economic powers in the world. The growth of consumption is expected to keep supporting the economy in 2012, and robust demand and investments on abundant resources are also expected to increase. Meanwhile, the growth of export is expected to slow down due to the effect of the European Debt Crisis, and the government lowered the expected growth rate which was initially 6.7% to 6.5%.

2. Background and Overview of the Project

(1) Background of the request

Cases of humans infected with the avian influenza (A/H5N1) virus have been intermittently reported mostly in Southeast Asia since 2003. In 2005, the first human case of avian influenza was reported in Indonesia, and 191 cases of such infection (of which 159 cases resulted in deaths), or

the largest number in the world, had been reported by August 2012. The case fatality rate is the highest among countries which reported more than 100 cases of such infection. Also, there is a concern over the possibility of causing outbreak and fatalities within Indonesia and also in the world when the virus transforms into a new type of influenza with strong infectious ability as the virus spreads widely among people. NIHRD, the government research institute under the Indonesian Ministry of Health, is supposed to handle high-risk pathogens such as emerging and re-emerging infectious diseases including avian influenza in Indonesia.

Avian influenza, one of the high-risk pathogens, must be handled in the containment laboratory – the Biosafety Level (BSL) -3 laboratory – as recommended by the World Health Organization (WHO). Therefore, NIHRD has built CBBTH, a national laboratory for infectious diseases, with the BSL-3 and BSL-2 laboratories in 2009. Some of the equipment necessary for carrying out research and diagnostic services including the identification and characterization of the avian influenza virus, as well as other emerging and re-emerging infectious diseases were installed, with the budget of the Indonesian government and the assistance of other donors, and the use of the laboratories started in 2010. In these laboratories, however, some additional equipment such as biosafety cabinets, etc. urgently needs to be installed in order to fulfill its functions. In OBRD Aceh, a research laboratory under NIHRD that performs diagnosis and research about emerging and re-emerging infectious diseases, including avian influenza, there is a plan to construct a new PCR Laboratory using the national budget of Indonesia, but they have not obtained the funding for the supply of equipment for the diagnosis and research of those infectious diseases.

Under such circumstances, the Indonesian government requested the government of Japan for grant aid to procure laboratory equipment for CBBTH and OBRD Aceh, which are under NIHRD.

(2) Outline of the Study

The project sites and content of the initial request (August 2010) were as follows.

Initial request (August 2010):
1) Project sites : CBBTH/NIHRD and regional laboratories in South Sumatra province and East Kalimantan province (3 project sites)
2) Content of request:
① Equipment: 57 items for CBBTH and 7 items for regional laboratories
② Soft Component: Technical assistance for operation, maintenance and evaluation and moritoring of equipment performance

In June 2012, the Indonesian side has reviewed the initial request: the regional laboratory in South Sumatra has been canceled and OBRD Aceh was added instead. They also have reviewed some items of equipment for CBBTH/NIHRD.

Request reviwed in June 2012:
1) Project sites : CBBTH/NIHRD, regional laboratory in East Kalimantan province and OBRD Aceh (3 project sites)
2) Content of request:
① Equipment: 46 items for CBBTH and 7 items for regional laboratories
② Soft Component: Technical assistance for operation, maintenance and evaluation and moritoring of equipment performance

At the start of preparatory survey in Indonesia, the regional laboratory in East Kalimantan province was excluded from the project sites because it was confirmed not to be a laboratory under NIHRD.

The project sites and content of the request, after the preparatory survey carried out in July and August 2012 and analyses in Japan are as follows.

Final project sites and content of request:
1) Project sites: CBBTH/NIHRD and OBRD Aceh (2 project sites)
2) Content of request:
① Equipment: 48 items for CBBTH and 20 items for OBRD Aceh
② Soft Component: Technical assistance for maintenance of BSL-3 and BSL-2 laboratories in CBBTH

3. Overview of inspection outcomes and contents of the project

Upon the request of the Indonesian government, the Japanese government decided to carry out the preparatory survey, and JICA conducted field survey in Indonesia on the outline designs from July 16 to August 12, 2012. JICA then analyzed the results of the field survey in Japan and prepared a draft of outline design, followed by the explanation of the draft report in Indonesia from October 28 to November 3, 2012.

In this project, the equipment with low priority and those which can be relocated from other laboratories were excluded from the list. The equipment in this project is limited to those which fit the contents of diagnoses, research, and training on emerging and re-emerging infectious diseases at the target facilities.

The tables in the next pages show the list of equipment to be procured in this plan and specifications and purposes of the major equipment.

List of Equipment

No.	Name of Equipment	Allocation								Total Q'ty
		CBBTH/NIHRD							OBRD Aceh	
		BSL-3 Lab	BSL-2 Supporting Lab	Clean /RNA Extract.	Isolation Room	Analysis Room	Common Equip.	Training Room		
1	Autoclave	3	2	2	1	1	3	1	1	14
2	Minicentrifuge	2	4	3	3	3		3	2	20
3	Refrigerated Centrifuge	2	1	1				1		5
4	Refrigerated Microcentrifuge	2	1					1	1	5
5	Tabletop Ultracentrifuge		1							1
6	Two-pan Balance		1							1
7	Electronic Balance		1	1				1	1	4
8	Electrophoresis Horizontal with Power Pack					2		2	1	5
9	Electrophoresis Vertical with Power Pack					1				1
10	Gel Documentation System					1		1	1	3
11	Biosafety Cabinet	3							1	4
12	Tissue Homogenizer	1		1						2
13	Magnetic Stirrer		2	1	1	1				5
14	pH Meter				1	1				2
15	Portable Pipette Aid	3	2		2			2	1	10
16	Repeater Pipette				2	1				3
17	Pipettes Set, 8 Channels	3	4		2	2		2	3	16
18	Pipettes Set, 12 Channels	3	4		2	2		2	3	16
19	Pipettes Set, Single Channel	3	4			2		4	3	16
20	Pipettes Stand	3	4		2	2		4	3	18
21	Sonicator					1				1
22	Vortex Mixer		4					3	3	10
23	Shaker Vertical for Plate					1				1
24	PCR Workstation							1	1	2
25	Water Bath	1	2						1	4
26	Shaker Incubator for Cloning					1				1
27	CO2 Incubator		2							2
28	Bottle Roller CO2 Incubator				1					1
29	Fluorescent Microscope with Camera		1							1
30	Inverted Microscope	2	1							3
31	Freezer -20°C		1		2			1	1	5
32	Deep Freezer -80°C (A)		2				1			3
33	Deep Freezer -80°C (B)							1	1	2
34	Medical Refrigerator	2						1	3	6
35	Ice Flaking Machine						1			1
36	Liquid Nitrogen Cryo-flask		2							2
37	Nanodrop Spectrophotometer					1				1
38	Aspirator	2	2		1					5
39	DNA Sequencer					1				1
40	Shaker Vertical for Tubes					1				1
41	Incubator	1								1
42	Stainless Table	5								5
43	Clean Bench		2		1					3
44	Real Time PCR					3				3

45	Thermal Cycler								1	1
46	Water Distiller						1			1
47	Dry Ice Making Machine						1		1	2
48	Maintenance Equipment Set						1			1

Specifications of Major Equipment

No.	Name of Equipment	Plan. Q'ty	Specification	Purpose of Use
1	Autoclave	14	Type: Vertical type, Biosafety type Effective internal volume: 69L Chamber material: Stainless steel	Sterilization of used instruments and materials after using in BSL-3 and BSL-2 laboratories.
3	Refrigerated Centrifuge	5	Type: Tabletop type, Biosafety type Max. speed: Not less than 15,000rpm Max. RCF: Not less than 25,000xg Temperature setting range: Approx. -10℃to +40℃	Centrifugation of clinical specimens, separation of virus, cells, etc.
5	Tabletop Ultracentrifuge	1	Type: Tabletop type Max. speed: Not less than 100,000rpm Max. RCF: Not less than 1,000,000xg	Isolation/separation of cells of plasmid DNA, RNA, etc.
11	Biosafety Cabinet	4	Type: A2 HEPA filter: Not less than 99.99% efficient for 0.3μ particles External dimensions: 1450W x 800D x 2,000H mm approx. UV lamp: Equipped	Handling of specimens infected with avian influenza virus, etc.
24	PCR Workstation	2	Cleanliness: ISO class 5 External dimensions: 1300W x 850D x 1,800H mm approx. UV lamp: Equipped	Handling of DNA, etc.
27	CO2 Incubator	2	Type: Tabletop type Capacity: Approx. 150L Temperature setting range: Approx. 5 to 50℃	Incubation of virus, etc.
28	Bottle Roller CO2 Incubator	1	Capacity: Approx. 200L Loading capacity of roller bottles: Not less than 16pcs. Temperature setting range: Approx. 5 to 50℃	Incubation of cells, etc.
29	Fluorescent Microscope with Camera	1	Magnification: Not less than 50 to 1,000x Objective lens: Not less than 5 kinds Fluorescent filter: Not less than 5 kinds Peripheral equipment: PC, printer, digital camera	To be used in diagnosis (immunofluorescence assay)
32	Deep Freezer -80°C (A)	3	Type: Vertical type Capacity: Approx. 700L Temperature setting range: Approx. -80℃	To storage specimen.
33	Deep Freezer -80°C (B)	2	Type: Vertical type Capacity: Approx. 400L Temperature setting range: Approx. -80℃	Same as the above.
37	Nanodrop Spectrophotometer	1	Light source: Xenon lamp Wavelength range: Approx. 200 to 800nm Sample volume: Approx. 1μL Peripheral equipment: PC for data analysis	To be used in quantitative analysis of materials.

No.	Name of Equipment	Plan. Q'ty	Specification	Purpose of Use
39	DNA Sequencer	1	Processing method: Pyrosequence Sample: PCR products, gDNA, etc. Read length: Average 400bp Data/run: Approx. 35Mb PC for data analysis: Desk-top type	Research and analysis of avian influenza.
43	Clean Bench	3	Type: Biosafety type Cleanliness: ISO Class 5 External dimensions: 1,350W x 800D x 1,800H mm approx. UV lamp: Equipped	Preparation of cells, medium, etc.
44	Real time PCR	3	Type: Real time PCR Sample: 96 Peripheral equipment: PC, printer	To amplify segment of DNA via the polymerase chain reaction for diagnosis and research of avian influenza, etc.
47	Dry Ice Making Machine	2	Type: Hydraulic cylinder Production capacity: Approx. 60kg/h	To make dry ice to be utilized in the transport of specimens of avian influenza.
48	Particle counter (Secondary side)	1	Minimum measurement particles: 0.3μm Air flow: 28.8L/minute Particle diameter measuring range: Not less than 6-step	To measure air cleanliness class after passing through HEPA filter.

4. Implementation Schedule and Cost Estimation

The period for detail design (preparation of tender documents, etc.) of the project is expected to be three months and the period for procuring and installing the equipment seven months. The implementation period for Soft Components is expected to be 12 months, which is to be finished about three months after the completion of procument and installation of equipment.

The cost to be borne by the Indonesian side for the implementation of this project is estimated at 1.8 million yen.

5. Project Evaluation

(1) Relevance

The relevance of the Project implemented in accordance with the Japanese grant aid scheme is confirmed in the following aspects:

1) Beneficiaries of this project

Target facilities of this project, CBBTH and OBRD Aceh, are positioned as the country's central laboratory and research facility to provide diagnosis services and to conduct infectious disease research, and these functions are strengthened by improving the laboratory equipment for infectious diseases. As a result, the response capability of Indonesia in terms of emerging and re-emerging infectious diseases including avian influenza and the capability of Indonesia

to prevent the spread of infectious diseases within the country and to neighboring countries will be enhanced.

2) Compatibility with the national health policy of the recipient country

Indonesia regards responses to avian influenza and other emerging and re-emerging infectious diseases as one of the most important issues in the "Strategic Plan of the Ministry of Health 2010-2014." They set a goal of achieving nationwide implementation of early warning response system and establishing a system to issue warning within 24 hours of an outbreak by 2014. In relation to this policy, the Ministry of Health is strengthening its capability to diagnose infectious diseases in Indonesia and positions this project to strengthen the functions of CBBTH and OBRD Aceh under NIHRD which are the target facilities of this project. Therefore, this project is considered adequate due to its high compatibility with the national health policy of Indonesia and the implementation is considered relevant.

3) Necessity of improving equipment

NIHRD is a government research institute that handles avian influenza and other infectious diseases in Indonesia, and CBBTH with BSL-3 laboratory and BSL-2 laboratory, which were constructed in 2009 to provide diagnosis services and conduct research on avian influenza and other infectious diseases. With the national budget of Indonesia and the assistance of other donors, some of the equipment such as CO2 incubator, deep freezer, and real-time PCR, etc. necessary for carrying out research and diagnostic services including identification and characterization of avian influenza virus, as well as other emerging and re-emerging infectious diseases were installed, and the use of the laboratories started in 2010. In these laboratories, however, some additional equipment such as biosafety cabinets, etc. urgently needs to be installed to fulfill its functions. In OBRD Aceh, a research laboratory under NIHRD that performs diagnosis and research about emerging and re-emerging infectious diseases, including avian influenza, there is a plan to construct a new PCR Laboratory with the national budget of Indonesia, but they have not obtained the funding for the supply of equipment for diagnosis and research of those infectious diseases.

Under such circumstances, there is an extremely high necessity for the supply of laboratory equipment for diagnosis and research on infectious diseases for CBBTH and OBRD Aceh through the Project.

4) Environment and social influences

CBBTH safely handles contaminated waste by collecting it in designated plastic bags which are clearly labeled for handling waste, processing it in high-pressure steam sterilizer, and outsourcing final disposal to external specialized waste processing company to be incinerated. Higher safety will be secured with the currently installed incinerator by renovating it such as adding a combustion burner to strengthen its performance. OBRD Aceh also has its own incinerator with which infected waste is disposed of through incineration.

The safety of the outside of these facilities is secured, because exhaust air from BSL-3 laboratory goes through a high-performance HEPA filter to prevent pathogens from spreading, and a special decontamination system is installed for treating drainage water.

Based on these observations, there is no influence to the surrounding environment as long as the facilities are properly operated.

5) Compatibility with the aid policy of the Japanese government

This project is compatible with the following aid policies and directions of Japan.

(i) The Japanese government regards measures to prevent infectious diseases on a global scale as one of the important tasks in relation to the "Okinawa Infectious Diseases Initiative" announced in the Kyushu-Okinawa Summit in 2000.

(ii) "Global Health Policy 2011-2015" that the Japanese government announced in September 2010 mentioned the importance of preparedness for emerging and re-emerging infectious diseases and international cooperation in relation to the Millennium Development Goals (MDG6).

(iii) The "Country-specific Aid Plan for Indonesia" formulated in April 2004 positions "improvement of medical healthcare services" as one of the important fields and aspects in the "Development of democratic and fair society" category, and focused aid for countermeasures against infectious diseases is announced.

(2) Effectiveness

1) Quantitative effects

Effectiveness of the Project

Indicator (CBBTH)	Baseline (2012)	Target (2017)
Number of AI tests carried out in BSL-3 laboratories Laboratory (tests per year)	120	500
Type of specimens (diseases) handled in BSL-3 laboratories Laboratory	1	4
Type of tests carried out in BSL-3 laboratories	2	5
Number of tests carried out for seasonal influenza (tests per year)	3,761(2011)	5,000
Number of trainees for PCR in the training room of CBBTH NIHRD	0	100
Indicator (OBRD Aceh)	Baseline (2012)	Target (2017)
Type of specimens (diseases) tested by PCR tests	0	2 or more

2) Qualitative effect

The following qualitative effects are expected from the implementation of the project.

(i) Enabling epidemiological responses to outbreaks within 24 hours

(ii) Enabling proper and safe control of emerging and re-emerging infectious diseases

(iii) Ensuring the safety of researchers and the safe disposal of contaminated waste from laboratories

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ABBREVIATIONS

AI	Avian Influenza
A/P	Authorization to Pay
APBN	Anggaran Pendapatan dan Belanja Negara
APSED	Asia Pacific Strategy for Emerging Diseases
ARI	Acute Respiratory Infections
AusAID	Australian Agency for International Development
AUD	Australian Dollar
AVR	Automatic Voltage Regulator
B/A	Banking Arrangement
BSL	Biosafety Level
CBBTH	Center for Biomedical and Basic Technology of Health
CCTV	Closed Circuit Television
CDC	Centers for Diseases Control
CIDA	Canadian International Development Agency
DIC	Disease Investigation Center
DIPA	Daftar Isian Pelaksanaan Anggaran
DNA	Deoxyribo Nucleic Acid
DNV	Det Norske Veritas
E/N	Exchange of Notes
EC	European Committee
EWARDS	Early Warning and Response System
EU	European Union
G/A	Grant Agreement
GDP	Gross Domestic Product
HEPA Filter	High Efficiency Particulate Air Filter
HIV/ AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome
HCV	Hepatitis C Virus
HIR	International Health Regulations
HPAI	Highly Pathogenic Avian Influenza
IDR	Indonesia Rupiah
ILI	Influenza-like Illness
ISO	International Organization for Standardization
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau
LIMS	Laboratory Information Management System
M/D	Minutes of Discussions

MDG	Millennium Development Goal
MOH	Ministry of Health
NCGM	National Center for Global Health and Medicine
NGO	Non-Governmental Organization
NIHRD	National Institute of Health Research and Development
NIID	National Institute of Infectious Diseases
OBRD Aceh	Office Biomedical Research Development, Aceh
ODA	Official Development Assistance
Pa	Pascal
PCR	Polymerase Chain Reaction
PIN	Personal Identification Number
RNA	Ribonucleic Acid
RO	Reverse Osmosis
RT-PCR	Real Time PCR
RIVM	Rijksinstituut voor Volksgezondheid en Milieu
SARI	Severe Acute Respiratory Illness
SMS	Short Message Service
SOP	Standard Operating Procedures
TB	Tuberculosis
TTS	Telegraphic Transfer Selling rate
UPS	Uninterruptible Power Supply
USAID	United States Agency for International Development
UV	Ultra Violet
WHO	World Health Organization

Chapter 1. Background of the Project

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1-1 Background of the Project

Cases of humans infected with the avian influenza (A/H5N1) virus have been intermittently reported mostly in Southeast Asia since 2003. In 2005, the first human case of avian influenza was reported in Indonesia, and 191 cases of such infection (of which 159 cases resulted in deaths), or the largest number in the world, had been reported by August 2012. The case fatality rate is the highest among countries which reported more than 100 cases of such infection. Also, there is a concern over the possibility of causing outbreak and fatalities within Indonesia and also in the world when the virus transforms into a new type of influenza with strong infectious ability as the virus spreads widely among people. The National Institute of Health Research and Development (NIHRD), the government research institute under the Indonesian Ministry of Health, is supposed to handle high-risk pathogens such as emerging and re-emerging infectious diseases including avian influenza in Indonesia.

Avian influenza, one of the high-risk pathogens, must be handled in the containment laboratory – the Biosafety Level (BSL) -3 laboratory – as recommended by the World Health Organization (WHO). Therefore, NIHRD has built the Center for Biomedical and Basic Technology of Health (CBBTH), a national laboratory for infectious diseases, with the BSL-3 and BSL-2 laboratories in 2009. Some of the equipment necessary for carrying out research and diagnostic services including the identification and characterization of the avian influenza virus, as well as other emerging and re-emerging infectious diseases were installed, with the budget of the Indonesian government and the assistance of other donors, and the use of the laboratories started in 2010. In these laboratories, however, some additional equipment such as biosafety cabinets, etc. urgently needs to be installed in order to fulfill its functions. In the Office Biomedical Research Development, Aceh (OBRD Aceh), a research laboratory under NIHRD that performs diagnosis and research about emerging and re-emerging infectious diseases, including avian influenza, there is a plan to construct a new PCR Laboratory using the national budget of Indonesia, but they have not obtained the funding for the supply of equipment for the diagnosis and research of those infectious diseases.

Under such circumstances, the Indonesian government requested the government of Japan for grant aid to procure laboratory equipment for CBBTH and OBRD Aceh, which are under NIHRD.

1-2 Natural Conditions

(1) Temperature and humidity

The climate of Jakarta is tropical, and the average highest temperature is 31.8°C and the average lowest temperature 25.0°C, meaning that the temperature is high throughout a year. Jakarta has two seasons: dry season lasts from May to October; and rainy season lasts from November to

April. The humidity is relatively low and comfortable in the dry season, but the humidity increases in rainy season with especially high humidity after a squall.

In Aceh, meanwhile, the average annual temperature is 27.1°C and the average highest temperature 32.6°C, while the average lowest temperature is 22.8°C, and the average annual humidity 81.4% which is high.

(2) Precipitation

The annual precipitation in Jakarta exceeds 1,650 mm and sometimes reaches nearly 2,000 mm, which is higher than about 1,500 mm in Tokyo. Especially, about 80% of the annual precipitation is recorded during the rainy season which lasts from November to April.

The annual precipitation in Aceh is also about 2,000 mm. Although there is no clear boundary between dry and rainy seasons, the precipitation is especially high in November and December which accounts for about 40% of annual precipitation.

1-3 Environment and Social Considerations

(1) Waste disposal

While the city collects non-industrial waste from CBBTH every day, infectious waste is supposed to be incinerated in the single-burner incinerator in a separate building. Since the local residents complained about the black smoke and odor emitted from the incinerator, however, the incinerator is not being used at the moment. Infected waste is now temporarily stored in the washing room on the second floor of CBBTH, and the disposal is outsourced to an infected waste disposal company when the waste accumulates to a certain volume.

According to the facility manager of CBBTH, the black smoke and odor were probably caused by the short chimney which was about five to six meters. According to the on-site inspection by an incinerator manufacturer, however, incomplete combustion occurred when the ratio of plastic material contained in waste exceeded 20%. The incinerator manufacturer suggested a renovation including the addition of burners and extension of the chimney. The renovation was already carried out in January 2013, and the staff was waiting for the arrival of the manual and training on the operation of the incinerator by the manufacturer.

In OBRD Aceh, infected waste is decontaminated in autoclave and then incinerated with the incinerator when the waste has accumulated to a certain volume.

Non-industrial waste is burned in an open space within the premises of the facility.

(2) Exhaust air and drainage water

In terms of environmental influence, one of the aspects of the target facility of this project which might affect the surrounding environment besides the waste disposal is exhaust air and drainage water from BSL-3 laboratory.

There is no problem with the exhaust air from BSL-3 laboratory as long as the facility is operated under normal conditions, because all exhaust air is released through HEPA filters.

Drainage water from BSL-3 laboratory is chemically decontaminated in drainage water treatment systems. Meanwhile, drainage water from BLS-2 laboratory at CBBTH is discharged after being treated in septic tank.

In OBRD Aceh drainage water is treated in a sedimentation treatment tank before discharge.

Chapter 2. Contents of the Project

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2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Purpose

In 2005, the first human case of avian influenza was reported in Indonesia, and 191 cases of such infection (of which 159 cases resulted in deaths), or the largest number in the world, had been reported by August 2012. The case fatality rate is the highest among countries which reported more than 100 cases of such infection. Also, there is a concern over the possibility of causing outbreak and fatalities within Indonesia and also in the world when the virus transforms into a new type of influenza with strong infectious ability as the virus spreads widely among people.

To prevent the spread of infection, the Indonesian government aimed to roll out an early warning and response system and a system to issue an alarm within 24 hours from the discovery of an outbreak by 2014, under the initiative of "Strategic Plan of the Ministry of Health 2010-2014." As part of this plan, the Center for Biomedical and Basic Technology of Health (CBBTH), including the BSL-3 Laboratory and BSL-2 Laboratory, were constructed, based on international standards, in the National Institute of Health Research and Development (NIHRD) which is under the Ministry of Health, to enhance its capability to perform diagnosis and research about infectious diseases. The Office of Biomedical Research Development of Aceh (OBRD Aceh) under NIHRD also plans to construct a new laboratory in order to strengthen its function with regard to infectious diseases.

The goal of this project is to strengthen a system to issue warnings on the outbreak of emerging and re-emerging infectious diseases, including avian influenza, within 24 hours of the outbreak through improving laboratory equipment for carrying out diagnosis and research of infectious diseases in BSL-3 and BSL-2 Laboratories in CBBTH and PCR Laboratory at OBRD Aceh under NIHRD, thereby reinforcing the functions of these laboratories and training systems. Such improvement will also have benefits in preventing the spread of infectious diseases within Indonesia and nearby countries.

2-1-2 Basic Concept of the Project

In this project, it is planned to procure equipment for BSL-3 Laboratory, BSL-2 Laboratory and training room in CBBTH and for PCR Laboratory in OBRD Aceh, which are under NIHRD, to reinforce the functions of early diagnostic systems for avian influenza and after emerging and re-emerging infectious diseases and to establish suitable countermeasures against them. Through this project, it is expected that the target facilities will become able to handle more types of pathogens, and NIHRD will become able to increase its number of trainees.

2-2 Outline Design of the Japanese Assistance

2-2-1 Design Policy

(1) Basic Policy

The target facilities of this project are CBBTH and OBRD Aceh, and the scope is as indicated in Table 2-1 below.

Table 2-1 Target facilities and laboratories of the project

CBBTH		OBRD Aceh
4th floor	・ Clean room, RNA Extraction Room ・ Analysis Room ・ Isolation Room	PCR Laboratory to be constructed with funds from the Indonesian Government in 2013.
3rd floor	・ Training Room	
2nd floor	・ Washing Room	
1st floor	・ BSL-3 Laboratory (3 out of 4 laboratories) ・ BSL-2 Supporting Laboratory	

Through the project, the equipment necessary for diagnosis and research of avian influenza as well as training equipment is provided mainly. The equipment is selected by focusing on the following, while giving special consideration to the characteristics of the project as the provision of equipment used in BSL-3 and BSL-2 laboratories.

a. Equipment essential for the diagnosis, research and training of laboratory technicians dealing with avian influenza and so forth
b. Equipment compliant with Biosafety standards
c. Equipment operable with the current technical level of the target facilities
d. Equipment that can be managed and maintained
e. Equipment for which spare parts, reagent and consumables can be smoothly procured

(2) Policy on Natural Conditions

Jakarta belongs to a tropical climate characterized by year-round hot weather, where the highest temperature is 31.8℃ and the lowest temperature is 25.0℃ on average. There are dry season and rain season. The dry season is from May to October and the rain season is from November to April in most cases. Meanwhile, in Aceh, the average temperature of a year is 27.1℃, where the highest temperature is 32.6℃ and the lowest temperature is 22.8℃ on average. The average humidity of a year is as high as 81.4%.

To address such natural conditions, air conditioning system is provided in each laboratory of CBBTH. Further, an installation of air conditioning system is planned for the new facility in OBRD

Aceh. Therefore, there is no special point to be noticed with regard to natural conditions of the recipient country, as far as the air conditioning system is appropriately operated including the back-up power source to be used in the event of main power failure.

(3) Policy on the Socio-economic Conditions

The Gross Domestic Product (GDP) per capita in Indonesia exceeded US$3,000 in 2010 and the economic growth of the country is remaining steady. Nevertheless, emerging and re-emerging infectious diseases including avian influenza could cause serious human and economic losses, and they are still a huge negative factor to be concerned about when considering the future of the country. With such a situation in the background, provision of equipment is requested for BSL-3 and BSL-2 laboratories to be used for diagnosis, research and training of infectious diseases including avian influenza. This is because the spread of infectious diseases can be controlled by establishing a system to enable safe, accurate and prompt diagnosis of a large number of specimens within the country and taking appropriate measures against infectious diseases based on the diagnosis results.

(4) Policy on the Equipment Procurement Conditions

Most of the equipment to be procured for the recipient county is made in Japan or is from European Union member countries or the United States. The distributors have engineers and/or technicians with sufficient experience who can handle the provision of laboratory equipment. They have fairly good customer service and after-sales service systems, and the spare parts and consumables are supplied promptly within the country. These distributors will be used for the procurement of equipment in this project.

(5) Policy on the Use of Local Contractors

Because the scope of this project is the procurement of equipment, water supply and drain systems, and power sources (receptacles) essential for installation of the equipment are provided by the recipient country. Installation, adjustment and testing of equipment to be procured under the project as well as training for the facility staff concerned are planned to be conducted by engineers of the equipment manufacturers dispatched from Japanese supplier or the engineers of the local distributors. This provision is to be supervised by a Japanese consultant. Therefore, the use of local consultants is not considered in this project.

(6) Policy on the Operation and Maintenance Capability

In the project, the equipment is installed in the existing facilities or those undergoing extension. Most items of equipment to be procured are similar to the existing ones, and it seems that an increase in operation and maintenance costs will not cause any significant problem. Concerning the allocation of staff, there is no problem with the number of staff at CBBTH, and manpower is to be reinforced at OBRD Aceh using the FY2013 budget after the implementation of this project.

However, because the staff does not have the essential knowledge necessary for safe operation of a BSL-3 facility, particularly knowledge necessary to elaborate SOP, a Soft Component is implemented to enhance the appropriate maintenance ability.

In selecting the items of equipment, equipment that can operate at the current technical level should be selected. The plan aims to reduce maintenance costs by giving priority to the type of equipment that consumes relatively less reagent and consumables.

(7) Policy on the Setting of Grade of Equipment

The grade of the equipment is almost equivalent to the existing equipment focusing on the types operable with the current technical level of researchers. The result of site survey shows that, because of the high voltage fluctuations due to power failure, some items of equipment are damaged. These items of equipment need to be equipped with automatic voltage regulators (AVR) or uninterruptible power supplies (UPS).

(8) Policy on Procurement Methods and Procurement Schedule

1) Policy on Procurement Methods

The equipment to be procured in this project is supplied from Japan, basically. However, some items of equipment such as analyzers could be procured from third countries for the following reasons: a) Agent of the manufacturer is necessary; and b) Limiting the scope to Japanese products may result in failure to carry out fair tender because it discourages competitive tendering.

2) Policy on Procurement Schedule

Manufacturing, inspection, transport and installation work of the equipment can be completed within a fairly short period, because there are no special items in the equipment to be procured in the project. To keep to the implementation schedule, the government of the recipient country should smoothly and quickly open a bank account in Japan once the Grant Agreement (G/A) is executed, and the Authorization to Pay (A/P) is issued. Also, the tax exemption procedure should be implemented promptly. Because these processes may take several months in some cases, special attention should be paid to the tax exemption procedure. In the project, the equipment procurement schedule has been planned by giving consideration to these points.

2-2-2 Basic Plan

(1) General

The equipment procured in this project is to be supplied to the two project facilities mentioned in Table 2-1. The items of equipment are suited to the diagnosis, research and training. The plan to

procure equipment in the project includes the transportation of the equipment to the project sites and installation work.

(2) Content of Final Request

Table 2-2 and Table 2-3 show the contents of the final equipment request that was agreed upon through discussions during the preparatory survey and recorded in the Minutes of Discussions signed by the Preparatory Survey Team and Indonesian side on August 3, 2012.

Table 2-2 Final Equipment Request List by CBBTH

No	Name of Equipment	Priority
Equipment for BSL-3 Laboratory		
1	Autoclave	A
2	Minicentrifuge	A
3	Refrigerated Centrifuge	A
4	Refrigerated Microcentrifuge	B
5	Tissue Homogenizer	A
6	Portable Pipette Aid	A
7	Pipettes Set, 8 Channels	A
8	Pipettes Set, 12 Channels	A
9	Pipettes Set, Single Channel	A
10	Pipettes Stand	A
11	Water Bath	A
12	CO2 Incubator	B
13	Inverted Microscope	A
14	Deep Freezer -80°C with CO2 or LN2 Back-up	A
15	Medical Refrigerator	A
16	Aspirator	A
17	Incubator	A
18	Biosafety Cabinet	A
19	Stainless Table	A
Equipment for BSL-2 Supporting Laboratory		
1	Minicentrifuge	A
2	Refrigerated Centrifuge	A
3	Refrigerated Microcentrifuge	A
4	Tabletop Ultracentrifuge	A
5	Two-pan Balance	A
6	Electronic Balance	A
7	Biosafety Cabinet	B
8	Magnetic Stirrer	B
9	Portable Pipette Aid	A
10	Pipettes Set, 8 Channels	A
11	Pipettes Set, 12 Channels	A
12	Pipettes Set, Single Channel	A
13	Pipettes Stand	A
14	Vortex Mixer	A
15	Water Bath	A
16	CO2 Incubator	A

No	Name of Equipment	Priority
17	Fluorescent Microscope with Camera	A
18	Inverted Microscope	A
19	Freezer -20°C	A
20	Deep Freezer -80°C with CO2 or LN2 Back-up	A
21	Liquid Nitrogen Cryo-flask	B
22	Aspirator	B
23	Autoclave	A
24	Clean Bench	A
Equipment for Clean Room and RNA Extraction Room		
1	Minicentrifuge	B
2	Refrigerated Centrifuge	B
3	Electronic Balance	B
4	Tissue Homogenizer	B
5	Magnetic Stirrer	B
6	Autoclave	A
Equipment for Isolation Room		
1	Minicentrifuge	B
2	Magnetic Stirrer	B
3	pH Meter	B
4	Portable Pipette Aid	A
5	Repeater Pipette	A
6	Pipettes Set, 8 Channels	A
7	Pipettes Set, 12 Channels	A
8	Bottle Roller CO2 Incubator	B
9	Freezer -20°C	B
10	Aspirator	A
11	Clean Bench	A
Equipment for Analysis Room		
1	Minicentrifuge	A
2	Electrophoresis Horizontal with Power Pack	A
3	Electrophoresis Vertical with Power Pack	A
4	Gel Documentation System	A
5	Magnetic Stirrer	A
6	pH Meter	A

No	Name of Equipment	Priority
7	Repeater Pipette	A
8	Pipettes Set, 8 Channels	A
9	Pipettes Set, 12 Channels	A
10	Pipettes Set, Single Channel	A
11	Sonicator	A
12	Shaker Vertical for Plate	A
13	Shaker Incubator for Cloning	A
14	Nanodrop Spectrophotometer	A
15	DNA Sequencer	B
16	Thermal Cycler	A
17	Shaker Vertical for Tubes	B
Equipment for Common Use		
1	Electron Microscope	B
2	Freezer -20°C	B
3	Deep Freezer -80° C with CO2 of LN2 Back-up	B
4	Ice Flaking Machine	A
5	Glassware Washing Machine	B
6	Water Distiller	A
7	Maintenance Equipment Set	B
8	Dry Ice Making Machine	A
Equipment for Training Room		
1	Minicentrifuge	A

No	Name of Equipment	Priority
2	Refrigerated Centrifuge	B
3	Refrigerated Microcentrifuge	A
4	Electronic Balance	A
5	Electrophoresis Horizontal with Power Pack	A
6	Gel Documentation System	A
7	Biosafety Cabinet	B
8	Magnetic Stirrer	A
9	pH Meter	A
10	Portable Pipette Aid	A
11	Pipettes Set, 8 Channels	A
12	Pipettes Set, 12 Channels	A
13	Pipettes Set, Single Channel	A
14	Pipettes Stand	A
15	Vortex Mixer	A
16	PCR Workstation	A
17	Water Bath	A
18	Inverted Microscope	A
19	Freezer -20°C	B
20	Deep Freezer -80°C with CO2 or LN2 Back-up	B
21	Medical Refrigerator	A
22	Autoclave	A

Priority A: Essential for the Project
Priority B: It is necessary but further study is needed

Table 2-3 Final Equipment Request List by OBRD Aceh

No	Name of Equipment	Priority
1	Minicentrifuge	A
2	Refrigerated Microcentrifuge	A
3	Electronic Balance	A
4	Electrophoresis Horizontal with Power Pack	A
5	Gel Documentation System	A
6	Portable Pipette Aid	A
7	Pipettes Set, 8 Channels	A
8	Pipettes Set, 12 Channels	A
9	Pipettes Set, Single Channel	A
10	Pipettes Stand	A

No	Name of Equipment	Priority
11	Vortex Mixer	A
12	PCR Workstation	A
13	Water Bath	A
14	Biosafety Cabinet	A
15	Freezer -20°C	A
16	Deep Freezer -80°C with CO2 or LN2 Back-up	A
17	Medical Refrigerator	A
18	Autoclave	A
19	Thermal Cycler	A
20	Dry Ice Making Machine	A

Priority A: Essential for the Project
Priority B: It is necessary but further study is needed

(3) Study on Requested Equipment

The result of a study on the requested equipment for each laboratory is described below. The "Requested Quantity" of each equipment stated in Table-2-4 to Table 2-11 is the quantity requested by the Indonesian side during the discussion on the Technical Memorandum.

1) Equipment Requested by CBBTH

Table 2-4 Equipment for BSL-3 Laboratory

No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty	No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty
1	Autoclave	A	3	3	11	Water Bath	A	1	1
2	Minicentrifuge	A	2	2	12	CO2 Incubator	B	1	0
3	Refrigerated Centrifuge	A	2	2	13	Inverted Microscope	A	2	2
4	Refrigerated Microcentrifuge	B	2	2	14	Deep Freezer -80°C with CO2 or LN2 Back-up	A	1	0
5	Tissue Homogenizer	A	1	1	15	Medical Refrigerator	A	2	2
6	Portable Pipette Aid	A	3	3	16	Aspirator	A	2	2
7	Pipettes Set, 8 Channels	A	3	3	17	Incubator	A	1	1
8	Pipettes Set, 12 Channels	A	3	3	18	Biosafety Cabinet	A	3	3
9	Pipettes Set, Single Channel	A	3	3	19	Stainless Table	A	4	5
10	Pipettes Stand	A	3	3					

In this project, equipment for three BSL-3 laboratories – namely "BLS-3 general laboratory", "BSL-3 virology laboratory (1)" and "BSL-3 virology laboratory (2) – is supplied. Supply of equipment in the "BSL-3 bacterial laboratory" is not included in the project.

a) An Autoclave to sterilize the infectious materials used in the laboratory is necessary for each laboratory. Three units are supplied.
b) While there is one existing Refrigerated Centrifuge in the virology laboratory (1), it is to be replaced by a new one because it does not satisfy the specification requirements for a BSL-3 laboratory. Because a Minicentrifuge, Refrigerated Centrifuge, and Refrigerated Microcentrifuge are necessary for each virology laboratory (1) and virology laboratory (2), they are supplied in each laboratory. Further, because an Inverted Microscope, Medical Refrigerator, and Aspirator are not available currently, they will be supplied in these laboratories.
c) Because a Tissue Homogenizer and Water Bath are necessary, one unit of each is to be procured and shared among the three laboratories.
d) Because of the shortage of pipettes set to be used in laboratories and Biosafety Cabinet, one each of a Portable Pipette Aid, 8-channel Pipette Set, 12-channel Pipette Set, and Single-channel Pipette Set is to be supplied in each laboratory.
e) One Incubator is to be supplied, because it is unavailable currently. However, because the existing CO_2 Incubator can be used, it is out of the scope of this project.
f) While a Deep Freezer -80°C with CO_2 or LN2 Back-up is requested, it is judged as unnecessary, because an emergency power source is provided in BSL-3 laboratories.

g) Because the existing Biosafety Cabinet does not satisfy the specification requirements for a BSL-3 laboratory, it is to be replaced with a new one. However, because the existing units can be used in BSL-2 laboratories, they are to be transferred to BSL-2 supporting laboratory and training room for further use.

h) Because two units of a Stainless Table for the general laboratory, one unit for the virology laboratory (1) and two units for the virology laboratory (2) are lacking, five units are to be procured in total.

Table 2-5 Equipment for BSL-2 Supporting Laboratory

No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty	No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty
1	Minicentrifuge	A	3	4	13	Pipettes Stand	A	4	4
2	Refrigerated Centrifuge	A	1	1	14	Vortex Mixer	A	4	4
3	Refrigerated Microcentrifuge	A	1	1	15	Water Bath	A	2	2
4	Tabletop Ultracentrifuge	A	1	1	16	CO2 Incubator	A	2	2
5	Two-pan Balance	A	1	1	17	Fluorescent Microscope with Camera	A	1	1
6	Electronic Balance	A	1	1	18	Inverted Microscope	A	1	1
7	Biosafety Cabinet	B	2	0	19	Freezer -20°C	A	1	1
8	Magnetic Stirrer	B	2	2	20	Deep Freezer -80°C with CO2 or LN2 Back-up	A	2	2
9	Portable Pipette Aid	A	2	2	21	Liquid Nitrogen Cryo-flask	B	1	2
10	Pipettes Set, 8 Channels	A	4	4	22	Aspirator	B	2	2
11	Pipettes Set, 12 Channels	A	4	4	23	Autoclave	A	2	2
12	Pipettes Set, Single Channel	A	4	4	24	Clean Bench	A	2	2

As diagnosis and research of avian influenza and such like cannot be done only with BSL-3 laboratory equipment, equipment for a BSL-2 supporting laboratory is indispensable. While there are two BSL-2 supporting laboratories in CBBTH, their equipment is not equipped yet. Therefore, the above-mentioned equipment is essential.

a) A Minicentrifuge unit is necessary for each laboratory and two units are needed for the Biosafety Cabinet. Accordingly, four Minicentrifuges are to be supplied in total.

b) Each laboratory requires a Magnetic Stirrer, Portable Pipette Aid, Water Bath, CO_2 Incubator, Deep Freezer -80°C, Aspirator, Autoclave, and Clean Bench. With regard to the Deep Freezer -80°C with CO_2 or LN2 Back-up, the "CO_2/LN2 Back-up" is not supplied because an emergency power source is provided in the facility.

c) Four sets each of various Pipettes and Vortex Mixers are to be supplied in each laboratory, Biosafety Cabinet and inside the Clean Bench for common use.

d) Two Liquid Nitrogen Cryo-flasks are to be provided for transporting cells and viruses.

Table 2-6 Equipment for Clean Room/RNA Extraction Room

No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty	No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty
1	Minicentrifuge	B	3	3	4	Tissue Homogenizer	B	1	1
2	Refrigerated Centrifuge	B	1	1	5	Magnetic Stirrer	B	1	1
3	Electronic Balance	B	1	1	6	Autoclave	A	4	2

a) Because the existing Minicentrifuges are old and hindering operations, three units are to be provided. They are planned to be used in the PCR Workstation.
b) Because a biohazard preventive Refrigerated Centrifuge, Electronic Balance, Tissue Homogenizer and Magnetic Stirrer are lacking, one unit of each is to be supplied.
c) Because a biohazard preventive Autoclave is lacking for clean room and RNA extraction room, one unit of each is to be supplied for each laboratory.

Table 2-7 Equipment for Isolation Room

No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty	No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty
1	Minicentrifuge	B	3	3	8	Bottle Roller CO2 Incubator	B	1	1
2	Magnetic Stirrer	B	1	1	9	Freezer -20°C	B	2	2
3	pH Meter	B	1	1	10	Aspirator	A	1	1
4	Portable Pipette Aid	A	3	2	11	Clean Bench	A	1	1
5	Repeater Pipette	A	3	2	12	Autoclave	-	-	1
6	Pipettes Set, 8 Channels	A	3	2	13	Pipettes Stand	-	-	2
7	Pipettes Set, 12 Channels	A	3	2					

a) Three Minicentrifuges are to be supplied because the equipment is lacking in the laboratory for common use, cell culture room and isolation room.
b) One each of a pH Meter, Bottle Roller CO_2 Incubator, Aspirator, Clean Bench, and Autoclave are to be supplied because they are not available. Because the number of Magnetic Stirrer is insufficient, one unit is to be added.
c) Because the number of Pipette Sets is insufficient for the laboratories for common use, two units are to be added. However, because continued use of the existing units is considered possible for the cell culture room and isolation room, they are not included in the scope of the project.
d) Units of Freezer -20°C are to be supplied, because the equipment is not available in the laboratory for common use and the virus culture room.

Table 2-8 Equipment for Analysis Room

No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty	No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty
1	Minicentrifuge	A	1	3	11	Sonicator	A	1	1
2	Electrophoresis Horizontal with Power Pack	A	2	2	12	Shaker Vertical for Plate	A	1	1

No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty	No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty
3	Electrophoresis Vertical with Power Pack	A	1	1	13	Shaker Incubator for Cloning	A	1	1
4	Gel Documentation System	A	1	1	14	Nanodrop Spectrophotometer	A	1	1
5	Magnetic Stirrer	A	1	1	15	DNA Sequencer	B	1	1
6	pH Meter	A	1	1	16	Thermal Cycler	A	3	3
7	Repeater Pipette	A	1	1	17	Shaker Vertical for Tubes	B	1	1
8	Pipettes Set, 8 Channels	A	2	2	18	Autoclave	-	-	1
9	Pipettes Set, 12 Channels	A	2	2	19	Pipettes Stand	-	-	2
10	Pipettes Set, Single Channel	A	2	2					

a) Because the number of Minicentrifuges to be used to prepare reagents for sequencing, electrophoresis and so forth is insufficient, three units are to be supplied.

b) Because the numbers of Electrophoresis Horizontal and Pipette Sets of various types are insufficient due to aging of the existing units, two of each are to be supplied. Because one out of two Gel Documentation System units failed and it is impossible to repair it, the unit is to be replaced by a new one. One Magnetic Stirrer is to be added because the number of units is insufficient.

c) One each of an Electrophoresis Vertical, pH Meter, Repeater Pipette, Sonicator, Shaker Vertical for Plates, Shaker Incubator, Nanodrop Spectrophotometer, DNA Sequencer, Shaker Vertical for Tubes, and Autoclave are to be supplied because they are lacking.

d) It is difficult to repair three out of ten existing Thermal Cycler/Real Time PCR due to aging-related degradation. These units are to be replaced because their spare parts will become unavailable around 2013.

Table 2-9 Equipment for Common Use

No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty	No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty
1	Electron Microscope	B	1	0	6	Water Distiller	A	1	1
2	Freezer -20°C	B	1	0	7	Maintenance Equipment Set	B	1	1
3	Deep Freezer -80°C with CO2 of LN2 Back-up	B	1	1	8	Dry Ice Making Machine	A	1	1
4	Ice Flaking Machine	A	1	1	9	Autoclave	-	-	3
5	Glassware Washing Machine	B	1	0					

a) Because one of the Deep Freezer -80°C units in specimen room failed and it is irreparably damaged, the unit is to be replaced by a new one. However, the "CO_2/LN_2 Back-up" is not to be supplied because an emergency power source is provided in the facility. Because the Water Distiller in the washing room is deteriorated due to aging-related degradation, it is to be replaced with a new one. Because an Ice Flaking Machine and Dry Ice Making Machine are necessary, each one unit is to be supplied.

b) Because a biohazard preventive Autoclave for sterilizing contaminated instruments and materials is lacking in the washing room, three units are to be supplied. Further, because maintenance equipment for operating the BSL-3 laboratory, BSL-2 laboratory and so forth is needed, one set is to be supplied.

c) Because there is no research program using an electron microscope, the Electron Microscope is not included in the scope of this project. A Freezer -20°C for the AI specimen room is judged to have a low priority. As glassware is washed in each laboratory, the Glassware Washing Machine for the washing room is judged to have a low priority. Therefore, these two items are removed from the scope of this project.

Table 2-10 Equipment for Training Room

No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty	No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty
1	Minicentrifuge	A	3	3	12	Pipettes Set, 12 Channels	A	2	2
2	Refrigerated Centrifuge	B	1	1	13	Pipettes Set, Single Channel	A	4	4
3	Refrigerated Microcentrifuge	A	1	1	14	Pipettes Stand	A	4	4
4	Electronic Balance	A	1	1	15	Vortex Mixer	A	3	3
5	Electrophoresis Horizontal with Power Pack	A	2	2	16	PCR Workstation	A	1	1
6	Gel Documentation System	A	1	1	17	Water Bath	A	1	0
7	Biosafety Cabinet	B	1	0	18	Inverted Microscope	A	1	0
8	Magnetic Stirrer	A	1	0	19	Freezer -20°C	B	1	1
9	pH Meter	A	1	0	20	Deep Freezer -80°C with CO2 or LN2 Back-up	B	1	1
10	Portable Pipette Aid	A	2	2	21	Medical Refrigerator	A	1	1
11	Pipettes Set, 8 Channels	A	2	2	22	Autoclave	A	1	1

While a training room is already established, PCR laboratory equipment is to be procured within the framework of this project. The CBBTH plans to carry out PCR tests training several times a year by using this equipment. During the period in which the room is not used for the training, PCR tests for things other than influenza (dengue fever, polio, measles etc.) are to be conducted in the training room. Approximately 10 trainees are trained in a training course and the period of a course is 5 days, basically.

Among the above-mentioned items of equipment, a Magnetic Stirrer, pH Meter, Water Bath and Inverted Microscope (4 items) are excluded from the scope of this project, because they are considered to be less necessary for the training of PCR tests. The other items of equipment are indispensable.

a) For the RNA extraction room, reagent preparation room and analysis room, one unit each of a Minicentrifuge and Vortex Mixer are necessary.

b) One unit of a Refrigerated Centrifuge, Refrigerated Microcentrifuge, Electronic Balance, Gel Documentation System, PCR Workstation, Freezer -20°C, Deep Freezer -80°C, Medical

Refrigerator and Autoclave are necessary. With regard to the Deep Freezer -80°C with CO_2 or LN2 Back-up, the "CO_2/LN_2 Back-up" is not supplied because an emergency power source is provided in the facility.

c) Two units each of Electrophoresis Horizontal, Portable Pipette Aid, Pipette Set (8-channel) and Pipette Set (12-channel) are shared by 8 to 10 trainees. With regard to the Pipette Set (single-channel), 4 sets are shared by 8 to 10 trainees.

d) With regard to Biosafety Cabinet, the existing equipment in the BSL-3 laboratory will be transferred and used. Therefore, it is excluded from the scope in the project.

e) With regard to Thermal Cycler, the existing equipment in the analysis room for influenza will be transferred and used. Therefore, it is excluded from the scope in the project.

2) Equipment Requested by OBRD Aceh

Table 2-11 Equipment for PCR Laboratory

No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty	No.	Name of Equipment	Prio-rity	Req. Q'ty	Plan. Q'ty
1	Minicentrifuge	A	2	2	11	Vortex Mixer	A	3	3
2	Refrigerated Microcentrifuge	A	1	1	12	PCR Workstation	A	1	1
3	Electronic Balance	A	1	1	13	Water Bath	A	1	1
4	Electrophoresis Horizontal with Power Pack	A	1	1	14	Biosafety Cabinet	A	1	1
5	Gel Documentation System	A	1	1	15	Freezer -20°C	A	1	1
6	Portable Pipette Aid	A	1	1	16	Deep Freezer -80°C with CO2 or LN2 Back-up	A	1	1
7	Pipettes Set, 8 Channels	A	3	3	17	Medical Refrigerator	A	3	3
8	Pipettes Set, 12 Channels	A	3	3	18	Autoclave	A	1	1
9	Pipettes Set, Single Channel	A	3	3	19	Thermal Cycler	A	1	1
10	Pipettes Stand	A	3	3	20	Dry Ice Making Machine	A	1	1

The above-mentioned items of equipment are essential for PCR tests to be carried out in the new laboratory. The reason for supplying more than one unit for some items of equipment is indicated below.

One Minicentrifuge is needed for AI specimen processing and one is needed for reagents. Three units each of the various types of Pipettes and Vortex Mixers are needed: one for the laboratory, one for the PCR Workstation, and one for Biosafety Cabinet. One Medical Refrigerator is necessary for each of the RNA extraction room, reagent preparation room and analysis room. With regard to a Deep Freezer -80°C with CO_2 or LN_2 Back-up, the "CO_2/LN_2 Back-up" is not supplied because emergency power source will be provided in the laboratory.

Based on the results of the above study on the requested equipment, the needs for and appropriateness of each item of equipment were further examined in accordance with the following selection criteria.

① Equipment required for the diagnosis, research and training of laboratory technicians dealing with avian influenza and other infectious diseases

- ○ Equipment essential for the diagnosis, research and training of laboratory technicians dealing with avian influenza and other infectious diseases
- △ Equipment is necessary but is not frequently used
- × Equipment with low priority for diagnosis and research of avian influenza or, existing equipment is still usable

② Equipment compatible with the technical level of the researchers

- ○ Equipment operable with the current technical level of the researchers
- △ Equipment operable if the current researchers receive training upon its delivery
- × Equipment that is difficult to operate with the technical level of the current researchers

③ Equipment which can be managed and maintained

- ○ Equipment that can be managed and maintained with the current system and budget for maintenance
- △ Equipment that can be managed and maintained if the current maintenance system is improved and a maintenance contract is concluded with the agents
- × Equipment which seems difficult to introduce because of expensive management and maintenance costs

(Overall evaluation)

- ○ Equipment considered appropriate for the plan to procure the equipment
- × Equipment which will not be included in the equipment plan

The results of this study are shown in Table 2-12 and Table 2-13 below.

Table 2-12 Result after Examination of Requested Equipment - CBBTH

No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			Evaluation	Plan. Q'ty	Remarks
				①	②	③			
Equipment for BSL-3 Laboratory									
1	Autoclave	A	3	○	○	○	○	3	
2	Minicentrifuge	A	2	○	○	○	○	2	
3	Refrigerated Centrifuge	A	2	○	○	○	○	2	
4	Refrigerated Microcentrifuge	B	2	○	○	○	○	2	
5	Tissue Homogenizer	A	1	○	○	○	○	1	
6	Portable Pipette Aid	A	3	○	○	○	○	3	
7	Pipettes Set, 8 Channels	A	3	○	○	○	○	3	
8	Pipettes Set, 12 Channels	A	3	○	○	○	○	3	
9	Pipettes Set, Single Channel	A	3	○	○	○	○	3	
10	Pipettes Stand	A	3	○	○	○	○	3	
11	Water Bath	A	1	○	○	○	○	1	

No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			Evaluation	Plan. Q'ty	Remarks
				①	②	③			
12	CO2 Incubator	B	1	×	○	○	×	0	Existing equipment is still usable
13	Inverted Microscope	A	2	○	○	○	○	2	
14	Deep Freezer -80°C with CO2 or LN2 Back-up	A	1	×	○	○	×	0	Existing equipment is still usable
15	Medical Refrigerator	A	2	○	○	○	○	2	
16	Aspirator	A	2	○	○	○	○	2	
17	Incubator	A	1	○	○	○	○	1	
18	Biosafety Cabinet	A	3	○	○	○	○	3	
19	Stainless Table	A	4	○	○	○	○	5	For 'Plan. Q'ty' refer to "(3) Study on Requested Equipment" above.
Equipment for BSL-2 Supporting Laboratory									
1	Minicentrifuge	A	3	○	○	○	○	4	For 'Plan. Q'ty' refer to "(3) Study on Requested Equipment" above.
2	Refrigerated Centrifuge	A	1	○	○	○	○	1	
3	Refrigerated Microcentrifuge	A	1	○	○	○	○	1	
4	Tabletop Ultracentrifuge	A	1	○	○	○	○	1	
5	Two-pan Balance	A	1	○	○	○	○	1	
6	Electronic Balance	A	1	○	○	○	○	1	
7	Biosafety Cabinet	B	2	×	○	○	×	0	The existing equipment in BSL-3 Lab will be transferred and used
8	Magnetic Stirrer	B	2	○	○	○	○	2	
9	Portable Pipette Aid	A	2	○	○	○	○	2	
10	Pipettes Set, 8 Channels	A	4	○	○	○	○	4	
11	Pipettes Set, 12 Channels	A	4	○	○	○	○	4	
12	Pipettes Set, Single Channel	A	4	○	○	○	○	4	
13	Pipettes Stand	A	4	○	○	○	○	4	
14	Vortex Mixer	A	4	○	○	○	○	4	
15	Water Bath	A	2	○	○	○	○	2	
16	CO2 Incubator	A	2	○	○	○	○	2	
17	Fluorescent Microscope with Camera	A	1	○	○	○	○	1	
18	Inverted Microscope	A	1	○	○	○	○	1	
19	Freezer -20°C	A	1	○	○	○	○	1	
20	Deep Freezer -80°C with CO2 or LN2 Back-up	A	2	○	○	○	○	2	CO2/LN2 back-up will not be included. Refer to "(3) Study on Requested Equipment" above.
21	Liquid Nitrogen Cryo-flask	B	1	○	○	○	○	2	For 'Plan. Q'ty' refer to "(3) Study on Requested Equipment" above.
22	Aspirator	B	2	○	○	○	○	2	
23	Autoclave	A	2	○	○	○	○	2	
24	Clean Bench	A	2	○	○	○	○	2	

No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			Evaluation	Plan. Q'ty	Remarks
				①	②	③			
Equipment for Clean Room/RNA Extraction Room									
1	Minicentrifuge	B	3	○	○	○	○	3	
2	Refrigerated Centrifuge	B	1	○	○	○	○	1	
3	Electronic Balance	B	1	○	○	○	○	1	
4	Tissue Homogenizer	B	1	○	○	○	○	1	
5	Magnetic Stirrer	B	1	○	○	○	○	1	
6	Autoclave	A	4	○	○	○	○	2	For 'Plan. Q'ty' refer to "(3) Study on Requested Equipment" above.
Equipment for Isolation Room									
1	Minicentrifuge	B	3	○	○	○	○	3	
2	Magnetic Stirrer	B	1	○	○	○	○	1	
3	pH Meter	B	1	○	○	○	○	1	
4	Portable Pipette Aid	A	3	○	○	○	○	2	For 'Plan. Q'ty' refer to "(3) Study on Requested Equipment" above.
5	Repeater Pipette	A	3	○	○	○	○	2	Same as the above
6	Pipettes Set, 8 Channels	A	3	○	○	○	○	2	Same as the above
7	Pipettes Set, 12 Channels	A	3	○	○	○	○	2	Same as the above
8	Bottle Roller CO2 Incubator	B	1	○	○	○	○	1	
9	Freezer -20°C	B	2	○	○	○	○	2	
10	Aspirator	A	1	○	○	○	○	1	
11	Clean Bench	A	1	○	○	○	○	1	
12	Autoclave	-	-	○	○	○	○	1	One Autoclave is essential
13	Pipettes Stand	-	-	○	○	○	○	2	It is necessary for items 6 and 7 above
Equipment for Analysis Room									
1	Minicentrifuge	A	1	○	○	○	○	3	For 'Plan. Q'ty' refer to "(3) Study on Requested Equipment" above.
2	Electrophoresis Horizontal with Power Pack	A	2	○	○	○	○	2	
3	Electrophoresis Vertical with Power Pack	A	1	○	○	○	○	1	
4	Gel Documentation System	A	1	○	○	○	○	1	
5	Magnetic Stirrer	A	1	○	○	○	○	1	
6	pH Meter	A	1	○	○	○	○	1	
7	Repeater Pipette	A	1	○	○	○	○	1	
8	Pipettes Set, 8 Channels	A	2	○	○	○	○	2	
9	Pipettes Set, 12 Channels	A	2	○	○	○	○	2	
10	Pipettes Set, Single Channel	A	2	○	○	○	○	2	
11	Sonicator	A	1	○	○	○	○	1	
12	Shaker Vertical for Plate	A	1	○	○	○	○	1	
13	Shaker Incubator for Cloning	A	1	○	○	○	○	1	
14	Nanodrop Spectrophotometer	A	1	○	○	○	○	1	

No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			Evaluation	Plan. Q'ty	Remarks
				①	②	③			
15	DNA Sequencer	B	1	○	○	○	○	1	
16	Thermal Cycler	A	3	○	○	○	○	3	
17	Shaker Vertical for Tubes	B	1	○	○	○	○	1	
18	Autoclave	-	-	○	○	○	○	1	One Autoclave is essential
19	Pipettes Stand	-	-	○	○	○	○	2	It is necessary for items 8, 9 and 10 above
Equipment for Common Use									
1	Electron Microscope	B	1	×	△	△	×	0	For reason of exclusion refer to "(3) Study on Requested Equipment" above.
2	Freezer -20°C	B	1	×	○	○	×	0	Freezer is not necessary in Specimen Room
3	Deep Freezer -80°C with CO2 or LN2 Back-up	B	1	○	○	○	○	1	CO2/LN2 back-up will not be included. Refer to "(3) Study on Requested Equipment" above.
4	Ice Flaking Machine	A	1	○	○	○	○	1	
5	Glassware Washing Machine	B	1	○	○	○	○	0	For reason of exclusion refer to "(3) Study on Requested Equipment" above.
6	Water Distiller	A	1	○	○	○	○	1	
7	Maintenance Equipment Set	B	1	○	○	○	○	1	
8	Dry Ice Making Machine	A	1	○	○	○	○	1	
9	Autoclave	-	-	○	○	○	○	3	Refer to refer to "(3) Study on Requested Equipment" above.
Equipment for Training Room									
1	Minicentrifuge	A	3	○	○	○	○	3	
2	Refrigerated Centrifuge	B	1	○	○	○	○	1	
3	Refrigerated Microcentrifuge	A	1	○	○	○	○	1	
4	Electronic Balance	A	1	○	○	○	○	1	
5	Electrophoresis Horizontal with Power Pack	A	2	○	○	○	○	2	
6	Gel Documentation System	A	1	○	○	○	○	1	
7	Biosafety Cabinet	B	1	×	○	○	×	0	The existing equipment in BSL-3 Lab will be transferred and used
8	Magnetic Stirrer	A	1	○	○	○	○	0	For reason of exclusion refer to "(3) Study on Requested Equipment" above.
9	pH Meter	A	1	○	○	○	○	0	Same as the above
10	Portable Pipette Aid	A	2	○	○	○	○	2	
11	Pipettes Set, 8 Channels	A	2	○	○	○	○	2	
12	Pipettes Set, 12 Channels	A	2	○	○	○	○	2	

No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			Evaluation	Plan. Q'ty	Remarks
				①	②	③			
13	Pipettes Set, Single Channel	A	4	○	○	○	○	4	
14	Pipettes Stand	A	4	○	○	○	○	4	
15	Vortex Mixer	A	3	○	○	○	○	3	
16	PCR Workstation	A	1	○	○	○	○	1	
17	Water Bath	A	1	○	○	○	○	0	For reason of exclusion refer to "(3) Study on Requested Equipment" above.
18	Inverted Microscope	A	1	○	○	○	○	0	Same as the above
19	Freezer -20°C	B	1	○	○	○	○	1	
20	Deep Freezer -80°C with CO2 or LN2 Back-up	B	1	○	○	○	○	1	CO2/LN2 back-up will not be included. Refer to "(3) Study on Requested Equipment" above.
21	Medical Refrigerator	A	1	○	○	○	○	1	
22	Autoclave	A	1	○	○	○	○	1	

Table 2-13 Result after Examination of Requested Equipment - OBRD Aceh

No.	Name of Equipment	Prio-rity	Req. Q'ty	Evaluation Items			Evaluation	Plan. Q'ty	Remarks
				①	②	③			
1	Minicentrifuge	A	2	○	○	○	○	2	
2	Refrigerated Microcentrifuge	A	1	○	○	○	○	1	
3	Electronic Balance	A	1	○	○	○	○	1	
4	Electrophoresis Horizontal with Power Pack	A	1	○	○	○	○	1	
5	Gel Documentation System	A	1	○	○	○	○	1	
6	Portable Pipette Aid	A	1	○	○	○	○	1	
7	Pipettes Set, 8 Channels	A	3	○	○	○	○	3	
8	Pipettes Set, 12 Channels	A	3	○	○	○	○	3	
9	Pipettes Set, Single Channel	A	3	○	○	○	○	3	
10	Pipettes Stand	A	3	○	○	○	○	3	
11	Vortex Mixer	A	3	○	○	○	○	3	
12	PCR Workstation	A	1	○	○	○	○	1	
13	Water Bath	A	1	○	○	○	○	1	
14	Biosafety Cabinet	A	1	○	○	○	○	1	
15	Freezer -20°C	A	1	○	○	○	○	1	
16	Deep Freezer -80°C with CO2 or LN2 Back-up	A	1	○	○	○	○	1	CO2/LN2 back-up will not be included. Refer to "(3) Study on Requested Equipment" above.
17	Medical Refrigerator	A	3	○	○	○	○	3	
18	Autoclave	A	1	○	○	○	○	1	
19	Thermal Cycler	A	1	○	○	○	○	1	
20	Dry Ice Making Machine	A	1	○	○	○	○	1	

(4) Equipment Plan

Table 2-14 and Table 2-15 show the proposed equipment lists and specifications and purposes of the major equipment.

Table 2-14 Equipment List

No.	Name of Equipment	Allocation								Total Q'ty
		CBBTH/NIHRD							OBRD Aceh	
		BSL-3 Lab	BSL-2 Supporting Lab	Clean /RNA Extract.	Isolation Room	Analysis Room	Common Equip.	Training Room		
1	Autoclave	3	2	2	1	1	3	1	1	14
2	Minicentrifuge	2	4	3	3	3		3	2	20
3	Refrigerated Centrifuge	2	1	1				1		5
4	Refrigerated Microcentrifuge	2	1					1	1	5
5	Tabletop Ultracentrifuge		1							1
6	Two-pan Balance		1							1
7	Electronic Balance		1	1				1	1	4
8	Electrophoresis Horizontal with Power Pack					2		2	1	5
9	Electrophoresis Vertical with Power Pack					1				1
10	Gel Documentation System					1		1	1	3
11	Biosafety Cabinet	3							1	4
12	Tissue Homogenizer	1		1						2
13	Magnetic Stirrer		2	1	1	1				5
14	pH Meter				1	1				2
15	Portable Pipette Aid	3	2		2			2	1	10
16	Repeater Pipette				2	1				3
17	Pipettes Set, 8 Channels	3	4		2	2		2	3	16
18	Pipettes Set, 12 Channels	3	4		2	2		2	3	16
19	Pipettes Set, Single Channel	3	4			2		4	3	16
20	Pipettes Stand	3	4		2	2		4	3	18
21	Sonicator					1				1
22	Vortex Mixer		4					3	3	10
23	Shaker Vertical for Plate					1				1
24	PCR Workstation							1	1	2
25	Water Bath	1	2						1	4
26	Shaker Incubator for Cloning					1				1
27	CO2 Incubator		2							2
28	Bottle Roller CO2 Incubator				1					1
29	Fluorescent Microscope with Camera		1							1
30	Inverted Microscope	2	1							3
31	Freezer -20°C		1		2			1	1	5
32	Deep Freezer -80°C (A)		2				1			3
33	Deep Freezer -80°C (B)							1	1	2
34	Medical Refrigerator	2						1	3	6
35	Ice Flaking Machine						1			1
36	Liquid Nitrogen Cryo-flask		2							2
37	Nanodrop Spectrophotometer					1				1

No.	Name of Equipment	Allocation								Total Q'ty
		CBBTH/NIHRD							OBRD Aceh	
		BSL-3 Lab	BSL-2 Supporting Lab	Clean /RNA Extract.	Isolation Room	Analysis Room	Common Equip.	Training Room		
38	Aspirator	2	2		1					5
39	DNA Sequencer					1				1
40	Shaker Vertical for Tubes					1				1
41	Incubator	1								1
42	Stainless Table	5								5
43	Clean Bench		2		1					3
44	Real Time PCR					3				3
45	Thermal Cycler								1	1
46	Water Distiller						1			1
47	Dry Ice Making Machine						1		1	2
48	Maintenance Equipment Set						1			1

Table 2-15 Specifications of Major Equipment

No.	Name of Equipment	Plan. Q'ty	Specification	Purpose of Use
1	Autoclave	14	Type: Vertical type, Biosafety type Effective internal volume: 69L Chamber material: Stainless steel	Sterilization of used instruments and materials after using in BSL-3 and BSL-2 laboratories.
3	Refrigerated Centrifuge	5	Type: Tabletop type, Biosafety type Max. speed: Not less than 15,000rpm Max. RCF: Not less than 25,000xg Temperature setting range: Approx. -10℃to +40℃	Centrifugation of clinical specimens, separation of virus, cells, etc.
5	Tabletop Ultracentrifuge	1	Type: Tabletop type Max. speed: Not less than 100,000rpm Max. RCF: Not less than 1,000,000xg	Isolation/separation of cells of plasmid DNA, RNA, etc.
11	Biosafety Cabinet	4	Type: A2 HEPA filter: Not less than 99.99% efficient for 0.3μ particles External dimensions: 1450W x 800D x 2,000H mm approx. UV lamp: Equipped	Handling of specimens infected with avian influenza virus, etc.
24	PCR Workstation	2	Cleanliness: ISO class 5 External dimensions: 1300W x 850D x 1,800H mm approx. UV lamp: Equipped	Handling of DNA, etc.
27	CO2 Incubator	2	Type: Tabletop type Capacity: Approx. 150L Temperature setting range: Approx. 5 to 50℃	Incubation of virus, etc.
28	Bottle Roller CO2 Incubator	1	Capacity: Approx. 200L Loading capacity of roller bottles: Not less than 16pcs. Temperature setting range: Approx. 5 to 50℃	Incubation of cells, etc.

No.	Name of Equipment	Plan. Q'ty	Specification	Purpose of Use
29	Fluorescent Microscope with Camera	1	Magnification: Not less than 50 to 1,000x Objective lens: Not less than 5 kinds Fluorescent filter: Not less than 5 kinds Peripheral equipment: PC, printer, digital camera	To be used in diagnosis (immunofluorescence assay)
32	Deep Freezer -80°C (A)	3	Type: Vertical type Capacity: Approx. 700L Temperature setting range: Approx. -80℃	To storage specimen.
33	Deep Freezer -80°C (B)	2	Type: Vertical type Capacity: Approx. 400L Temperature setting range: Approx. -80℃	Same as the above.
37	Nanodrop Spectrophotometer	1	Light source: Xenon lamp Wavelength range: Approx. 200 to 800nm Sample volume: Approx. 1μL Peripheral equipment: PC for data analysis	To be used in quantitative analysis of materials.
39	DNA Sequencer	1	Processing method: Pyrosequence Sample: PCR products, gDNA, etc. Read length: Average 400bp Data/run: Approx. 35Mb PC for data analysis: Desk-top type	Research and analysis of avian influenza.
43	Clean Bench	3	Type: Biosafety type Cleanliness: ISO Class 5 External dimensions: 1,350W x 800D x 1,800H mm approx. UV lamp: Equipped	Preparation of cells, medium, etc.
44	Real Time PCR	3	Type: Real time PCR Sample: 96 Peripheral equipment: PC, printer	To amplify segment of DNA via the polymerase chain reaction for diagnosis and research of avian influenza, etc.
47	Dry Ice Making Machine	2	Type: Hydraulic cylinder Production capacity: Approx. 60kg/h	To make dry ice to be utilized in the transport of specimens of avian influenza.
48	Particle counter (Secondary side)	1	Minimum measurement particles: 0.3μm Air flow: 28.8L/minute Particle diameter measuring range: Not less than 6-step	To measure air cleanliness class after passing through HEPA filter.

Reagent and consumables of the equipment to be supplied through the project

Because most items of equipment to be procured in this project are similar to the existing equipment, the operation and maintenance costs are considered to be secured. Therefore, spare parts for the equipment are not included in the project. With regard to reagents and consumables, only those necessary for test operation, training for operation and maintenance to be carried out by the supplier after equipment installation are included in the scope, basically. Further, with regard to the consumables excluding reagents such as fuses, lamps and recording paper, those consumed during the six months are included in the scope of the project, as it takes about six months normally from internal procedure through order placement to the delivery of consumables in each facility. Consumables other than the forgoing will be procured by the Indonesian side.

2-2-3 Outline Design Drawing

CBBTH

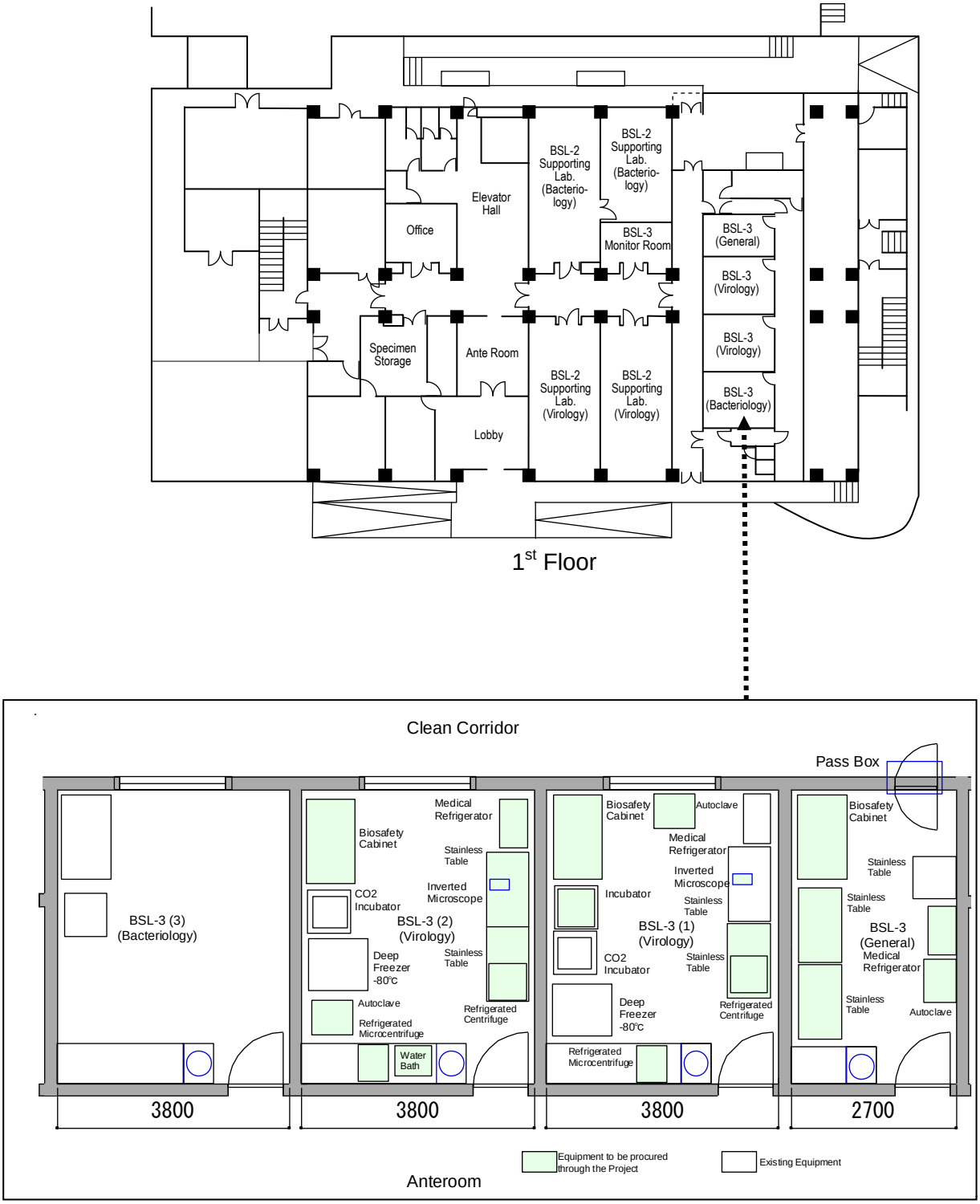


Figure 2-1 Layout Plan for BSL-3 Laboratory

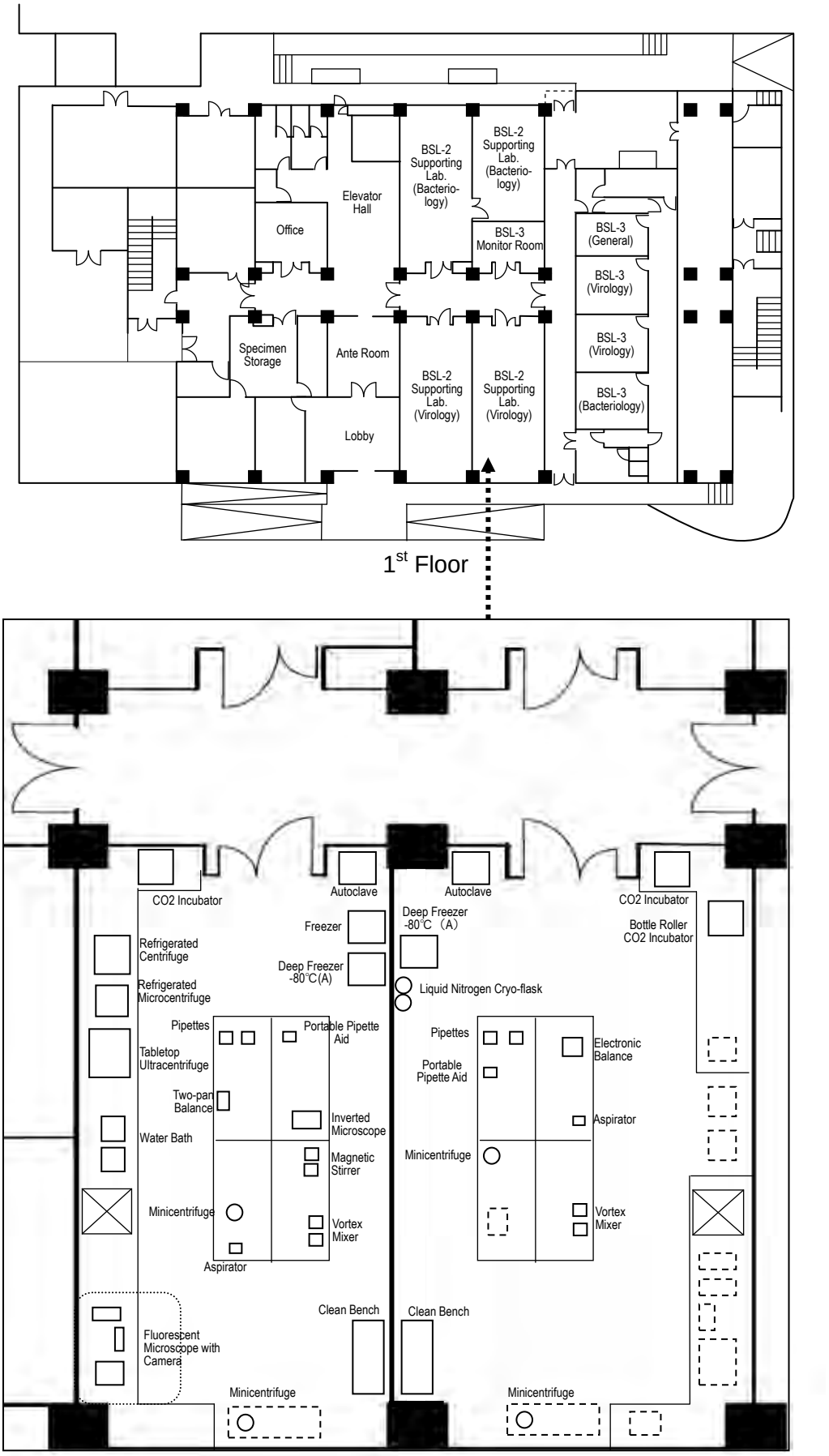


Figure 2-2 Layout Plan for BSL-2 Supporting Laboratory

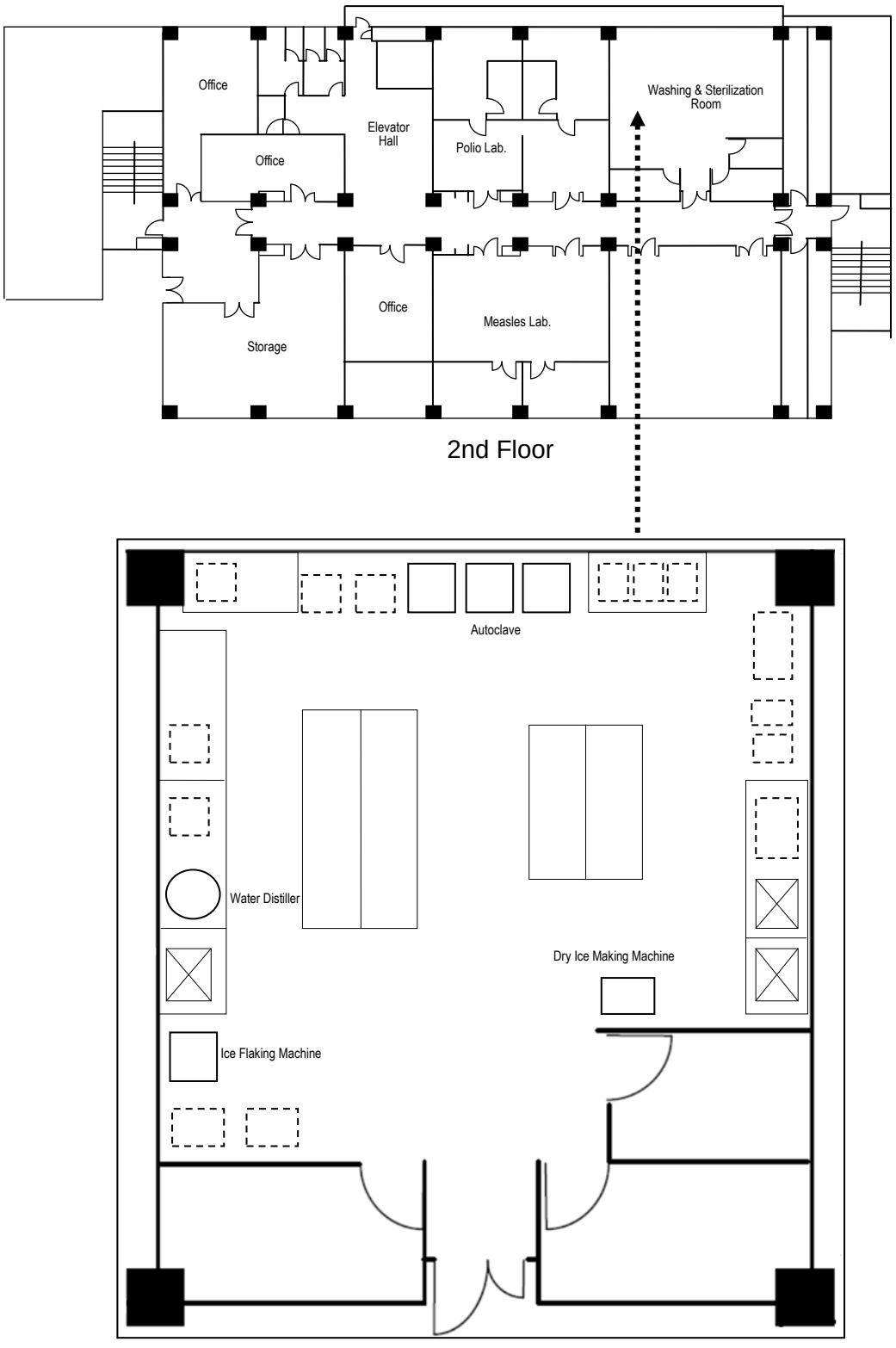


Figure 2-3 Layout Plan for Washing & Sterilization Room

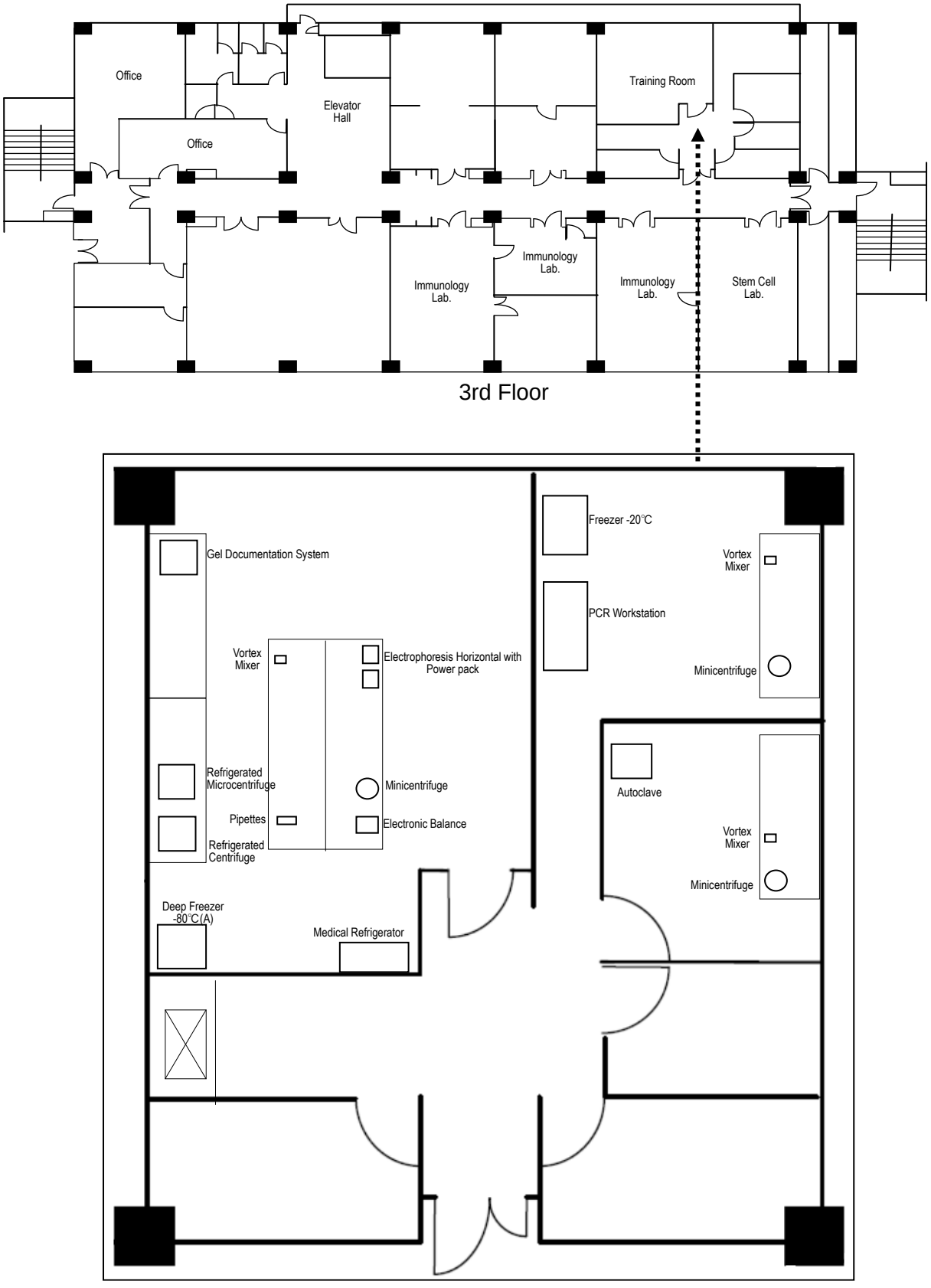


Figure 2-4 Layout Plan for Training Room

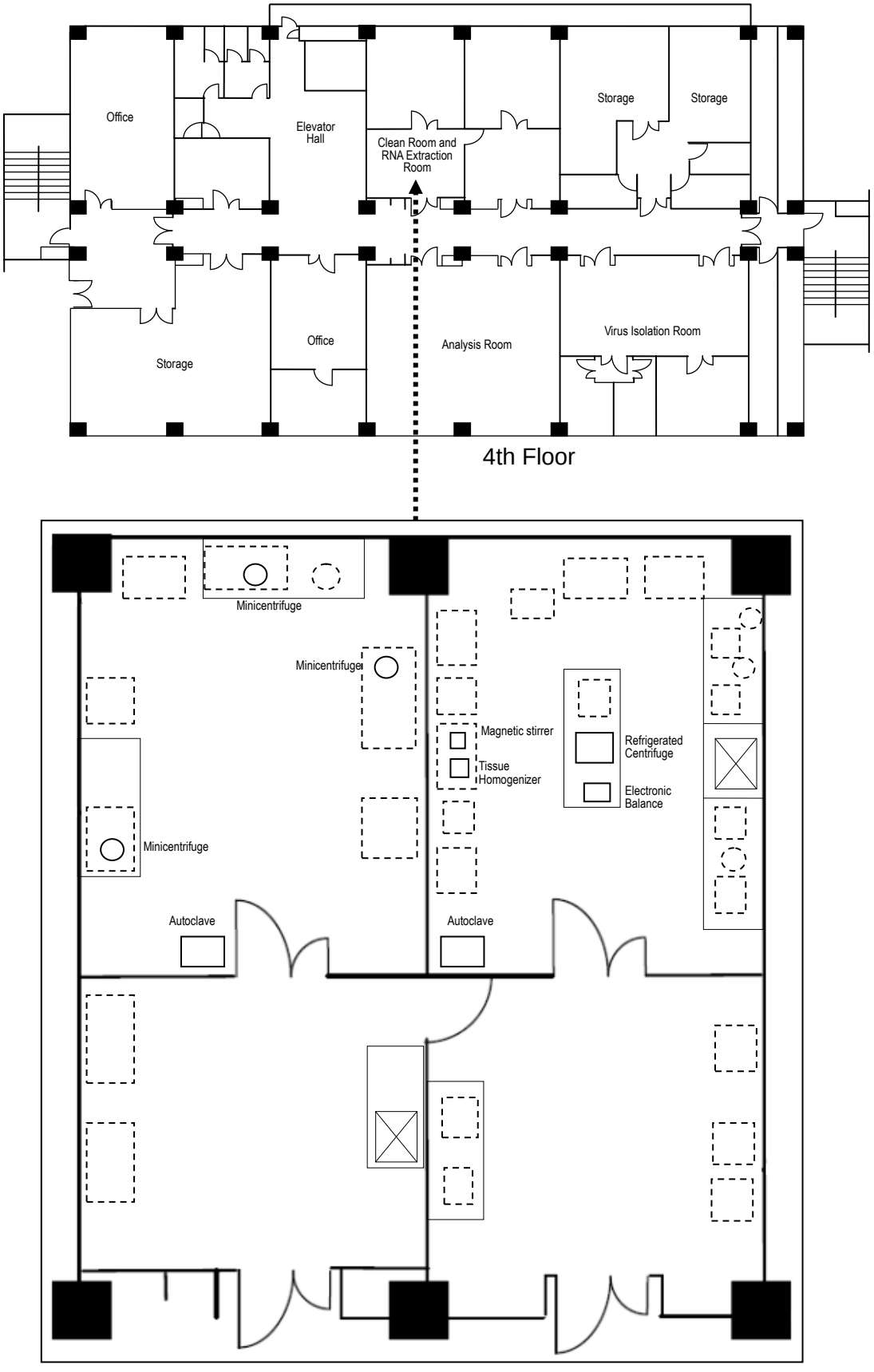


Figure 2-5 Layout Plan for Clean Room/RNA Extraction Room

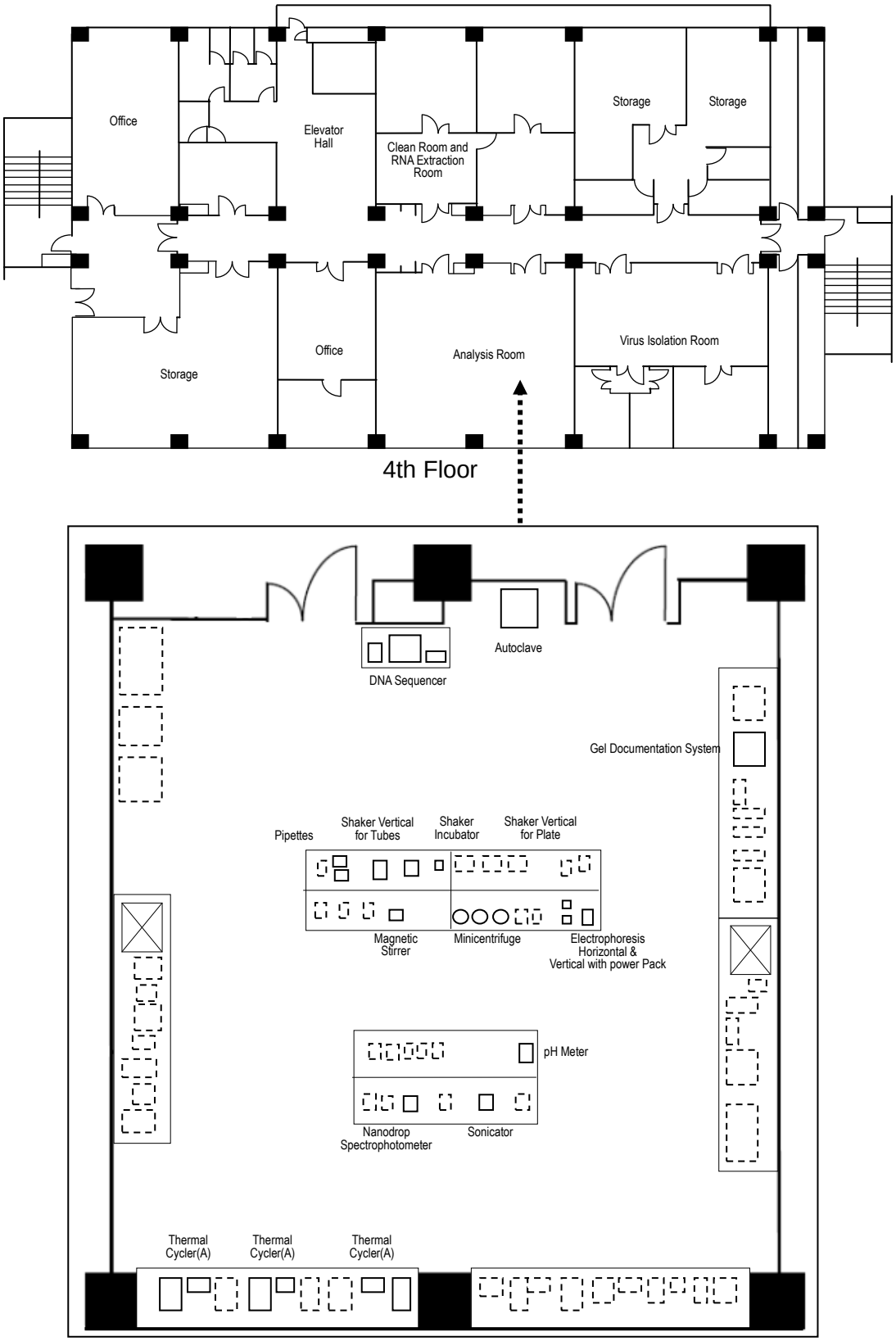


Figure 2-6 Layout Plan for Analysis Room

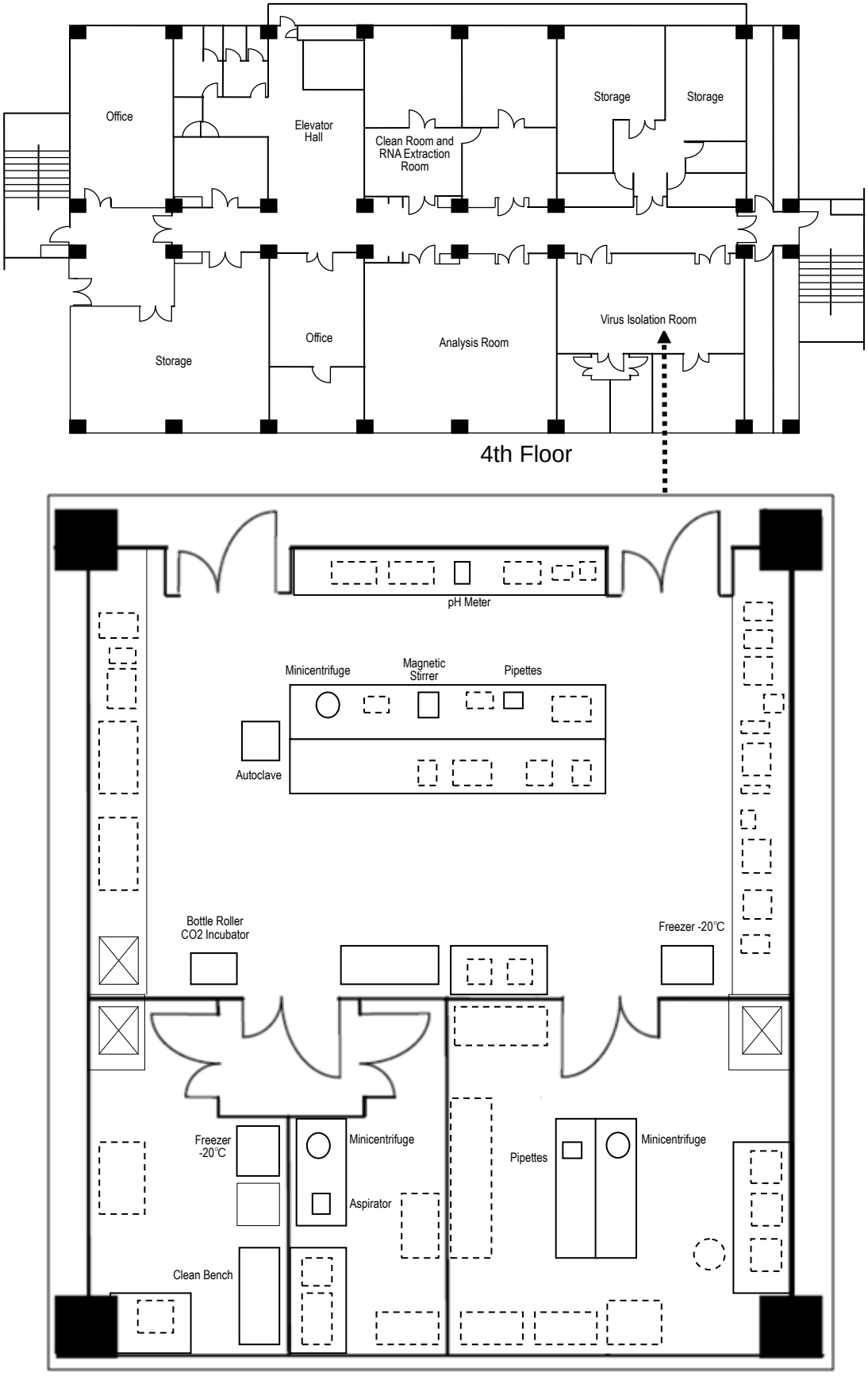


Figure 2-7 Layout Plan for Virus Isolation Room

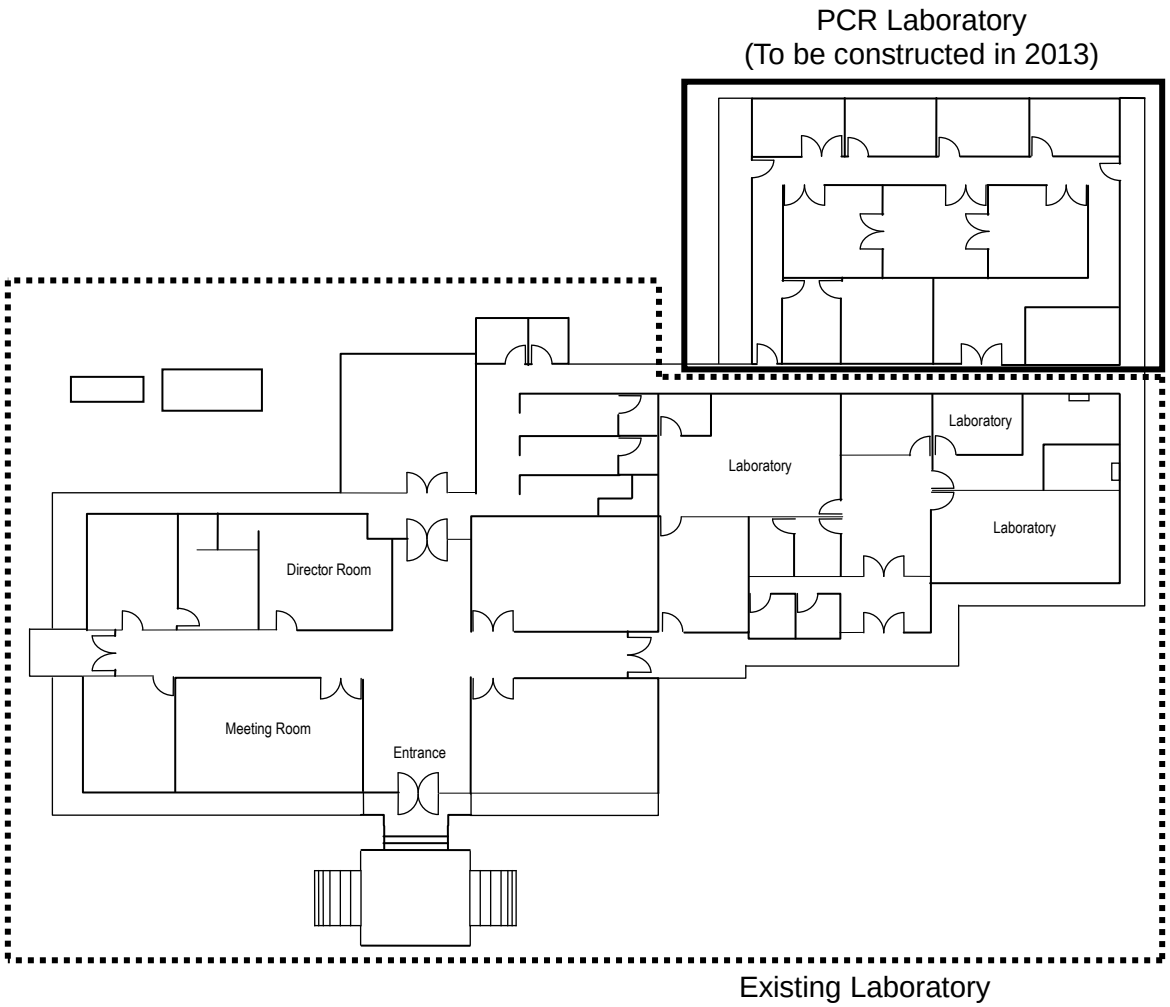


Figure 2-8 Facility of PCR Laboratory

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The project will be implemented in accordance with the grant aid system of the Government of Japan after obtaining the approval of the Japanese Cabinet and after concluding the Exchange of Notes (E/N) between the Indonesian government and Japanese government and the Grant Agreement (G/A) between the Indonesian government and JICA. After the signing of E/N and G/A, the Consultant enters into an agreement with the implementing organization of the recipient country, and the detail design is developed based on this agreement. Thereafter, equipment is procured and installed by a supplier selected in tender bids for Japanese firms.

(1) Implementing Organization

The responsible organization of the project is the Ministry of Health of Republic of Indonesia, and the implementing organization is the National Institute of Health Research and Development (NIHRD).

(2) Consultant

After concluding the E/N and the G/A, NIHRD is to enter into a consultant agreement with regard to the detail design and the procurement supervision with the Consultant. The consultant agreement is to go into effect upon JICA's verification of. To implement the project smoothly, it is essential to close the consultant agreement promptly after the signing of G/A. The Consultant is to carry out the following work based on this agreement.

1) Detail design: Final confirmation of project contents, development of detail design documents (specifications and the other technical documents, tender documents), assistance in tender process, evaluation of tender, assistance in procurement contract.
2) Procurement supervision: Supervision of procurement, installation, operation and maintenance guidance for the equipment.

"Detail design" is a process to determine details of an equipment procurement plan based on the preparatory survey report for the project and the process to develop tender documents comprised of specifications, tender conditions and draft for supplier's contract necessary to select a supplier to supply equipment from Japanese firms. In the tender assistance, the Consultant performs a series of tender-related work such as tender announcement, delivery of tender documents, answering questions, reception and evaluation of bidding documents. Further, the Consultant provides advice to the implementing organization about the equipment procurement contract and reporting to the concerned parties of the Government of Japan.

The procurement supervision means a series of processes to confirm that the project work is implemented in conformance with the procurement contract and to ensure that the contents of the

contract are implemented appropriately and smoothly. To promote the procurement work, the following procedures are to be conducted from an independent standpoint.

1) Confirmation and approval of equipment procurement schedule, equipment specifications, equipment layout drawings and other drawings submitted by the supplier.
2) Confirmation and reporting on progress of procurement based on the equipment procurement schedule.
3) Confirmation of consistency between the procured equipment and the contract document; quality inspection.
4) Confirmation of installation of equipment, explanation on how to operate the equipment, guidance for operation and maintenance.
5) Witness of equipment delivery.

(3) Supplier of equipment

The procurement and installation of the equipment related to this project are to be conducted by the supplier selected in a tender bid for Japanese firms. The supplier shall procure and install equipment based on the equipment procurement contract. Further, the equipment supplier shall give guidance to the Indonesian parties concerned about the operation and maintenance of the supplied equipment. They shall establish an after-sales service system supported by equipment manufacturers and agents so that the recipient country can receive supplies of spare parts, reagents and consumables for a charge as well as technical assistance on a continued basis even after the delivery of the equipment.

2-2-4-2 Implementation Conditions

(1) Opening of bank account and tax exemption procedure by government of recipient country

The equipment in this project is to be procured within a period of 11 months after the signing of G/A. To procure the equipment within this period, the following matters should be strictly complied with:

1) After executing the G/A, the government of the recipient country needs to open a bank account in a bank in Japan and the A/P should be issued based on the project implementation schedule promptly.
2) Upon execution of G/A, a tax exemption procedure should be confirmed immediately, and the tax exemption procedure should be completed within the equipment transportation period (two months). Based on the conventional tax exemption procedure in Indonesia, the tax exemption process is started after completing DIPA registration. Because these processes may take more than two months sometimes, an approach to accelerate the tax exemption procedure should be discussed in such a case with assistance from the JICA.

(2) Management for installation of equipment in CBBTH

CBBTH is a national research institute in Indonesia, and it is necessary to pay attention to the following points with regard to the installation of equipment.

1) Access control

To access CBBTH, visitors should enter the name, organization and contact person in CBBTH in the visitors' list at the reception and undergo an access procedure to receive an access card. Even after completing the access procedure, you cannot enter inside if the contact person is absent. Therefore, it is important to discuss with the concerned party and make necessary arrangements beforehand.

2) Transportation of equipment into and installation in BSL-3 laboratory

When transporting equipment into the BSL-3 laboratory and installing it, it is important to pay attention to the following points:

a) To access the BSL-3 control area, it is necessary to apply for access permission by submitting your personal profile in advance.

b) While BSL-3 laboratories are operated on 24/7 basis normally, all of them should be shut down for sterilizing processes. Therefore, during the installation period of equipment, all the experiments by researchers should be discontinued. Prior consultation and coordination with managers and researchers of BSL-3 laboratories, Biorisk Committee and the other concerned parties are essential.

c) Renewal of the Biosafety Cabinet accompanies the removal and disposal of HEPA filters when transporting the existing Biosafety Cabinet from the site as well as the sterilization of the main unit of the cabinet.

Sufficient attention should be given to the above-mentioned points, because these procedures and coordination might take as long as several months.

3) Transportation of equipment to and installation in BSL-2 laboratory

Before entering each laboratory, the permission of the laboratory manager must be obtained. Therefore, it is important to discuss with the concerned party and make the necessary arrangements beforehand.

With regard to the transportation of equipment to and installation in CBBTH, it is essential to prepare a detailed plan for installation of equipment and to hold prior consultation with the researchers of CBBTH. Particularly, with regard to the plan for installation of equipment in the BSL-3 laboratory, approval of the Biorisk Committee is necessary in addition to the facility manager and the researchers. To ensure that the transportation and installation of equipment do not disturb their research activities, it is essential to carefully manage the installation schedule under close cooperation with the CBBTH parties concerned.

(3) Management for installation of equipment in OBRD Aceh

The procured equipment is to be installed in the PCR laboratory building, which will be built in 2013 with funds from the Indonesian government. This PCR laboratory building is planned to be completed by the time the equipment arrives at the project site. The Consultant needs to keep communicating periodically with the Director of OBRD Aceh to check the progress of the construction work so that any drastic delay of the building completion due to local factors should not affect the procurement of equipment.

2-2-4-3 Scope of Works

The demarcation of the work between Japan and Indonesia sides is clearly defined in order to execute this cooperative project smoothly. The contents of each scope are as listed in Table 2-16 below.

Table 2-16 Scope of Work Table

To be Covered by Japan Side	To be Covered by Indonesia Side
Equipment procurement 1) Equipment procurement 2) Equipment transportation to the project site Equipment installation 3) Equipment installation 4) Test operation, adjustment of equipment 5) Explanation and guidance to recipient parties concerned on how to operate and maintain the equipment	Custom clearance of the equipment 1) Tax exemption procedure Space for equipment installation 2) Securing space for equipment installation 3) Transportation and removal of existing equipment associated with installation of new equipment 4) Offering of provisional storage space for the equipment 5) Securing access for the equipment to be transported in the installation place 6) Modification of facility associated with the equipment installation (if necessary) 7) Supply of electric power, water and drain system necessary for the installation of equipment Others 8) Permissions and procedures necessary for the work 9) Bearing costs for all the related work not included in the Japanese grant aid scheme.

2-2-4-4 Consultant Supervision

The Consultant will enter into a consultant agreement with NIHRD and perform the detail design, tender and procurement supervision of the project.

The purpose of the procurement supervision is to confirm that equipment is being procured in conformance with the contract documents and to ensure appropriate performance of the procurement contract.

(1) Procurement supervision policy

Based on the grand aid system, a project supervision system is to be established to confirm that the supplier's work is being performed as stipulated in the contract documents, and appropriate and streamlined supervision work is being implemented. The procurement supervision policy is as below:

1) To promote implementation of the supplier's work, guidance, advance and coordination are provided from an independent standpoint.

2) With regard to the equipment procured from Japan or third countries, pre-shipment inspection of the equipment is carried out by a third-party inspection organization at ship loading. The Consultant issues an inspection report to the supplier upon confirming the pre-inspection report issued by the third-party inspection organization.

3) Confirms performance of ship loading, marine transport, inland transport, tax exemption and customs clearance and inland transport of the equipment based on the implementation schedule to achieve the project within the contracted period.

4) Confirms plans for transport of equipment to and installation in the project site, test operation and adjustment, guidance for operation and maintenance, and, whenever necessary, provides guidance and coordination.

5) With the witness of the implementing organization, inspection is conducted based on the contract documents to confirm the items of equipment, manufacturer, model, specification and quantity of the procured equipment as well as the equipment condition.

6) After confirming that all the work is completed and the contract conditions are fulfilled, the Consultant witnesses the delivery of the equipment and has completed their work upon obtaining the approval of the Indonesian side.

7) In performing the above-mentioned work the Consultant shall report the progress, payment procedure and completion of the works related to the project to the concerned parties in the Japanese government.

(2) Procurement supervision plan

To achieve the above-mentioned work, the Consultant shall assign supervisor(s) and inspector(s) for the supervision of procurement. The inspector(s) will perform a series of tasks including meeting with supplier, inspecting equipment in Japan, arranging and preparing equipment collation checks before ship loading, confirming inspection certificates and issuing third-party inspection certificates. Supervisor(s) will enter the project site based on the procurement schedule and perform a series of tasks including inspections based on the contract documents, witness of the training for equipment operation and maintenance and confirmation of delivery documents such as operation manuals. Supervisor(s) shall confirm that entire scope of the work stipulated in the supplier's contract has been achieved and witness the final equipment delivery at Jakarta. Further, necessary report items about completion and delivery are to be reported to the Japanese Government parties concerned.

2-2-4-5 Quality Control Plan

With regard to the equipment procured in Japan, the Consultant will inspect all items based on the contract documents at the warehouse in Yokohama Port before ship loading. With regard to the equipment procured in Japan or any third country, pre-shipment inspection of equipment is to be carried out at ship loading by a third-party inspection organization.

2-2-4-6 Procurement Plan

(1) Equipment procurement plan

Most of the equipment to be procured in this project is manufactured in Japan. However, some of the items with the specification requested in this project such as a Tabletop Refrigerated Centrifuge and DNA Sequencer are not manufactured in Japan. Further, procurement of products such as a Tabletop Ultracentrifuge, Electrophoresis, Gel Documentation System and PCR Workstation from third countries is considered, because limiting the scope to Japanese products may result in a failure to carry out a fair tender because it discourages competitive tendering.

The items listed in the Table 2-17 indicate equipment that we expect to be procured from a third country.

Table 2-17 Items of Equipment that is Supposed to be Procured from Third Countries

No.	Name of Equipment	Indonesia	Japan	Third Countries
2	Minicentrifuge		○	○
3	Refrigerated Centrifuge			○
4	Refrigerated Microcentrifuge			○
5	Tabletop Ultracentrifuge		○	○
6	Two-pan Balance		○	○

No.	Name of Equipment	Indonesia	Japan	Third Countries
7	Electronic Balance		○	○
8	Electrophoresis Horizontal with Power Pack		○	○
9	Electrophoresis Vertical with Power Pack		○	○
10	Gel Documentation System		○	○
12	Tissue Homogenizer		○	○
15	Portable Pipette Aid		○	○
16	Repeater Pipette		○	○
17	Pipettes Set, 8 Channels		○	○
18	Pipettes Set, 12 Channels		○	○
19	Pipettes Set, Single Channel		○	○
20	Pipettes Stand		○	○
21	Sonicator		○	○
22	Vortex Mixer			○
23	Shaker Vertical for Plate		○	○
24	PCR Workstation		○	○
26	Shaker Incubator for Cloning		○	○
27	CO2 Incubator		○	○
28	Bottle Roller CO2 Incubator		○	○
36	Liquid Nitrogen Cryo-flask			○
37	Nanodrop Spectrophotometer		○	○
38	Aspirator		○	○
39	DNA Sequencer			○
40	Shaker Vertical for Tubes		○	○
41	Incubator		○	○
43	Clean Bench		○	○
44	Real Time PCR		○	○
45	Thermal Cycler		○	○
47	Dry Ice Making Machine		○	○
48	Maintenance Equipment Set		○	○

(2) Transportation plan

Transportation of equipment from Japan or any third country is done by sea to Tanjung Priok Port in Jakarta. The freight is transported by truck from Tanjung Priok Port to the project site in Jakarta. The equipment is transported to the project site of Aceh from Tanjung Priok Port by land using trucks.

Tanjung Priok Port is a trading port that can accept 40-foot containers, and it takes about one week to go from Japan to Tanjung Priok Port. The project site in Jakarta is located one hour away from the Port by truck and the project site in Aceh is about three days by truck. Because the road condition is good, no significant problem is anticipated for inland transportation. The transportation costs are to be borne by Japan side

2-2-4-7 Operational Guidance Plan

The engineers dispatched by the supplier of equipment will instruct the method of basic equipment operation to the researchers and equipment maintenance technicians on the occasion of equipment delivery and installation. The contents of this instruction shall include guidance on initial operation, points to note in maintenance, explanation of how to make daily checks, and method of simple troubleshooting.

2-2-4-8 Soft Component (Technical Assistance) Plan

Through the Preparatory Survey carried out from July 17 to August 11, 2012, the survey team could identify issues to be addressed in terms of operation and maintenance of BSL-2 and 3 Laboratories. Based on this result, the recipient country requested technical guidance on the following points in an attempt to overcome these issues and asked for continued strengthening of the maintenance system.

(1) Dispatch Japanese long term experts who stay in NIHRD (CBBTH) for two years to provide guidance and evaluation of the experiments and carry out inspections.

(2) Technical assistance targeted for researchers and laboratory technicians

a) Virology laboratories technique

b) Virology informatics

c) Animal handling

d) Biosafety and Biosecurity

e) GLP

f) Overall management of BSL-3 and BSL-2 laboratories including establishment of documentation system

g) Development of Standard Operating Procedures (hereafter “SOP”) and implementation of necessary validation related to Biosafety and Biosecurity for BSL-3 and BSL-2 laboratories

(3) Technical assistance targeted for engineer

h) Improvement of engineers’ technical level for maintenance and its management of BSL-3 laboratory and the preparation of related documents

i) Improvement of engineers’ technical level for maintenance and its management of equipment and the preparation of related documents

j) Improvement of engineers’ technical level for maintenance and its management of entire facilities and the preparation of related documents

Contents agreed upon the discussions and recorded in the Minutes of Discussions during the preparatory survey are as below:

1) Long-term Japanese experts in (1) and items a) to c) in (2) are related to the improvement of general laboratory testing technique. Because laboratory technical assistance for this aspect can be expected from other donors, it is excluded from the scope of technical assistance in this project.
2) Items d) to g) in (2) are related to the overall operation and management techniques for BSL-3 and BSL-2 laboratories, which is included in the scope of the review.
3) Items h) to j) in (3) are related to the improvement of maintenance and its management techniques of BSL-3 and BSL-2 laboratories, equipment, and the entire facilities. Therefore, these items are included in the scope of the review.

Result of review after returning to Japan:

With regard to 2) in the foregoing paragraph, it was found that they include extremely special and professional aspects that are difficult to address within this Soft Component. Accordingly, JICA has decided to consider these requests within the framework of another scheme.

Accordingly, with regard to this Soft Component, it is judged as useful to implement technical assistance that helps meet the requests of the Indonesian side by giving consideration to the issues and current status of this recipient country and based on the assumption that the continuity of the effect of Japanese grand aid can be assured, at least. It was decided to implement guidance by the Consultant at the project site only for the scope mentioned in 3) above. The specific contents of the guidance (activity plan) are as described in the Table 2-18 below.

Table 2-18 Contents of Guidance for Each Output (Activity Plan)

Outputs	Activity Plan		Scope of Guidance
Documents and data related to maintenance and its management are established and appropriately operated, and techniques for operation, maintenance and its management for the facilities and equipment are improved.	1	Documents such as inventory related to maintenance and its management as well as operation and maintenance and its management manuals for facilities and equipment are established, and guidance for operation is implemented.	All 9 maintenance and its management staff in CBBTH
	2	SOPs for operation and control, maintenance method and validation and calibration (to accurately correct measurement devices and instrumentation) of HVAC systems, Biosafety Cabinet, and such like are established and technical guidance is implemented to carry out actual validation.	3 dedicated maintenance staff for BSL-3 laboratory in CBBTH. However, the same guidance is given to the other technicians (4 people in charge of equipment and electric systems), giving consideration to the establishment of a back-up system.

	3	Measurement results are appropriately recorded and analyzed. Then, technical guidance is implemented to create trend data and such like to develop a data management manual.	As above
	4	Technical guidance is implemented for inventory management of consumables and spare parts.	All 9 maintenance and its management staff

For details of the Soft Component plan in this project, see Appendix 5.

2-2-4-9 Implementation Schedule

After signing of the E/N and the G/A between the Government of Indonesia and JICA, NIHRD will enter into a consultant agreement for the detail design and procurement supervision with the Consultant. The implementation schedule thereafter is as indicated in Figure 2-9. The work is comprised of the detail design stage, equipment delivery and installation work by the supplier of equipment, and procurement supervision by the Consultant.

(1) Detail design work

NIHRD and the Consultant will enter into a consultant agreement for detail design (preparation of tender documents) and procurement supervision for the project and this agreement is verified by JICA. Then, the Consultant will prepare the tender documents based on this Preparatory Survey Report upon consultation with NIHRD and obtain approval from NIHRD.

The period necessary for the detail design is estimated to be three months

(2) Procurement of equipment and installation work by the supplier and procurement supervision by the Consultant

The supplier is to start procurement after signing the equipment procurement contract. At the same time, the Consultant will start supervising the procurement.

The period required for the procurement and installation is expected to be seven months. The implementation schedule of the work is as shown in Figure 2-9.

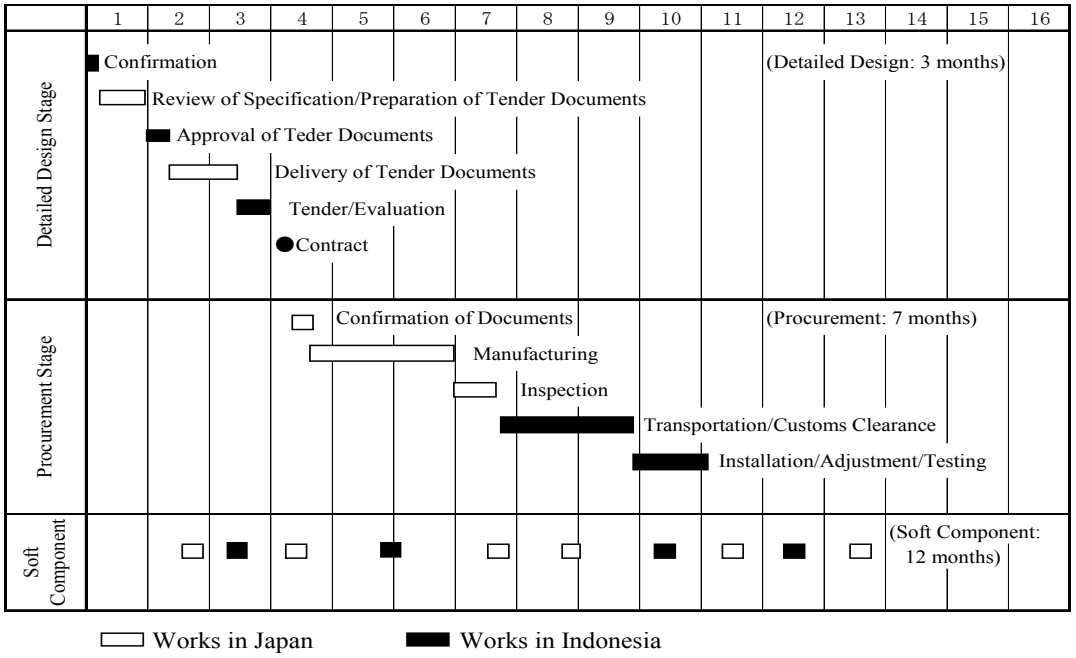


Figure 2-9 Implementation Schedule

2-3 Obligations of Recipient Country

The main items to be done by the Indonesian side in this project are as below:

(1) Equipment installation

1) Securing space for the installation of equipment
2) Transportation and removal of existing equipment associated with installation of new equipment
3) Offering of provisional storage space for the equipment
4) Securing access for the equipment to be transported inside
5) Modification of facility associated with the installation of equipment (if necessary)
6) Supply of electric power, water, drain system and CO_2 gas necessary for the equipment to be installed.

(2) Equipment operation and maintenance

1) Arrangement of suitable manpower for the operation and maintenance of equipment, signing of maintenance contract
2) To secure budget for operation and maintenance of equipment procured through the project

(3) Soft Component

1) Continuation of maintenance contract for BSL-3 laboratory
2) Arrangement of maintenance engineers (9 persons) who will receive guidance
3) Calibration of equipment within the scope of validation (calibration of equipment for which calibration can be outsourced within Indonesia such as temperature sensors)
4) Spare parts and consumables necessary for implementing validation
5) Arrangement of meeting room and seminar room to be used for technical guidance; preparation of video camera, digital camera, recording paper and office supplies
6) Arrangement of (air-conditioned) office for Japanese consultants free of charge (including the use of Internet connection, telephone and copy machine.)
7) Items necessary for technical guidance other than those mentioned in 1) to 7) above.
8) Disclosure of the following documents related to BSL-3 and BSL-2 laboratory buildings, HVAC system, hygienic system and water supply and drain systems, electric system, biosafety cabinet and Autoclave: Various rules and provisions, criteria and guidelines established by CBBTH on its own; SOP list and a set of SOPs related to it; basic and detailed design drawings, As Built Drawings, photos at completion; technical specifications; manufacturing drawings; a set of operation and maintenance manuals; detailed accreditation materials by a certifying body; activity records of Biorisk Committee including minutes; other BSL-3 laboratory related documents

(4) Procedures

1) Banking Arrangement (B/A) and Authorization to Pay (A/P) as well as bearing of charges associated with the forgoing.
2) Prompt unloading, tax exemption procedure and custom clearance for the procured equipment.
3) Take necessary measures for the stay and pursuit of the project in Indonesia for Japanese staff and the staff of the third country who intend to deliver the equipment and to achieve the related work based on the verified contract.
4) Exemption of custom duties and any applicable tax in Indonesia for Japanese staff and the staff of the third country who intend to deliver the equipment and to achieve the related work based on the verified contract.
5) Permissions, licenses and other actions necessary for the project.
6) Bearing of all the other expenses necessary for the project that are not included in the grant aid scheme.

2-4 Project Operation Plan

(1) Personnel Plan

The responsible organization of this project is the Ministry of Health, and NIHRD is the implementing organization. The target facilities in this project are CBBTH, one of four centers conducting health-related research under NIHRD and OBRD Aceh, a regional research institute, which is also under NIHRD. OBRD Aceh is one of eleven regional research institutes (nine of which are conducting research on infectious diseases).

CBBTH consists of eleven laboratories including a bacteriology laboratory, virology laboratory, immunology laboratory, stem cell laboratory, parasitology laboratory, mammalogy and reservoir laboratory, pharmaceutical laboratory, biomarker laboratory, experimental animal laboratory, BSL-3 Laboratory, and food and nutrition laboratory. Of which, the virology laboratory and BSL-3 Laboratory (general laboratory, virology laboratory (1), virology laboratory (2)) are the targets of this plan. CBBTH was being operated, maintained, and managed by 219 staff in 2011, and the breakdown is 93 researchers, 27 laboratory technicians, two document managers, and 97 staff for miscellaneous operations. Of these staff, a total of 28 staff including 21 researchers and 7 laboratory technicians from the virology laboratory, one medical doctor and three technicians from BSL-3 Laboratories will be directly involved with this plan. Since the number of staff is sufficient, the facilities will be operated under the same system after the implementation of this project, but the operational capacities must be improved.

Current problems include insufficient preparation of documents concerning policies such as document management rules, safety management rules, and safe operation rules to operate BSL-3 Laboratories and SOP documents for implementing actual operations. Also, no document is signed, meaning that the management of these documents is not sufficient. In addition, concerning the handling of abnormality, the only available document is the one which describes movement of people with no description of specific measures. These situations indicate a great concern over systems to safely operate BSL-3 Laboratory. The accreditation of BSL-3 Laboratory is only based on infrastructures, and systems and operations are not included. Thus, it is an urgent task to strengthen the abilities and skills of staff to safely operate the facilities.

The staff at CBBTH do not have sufficient knowledge and experience, and it is difficult for them to solve these problems by themselves. Therefore, the staff at each department at CBBTH must cooperate with each other and prepare necessary documents including documents on policies for conducting operations while receiving technical support. Then, the staff must learn proper methods of operations including validations to secure safety and reliability based on the prepared and approved rules and documents such as SOP documents.

OBRD Aceh has procured some of the equipment needed for PCR testing such as Real-time PCR machine and started PCR testing on malaria, but the available space at the current facility is insufficient; thus, the expansion of PCR Laboratory is being planned. The PCR Laboratory is to

be added using the government budget of Indonesia in 2013. Also, the number of staff, which was initially 27, is going to be increased to 41 as equipment are procured in this plan, which means there would be no problem with the number of staff. The equipment procured through this plan does not include complicated machines, and there should be no problem with the operation. Yet, the improvement of skills concerning PCR testing must be continued with the support of the Eijkman Institute, CBBTH or other institutions.

(2) Maintenance Plan

1) CBBTH

The maintenance and management of CBBTH are conducted in two groups: the group of the entire facility and the group of BSL-3 Laboratory.

The group of the entire facility consists of a total of five people including one leader (in charge of laboratory equipment and electricity), two building staff, one electrician, and two device staff (one for machineries and one for testing devices). There are three technicians specifically assigned to BSL-3 Laboratory including two staff in charge of air conditioning/ventilation systems and water supply and wastewater and one electrician under the leader (medical doctor). There are a total of eight technicians combined with the group of the entire facility. Fig. 2-10 shows the maintenance system of CBBTH.

The overall facility and equipment maintenance and management of BSL-3 Laboratory is outsourced to a maintenance firm. Two full-time engineers are assigned to CBBTH from the outsourced Indonesian company and conducting all daily operations involving BSL-3 Laboratory.

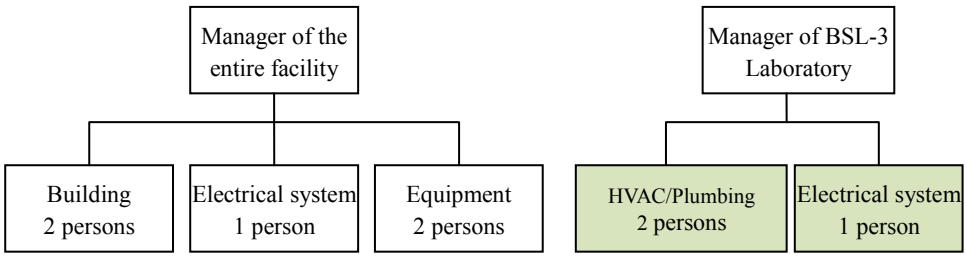


Figure. 2-10 CBBTH Maintenance System

These eight technicians do not have experience in the maintenance and management of the BSL-3 Laboratory. They have only received three days of training at the Eijkman Institute. The maintenance and management technician at BSL-3 Laboratory only receives reports from engineers from the outsourced company and does not conduct sufficient analysis and evaluation on the reports. Thus, there is a need to improve the maintenance and management skills through the implementation of Soft Component.

The equipment procured through the project will be maintained by the aforementioned two engineers. These two engineers have such a skill level as to repair mechanical equipment such as autoclave and water distiller, so some items of equipment are repaired within the

CBBTH. Periodical inspections and repairs for electronic devices such as analyzers are outsourced to the agents in Indonesia or countries in the vicinity. The same approach will be used for maintenance of similar equipment to be procured through the project.

It is essential to improve the maintenance system for the existing equipment in CBBTH and for the equipment to be procured through the project. The aim is to improve technicians' skills by making positive use of the Soft Component. The following points are essential with regard to equipment-related maintenance work related to equipment.

a) Periodical inspection

Equipment at CBBTH is grouped into those for which the existing maintenance engineer can perform periodical inspection and those whose inspection needs to be outsourced to agents or such like. Equipment for which periodical inspection can be conducted within the CBBTH and those requiring outsourcing is to be grouped, and periodical inspection following the planned inspection schedule is to be carried out.

b) Performance inspection of equipment

Including the equipment to be procured in this project, the Biosafety Cabinet requires periodical replacement of HEPA filters and performance inspection as a part of maintenance. It should be confirmed periodically that autoclaves have the necessary functions (internal sterilization temperature and hold time). It is desirable that the maintenance engineers of the facility can carry out performance inspection for these items of equipment. The performance inspection for analyzers such as the DNA sequencer and PCR machine are to be outsourced to agents and such like.

c) Preventive maintenance

Currently, no periodical maintenance takes place. Only when a failure occurs does the staff take some action such as obtaining a spare component. The current maintenance engineers and engineers of agents of equipment will perform periodical maintenance including the equipment to be procured in this project in an attempt to achieve preventive maintenance. Further, a maintenance system is to be built that enables prompt repair in the event of failure of equipment.

d) Inventory and budgeting for spare parts and consumables

Currently, the spare parts and consumables are procured when necessary by submitting a budget request. Sometimes, it takes a long time to repair damaged equipment. With regard to spare parts of equipment for which the existing engineers of the facility directly perform periodical maintenance and repair, a maintenance activity plan including the maintenance cost is to be developed so that

the spare parts and consumables necessary for the equipment operation can be procured in a timely manner.

2) OBRD Aceh

This is a relatively small facility, and three technicians are maintaining and managing the facility, equipment, and network. They are conducting relatively simple repairs and outsourcing complicated repairs to contractors or other companies.

Equipment procured through this plan does not include equipment which requires complicated maintenance, except for the biosafety cabinet; thus, the current technicians are probably capable of handling them. Periodical inspection of the biosafety cabinet, including the HEPA filter replacement and inspection of the functions, is outsourced to companies in Jakarta or Singapore.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

(1) Cost and Expense of Indonesian side Obligatory Works

Cost and expense of Indonesian side obligation are as indicated in the Table 2-19 below.

Table 2-19 Cost and Expense of Indonesian side Obligatory Works

Item	Expenses (IDR)
Replacement of HEPA filters of three existing biosafety cabinets in the BSL-3 laboratories before transferring to the other laboratories	72,289,000
Expenses necessary for calibration of equipment within the scope of validation, provision of spare parts and consumables necessary for implementing validation and so on for Soft Component	120,482,000
Banking Arrangement	25,663,000
Total Amount	218,434,000

(2) Conditions for Cost Estimation

1) Time of cost estimate August 2012

2) Currency exchange rate (Average TTS rate)

1US$ = JPY81.06

1IDR = JPY0.0083

3) Project period: Periods for detail design and procurement of equipment are as shown in the implementation schedule.

4) Others: The expenses above are estimated in accordance with the grant aid system of the Government of Japan.

2-5-2 Operation and Maintenance Cost

(1) Operation Cost

CBBTH and OBRD Aceh, the target facilities of this plan, were built in 2009, and the number of years in operation is still relatively small. Thus, as shown in Table 2-20 and Table 2-21, the budget and expenditures in three years from 2009 to 2011 indicate fluctuations. In CBBTH, the expenditure was 11,148 million IDR in 2010 when one BSL-3 Laboratory and four BSL-2 Laboratories began to be used. In 2011, the number of BSL-2 Laboratories increased from six to ten rooms, and the expenditure

also increased by 2,503 million IDR and became 13,650 million IDR. Nevertheless, the budget for 2011 was 9,845 million IDR, the same as 2010, and the expenditure in 2011 was 3,805 million IDR over the budget. The amount of expenditure exceeding the budget in 2010 and 2011 was provided from the overall budget of NIHRD.

The budget of OBRD Aceh in 2012 was increased by 422 million IDR due to situations such as that the facility started some of the PCR tests from 2012.

Table 2-20 CBBTH's Budget and Expenditure in the years 2010 and 2011

(Unit: 1,000IDR)

Fiscal Year	2009	2010	2011	Remarks
(a) Budget	901,582	9,845,440	9,845,440	
(b) Expenditure	-	11,147,900	13,650,500	
(a) – (b)	-	-1,302,460	-3,805,060	The balance is supplemented with a budget of NIHRD

Note: Personnel expenses and costs for fuel and light of the facility are not included in the table above because they are are borne by NIHRD.

Table 2-21 OBRD Aceh's Budget and Expenditure in the years 2010 and 2011

(Unit: 1,000IDR)

Fiscal Year	2009	2010	2011	Remarks
(c) Budget	1,475,946	890,647	2,638,360	
(d) Expenditure	1,475,946	890,647	2,638,360	
(b) – (b)	0	0	0	

Note: Personnel expenses and costs for fuel and light of the facility are not included in the table above because they are are borne by NIHRD.

(2) Maintenance Cost

1) CBBTH

Because the equipment to be procured in this project contains some renewal components, there will be some cost increase from the reagent, consumables and spare parts for the additional number of units, basically. An estimate of yearly increase in operation and maintenance costs is indicated in Table 2-22. However, as indicated in the below table, a relatively small number of parts require yearly replacement. The estimate includes costs of the HEPA filter for the Biosafety Cabinet that requires replacement every other year and the packing of the Autoclave that requires replacement every five years. Thus, the estimated amount is the average costs considered to be incurred in a year. Further, as indicated in this table, an expensive reagent for the DNA sequencer contributes to such an extremely expensive maintenance cost. Because approximately 24 million IDR is spent in a cycle, the maintenance costs fluctuate drastically depending on the frequency of diagnosis and studies conducted in a year.

Table 2-22 CBBTH's Additional Maintenance Cost of the Equipment to be Procured Through the Project

(Unit: IDR)

No.	Name of Equipment	Quantity	Consumables/ spare parts	Unit Pirce	Total
1	Autoclave	13	Packing[1)], HEPA filter[1)]	3,002,410	39,031,330
2	Biosafety Cabinet	3	HEPA filter[2)], Fluorescent lamp, UV lamp	14,457,831	43,373,493
3	PCR Workstation	1	HEPA filter[2)], Prefilter[2)], Fluorescent lamp, UV lamp	8,433,735	16,867,470
4	DNA Sequencer	1	Reagent[3)]	146,963,855	146,963,855
5	Clean Bench	3	HEPA filter[2)], Fluorescent lamp, UV lamp	11,445,782	34,337,346
6	Water Distiller	1	Heater[2)]	4,337,349	4,337,349
7	Dry Ice Making Machine	1	Solenoid valve[1)]	1,445,783	1,445,783
8	Others (5% of the amount above) [4)]	1		14,317,831	14,317,831
	Total				300,674,457

Remarks: [1)] Assuming that they are replaced every 5 years.
[2)] Assuming that they are repleced every 2 years.
[3)] Assuming that will have 6 runs a year.
[4)] For consumable and spare parts for other items of equipment that are not listed in this table.

Meanwhile, concerning the maintenance and management cost of the facilities, this project does not include repairs of the facilities, and NIHRD is responsible for paying utility costs; thus, the facility maintenance and management cost at CBBTH will remain the same. The increase in the utility cost paid by NIHRD comes from the increased amount of electricity used mainly by deep freezer, freezer, and medical refrigerator (several units), meaning that the influence on the expenditure of NIHRD due to the implementation of this plan is extremely small.

As shown in Table 2-23, the 300.67 million IDR for the maintenance and management cost to be increased in a year for the equipment procured in this plan is about 2.2% of the maintenance and management cost in 2011. This increase is well within the range that can be paid by the budget of NIHRD.

Table 3-23 CBBTH's Maintenance Estimation Cost

(Unit: 1,000IDR)

Fiscal Year	2011	After Implementation of the Project	Remarks
1. Research expenses	7,725,000	7,725,000	
2.Maitenance cost of the facility	1,325,700	1,325,700	
3.Maintenance cost of BSL-3 laboratory	3,260,000	3,260,000	
Sub-total	12,310,700	12,310,700 (assuming no rate increase)	
4. Maintenance cost of equipment		1,339,800	
		＋300,674	Additional cost due to the supply of equipment through the project
	1,339,800 100%	1,640,474 122.4%	
Total	13,650,500 100%	13,951,174 102.2%	

2) OBRD Aceh

Table 2-24 indicates an estimate of yearly operation and maintenance costs necessary for procurement of spare parts and consumables to be used for the equipment procured within the framework of this project. As was the case with the aforementioned CBBTH, many of the components requires replacement every other year or only once in five years. Thus, the estimated amount is the average costs considered to be incurred in a year.

Table 2-24 OBRD Aceh's Additional Maintenance Cost of the Equipment to be Procured Through the Project

(Unit: IDR)

No.	Name of Equipment	Quantity	Consumables/ spare parts	Unit Pirce	Total
1	Autoclave	1	Packing[1)], HEPA filter[1)]	3,002,410	3,002,410
2	Biosafety Cabinet	1	HEPA filter[2)] Fluorescent lamp, UV lamp	14,457,831	14,457,831
3	PCR Workstation	1	HEPA filter[2)], Prefilter[2)], Fluorescent lamp, UV lamp	8,433,735	8,433,735
4	Thermal Cycler	1	Reagent, Tube, etc. [3)]	15,060,240	15,060,240
5	Dry Ice Making Machine	1	Solenoid valve[1)]	1,445,783	1,445,783
	Total				42,399,999

Remarks: [1)] Assuming that they are replaced every 5 years.
[2)] Assuming that they are repleced every 2 years.
[3)] Assuming that they will have 100 specimens a year.

Meanwhile, concerning the maintenance and management cost of the facilities, the equipment to be procured through the project will be installed in the new facility that NIHRD is responsible for paying utility costs; thus, the facility maintenance and management cost at OBRD Aceh will not be increased.

As shown in Table 2-25, the 42.40 million IDR for the maintenance and management cost to be increased in a year for the equipment procured in this plan is about 1.6% of the maintenance and management cost in 2011. This increase is well within the range that can be paid by the budget of OBRD Aceh.

Table 2-25 OBRD Aceh's Maintenance Estimation Cost

(Unit: 1,000IDR)

Fiscal Year	2011	After Implementation of the Project	Remarks
1. Research expenses	2,383,735	2,383,735	
2.Maitenance cost of the facility	187,338	187,338	
Sub-total	2,571,073	2,571,073 (assuming no rate increase)	
3. Maintenance cost of equipment		67,287	
		＋42,400	Additional cost due to the supply of equipment through the project
	67,287 100%	109,687 163.0%	
Total	2,638,360 100%	2,680,760 101.6%	

Chapter 3. Project Evaluation

CHAPTER 3. PROJECT EVALUATION

3-1 Preconditions

The preconditions for implementing the Project are as follows:

(1) Implementation of the obligations of the recipient country according to the implementation schedule of the project

An important aspect for smoothly implementing the whole project is that the works are done by the Indonesian side described in "2-3. Obligations of Recipient Country" are implemented at proper timing.

(2) Construction of the new PCR Laboratory in OBRD Aceh

OBRD Aceh has started PCR testing in the existing laboratories, but the small space is making it difficult to conduct the tests. Thus, there is a plan to construct a new PCR Laboratory next to the current facility with the budget of the Indonesian government. Since the planned equipment is to be installed in the new facility, the construction must be completed before the delivery of the equipment.

(3) Tax exemption procedure for procuring equipment

Tax exemption procedure for the equipment to be procured through the project cannot be started unless the DIPA (budget execution plan) registration is completed in advance at Ministry of Finance. DIPA registration is a complicated and time-consuming procedure to be carried out by the Ministry of Finance and Ministry of Health. Smooth implementation of equipment supply requires that the Indonesian side quickly performs DIPA registration procedure after signing G/A, and that DIPA registration be completed before starting tax exemption procedure.

3-2 Necessary Inputs by Recipient Country

(1) Allocation of engineers

A total of 219 staff run CBBTH currently, and the same operation system will continue after the implementation of this plan. However, because of the construction of a new PCR Laboratory in 2013, there is a plan to increase nine staff to OBRD Aceh when equipment supply is completed. Thus, the allocation of proper number of staff is required to properly run the facility.

(2) Allocation of supplied equipment

There is an undeniable possibility that the completion of a new PCR Laboratory at OBRD Aceh will be delayed and will not be able to be completed within the implementation period of this plan. In such cases, the Indonesian side must allocate equipment by themselves and properly install them in accordance with installation manuals provided by the supplier in advance.

(3) Environmental and Social Considerations

Infected waste from CBBTH is supposed to be incinerated in their incinerator installed in the facility, which was out of order at the time of the preparatory survey. The renovation of that incinerator was completed in January 2013, and the staff was waiting for the distribution of manuals and training on operations by the manufacturer. Outsourcing of collection and treatment of infected waste shall be continued until proper incineration operation, maintenance, and management are established in CBBTH.

3-3 Important Assumptions

BSL-3 laboratory of CBBTH is being used under the certification by Basler & Hofmann in Singapore. Yet, this certification is limited to facilities (infrastructures) and does not include uses and operations. There is a need to establish rules such as document management rules and safety management rules to properly use BSL-3 laboratory as described in "(1) Personnel Plan" in "2-4 Project Operation Plan" and prepare documents such as SOP to properly implement operations. In addition, abilities and skills of staff must be strengthened and improved to safely use the laboratory. It is important that staff of each department in CBBTH receive technical support and first prepare documents including necessary overview documents for operations to achieve and maintain the effects of this project. A necessary external condition is that staff then learn proper operation methods including validation to secure safety and reliability based on approved rules and documents such as SOP.

3-4 Project Evaluation

3-4-1 Relevance

The relevance of the Project implemented in accordance with the Japanese grant aid scheme is confirmed in the following aspects:

(1) Beneficiaries of this project

Target facilities of this project, CBBTH and OBRD Aceh, are positioned as the country's central laboratory and research facility to provide diagnosis services and to conduct infectious disease research, and these functions are strengthened by improving the laboratory equipment for infectious diseases. As a result, the response capability of Indonesia in terms of emerging and re-emerging infectious diseases including avian influenza and the capability of Indonesia to prevent the spread of infectious diseases within the country and to neighboring countries will be enhanced.

(2) Compatibility with the national health policy of the recipient country

Indonesia regards responses to avian influenza and emerging and re-emerging infectious diseases as one of the most important issues in the "Strategic Plan of the Ministry of Health 2010-2014." They set a goal of achieving nationwide implementation of early warning response system and establishing a system to issue warning within 24 hours of an outbreak by 2014. In relation to this policy, Ministry of Health is strengthening its capability to diagnose infectious diseases in Indonesia and positions this project to strengthen the functions of CBBTH and OBRD Aceh under NIHRD which are the target facilities of this project. Therefore, this project is considered adequate due to its high compatibility with the national health policy of Indonesia and the implementation is considered relevant.

(3) Necessity of improving equipment

NIHRD is a government research institute that handles avian influenza and other infectious diseases in Indonesia, and CBBTH with BSL-3 laboratory and BSL-2 laboratory, which were constructed in 2009 to provide diagnosis services and conduct research on avian influenza and other infectious diseases. With the national budget of Indonesia and the assistance of other donors, some of the equipment such as CO2 incubator, deep freezer, and real-time PCR, etc. necessary for carrying out research and diagnostic services including identification and characterization of avian influenza virus, as well as emerging and re-emerging infectious diseases were installed, and the use of the laboratories started in 2010. In these laboratories, however, some additional equipment such as biosafety cabinets, etc. urgently needs to be installed to fulfill its functions. In OBRD Aceh, a research laboratory under NIHRD that performs diagnosis and research about emerging and re-emerging infectious diseases, including avian influenza, there is a plan to construct a new PCR Laboratory with the national budget of Indonesia, but they have not obtained the funding for the supply of equipment for diagnosis and research of those infectious diseases.

Under such circumstances, there is an extremely high necessity for the supply of laboratory equipment for diagnosis and research on infectious diseases for CBBTH and OBRD Aceh through the Project.

(4) Environment and social influences

CBBTH safely handles contaminated waste by collecting it in designated plastic bags which are clearly labeled for handling waste, processing it in high-pressure steam sterilizer, and outsourcing final disposal to external specialized waste processing company to be incinerated. Higher safety will be secured with the currently installed incinerator by renovating it such as adding a combustion burner to strengthen its performance. OBRD Aceh also has its own incinerator with which infected waste is disposed of through incineration.

The safety of the outside of these facilities is secured, because exhaust air from BSL-3 laboratory goes through a high-performance HEPA filter to prevent pathogens from spreading, and a special decontamination system is installed for treating drainage water.

Based on these observations, there is no influence to the surrounding environment as long as the facilities are properly operated.

(5) Compatibility with the aid policy of the Japanese government

This project is compatible with the following aid policies and directions of Japan.

1) The Japanese government regards measures to prevent infectious diseases on a global scale as one of the important tasks in relation to the "Okinawa Infectious Diseases Initiative" announced in the Kyushu-Okinawa Summit in 2000.

2) "Global Health Policy 2011-2015" that the Japanese government announced in September 2010 mentioned the importance of preparedness for emerging and re-emerging infectious diseases and international cooperation in relation to the Millennium Development Goals (MDG6).

3) The "Country-specific Aid Plan for Indonesia" formulated in April 2004 positions "improvement of medical healthcare services" as one of the important fields and aspects in the "Development of democratic and fair society" category, and focused aid for countermeasures against infectious diseases is announced.

3-4-2 Effectiveness

The effectiveness of this project is recognized, because this project is expected to have quantitative and qualitative effects to control and re-emerging infectious diseases including avian influenza.

(1) Quantitative effects

Table 3-1 Effectiveness of the Project

Indicator (CBBTH)	Baseline (2012)	Target (2017)
Number of AI tests carried out in BSL-3 laboratories	120	500
Type of specimens (diseases) handled in BSL-3 laboratories	1	4
Type of tests carried out in BSL-3 laboratories	2	5
Number of tests carried out for seasonal influenza (tests per year)	3,761(2011)	5,000
Number of trainees for PCR in the training room of CBBTH	0	100
Indicator (OBRD Aceh)	Baseline (2012)	Target (2017)
Type of specimens (diseases) tested by PCR tests	0	2 or more

(2) Qualitative effect

The following qualitative effects are expected from the implementation of the project.

(i) Enabling epidemiological responses to outbreaks within 24 hours
(ii) Enabling proper and safe control of emerging and re-emerging infectious diseases
(iii) Ensuring the safety of researchers and the safe disposal of contaminated waste from laboratories

Appendices

1. Member List of the Survey Team

Preparatory Survey (July 16 to August 12, 2012)

No.	Name	Assignment	Organization
1	Dr. Mitsuhiro USHIO	Leader	Executive Technical Adviser to the Director General, Human Development Department, Japan International Cooperation Agency
2	Dr. Masato TASHIRO	Infectious Disease Control 1	Director, Center for Influenza Virus Research, National Institute of Infectious Diseases
3	Dr. Hitoshi MURAKAMI	Infectious Disease Control 2	Medical Officer, 2nd Expert Service Division, Bureau of International Medical Cooperation, National Center for Global Health and Medicine
4	Ms. Maki OZAWA	Planning Management	Assistant Director, Grant Aid Project Management Division2, Financing Facilitation and Procurement Supervision Department, Japan International Cooperation Agency
5	Mr. Makoto SUZUKI	Project Manager & Equipment Planner	Nihon Sekkei MedicalCore, Inc.
6	Mr. Motohiro OKADA	Laboratories and Utilities Planner	Nihon Sekkei International, Inc.
7	Mr. Shuzo ISHIKAWA	Operation and Maintenance Planner 1	Nihon Sekkei, Inc.
8	Mr. Nobuyuki SOMEKAWA	Operation and Maintenance Planner 2	Nihon Sekkei, Inc.
9	Ms. Yoko YAMAMOTO	Equipment Procurement & Cost Planner	Fujita Planning Co., Ltd.

Explanation on Draft Report (October 28 to November 3, 2012)

No.	Name	Assignment	Organization
1	Mr. Takaaki Oiwa	Leader	Senior Representative, JICA Indonesia Office
2	Ms. Miho KYOGUCHI	Planning Management	Associate Expert, Health Division 3, Health Group 2, Human Development Department, Japan International Cooperation Agency
3	Mr. Makoto SUZUKI	Project Manager & Equipment Planner	Nihon Sekkei MedicalCore, Inc.
4	Mr. Shuzo ISHIKAWA	Operation and Maintenance Planner 1	Nihon Sekkei, Inc.

2. Study Schedule

Preparatory Survey (July 16 to August 12, 2012)

	Team Member / Date	Official Member				Consultant				
		Leader	Infectious Disease Control 1	Infectious Disease Control 2	Project Planning	Project Manager/Equipment Planner	Laboratories and Utilities Planner	Operation and Maintenance Planner-1	Operation and Maintenance Planner-2	Equipment Cost and Procurement Planner
1	16-Jul (Mon)					・Dep. Narita→Ar. Jakarta				
2	17-Jul (Tue)					・Meeting at NIHRD				
3	18-Jul (Wed)					・Survey/Discussion at NIHRD		・Dep. Narita →Ar. Jakarta		
4	19-Jul (Thu)					・Survey/Discussion at NIHRD				
5	20-Jul (Fri)					・Survey/Discussion at NIHRD ・Visit to Eijkman Institute				
6	21-Jul (Sat)					・Internal Meeting/Preparation of Documents				
7	22-Jul (Sun)					・Internal Meeting/Preparation of Documents			・Dep. Narita →Ar. Jakarta	
8	23-Jul (Mon)	・Dep. Narita →Ar. Jakarta, Internal Meeting				・Survey/Discussion at NIHRD, Internal Meeting				
9	24-Jul (Tue)	・Courtesy Call to Senior Advisor to the Minister of Health ・Visit to CBBTH ・Courtesy Call on Embassy of Japan ・Meeting at JICA Indonesia Office				Together with official members	・Survey/Meeting at NIHRD			
10	25-Jul (Wed)	・Visit to NHIRD ・Visit toUSAID ・Visit to WHO				Together with official members	・Survey/Meeting at NIHRD			
11	26-Jul (Thu)	・Preparation of Documents	・Dep. Jakarta →Ar. Surabaya ・Visit to Airlanga Univ.	→Ar. Jakarta		Together with official members	・Dep. Jakarta→Ar. Surabaya ・Visit to Airlanga Univ.			
12	27-Jul (Fri)	・Preparation of Documents	・Dep. Surabaya→Ar. Jakarta ・Internal Meeting	Jakarta		Together with official members	・Surabaya→Ar. Jakarta ・Internal Meeting			
13	28-Jul (Sat)	・Preparation of Documents ・Internal Meeting					・Preparation of Documents ・Internal Meeting			
14	29-Jul (Sun)	・Dep. Jakarta→Ar. Aceh, Internal Meeting								
15	30-Jul (Mon)	・Courtesy Call and discussions on Banda Aceh Laboratory ・Dep. Aceh→Ar. Jakarta					・Survey/Discussions at Banda Aceh Laboratory ・Dep. Aceh →Ar. Jakarta			
16	31-Jul (Tue)	・Visit to Eijkman Institue ・Draft of Minutes of Discussions					・Visit to Eijkman Inst. ・Draft of Minute of Discussions		・Meeting at NIHRD	
17	1-Aug (Wed)	・Discussion on Minute of Discussions ・Internal Meeting					・Discussion on Minute of Discussions ・Internal Meeting		・Meeting at NIHRD, Dep. Jakarta →	・Dep. Narita → Ar. Jakarta
18	2-Aug (Thu)	・Preparation of Documents ・Courtesy call to DG of Disease Control & Environmental Health, MoH ・Internal Meeting					・Meeting at NIHRD ・Internal Meeting	・Meeting at NIHRD, Dep. Jakarta→	→Ar. Narita	Survey at procurement
19	3-Aug (Fri)	・Preparation of Documents ・Report to Embassy of Japan ・Signing of Minute of Discussions ・Report to JICA Indonesia Office ・Dep. Jakarta→				・Preparation of Documents		→Ar. Narita		Survey at procurement
20	4-Aug (Sat)	→Ar. Narita				・Preparation of Documents				Survey at procurement
21	5-Aug (Sun)					・Dep. Jakarta→Ar. Aceh , Intenal Meeting				Preparation of Documents
22	6-Aug (Mon)					・Survey at laboratory in Aceh				Survey at procurement
23	7-Aug (Tue)					・Dep. Aceh →Ar. Jakarta , Internal Meeting				Survey at procurement
24	8-Aug (Wed)					・Meeting at NIHRD				Survey at procurement
25	9-Aug (Thu)					・Meeting at NIHRD ・Discussion on Technical Memorandum				Survey at procurement
26	10-Aug (Fri)					・Signing of Technical Memorandum ・Report to JICA office、 ・Dep Jakarta →				Survey at procurement
27	11-Aug (Sat)					→Ar. Narita				Survey at procurement, Dep Jakarta→
28	12-Aug (Sun)									→Ar. Narita

Explanation on Draft Report (October 28 to November 3, 2012)

Date \ Team Member		Official Member		Consultant	
		Leader	Project Planning	Project Manager/ Equipment Planner	Operation and Maintenance Planner-1
1	28-Oct (Sun)		Departure Narita→Arriving to Jakarta		
2	29-Oct (Mon)	Explanation and Discussion on Draft Final Report			
3	30-Oct (Tue)	Meeting with USAID partners Meeting with WHO			Meeting with NIHRD
4	31-Oct (Wed)	Discussion on Draft Final Report, Soft Component and Technical Specification			
5	1-Nov (Thu)	Discussion on Minutes of Discussions			
6	2-Nov (Fri)	Signing on Minutes of Discussions, Report to the Embassy of Japan			
			Departure Jakarta→		
7	3-Nov (Sun)		→Arriving to Narita		

3. List of Parties Concerned in the Recipient Countries

	Name	Title/Organization
Indonesian side		
1	**Ministry of Health**	
	Dr. dr. Triono Soendoro, PhD.	Senior Advisor to the Minister of Health for Protection Against Health Risk Factors
	Prof. Tjandra Yoga Aditama, Sp. P(K), DTM&H	Directorate General of Disease Control and Environment Health
	Dr. H Andi Muhadir, MPH	Director Surveillance, Immunization, quarantine and Matra Health
	Dr. Hari Santoso SKM, M.Epid	Head Of Sub-directorate Surveillance & Outbreak Response, Center for Disease Control and Environment Health
2	**NIHRD/CBBTH**	
	Dr. dr. Trihono, MSc	Director General of NIHRD
	Drs. Ondri Dwi Sampurno, MSi., Apt	Director of Center for Biomedical and Basic Technology of Health
	Dr. Vivi Lisdawati, MSi, Apt	Head of Basic Technology of Health Division Head of CBBTH Laboratories
	Dr. Vivi Setiawaty, MBiomed	Chief of Virology Laboratory
	Dr. Krisna Nur Andriana Pangesti, MS	Head of Human Biomedical Sub Division
	Dr. Ni Ketut Susilarini, MS	Chief of BSL3 Laboratory
	Ms. Ida Susanti. MSc	Chief of Laboratory Administration and Facilities
	Ms. Made Lely Suratri, MKes	Head of Administration Division
	Ms. Hana A. Pawestri, MSc	Staff of Virology Lab – Biology Molecular Coordinator
	Ms. Ririn Ramadhany	Staff of Virology Lab
	Budianto, ST	Staff of BSL3 laboratory
	Yacub Gunawan, AMD	Staff of BSL3 laboratory
	Dian Taufik Hidayat, AMD	Staff of BSL3 laboratory
	Sumiyanto, ST	Staff of Lab Facility
	Alwi Hasbullah, AMD	Staff of Lab Equipment
	Rohmatullah, Akbar, ST	Staff of Lab Facility
	Dwita Retnani, ST	Staff of Lab Facility
	Yuswanto, AMD	Staff of Lab Equipment
3	**OBRD Aceh**	
	Fahmi Ichwansyah, S. Kp.,MPH., HR. Dpl	Head of Office
	Paisal, MD, M. Biomed	Staff of Laboratorium
	Aya Yuriestia A., Bachelor in Science	Staff of Laboratorium
	Rosdiana	Staff of Laboratorium
	Sari Hanum	Staff of Laboratorium
4	**WHO Indonesia**	
	Khanchit Limpakarnjanarat, M.D., MPH	Representative to Indonesia
	Dr. Anand B Joshi	Team Leader of Vector-BorneDisease Control, WHO Indonesia
	Prof. Mohammad Sudomo	Consultant for H5N1 Reserch
	Dr. Graham Tallis	Medical Officer, Disease Surveillance and Epidemiology

	Name	Title/Organization
5	**USAID/ CDC**	
	Mr. Benjamin Wohlauer	Deputy Economic Counselor - Chief of Environment, Science & Technology, Health Embassy of the United States of America
	Dr. Kendra Chittenden, pH.D	Senior Diseases and Science Technology Advisor
	Dr. Artha Camelia, MHA, MPH	Emerging Infectious Diseases Specialist
	Mr. Bambang Heryanto	Health Office
	Dr. Gina Samaan, PhD, MAppEpid	Team Leader, Influenza Division - Indonesia
6	**Airlangga University Institute of Tropical Diseases**	
	Dr. Chairul A. Nidom, DVM., MS	Chairman Avian Influenza-Zoonosis Reserch Center
	Prof. Nasronudin, M.D., Ph.D	Chairman internist-Tropical Infectous Disease Consultant
	Dr. Takako Utsumi, Ph.D.	Assistant Professor Center for Infectious Diseases Kobe University Graduate School of Medicine
7	**Eijkman Institute**	
	Professor Herawati Sudoyo, MD., PhD	Principal Investigator, Deputy Director
Japan Side		
8	**Embassy of Japan**	
	Mr. Shigeru Ushio	Minister, Economic Section
	Mr. Taku Ohara	First Secretary, Economic Section
9	**JICA Indonesia Office**	
	Mr. Motofumi Kohara	Chief Representative
	Mr. Tomoyuki Tada	Senior Representative
	Mr. Takaaki Oiwa	Senior Representative
	Ms. Tomoko Enoki	Project Formulation Advisor

4. Minutes of Discussions

MINUTES OF DISCUSSIONS
ON PREPARATORY SURVEY (OUTLINE DESIGN)
ON THE PROJECT FOR STRENGTHENING THE NATIONAL LABORATORY AND REFERRAL LABORATORY IN PROVINCE FOR CONTROLLING THE HIGHLY PATHOGENIC AVIAN INFLUENZA AND OTHER EMERGING AND RE-EMERGING INFECTIOUS DISEASES IN THE REPUBLIC OF INDONESIA

In response to the request from the Government of the Republic of Indonesia (hereinafter referred to as "Indonesia"), the Government of Japan decided to conduct a Preparatory Survey on the Project for Strengthening the National Laboratory and Referral Laboratory in Province for Controlling the Highly Pathogenic Avian Influenza and other Emerging and Re-emerging Infectious Diseases (hereafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereafter referred to as "JICA").

JICA sent to Indonesia the Preparatory Survey Team (hereafter referred to as "the Team"), headed by Dr. Mitsuhiro USHIO, Executive Technical Adviser to the Director General, JICA and was scheduled to stay in the country from July 16th to August 11th, 2012.

The Team held discussions with the officials concerned of Ministry of Health, Indonesia and conducted a field survey.

In the course of discussions and field survey, both sides confirmed the main items described in the attached sheets.

Jakarta, Indonesia
August 3rd, 2012

Dr. Mitsuhiro Ushio
Leader,
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Dr. dr. Trihono, M.Sc
Director General,
National Institute of Health Research and Development
Indonesia

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve capacity of early diagnosis of the highly pathogenic avian influenza and other emerging and re-emerging infectious diseases through the procurement of equipment for Center of Biomedical and Basic Technology of Health (CBBTH), National Institute for Health Research and Development (NIHRD) and Office of Biomedical Research and Development Aceh (OBRD Aceh), NIHRD.

2. Project Sites

2-1. The sites of the Project are the following;

(1) CBBTH, NIHRD

(2) OBRD Aceh, NIHRD

3. Responsible and Implementing Organization

3-1. The responsible organization of the Project is Ministry of Health.

3-2. The implementing organization of the Project is NIHRD.

4. Items Requested by the Government of Indonesia

After discussion with the Team, the items described in Annex-1 (for CBBTH/NIHRD) and Annex-2 (for OBRD Aceh/NIHRD) were requested by the Ministry of Health, Indonesia with priorities. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

5-1. Ministry of Health, Indonesia understands the Japan's Grant Aid scheme explained by the Team, as described in Annex-3.

5-2. Ministry of Health, Indonesia will take the necessary measures, as described in Annex-4, for smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented.

6. Schedule of the Study

6-1. The consultants will proceed furthers studies in Indonesia until August 11th, 2012.

6-2. The results of the Survey will be summarized in the draft report. The Team will explain the draft report by December, 2012.

7. Other Relevant Issues

(1) The Team studies current (a) infrastructure, budget allocation and other relevant conditions, (b)

human resources for and their skills in the management and operation of equipment, and (c) maintenance of the equipment, in order for appropriate use of the equipment; and verifies the potential improvements of overall laboratory testing especially for avian influenza and other emerging and re-emerging infectious diseases through the provision. Based on the study result found by the Team, the Japanese side will determine the item, amount, and detailed specification of equipment.

(2) The Team confirmed that CBBTH/NIHRD is mandated to perform research, trainings and diagnostic services including identification and characterization of avian influenza virus, emerging and re-emerging infectious diseases as a National Influenza Centre of WHO Global Influenza Surveillance and Response System. CBBTH/NIHRD constructed new laboratory for infectious diseases and started installing of laboratory equipment; however, some additional equipment need to be installed to fulfill its functions. Therefore, NIHRD requested the Japan's Grant Aid Project.

(3) The Team confirmed that OBRD Aceh/NIHRD is one of the acting laboratories under the auspices of NIHRD for infectious diseases such as malaria, dengue fever and tuberculosis. OBRD Aceh/NIHRD was upgraded to have a competency to conduct research and early diagnosis of emerging and re-emerging infectious diseases in November 2011. NIHRD has a plan for expansion of the laboratory facility and staff, and the laboratory is expected to strengthen its function to avian influenza with the Project.

(4) The Team confirmed that biosafety level 3 (BSL-3) laboratory facility in CBBTH/NIHRD was certified by "Basler & Hofmann Singapore Pte Ltd" excluding biorisk program. On the other hand, the Ministry of Health, Indonesia requested to Japanese side to include technical assistances for a) general virology laboratory techniques, b) improvement of laboratory practices and document system in BSL-2 and BSL-3 laboratories, and c) improvement of total management of facilities and equipment including document system as a "Soft-Component" of the Project. Since a) is planned to be covered partly by the other donors, Japanese side will consider the possibility of inclusion of b) and/or c) as a "Soft-Component" and other form of the trainings.

(5) The Team underscores the importance of collaboration between laboratory and epidemiological surveillances both in humans and animals in order to strengthen the preparedness and response for the pandemic of Avian Influenza.

END

Annex-1: Requested Equipment List with priority for CBBTH/NIHRD

Annex-2: Requested Equipment List with priority for OBRD Aceh/NIHRD

Annex-3: Japan's Grant Aid

Annex-4: Major Undertakings to be taken by Each Government

4

Annex-1

Requested Equipment List with priority for CBBTH/NIHRD

Equipment for BSL-3 Laboratory

No	Name of Equipment	Priotiry
1	Autoclave	A
2	Minicentrifuge	A
3	Refrigerated Centrifuge	A
4	Refrigerated Microcentrifuge	B
5	Tissue Homogenizer	A
6	Portable Pipette Aid	A
7	Pipettes Set, 8 Channels	A
8	Pipettes Set, 12 Channels	A
9	Pipettes Set, Single Channel	A
10	Pipettes Stand	A
11	Water Bath	A
12	CO2 Incubator	B
13	Inverted Microscope	A
14	Deep Freezer -80°C with CO2 or LN2 Back-up	A
15	Medical Refrigerator	A
16	Aspirator	A
17	Incubator	A
18	Biosafety Cabinet Class II	A
19	Stainless Table	A

Equipment for BSL-2 Laboratory

No	Name of Equipment	Priotiry
1	Minicentrifuge	A
2	Refrigerated Centrifuge	A
3	Refrigerated Microcentrifuge	A
4	Tabletop Ultracentrifuge	A
5	Two-pan Balance	A
6	Electronic Balance	A
7	Biosafety Cabinet Class II	B
8	Magnetic Stirrer	B
9	Portable Pipette Aid	A
10	Pipettes Set, 8 Channels	A
11	Pipettes Set, 12 Channels	A
12	Pipettes Set, Single Channel	A
13	Pipettes Stand	A
14	Vortex Mixer	A
15	Water Bath	A
16	CO2 Incubator	A
17	Fluorescent Microscope with Camera	A
18	Inverted Microscope	A
19	Freezer -20°C	A
20	Deep Freezer -80°C with CO2 or LN2 Back-up	A
21	Liquid Nitrogen Cryo-flask	B
22	Aspirator	B
23	Autoclave	A
24	Clean Bench	A

Equipment for RNA Extraction and Clean Room

No	Name of Equipment	Priotiry
1	Minicentrifuge	B
2	Refrigerated Centrifuge	B
3	Electronic Balance	B
4	Tissue Homogenizer	B
5	Magnetic Stirrer	B
6	Autoclave	A

Equipment for Isolation Room

No	Name of Equipment	Priotiry
1	Minicentrifuge	B
2	Magnetic Stirrer	B
3	pH Meter	B
4	Portable Pipette Aid	A
5	Repeater Pipette	A
6	Pipettes Set, 8 Channels	A
7	Pipettes Set, 12 Channels	A
8	Bottle Roller CO2 Incubator	B
9	Freezer -20°C	B
10	Aspirator	A
11	Clean Bench	A

Equipment for Analysis Room

No	Name of Equipment	Priotiry
1	Minicentrifuge	A
2	Electrophoresis Horizontal with Power Pack	A
3	Electrophoresis Vertical with Power Pack	A
4	Gel Documentation System	A
5	Magnetic Stirrer	A
6	pH Meter	A
7	Repeater Pippette	A
8	Pipettes Set, 8 Channels	A
9	Pipettes Set, 12 Channels	A
10	Pipettes Set, Single Channel	A
11	Sonicator	A
12	Shaker Vertical for Plate	A
13	Shaker Incubator for Clonning	A
14	Nanodrop Spectrophotometer	A
15	DNA Sequencer	B
16	Thermal Cycler	A
17	Shaker Vertical for Tubes	B

Equipment for Common Use

No	Name of Equipment	Priotiry
1	Electron Microscope	B
2	Freezer -20°C	B
3	Deep Freezer -80°C with CO2 or LN2 Back-up	B
4	Ice Flaking Machine	A
5	Glassware Washing Machine	B
6	Water Distiller	A

7	Maintenance Equipment Set	B
8	Dry Ice Making Machine	A

Equipment for Training Room

No	Name of Equipment	Priotiry
1	Minicentrifuge	A
2	Refrigerated Centrifuge	B
3	Refrigerated Microcentrifuge	A
4	Electronic Balance	A
5	Electrophoresis Horizontal with Power Pack	A
6	Gel Documentation System	A
7	Biosafety Cabinet Class II	B
8	Magnetic Stirrer	A
9	pH Meter	A
10	Portable Pipette Aid	A
11	Pipettes Set, 8 Channels	A
12	Pipettes Set, 12 Channels	A
13	Pipettes Set, Single Channel	A
14	Pipettes Stand	A
15	Vortex Mixer	A
16	PCR Workstation	A
17	Water Bath	A
18	Inverted Microscope	A
19	Freezer -20°C	B
20	Deep Freezer -80°C with CO2 or LN2 Back-up	B
21	Medical Refrigerator	A
22	Autoclave	A

Priority A: Essential for the Project
Priority B: It is necessary but further study is needed

Annex-2

Requested Equipment List with priority for OBRD Aceh/NIHRD

No.	Name of Equipment	Priority
1	Minicentrifuge	A
2	Refrigerated Microcentrifuge	A
3	Electronic Balance	A
4	Electrophoresis Horizontal with Power Pack	A
5	Gel Documentation System	A
6	Portable Pipette Aid	A
7	Pipettes Set, 8 Channels	A
8	Pipettes Set, 12 Channels	A
9	Pipettes Set, Single Channel	A
10	Pipettes Stand	A
11	Vortex Mixer	A
12	PCR Workstation	A
13	Water Bath	A
14	Biosafety Cabinet Class II	A
15	Freezer -20°C	A
16	Deep Freezer -80°C with CO2 or LN2 Back-up	A
17	Medical Refrigerator	A
18	Autoclave	A
19	Thermal Cycler	A
20	Dry Ice Making Machine	A

Priority A: Essential for the Project
Priority B: It is necessary but further study is needed

JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Japan's Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
  - The Survey conducted by JICA
- Appraisal &Approval
  - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
  - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
  - Agreement concluded between JICA and a recipient country
- Implementation
  - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid

Scheme from a technical, financial, social and economic point of view.

- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a basic design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey

will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex-4.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under

an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

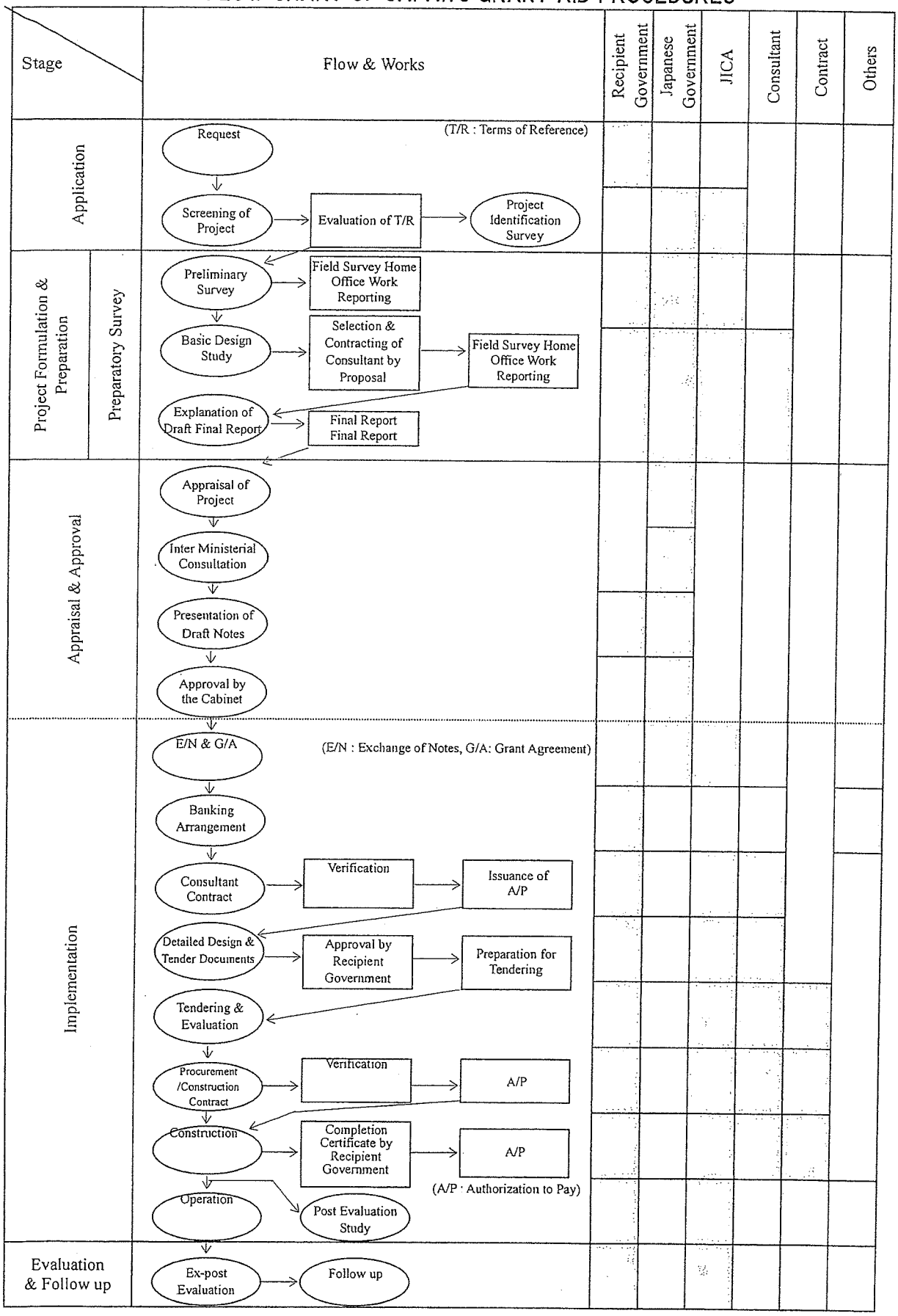
(End)

Major Undertakings to be taken by Each Government

NO	Items	To be covered by the Grant	To be covered by Indonesian side
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
	1) Marine(Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project sites	●	
3	To accord Japanese nationals and/or nationals of third countries whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
4	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract		●
5	To provide facilities and/or utilities, such as electricity, water, drainage, etc, necessary for the installation of the equipment to be supplied under the Grant Aid.		●
6	To renovate facilities for the installation of the equipment, when necessary.		●
7	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		●
8	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for the transportation and installation of the equipment		●

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

FLOW CHART OF JAPAN's GRANT AID PROCEDURES



MINUTES OF DISCUSSIONS

ON

THE OUTLINE DESIGN STUDY

ON

THE PROJECT FOR STRENGTHENING THE NATIONAL LABORATORY AND REFERRAL LABORATORIES IN PROVINCES FOR CONTROLLING THE HIGHLY PATHOGENIC AVIAN INFLUENZA AND OTHER EMERGING AND RE-EMERGING INFECTIOUS DISEASES IN THE REPUBLIC OF INDONESIA

(EXPLANATION OF DRAFT REPORT)

In August 2012, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey team on the Project for Strengthening the National Laboratory and Referral Laboratories in Provinces for Controlling the Highly Pathogenic Avian Influenza and other Emerging and Re-emerging Infectious Diseases (hereinafter referred to as "the Project") to the Republic of Indonesia (hereinafter referred to as "Indonesia"), and through discussion, field survey, and technical examination of the study results in Japan, JICA prepared the draft report on the study.

In order to explain and to consult the Government of Indonesia on the components of the draft report, JICA sent to Indonesia the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Takaaki Oiwa, Senior Representative, JICA Indonesia Office and scheduled to stay in the country from October 28 to November 2, 2012.

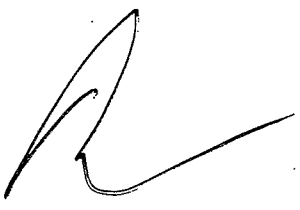
In the course of explanation of draft report, both parties confirmed the main items described on the attached sheets.

Jakarta, Indonesia

November 2nd, 2012

On behalf of Director General of National Institute of Health Research and Development (NIHRD)

Mr. Takaaki Oiwa
Senior Representative
JICA Indonesia Office
Japan International Cooperation Agency
Japan



Drs. Ondri Dwi Sampurno, MSi, Apt.
Director of Center for Biomedical and Basic Technology of Health
NIHRD, Ministry of Health
Indonesia

ATTACHMENT

1. Components of the Draft Report

The Indonesian side agreed and accepted in principle the components of the draft report explained by the Team.

2. Japan's Grant Aid scheme

The Indonesian side understands the Japan's Grant Aid scheme and the necessary measures to be taken by the Government of Indonesia explained by the Team and described in Annex-3 and Annex-4 of the Minutes of Discussions signed by both sides on August 3rd, 2012.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of Indonesia by February 2013.

4. Other Relevant Issues

4-1. Modification of the Name of the Project

Both sides agreed modifying the name of the Project since the Office of Biomedical Research and Development Aceh is under NIHRD. The name of the Project will be modified as "the Project for Strengthening the National Laboratory for Controlling the Highly Pathogenic Avian Influenza and other Emerging and Re-emerging Infectious Diseases".

4-2. Confidentiality of the Project Cost Estimation

The Team explained the cost estimation of the Project as described in Annex-1. Both sides agreed that the Project Cost Estimation should never be duplicated or released to any outside parties before signing of all the Contract(s) for the Project. The Government of Indonesia understands that the Project Cost Estimation described in Annex-1 is not final and is subject to change.

4-3. Criteria for Equipment Provisions

Based on the result of the Previous Survey and the following analyses, the number of equipment was decided.

Support from other donor agencies was also taken into consideration to avoid the overlap of equipment.

Both sides agreed that the equipment specified in Annex-2 are the tentative equipment list, final decision on the number of equipment will be made in the final report.

4-4. Soft Component

The Project includes the trainings on the maintenance of BSL-2/3 laboratories as the soft component. Both sides agreed that the outline of the soft component described in Annex-3.

The Government of Indonesia will make necessary arrangements to conduct the trainings, in terms of provision of training sites and logistics for the participants, as well as sharing of necessary information for maintenance of NIHRD in Annex-4. The necessary information in Annex-4 should be confirmed by November 20, 2012. JICA will utilize the information in Annex-4 which was shared by the Indonesian side only for the implementation of the Project.

4-5. Undertakings by the Government of Indonesia

The Government of Indonesia will take every necessary measure to conduct the following undertakings according to the estimation of expense borne by the Indonesian side in Annex-1 and tentative schedule described in Annex-5.

Annex-1	Project Cost Estimation
Annex-2	Tentative Equipment List
Annex-3	Outline of the Soft Component
Annex-4	List of Necessary Information for the Soft Component
Annex-5	Tentative Schedule of the Project

Annex-1

Project Cost Estimation

This part is closed due to the confidentiality.

(2) Expense Obligations for the Republic of Indonesia

Project cost borne by the Indonesian side is estimated to be approx. 218.4 million Indonesian Rupiah (Approx. 1.8 million Japanese Yen).

Item	Approximate Project Cost (million Indonesian rupiah)
Replacement of HEPA filters of three existing biosafety cabinets in the BSL-3 laboratories before transferring to the other laboratories	72,289,000
Expenses necessary for calibration of equipment within the scope of validation, provision of spare parts and consumables necessary for implementing validation and so on for Soft Component	120,482,000
Banking Arrangement *	25,663,000
Total Amount	218,434,000

* Indonesian side will confirm the mechanism of financial administration as soon as possible.

(2) Cost estimate conditions

1) Time of cost estimate August 2012

2) Currency exchange rate (Average TTS rate)

1US$ = JPY81.06

1IDR = JPY0.0083

3) Project period: Periods for detail design and procurement of equipment are as shown in the implementation schedule.

4) Others : The cost estimation above is performed in accordance with the grant aid system of the Government of Japan.

Tentative Equipment List

No.	Name of Equipment	Allocation								Total Q'ty
		CBBTH/NIHRD							OBRD Aceh	
		BSL-3 Lab	BSL-2 Supp. Lab	Clean /RNA Extract.	Virus Isolation Room	Analysis Room	Common Equip.	Training Room		
1	Autoclave	3	2	2	1	1	3	1	1	14
2	Minicentrifuge	2	4	3	3	3		3	2	20
3	Refrigerated Centrifuge	2	1	1				1		5
4	Refrigerated Microcentrifuge	2	1					1	1	5
5	Tabletop Ultracentrifuge		1							1
6	Two-pan Balance		1							1
7	Electronic Balance		1	1				1	1	4
8	Electrophoresis Horizontal with Power Pack					2		2	1	5
9	Electrophoresis Vertical with Power Pack					1				1
10	Gel Documentation System					1		1	1	3
11	Biosafety Cabinet	3							1	4
12	Tissue Homogenizer	1		1						2
13	Magnetic Stirrer		2	1	1	1				5
14	pH Meter				1	1				2
15	Portable Pipette Aid	3	2		2			2	1	10
16	Repeater Pipette				2	1				3
17	Pipettes Set, 8 Channels	3	4		2	2		2	3	16
18	Pipettes Set, 12 Channels	3	4		2	2		2	3	16
19	Pipettes Set, Single Channel	3	4			2		4	3	16
20	Pipettes Stand	3	4		2	2		4	3	18
21	Sonicator					1				1
22	Vortex Mixer		4					3	3	10
23	Shaker Vertical for Plate					1				1
24	PCR Workstation							1	1	2
25	Water Bath	1	2						1	4
26	Shaker Incubator for Cloning					1				1
27	CO2 Incubator		2							2
28	Bottle Roller CO2 Incubator				1					1
29	Fluorescent Microscope with Camera		1							1
30	Inverted Microscope	2	1							3
31	Freezer -20°C		1		2			1	1	5
32	Deep Freezer -80°C (A)		2				1			3
33	Deep Freezer -80°C (B)							1	1	2
34	Medical Refrigerator	2						1	3	6
35	Ice Flaking Machine						1			1
36	Liquid Nitrogen Cryo-flask		2							2
37	Nanodrop Spectrophotometer					1				1
38	Aspirator	2	2		1					5
39	DNA Sequencer					1				1
40	Shaker Vertical for Tubes					1				1
41	Incubator	1								1
42	Stainless Table	5								5
43	Clean Bench		2		1					3
44	Real Time PCR					3				3
45	Thermal Cycler								1	1
46	Water Distiller						1			1
47	Dry Ice Making Machine						1		1	2
48	Maintenance Equipment Set						1			1

Outline of the Soft Component

1. Outputs of Soft Component

   Documents and data related to maintenance and its management are established and appropriately operated, and techniques for operation, maintenance and its management for the facilities and equipment are improved.

2. Soft Component Activities (Input Plan)

   (1) Documents such as an inventory related to maintenance and its management as well as operation, maintenance and its management manuals for facilities and equipment are established, and guidance for operation is implemented.

   (2) SOPs for operation and control, maintenance method and validation and calibration (to accurately correct measurement devices and instrumentation) of HVAC systems, biosafety cabinets, and such like are established and technical guidance is implemented to carry out actual validation.

   (3) Measurement results are appropriately recorded and analyzed. Then, technical guidance is implemented to create trend data and such like to develop a data management manual.

   (4) Technical guidance is implemented for inventory management of consumables and spare parts.

3. Implementation Structure

   (1) The Consultant side

   The following engineers and interpreter shall be assigned:

   1) 3 consultant engineers and 2 validation engineers, one of three consultant engineers as a manager of soft component project
   2) 1 local engineer who has experience of site practice for HVAC engineering
   3) 1 interpreter /translator for Indonesian – English language

   (2) Indonesian side

   1) The Biorisk Team in CBBTH is positioned as the project management function on the CBBTH side in this soft component project.
   2) A leader of Biorisk Team shall be assigned as a manager of soft component project.

4. Implementation Schedule

   The project is implemented over a one-year period from April 2013 to March 2014

tentatively.

5. Dispatch Plan of the Consultant
   (1) Dispatch Plan; 4 times (11 trips) and 109 man-day in total

6. Outputs Products of Soft Component
   (1) Soft Component implementation plan
   (2) Inventory, operation, maintenance and its management manuals
   (3) Manual and record of routine maintenance and inspection
   (4) Operation and maintenance SOPs, validation and calibration implementation plan (Protocol) and report for HVAC system and Biosafety cabinet
   (5) Inventory management system
   (6) Data management manual
   (7) Other guidance materials, guidance records, visual records etc.
   (8) Reports on progress and completion of Soft Component

7. Responsibility of Recipient Country
   (1) It is essential to have understanding and cooperation by CBBTH top management. Particularly, all the information owned by CBBTH must be disclosed to implement the Soft Component and information must be provided along with cooperation from Indonesian private organizations (including the subcontracted Singaporean company) in charge of designing and maintenance of the existing BSL-3 laboratory facilities.
   (2) Before implementing the validation, sensors and such like need to be calibrated. Because the calibration is carried out basically from the budget of the Indonesian side, allocation of this budget to this item is necessary in advance. Many spare parts and consumables are necessary for implementing the validation. While the Japanese side will assist in preparing a list of the necessary items, their procurement costs are not covered by this Soft Component. The Indonesian side should bear the costs.
   (3) Other than above, offering of a small office for the Consultant inside CBBTH is requested free of charge. The office equipment should include an Internet connection, telephone, copy machine, air conditioner and such like.

Annex-4

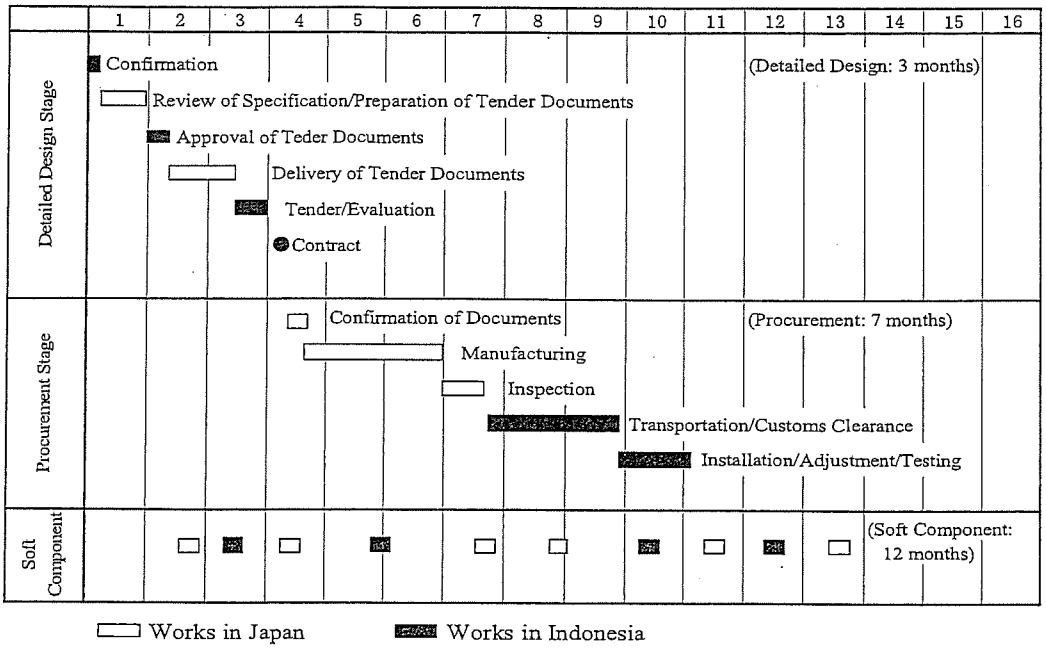
List of Necessary Information for the Soft Component

The documents of CBBTH/NIHRD below which are indispensable for the implementation of Soft Component will be shared with the Consultant. The documents will be used only by the Consultant and exclusively for the works of Soft Component.

(1) Various rules and provisions, criteria and guidelines established by CBBTH on its own.
(2) SOP list and a set of SOPs related to it
(3) Basic and detailed design drawings, As Built Drawings, photos at completion
(4) Technical specifications
(5) Manufacturing drawings
(6) A set of operation and maintenance manuals
(7) Detailed accreditation materials by a certifying body
(8) Activity records of Biorisk Team including minutes of meeting
(9) Other BSL-3 laboratory related documents

Tentative Schedule of the Project

The implementation schedule of the Project consists of detailed design stage, procurement stage and soft component. The table shows the process of implementation from the conclusion of G/A to completion.



5. Soft Component (Technical Assistance)

The Project for Strengthening the National Laboratory for Controlling Highly Pathogenic Avian Influenza and other Emerging and Re-emerging Infectious Diseases

Plan of Technical Assistance

(Soft Component)

March 2013

THE CONSORTIUM OF
NIHON SEKKEI Medicalcore, Inc.
NIHON SEKKEI International Inc.
NIHON SEKKEI, Inc.
Fujita Planning Co., Ltd.

Table of Contents

1. Background to Planning the Soft Component

In the National Institute of Health Research and Development (hereafter "NIHRD") under the governance of the Ministry of Health of the Republic of Indonesia, buildings for a Biosafety Level 3 laboratory (hereafter "BSL-3 laboratory") and BSL-2 laboratory were constructed in 2009 within the Center for Biomedical and Basic Technology of Health (hereafter "CBBTH"). They were built using the national budget of the Republic of Indonesia (hereafter "Indonesia"). These laboratories are essential facilities for diagnosing and researching emerging and re-emerging infectious diseases including Avian Influenza (AI) and began actual operation in 2010. However, some additional equipment needs to be installed in the BSL-3 and BSL-2 laboratories to fulfill its functions. The purpose of this project is to enable diseases to be rapidly and very reliably diagnosed by enhancement of the equipment.

The contents of requests related to Soft Component are summarized as below:

(1) Contents of requests in Grant Aid Application Form

In the request dated August 6, 2010, a concern about the development of junior researchers as human resources was cited. The NIHRD's plan also refers to the necessity of having technical assistance provided by Japan to improve staff's knowledge and performance. Further, an overview of the request mentions a request for the Soft Component in the project.

(2) Contents of requests submitted on site

On July 25 during Preparatory survey, there were the requests cited in Appendix 1 from Dr. Ondri, the director of the CBBTH. An overview of the requests is shown below.

Though it is not shown in the Table, there was also a request to dispatch Japanese long term experts who would stay in NIHRD (CBBTH) for two years to provide guidance and evaluation of the experiments and carry out inspections. The contents of the table are shown below:

A. Technical assistance for researchers and laboratory technicians

a) Virology laboratories technique	[i]
b) Virology informatics	
c) Animal handling	
d) Biosafety and Biosecurity	[ii]
e) GLP	
f) Overall management of BSL-2/3 laboratories including establishment of documentation system	
g) Development of Standard Operating Procedures (hereafter "SOP") and implementation of necessary validation related to Biosafety and Biosecurity for BSL-2/3 laboratories	

B. Technical assistance for engineers

h) Improvement of engineers' technical level for maintenance and its management of BSL-3 laboratory and the preparation of related documents

i) Improvement of engineers' technical level for maintenance and its management of equipment and the preparation of related documents

j) Improvement of engineers' technical level for maintenance and its management of entire facilities and the preparation of related documents

} [iii]

(3) Result of review to date

The scope of requests for technical assistance from CBBTH covers a wide range of areas and includes items that are apparently difficult to cope within the framework of the Soft Component. Therefore, the requests were categorized as below:

Contents agreed upon the discussions and recorded in the minutes

[i] Long-term Japanese experts and Items a) to c) in the request table ([i] of A on the previous page) are related to the improvement of general laboratory testing technique. Because laboratory technical assistance for this aspect can be expected from other donors, it is excluded from the scope of technical assistance in this project.

[ii] Items d) to g) in the request table ([ii] of A on the previous page) are related to the improvement of the overall operation and management techniques for BSL-2/3 laboratories, which is included in the scope of the review.

[iii] Items h) to j) in the request table ([iii] of B in the above) are related to the improvement of maintenance and its management techniques of BSL-2/3 laboratories, equipment, and the entire facilities. Therefore, these items are included in the scope of the review.

Result of review after returning to Japan

With regard to [ii] in the foregoing paragraph, it was found that they include extremely special and professional aspects that are difficult to address within this Soft Component. Accordingly, JICA has decided to consider these requests within the framework of another scheme.

Further, the following situation has been revealed as a result of carrying out Preparatory survey after completing the detailed study of CBBTH.

(1) BSL-2/3 laboratories overall operation and management techniques; contents related to [ii] above

The BSL-3 laboratory in CBBTH started operating just two years ago and it is considered that the facility staffs still do not have sufficient experience in its operation. It seems that they manage to continue operating the laboratory by outsourcing the entire work currently. The staff in charge of the target sections in the scope of this project -the BSL-3 laboratory and the virology laboratory -underwent short-term training last year in an overseas BSL-3 facilities (both of them are medical doctors). However, considering that essential documentation is still unavailable, it seems that their system has yet to reach an acceptable level for independent operation. If a sufficient budget for maintenance and its management is ensured and continued budgets for the long term are guaranteed, there seems to be no significant issue concerning the maintenance and its management of the facility. This is because the hard component of the facility was given an accreditation by a Singaporean certifying body (Basler and Hofmann). However, considering the high budget amount, there is room for skepticism about its sustainability.

Meanwhile, the budget for maintenance and its management is a budget specifically for the BSL-3 laboratories (including HVAC system). The costs and expenses necessary for arranging essential documents and appropriately implementing a Biorisk programs by CBBTH staff have not been secured so far. Besides, the Singaporean certifying body has officially expressed concern about the feasibility of operating the high risk facility (in terms of the Soft) in written form. The citation of the expressed concern is shown below:

“The Certifiers wish to express concern that they have no evidence whether sufficient and appropriate Biorisk program has been implemented and adopted, and whether staff have not received adequate training to reach a skill and competence level to work safely and efficiently in such a high-risk facility.”

Accordingly, it is revealed that, while focusing on the staff in charge of the targeted sections in CBBTH, it is necessary to provide assistance for acquiring the essential documents such as SOP including assistance to prepare higher level documentation and to implement validation. Besides, it is also necessary to provide technical assistance in terms of the comprehensive operation techniques to operate biosafety related rooms. Nevertheless, as mentioned before, it is difficult to address these requirements within the framework of the Soft Component, and JICA will study countermeasures within the framework of a technical cooperation project in future.

(2) Maintenance and its management techniques for BSL-2/3 laboratory facilities and equipment; contents related to [iii] above

CBBTH's maintenance and its management system are operated by nine people in total with the following breakdown:

Dedicated staff for BSL-3 laboratory (3 people):

HVAC and Plumbing engineers (2), Electrical engineer (1)

Staffs for entire CBBTH for equipment (2 people):

Equipment maintenance (2)

Staffs of the entire facility (4 people):

Facility manager (laboratory equipment, electrical system) (1),

Building maintenance (2)

Electrical maintenance (1)

As mentioned before, the maintenance and its management of the BSL-3 laboratory (facility/equipment) in CBBTH have been totally outsourced. Two technicians from the consigned Indonesian company stay in CBBTH on a continuous basis and perform all the routine work related to the BSL-3 laboratory.

Meanwhile, CBBTH recruited three engineers in March last year as dedicated staff for the BSL-3 laboratory (1 university graduate aged 30, and 2 vocational school graduates aged 31). CBBTH intends to improve the maintenance management techniques including those carried out by outsourced staff. While all of the three rookies have 6 to 8 years of work experience, their careers have been limited to carrying out maintenance related to ordinary construction work, automobile manufacturing or electric utilities. None of them has experience in maintaining or managing any medical facility, not to mention the BSL-3 laboratory. However, they have no access to any systematic training including deployment of the essential documents at the moment.

Further, the USAID also has expressed concern about appropriate maintenance and its management of the laboratory equipment. Both of these staff members are still young (vocational school graduates aged 26 and 31). Both were recruited in March last year and their skills are still far from being reliable (while they perform simple repair work, work servicing analyzers and other equipment is outsourced to the distributors).

The BSL-3 laboratory is only a part of the entire facility. If an appropriate supply of utilities (electric power, water and so forth) to the entire facility including equipment is disturbed, the functions of the laboratories will be totally lost. However, among the four engineers responsible for the entire facility, three people are still young (vocational school graduates aged 23 to 28) and were recruited in March last year as was the case with other people. Therefore, their knowledge level and experience are still insufficient.

Therefore, CBBTH staffs need to improve their maintenance and its management techniques for the entire facility, which is something that was pointed out also by the Singaporean certifying body as a concern, considering the fact that the facility handles high-risk pathogens.

2. Objective of Soft Component

An objective of the Soft Component is as below:

Maintenance and its management shall be implemented for the BSL-2/3 laboratory facilities and equipment in CBBTH based on the management system in conformance with the international standard (WHO Guideline).

3. Outputs of Soft Component

The outputs to be achieved at the completion of the Soft Component are as below:

Outputs: Documents and data related to maintenance and its management are established and appropriately operated, and techniques for operation, maintenance and its management for the facilities and equipment are improved.

4. Method to Confirm Accomplishment of Outputs

Items to be checked to judge the accomplishment level of outputs at the completion of the Soft Component are listed in the following table.

Item	Confirmation method
Outputs	(1) It shall be confirmed that the inventory related to maintenance and its management, essential operation and maintenance manuals, and routine maintenance and inspection records are established and operated. (2) It shall be confirmed that SOPs for HVAC system of BSL-3 laboratory as well as SOPs for operation and control of Biosafety cabinet of BSL-2/3 laboratories are established and operated. (3) It shall be confirmed that validation[*1] is implemented and judged as compliant to verify and guarantee the performance of HVAC system and Biosafety cabinet directly related to the handling of high risk pathogens. (4) It shall be confirmed that the data management manual for validation and routine maintenance and inspection records are established and operated. (5) It shall be confirmed that the management system for consumables and spare parts necessary for maintenance and its management is established and operated.

[*1] Validation (validation of qualification): This means that a process and method are designed based on scientific grounds and appropriateness, and that they are validated and documented systematically to show that they function pursuant to the initial objectives. GMP (Good Manufacturing Practices) is comprised of the five steps, i.e., Design Qualification (DQ), Installation Qualification (IQ), Operational Qualification (OQ), Performance Qualification (PQ) and Process Validation (PV). However, because GMP is not applicable to this project, only PQ is implemented. In PQ, validation is carried out by applying an actual load. Nevertheless, guidance of the National Institute of Infectious Diseases (NIID) is given in developing a detailed plan.

5. Soft Component Activities (Input Plan)

An activity plan for each output is described in the following table.

Outputs	Activity plan		Scope of guidance
Documents and data related to maintenance and its management are established and appropriately operated, and techniques for operation, maintenance and its management for the facilities and equipment are improved.	1	Documents such as an inventory related to maintenance and its management as well as operation, maintenance and its management manuals for facilities and equipment are established, and guidance for operation is implemented.	All 9 maintenance and its management staffs in CBBTH
	2	SOPs for operation and control, maintenance method and validation and calibration (to accurately correct measurement devices and instrumentation) of HVAC systems, Biosafety cabinets, and such like are established and technical guidance is implemented to carry out actual validation.	3 dedicated maintenance and its management staffs for BSL-3 laboratory in CBBTH. However, the same guidance is given to the other technicians (4 people in charge of equipment and electric systems), giving consideration to the establishment of a back-up system.
	3	Measurement results are appropriately recorded and analyzed. Then, technical guidance is implemented to create trend data and such like to develop a data management manual.	As above
	4	Technical guidance is implemented for inventory management of consumables and spare parts.	All 9 maintenance and its management staffs

The makeup of consultants implementing the technical guidance and its reason are described below.

[i] Japanese consultants with knowledge and experience of design, maintenance, management and validation for HVAC systems, Plumbing system, Electric system and equipment: 3 people

JICA has experience in completing a technical assistance project (hereafter "technical cooperation project") where guidance for validation of "Capacity Development for National Institute of Hygiene and Epidemiology (NIHE)" was given by multiple experts dispatched from NIID and other organizations. It is JICA's judgment that the consultants who work for this Soft Component require a considerably high level of expertise and experience in each concerned area equivalent to those requested in the Vietnamese case. Therefore, an expert in one area of expertise cannot work in another area of expertise at the same time. One

consultant needs to be dispatched for each area of expertise. Accordingly, three consultants (3 people corresponding to A, B and C below) should be dispatched in total.

This case is regarded as a technology transfer project, for which a high level of expertise is needed. To obtain a result within a short period, consultants with experience being an expert for a technical cooperation project or experience giving instructions for a Soft Component related to operation control, maintenance and its management of BSL-3 laboratory should be selected.

A: Manager in charge of Soft Component (Grade 2)

- Performs management of the entire project as a manager of Soft Component implementation (Soft Component project manager). Promotes project efficiently particularly by playing a role as a contact point for the domestic organizations concerned (JICA, NIID etc.) and for CBBTH as a counterpart organization in terms of reporting, liaison and consultation.
- Based on experience of being engaged in a technical cooperation project as an expert, coordinates opinions from the consultant team that are related to the documentation and implementation of validation.
- Formulates a plan for guidance of documentation related to maintenance and its management system and gives instructions and coordinate it on site.
- Offers coordination and information-gathering with CBBTH concerning the implementation of validation on site.
- Creates a plan for operation control, maintenance and its management of electric systems, and laboratory equipment, develops teaching materials and gives guidance on site.
- Creates a plan for inventory management, develops teaching materials and gives guidance on theory and practice on site.

B: Personnel in charge of HVAC system (Grade 3)

- Creates a plan for theory and basic techniques of operation control, maintenance, management and validation of HVAC systems and Biosafety cabinets, develops teaching materials and gives guidance on site.
- Creates teaching materials for guidance of documentation and gives guidance on site.
- Creates teaching materials for creation of data analysis and data management manuals and gives guidance on site.

C: Personnel in charge of Plumbing system (Grade 3)

- Creates a plan and teaching materials and gives guidance on site related to operation control, maintenance and its management of contaminated waste water treatment system and autoclave as well as the validation of sterilization.
- Creates a plan and teaching materials and gives guidance on site related to operation control, maintenance and its management of other plumbing system.
- Creates teaching materials for guidance of documentation and gives guidance on site.
- Assists the team in creating software for guidance of inventory management as well as in performance of guidance.
- Creates teaching materials for creation of data analysis and data management manuals and gives guidance on site.

[ii] Japanese consultants with the experience instructing practice of validation for HVAC systems and Biosafety cabinets (outsourcing consultant): 2 people

With regard to the validation of HVAC systems and Biosafety cabinets, validation theories are lectured on site by using the donated validation equipment, and hands-on training on HEPA filter replacement and validation training are performed by using actual equipment essential for technology transfer. While HVAC systems and Biosafety cabinets have the same basic technology, they are operated separately as HVAC system technology and equipment technology in actual operation, and each area is handled by separate engineer in general. Therefore, it is necessary to dispatch two consultants. In addition, with regard to HVAC system technology, it is necessary to give guidance by a pair of people — one for the measured section and the other for the instrumentation side (or one inside the room and the other for outside of the room). Therefore, two HVAC system consultants (engineers) should be dispatched.

Considering this situation, dispatch of at least three people is necessary in general. However, from the standpoint of saving cost, the plan is to dispatch only two people for the current project (i.e. one mainly in change of the HVAC system and the other mainly in charge of the Biosafety cabinet system). Because the HVAC system is based on the same basic technology as those of the Biosafety cabinet, guidance on the HVAC system is being given by having the instructor assisted by the engineer in charge of the Biosafety cabinet.

D: Consultant mainly in charge of hands-on training for HVAC system validation (Grade 3)

E: Consultant mainly in charge of hands-on training for Biosafety cabinet validation (Grade 3)

[iii] Local engineer: 1 person (an engineer with knowledge and experience in HVAC and plumbing systems who has some knowledge about validation. Engagement on contract basis with local company is assumed.) (See Item 6 on page 12.)

[iv] Interpreter/Translator (English – Indonesian, basically); His or her main work is to translate as a part of the documentation process, while there are some interpretation tasks for Japanese consultants during their stay on the project site.

The translation costs for essential documents should be included in this project including the SOP, various teaching materials, plan, reports and validation-related documents formulated in Japan or on site.

Details of the work contents and estimated schedule are mentioned below.

[i] April 2013; Work in Japan (A: 4 days, B: 4 days, C: 4 days, 12 person-days in total)

- Preparation work including reading, analyzing and information-gathering for an enormous amount of related documents currently owned by the Indonesian side, design documents, specifications, various manuals and so forth.
- Formulation of soft component implementation plan (draft)
- Formulation of sample education material for creation of SOP

[ii] May 2013; Site work (A: 7 days, B: 7 days, C: 7 days, 21 person-days in total) →The 1st dispatch

- Detailed survey on the latest status of CBBTH and its staff, consultation over and agreement on the soft component implementation plan (draft) and its issuance.
- Advice and assistance for the establishment of the project implementation system on the Indonesian side.
- Establishment of a system that enables continued education (self-learning) of the counterpart even in the absence of consultants.
- Guidance on documentation of the documents including SOPs etc.
- Recruitment of local engineers and guidance for the work.
- While there is some shortcoming in some areas of expertise, three consultants should cooperate with each other to work as a whole team.

[iii] June – July, 2013; Work in Japan (A: 8 days, B: 8 days, C: 8 days, 24 person-days in total)

- Formulation of teaching materials for buildings, HVAC system, plumbing system, electrical system, equipment and so forth.
- Review of detailed method for effective training, preliminary coordination with Indonesian side and so forth.
- Formulation of software and teaching materials related to inventory management.

[iv] August 2013; On site guidance (A: 11 days, B: 11 days, C: 11 days, 33 person-days in total) →The 2nd dispatch

- Orientation
- Whole party seminar is held to give guidance on the concept of documentation and validation.
- Implementation of training for each group and guidance for each area of expertise and so forth.
- While there is some shortcoming in some areas of expertise, three consultants should cooperate with each other to work as a whole team.

[v] September 2013; Work in Japan (A: 4 days, B: 4 days, C: 4 days, 12 person-days in total)

- Analysis and evaluation of the progress status, formulation of countermeasures, instruction on site and so forth.
- Formulation of continuation guidance plan and creation of additional teaching materials required.
- Creation of teaching materials related to calibration and coordination with CBBTH.
- Formulation of the list of materials and equipment necessary for validation, guidance for inventory from the domestic team.
- Formulation and submission of the report on progress.

[vi] October – November 2013; Work in Japan (A: 4 days, D: 4 days, E: 4 days, 12 person-days in total)

- Formulation of validation implementation plan (draft)
- Formulation of validation record and validation report (draft)
- Review of detailed method for training.
- Preliminary coordination with the Indonesian side concerning the confirmation of materials and equipment in inventory, implementation status of calibration and so forth.

[vii] December 2013; On site guidance (A: 11 days, D: 11 days, E: 11 days, 33 person-days in total) →The 3rd dispatch

- Evaluation and guidance for the result of calibration.
- Opening of seminar for basic theory of validation.
- Guidance on and completion of validation implementation plan.
- Guidance on the method of recording and method of creating a report.
- Confirmation of and guidance on the necessary materials and equipment.
- Explanation of handling of validation equipment, guidance on implementation.
- Guidance on implementation, recording, data analysis and so forth for validation.
- Guidance on documentation.

[viii] January 2014; Work in Japan (A: 4 days, B: 4 days, 8 person-days in total)

- Evaluation and analysis of the progress status, formulation of countermeasures, and formulation of additional teaching materials required.
- Creation of teaching materials related to data management.
- Creation of additional teaching materials related to inventory management.
- Preliminary coordination with Indonesian side and formulation of completion report

[ix] February 2014; On site guidance (A: 11 days, B: 11 days, 22 person-days in total) →The 4th dispatch

- Follow-up guidance to supplement insufficiencies in the entire scope and necessary additions.
- Formulation of various reports for receiving completion report from the Indonesian side, report to CBBTH and so forth.
- Reporting to Japanese Embassy, JICA Indonesia Office, United Nation organizations concerned and so forth.

[x] March 2014; Work in Japan (A: 4 days, B: 4 days, 8 person-days in total)

- Comprehensive evaluation and analysis
- Formulation and submission of final report

6. Method for Procurement of Implementation Resources for Soft Component

Because people with experience in extremely special work are required to give guidance on implementation of validation and calibration methods, Japanese validation experts are requested to cooperate.

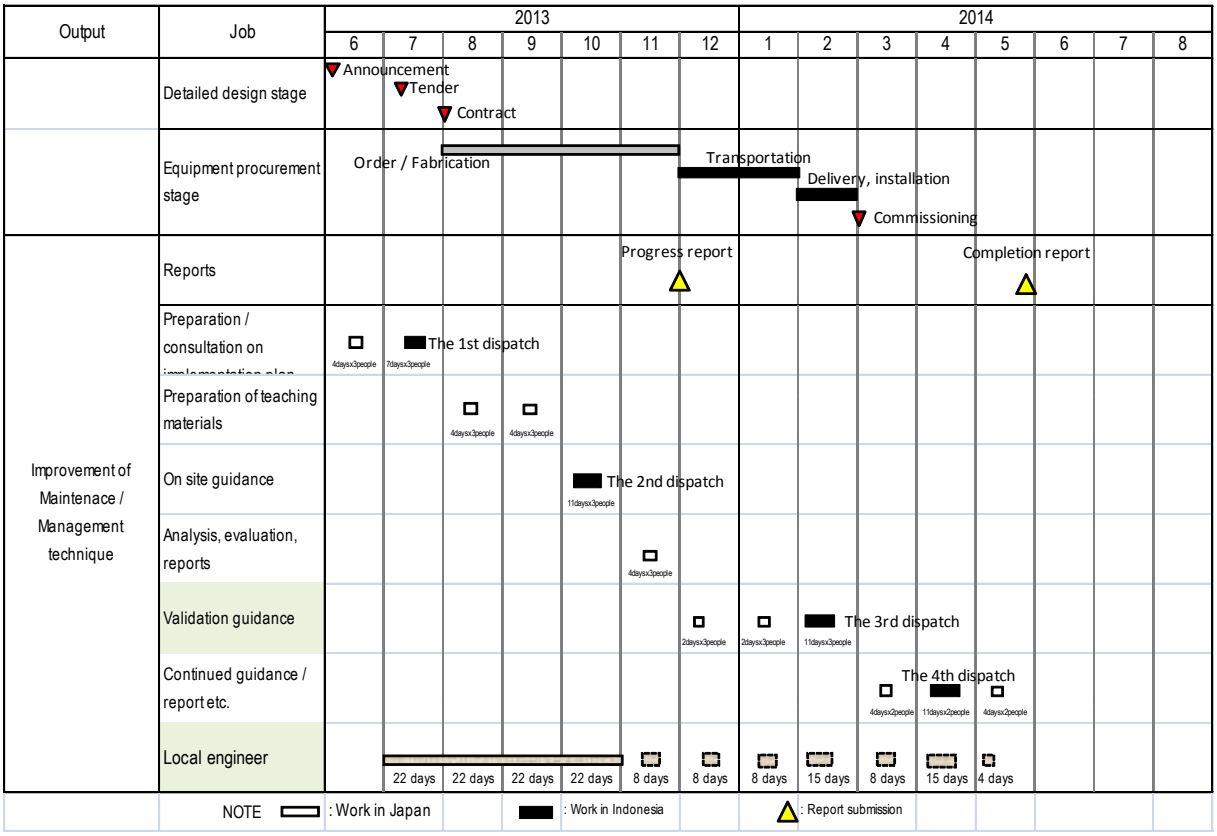
Besides, to promote the smooth transfer of technology a contract is entered into to stay one local engineer who has knowledge and experience in HVAC systems, which is the core technology (containment technology) of this project. The local engineer should be responsible for the following: Liaising questions from the counterpart when Japanese consultants are absent, giving guidance to the counterpart on the instructions from Japanese consultants, checking the daily progress in each area of expertise and activities of counterpart, reporting to Japanese consultants, and assisting in the guidance by Japanese consultants during their stay in the project site. Further, the local engineer is requested to perform liaison, coordination and clerical correspondence with CBBTH, offer details of the local situation and information and clerical assistance to the Japanese consultants during their stay in the project site.

7. Schedule and Method for Implementation of Soft Component

1) Implementation schedule

The project is implemented over a one-year period from April 2013 to March 2014. The Japanese consultants conducting the Soft Component determine the detailed contents of guidance and cooperation, and they formulate an implementation schedule based on mutual agreement with CBBTH without changing the entire framework on the basis of the following Soft Component implementation schedule.

Implementation schedule for Soft Component



2) Basic policy for implementation of Soft Component

The basic policy for implementation of Soft Component shall be as below:

[i] In implementation, it is desirable to establish a system that enables CBBTH activities and progress, including sophisticated and professional items, to be continuously monitored and to give timely advice from Japan with active use of the local engineer. Further, whenever needed, the local engineer is requested to assist Japanese consultants in their on site guidance by working as an interpreter or translator.

[ii] All the guidance, training and seminars, and such like shall be recorded. Further, videotaping is carried out to keep a record of everything as much as possible so that the records can be used for follow-up guidance.

3) Method for implementation of Soft Component

The Japanese side starts domestic preparation work in Japan upon accreditation of the consultant contract. As soon as the preparation is ready, detailed site survey is implemented, detailed consultation with CBBTH is held, the Soft Component implementation plan is formulated and the plan is agreed upon with the Indonesian side.

Further, when giving technology guidance on site, the Biorisk Committee in CBBTH is positioned as the project management office on the CBBTH side in this project. The personnel responsible for this project are reconfirmed, and the establishment of a close tie-up and communication with Japanese consultants is planned. Further, to ensure the project activities are efficient, it is essential for the success of this project to include the project in provisions that stipulate the activities of the Biorisk Committee comprised of the personnel from each section. Thus, thorough awareness of specific work, education and training, monitoring of activity status, evaluation and development of necessary actions in each section are achieved.

Meanwhile, on the Japanese side, teaching materials suitable for the level of CBBTH staff are prepared, and the necessary numbers of Japanese consultants in the appropriate areas of expertise are dispatched to the project site based on the plan, and education and hands-on training is given to transfer the essential technologies for operation, maintenance and its management.

Further, when the Soft Component starts, the Japanese consultants implement follow-up on a continuous and successive basis from Indonesia (guidance via monitoring and the local engineer and so forth).

Upon completion, the completion certificate is received from the Indonesian side. All the agenda is completed when the Soft Component completion report is submitted to JICA H.Q. at the end of March 2014 (plan).

Specific details are described below:

CBBTH secured the minimum necessary human resources for maintenance and its management of BSL-2/3 laboratory facilities as well as their equipment in March last year. Accordingly, upon accreditation of the consultant contract, detailed site survey is carried out again to understand the availability status of the latest document and improve the capability of staffs of CBBTH. Then, a more detailed soft component implementation plan is prepared that incorporates the results of this survey. Starting from the guidance on the development of documentation system, the curriculum is shifted gradually to the guidance of each area of expertise. Because the main part of this project is the containment technology for the HVAC system related to the BSL-3 laboratory, the guidance is started from the basic technologies of this area including the update of HEPA filters for HVAC system and Biosafety cabinet as well as their validation after the update. Then, hands-on training for validation equipment is conducted on site by actually using the validation equipment newly purchased for the maintenance and its management at the time when CBBTH received the equipment.

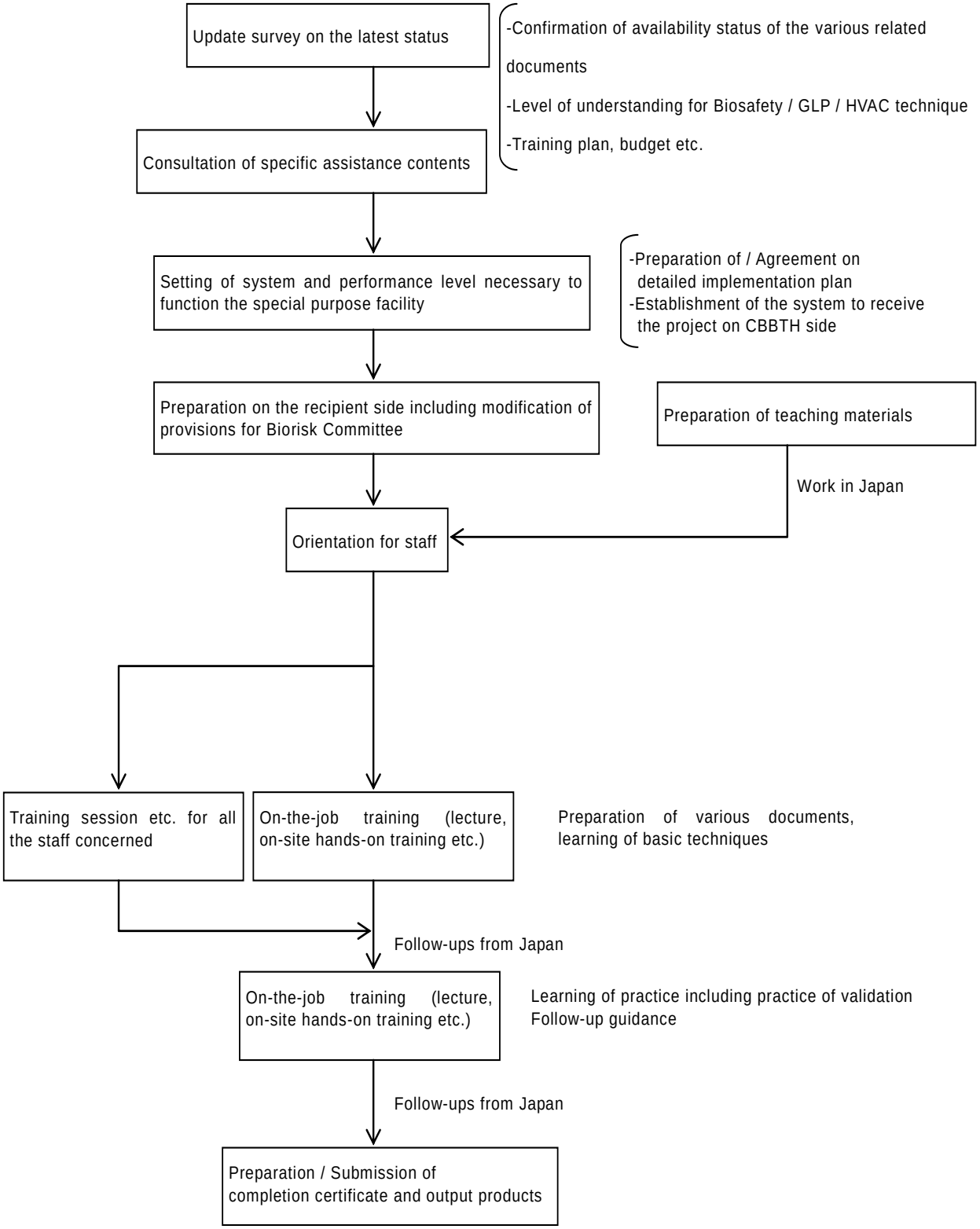
The guidance is given in a similar manner as that mentioned above also with regard to the study and laboratory equipment, buildings, plumbing system and electric systems.

Further, training programs such as lectures are held for all the end-users who work in the concerned divisions including the virology laboratory in CBBTH as the main division of this project to enhance staff capability in terms of appropriate use and operation of the facility and equipment.

Because acquiring knowledge is a temporary process similar to the previous item, continuous follow-up is essential to nurture workers' ability in practice. This will result in establishing human resources with skills in CBBTH. Therefore, follow-ups should be implemented as much as practically possible.

A flow chart for implementation of the Soft Component is indicated in the next page.

Flow chart for implementation of the Soft Component



8. Outputs of Soft Component

The main outputs of the Soft Component are listed in the following table.

Output	Output products
Improvement of maintenance and its management techniques	(1) Soft Component implementation plan (2) Inventory, operation, maintenance and its management manuals (3) Manual and record of routine maintenance and inspection (4) Operation and maintenance SOPs, validation and calibration implementation plan and report for HVAC systems and Biosafety cabinets (5) Inventory management system (6) Data management manual (7) Other guidance materials, guidance records, visual records etc. (8) Reports on progress and completion of Soft Component

9. Responsibility of Recipient Country

This Soft Component is implemented to improve abilities in maintenance and its management of BSL-2/3 laboratories in the Indonesian side as well as to ensure safety and sustainability of those abilities.

Accordingly, each piece of guidance needs to be given in a manner that promotes voluntary commitment on the Indonesian side as much as possible. To achieve this, it is essential to have understanding and cooperation by CBBTH top management. Particularly, all the information owned by CBBTH must be disclosed to implement the Soft Component and information must be provided along with cooperation from Indonesian private organizations (including the subcontracted Singaporean company) in charge of designing and maintenance of the existing BSL-3 laboratory facility.

As a specific approach, CBBTH (centered on the Biorisk Committee) needs to keep close tie-ups and communication with Japanese consultants to establish a system for implementing this project at first.

Further, the managers of virology and BSL-3 laboratories in CBBTH need to fully understand the importance of the operation, maintenance and its management. They need to take the initiative in understanding the contents of guidance given by Japanese consultants and promote understanding among their staff. Also, to secure safety, all the staff including researchers, engineers and maintenance staff engaged in the BSL-2/3 laboratories need to understand and steadily use the newly established system.

Further, it is essential that CBBTH takes appropriate measures so that the staff with improved performance after the technology transfer can maintain their motivation in the long term without quitting the job.

Besides, even after this technology guidance has been completed, outsourcing of sophisticated and complex maintenance is essential. Therefore, the outsourcing budget for this area should be secured on a continued basis.

Before implementing the validation, sensors and such like need to be calibrated. Because the calibration is carried out basically from the budget of the Indonesian side, allocation of this budget to this item is necessary in advance. Many spare parts and consumables are necessary for implementing the validation. While the Japanese side will assist in preparing a list of the necessary items, their procurement costs are not covered by this Soft Component. The Indonesian side should bear the costs.

Other than above, offering of a small office for Japanese consultants inside CBBTH is requested free of charge. The office equipment should include an Internet connection, telephone, copy machine, air conditioner and such like.

10. Current Issues

Current issues are mentioned below.

(1) At present, the amount of information disclosed by CBBTH is not sufficient. In implementing the Soft Component, disclosure of the related documents, drawings, specifications and such like currently owned by CBBTH is indispensable. Therefore, it is necessary to obtain its written consent to disclose such information when preparing the draft.
The following documents should be disclosed with regard to the buildings, HVAC system, plumbing systems, electric systems, Biosafety cabinets and autoclave for the BSL-2/3 laboratories.
   1) Various rules and provisions, criteria and guidelines established by CBBTH on its own.
   2) SOP list and a set of SOPs related to it
   3) Basic and detailed design drawings, As Built Drawings, photos at completion
   4) Technical specifications
   5) Manufacturing drawings
   6) A set of operation and maintenance manuals
   7) Detailed accreditation materials by a certifying body
   8) Activity records of Biorisk Committee including minutes
   9) Other BSL-3 laboratory related documents

(2) Further, there are some areas where access by Japanese consultants is controlled including the area above the ceiling where exhaust air system for BSL-3 laboratory is installed, while the system belongs to the core part of the containment technology. Cooperation of CBBTH side is requested also in this aspect.

Appendix. 1

Proposed Topic of Training requested by NIHRD
Proposed from NIHRD: experts from Japan stay in the NIHRD lab for tutorial and evaluating the laboratory technique and system minimum for 2 years

Participant	Number of people	Topic of training	Location of Training	institution	candidates	
researchers / laboratory technicians	5	virology technique	INDONESIA / JAPAN	NIHRD / NIID	Eka Pratiwi/Arie Ardiansyah/Agustiningsih/Raturnas/Nur Ika Harlastuti	
		- IFA				
		- Netralization				
		- Cloning				
		- PCR				
		- Sequencing				
		- Isolation / Cell culture				
	3	virology bioinformatic			Hana A. Pawestri/Kartika Dewi Puspa/Hartanti Dian Ikawati	
	3	animal handling			Suboko/Intan/Tata	
	6	biosafety and biosecurity			Reni Herman/Asri/Sumamo/Triyani/Budi	
	6	good laboratory practice			Kindi Adam/Natalie/Subangkit/Eka Pratiwi/Mursinah/Hema	
	2	Over All Management of BSL3/BSL2 including establishment of documentation system			NI Ketut Susilarini/Vivi Setiawaty	
	4	SOP preparation and validation for BSL2 and BSL3			Vivi Setiawaty/NI Ketut Susilarini/Subangkit/Krisna Nur AP	
Technicians	3	Improvement of technology and documentation for management of BSL3	INDONESIA /JAPAN	NIID / Manufacturer	Budi/Yakub/Taufik	sign agreement not to move to other institution
	2	Improvement of technology and documentation for management of equipment	INDONESIA /JAPAN	NIID / Manufacturer	Alwi/Yuswanto	sign agreement not to move to other institution
	4	Improvement of technology and documentation for management of general facility	INDONESIA /JAPAN	NIID / Manufacturer	Rahmatulloh/Ida Susanti/Sumiyanto/Dwita Retnani	sign agreement not to move to other institution

Jakarta, 25 July 2012
Approved by,

Drs. Ondri Dwi Sampurno, MSi., Apt
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