

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT
OF
SAFETY LABORATORY FOR
NATIONAL INSTITUTE OF
HYGIENE AND EPIDEMIOLOGY
IN
THE SOCIALIST REPUBLIC OF VIET NAM**

JUNE 2006

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to a request from the Government of the Socialist Republic of Viet Nam, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Safety Laboratory for National Institute of Hygiene and Epidemiology and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Viet Nam a study team from January 11th to 27th, 2006.

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

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

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

June 2006

Masafumi Kuroki
Vice President
Japan International Cooperation Agency

June 2006

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of Safety Laboratory for National Institute of Hygiene and Epidemiology in the Socialist Republic of Viet Nam.

This study was conducted by the Consortium of Nihon Sekkei, Inc. and Fujita Planning Co., Ltd., under a contract to JICA, during the period from January to June 2006. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Viet Nam and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

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

Very truly yours,

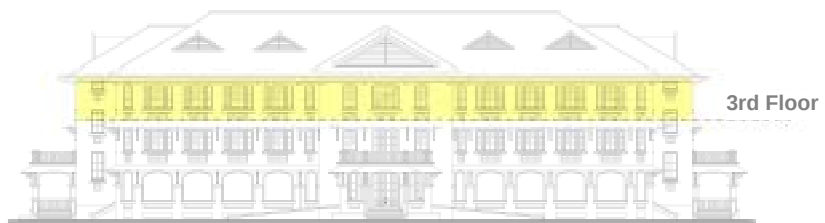
Kanichi Kuwana
Project Manager

Basic Design Study Team on
the Project for Safety Laboratory for
National Institute of Hygiene and Epidemiology

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

Location Map





The High Tech Center Building



BSL-2 Laboratory, Chemical Laboratory

BSL-3 Laboratory

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
A/P	Authorization to Pay
B/A	Banking Arrangement
BS	British Standard
BSL	Bio-Safety Level
CDC	Centers for Disease Control and Prevention
CPRGS	Comprehensive Poverty Reduction and Growth Strategy
DANIDA	Danish International Development Agency
E/N	Exchange of Notes
ECG	Electrocardiogram
GDP	Gross Domestic Product
GNI	Gross National Income
JASS	Japanese Architectural Standard Specification
JICA	Japan International Cooperation Agency
JIS	Japan Industrial Standard
HIV	Human Immunodeficiency Virus
HTC	High-Tech Center Building
MDF	Main Distribution Frame
MOH	Ministry of Health
MPI	Ministry of Planning and Investment
NICE	
NGO	Non-Governmental Organization
NIHE	National Institute of Hygiene and Epidemiology
PABX	Private Automatic Branch Exchange
SARS	Severe Acute Respiratory Syndrome
UNFPA	United Nations Population Fund
VND	Viet Nam Dong
WHO	World Health Organization

Summary

In the Socialist Republic of Viet Nam (hereinafter ‘Viet Nam’), in the wake of the SARS outbreak, avian influenza is presently causing serious damage to the people and fowls in Viet Nam. In 2005, 65 cases of human avian influenza infection were reported. Further spread of the infection is being feared. To implement urgent and highly effective infectious disease control measures, the government of Viet Nam issued a ‘Resolution of the Political Bureau on Protection, Care and Promotion of People’s Health in the New Situation’ on 23rd February 2005. Subsequently, to execute the resolution, the government formulated a ‘Government Action Program’ and announced it on 5th October 2005. In this program, the government of Viet Nam recognizes manufacturing of various medicines and strengthening of technology in examination and analysis of high-risk pathogens as measures against emerging and re-emerging infectious diseases such as avian influenza.

The high-risk pathogens including avian influenza virus, SARS corona virus, and HIV are mainly handled in the National Institute of Hygiene and Epidemiology (NIHE), the core institution in the infectious disease control in Viet Nam. In 2005, NIHE received 2,346 clinical specimens from cases of avian influenza. It uses the existing BSL-2+ laboratories for the diagnosis. In accordance with the recommendation of the World Health Organization (WHO), this high-risk pathogen, avian influenza virus, must be handled in highly secure laboratories at the level of BSL-3 (Bio-Safety Level 3, BSL-3 laboratories). However, as there is no BSL-3 laboratory either in NIHE or even in Viet Nam, the safety of laboratory workers or the surrounding environment is not ensured because of the inability to maintain negative pressure in the interior of laboratories or sterilize the exhaust with high-performance filters.

Under such circumstances, construction of BSL-3 laboratories which enables safe and appropriate examination of high-risk pathogens is the issue of the highest priority in the infectious disease control in Viet Nam. The preparation of bio-safety regulations for and the improvement of the technology in the handling of high-risk pathogens are required, as well as the construction of the BSL-3 laboratories in Viet Nam.

Taking such current conditions into consideration, the Ministry of Health of Viet Nam requested the government of Japan to provide Grant Aid Cooperation to the construction of the BSL-3 laboratories and associated laboratories for experiments on and diagnosis of high-risk pathogens. The purpose of this project is to enable NIHE to experiment on and diagnose high-risk pathogens safely and appropriately by constructing four BSL-3 laboratories and BSL-2 and chemical laboratories, which support activities in the BSL-3 laboratories, in the High-Tech Center (HTC) Building under construction in the premises of NIHE, and procuring the relevant laboratory equipment.

In addition, Viet Nam requested a Technical Cooperation project mainly for the capacity building of NIHE in examination of high-risk pathogens for the safe operation of the BSL-3 laboratories. In accordance with the Record of Discussions of March 2006, the Technical Cooperation project started with assistance in the preparation and application of the bio-safety regulations and the improvement of technology in handling high-risk pathogens. The construction of the BSL-3 laboratories under Grant Aid Cooperation and the preparation and application of the bio-safety regulations and improvement of the technology in handling high-risk pathogens under Technical Cooperation will enable safe and accurate examination and diagnosis of high-risk pathogens in accordance with international standards.

The summary of the ‘Project for Improvement of Safety Laboratory for National Institute of Hygiene and Epidemiology’ is as follows:

Responsible Agency:	The Ministry of Health, the Government of Viet Nam
Implementing Agency:	The National Institute of Hygiene and Epidemiology (NIHE)
Entire project period:	Approximately 13 months, including the detailed design and bidding (plan)
Planned construction site:	Hai Ba Trung District, Hanoi City

Building structure:	The High-Tech Center Building	
	The interior works on the third and fourth floors of a building of reinforced concrete and with one floor below the ground and four floors above the ground (an existing building constructed by the Vietnamese side)	
	Associated facilities (Energy Plant)	
	Equipment works in a one-storied building of reinforced concrete/iron-framed (to be constructed by the Vietnamese side)	
Total floor area:	The High-Tech Center Building	1,775.6 m ²
	The associated facilities	172.5 m ²
	Total	1,948.1 m ²

Project details:

Building	Structure type	Facility details
HTC Building	Reinforced concrete, four-storied	Third Floor <u>BSL-3 laboratories</u> <u>BSL-2 laboratories, chemical laboratories, and associated facilities</u> <u>Control room</u> Fourth Floor mechanical/electric equipment and machinery required for the BSL-3 laboratories and associated facilities Basement Sterilization tank unit
Energy Plant Block and Trench	Reinforced concrete, one-storied	Boiler, chiller, associated plumbing and wiring, etc. (However, the building and the back-up generator are under the responsibility of the Vietnamese side.)
Procurement of Equipment	The equipment necessary for the operation of Project facilities. (Inverted Microscope, Centrifuge, Refrigerated, Refrigerated Microcentrifuge, Deep Freezer -80°C, CO ₂ Incubator, Vertical Autoclave, Shaking Water Bath, Medical Refrigerator, etc.)	
Software component	Technical training on the maintenance/management of the equipment systems in the BSL-3 laboratories	

The total expense required for this project is estimated at 979 million Yen (888 million Yen from the Japanese side and 91 million Yen from the Vietnamese side).

The budgets required for the maintenance/management of the third and fourth floors of the HTC Building for the first fiscal year after the completion of the works under this project, the fiscal 2008, and the following fiscal year, the fiscal 2009, will be VDN 5.82 billion and 7.15 billion (approximately 42 million and 51 million Yen), respectively.

With regard to the balance between the revenue and the expenditure of the entire NIHE, the budgetary allocation from the Ministry of Health is expected to increase. The revenue from the examinations is also expected to increase because of the increases in diagnosis and research activities on emerging and re-emerging infectious diseases and the number of examinations. With these increases, the surpluses of VDN 2.4 billion and 4.0 billion (or approximately 17 and 29 million Yen) are expected for the fiscal 2008 and 2009, respectively, even after deducting the costs borne by Vietnamese side for the Project. Therefore, it is considered unlikely that a financial problem will hinder the maintenance/management of the facilities and equipment.

The implementation of this project (including the works under Japan's cooperation and those under the responsibility of the Vietnamese side) is expected to generate the following direct impacts:

Safety of handling high-risk pathogens will be ensured.

At present, high-risk pathogens such as avian influenza virus are handled in the BSL-2+ laboratories with insufficient safety in NIHE. The construction of the BSL-3 laboratories will enable experiments on and diagnoses of the pathogens under the appropriate and safe environment.

The number of examination items and examinations will increase.

At present, as high-risk pathogens are handled in the existing BSL-2+ laboratories, the number of specimens acceptable to NIHE is limited. The construction of the BSL-3 laboratories equipped with the necessary functions will increase the number of examination items, including the examination of high toxicity viruses, and the acceptable number of specimens.

The implementation of this project is expected to realize the following indirect impacts:

It will become possible to take appropriate measures against emerging and re-emerging infectious diseases.

The construction of the BSL-3 laboratories will enable prompt assessment of the prevalence and cases of infectious diseases and such assessment will enable implementation of appropriate infectious disease control measures.

NIHE will become a model institute for the construction of epidemiologic research facilities in Viet Nam.

The first BSL-3 laboratories in Viet Nam will be constructed in this cooperation project. These laboratories will be able to act as a model for the construction of high safety laboratories in subordinate local research institutes.

The number of research papers will increase and their contents will be improved.

This project is expected to lead to the increase in the number of published research papers by enabling experiments and research on high-risk pathogens, which are to be conducted in a BSL-3 laboratory and, thus, contribute to the development of the infectious disease research in Viet Nam.

These observations prove that the implementation of this project under Japan's Grant Aid Cooperation as a measure against emerging and re-emerging infectious diseases such as avian influenza for the (approximately 83 million) Vietnamese is highly significant. It is extremely relevant and necessary because the project will build the capacity in manufacturing of various medicines and in the technology for the examination and analysis of high-risk pathogens.

The implementation of the works under the responsibility of the Vietnamese side at appropriate times is an important condition for the launch of this cooperation project. In particular, the completion of the modification of the HTC Building under construction and the construction of the Energy Plant Block by the Vietnamese side is a prerequisite for the launch of the works by the Japanese side. The continuous usage of the facilities and equipment provided in this project in good conditions will have to be guaranteed by securing the budget and personnel required for the appropriate operation and maintenance/management and through sufficient training to the laboratory and maintenance/management staff.

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Chapter 1. Background of the Project

CHAPTER 1. BACKGROUND OF THE PROJECT

In Viet Nam, in the wake of the SARS outbreak in 2003, avian influenza is presently causing serious damage to the people and fowls in Viet Nam. In 2005, 65 cases of human avian influenza infection were reported. As the country has the largest fatalities caused by the disease in the world, further spread of the infection is being feared. Under such conditions, to implement urgent and highly effective infectious disease control measures, the government of Viet Nam issued a 'Resolution of the Political Bureau on Protection, Care and Promotion of People's Health in the New Situation' on 23rd February 2005. Subsequently, to execute the resolution, the government formulated a 'Government Action Program' and announced it on 5th October 2005. In this program, the government of Viet Nam recognizes manufacturing of various medicines and strengthening of technology in examination and analysis of high-risk pathogens (corresponding to the Level 3 or higher in 'the Risk Group and Bio-safety Level Definitions' of the Guideline for the Safety Control of Pathogens of the National Institute of Infectious Diseases of Japan, May 2005) as measures against emerging and re-emerging infectious diseases such as avian influenza.

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