THE SOCIALIST REPUBLIC OF VIETNAM
MINISTRY OF CONSTRUCTION

FINAL REPORT
ON
PROJECT FOR CAPACITY ENHANCEMENT IN CONSTRUCTION QUALITY ASSURANCE
IN
THE SOCIALIST REPUBLIC OF VIETNAM

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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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ABBREVIATIONS

AMC	:	Academy for Mangers of Construction and Cities
CAMD	:	Construction Activity Management Department
CIC	:	Construction Inspection Center
CIP	:	Construction Investment Project
CME	:	Construction Management Engineer
CPD	:	Continuous Professional Development
CONINCO	:	Consultant and Inspection Join Stock Company of Construction Technology and Equipment
C / P	:	Counterpart
CQM	:	Viet Nam Center for Technology of Construction Quality Management
CS	:	Construction Supervise
DOC	:	Department of Construction
DOT	:	Department of Transportation
DPI	:	Department of Planning and Investment
FIDIC	:	International Federation of Consulting Engineers
IBST	:	Institute of Building Science and Technology
GS1	:	Qualification for Supervisor Who Graduated University
GS2	:	Qualification for Supervisor Who Graduated Junior College or High School
HDOC	:	Hanoi Department of Construction
HDOT	:	Hanoi Department of Transportation
IT / R	:	Interim Repot
ITST	:	Institute of Transport Science & Technology
JCC	:	Joint Coordinating Committee
JICA	:	Japan International Cooperation Agency (Japan)
KS	:	Qualification for Engineer
KTS	:	Qualification for Architect
MLIT	:	Ministry of Land, Infrastructure, Transportation and Tourism(Japan)
M / M	:	Minutes of Meeting
MOA	:	Ministry of Agriculture and Rural Development
MOC	:	Ministry of Construction
MOET	:	Ministry of Education and Training
MOHA	:	Ministry of Home Affairs
MOI	:	Ministry of Industry and Trade

MOLISA	:	Ministry of Labor, Invalids and Social Affairs
MOT	:	Ministry of Transport
MPI	:	Ministry of Planning and Investment
OCAJI	:	Overseas Construction Association of Japan, Inc.
ODA	:	Official Development Assistance
PDM	:	Project Design Matrix
PMC	:	Project Management Consultant
PMU	:	Project Management Unit
PPC	:	Provincial-level People's Committee
PQ	:	Pre-Qualification
P / R	:	Progress Report
QE Center	:	MOC Qualification Examination Center
R / D	:	Record of Discussion
R & D	:	Research and Development
SACQI	:	State Authority of Construction Quality Inspection
TC	:	Training Center
TCQM	:	Transport Construction Quality Control and Management Bureau
VECAS	:	Vietnam Engineering Consultant Association
VFCEA	:	Vietnam Federation of Civil Engineering Associations
VNBAC	:	Vietnam Network of Bodies for Assessing Construction Quality Conformity
W / P	:	Work Plan
WTO	:	World Trade Organization

CHAPTER 1 INTRODUCTION

1.1 PROJECT BACKGROUND

The Government of the Socialist Republic of Vietnam (the Government of Vietnam) has been pushing forward its open economy policy and enjoyed favorable economic growth in recent years, benefitting from foreign investment as a lever, although there are some concerns about inflation. the Government of Vietnam has successfully realized its participation in World Trade Organization (WTO) in 2007. In order to keep maintaining sustainable economic growth imperative to support the National Development Plan, the Government of Vietnam manages a large number of infrastructure development projects and put them into realization successfully. However, a rapid increase in infrastructure construction projects has also brought negative aspects of development, i.e. inadequate quality of construction works and labor accidents during construction works which is emerged to be a social concern recently.

The Government of Vietnam has tackled the development of institutions for infrastructure construction projects over a decade. This includes regulations of construction quality assurance, quality management technologies, human capacity development programs and so forth. However, a study on the current status of institutions identified the following issues;

- Lack of understanding of rules and regulations particularly for the site engineers;
- Increase in violations of regulations and contract conditions;
- Increase in local project owners without sufficient management capacity who are emerged as a result of the government decentralization policy;
- Lack of capacity in the field of work quality inspection and technical guidelines and manuals is imperative to support field activities of construction works;
- Current engineer qualification system is not caught up with rapid increase of infrastructure construction projects.

As the system, technologies and human capacity development in construction quality assurance should work together and create synergy in order to improve construction work quality and labor safety, the Ministry of Construction (MOC) of the Government of Vietnam proposed technical assistance to the Government of Japan for the purpose of improving and enhancing capacity of construction quality assurance as well as labor safety during construction works. Upon receiving this request, the Japan International Cooperation Agency (JICA) sent the first mission in June 2009 and the second mission in September 2009 for assessing the proposal and formulating technical assistance programs to this proposal. the Government of Vietnam and JICA have reached agreement on the technical assistance programs which leads to the implementation of this project. The Minutes of Meeting (M/M) was agreed upon between both parties on October 9th, 2009 and the Record of Discussions (R/D) on March 26th, 2010.

1.2 PROJECT OBJECTIVES

Efficient administration functions which provide general rules over the implementation of various construction investment projects are prepared aiming to;

- Enhance construction quality assurance system.
- Develop project management technologies for construction quality assurance.
- Provide training opportunities to spread out project outcomes to persons related to construction projects.

1.3 PROJECT MANAGEMENT

In accordance with R/D dated on October 9th, 2009, a Joint Coordinating Committee (JCC) and a MOC counterpart team (PMU) will be established. **Figure 1.3.1** shows the inter-relation between these organizations. The latter will include full-time counterpart personnel who will work regularly with the JICA experts assigned for this project.

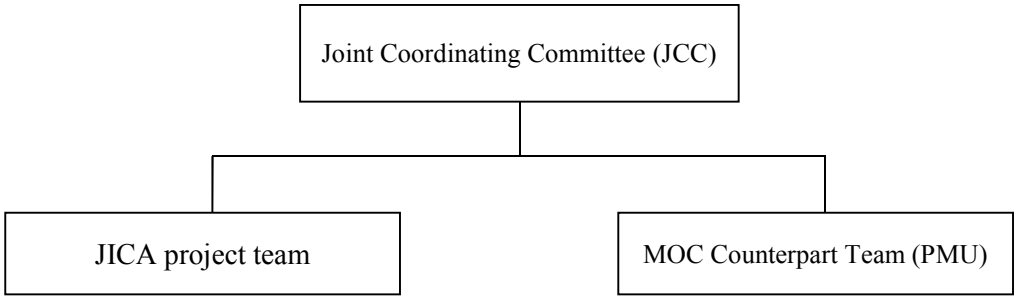


Figure 1.3.1 Project Management Structure

(1) Joint Coordinating Committee (JCC)

1) Function

JCC is to meet at least once a year and whenever the necessity arises, in order to fulfill the following functions;

- To discuss and approve the annual work plans of the Project based on the approved annual budget;
- To review the overall progress and annual expenditure of the Project as well as the achievement of the annual work plans mentioned above; and
- To review and exchange views on major issues arising from or in connection with the Project and feedback to annual work plans.

2) Members

Chairperson:	Vice Minister, Ministry of Construction
Member of Vietnamese side: from Vietnamese side	Project Director, Project Manager, Representatives
Member of the Japanese side: Vietnam Office	Japanese experts, Chief Representative of JICA

3) Project Management Unit (PMU)

Chair Person:	Dr. Le Quang Hung - Head of SACQI, MOC

1.4 JICA PROJECT TEAM

The member list of the JICA Project Team is shown below. Also, the organization structure of the JICA Project Team is shown in **Figure 1.4.1** and the advisor and expert work assignments in **Figure 1.4.2**.

(1) Long-term Experts

(1)	NAKASUKA, Satoshi;	Advisor for Construction Quality Assurance
(2)	INOUE, Sadafumi;	JICA Expert / Construction Management
(3)	KAMIGATAKUCHI, Tokujiro;	Project Coordinator

(2) Consultant Experts

(1)	KATO, Tsuneo;	Team Leader / Administration System / Quality Management System
(2)	KUSANO, Seiichi;	Deputy Team Leader / Quality Management Technology / Specifications / Examination System for Engineer Qualification
(3)	SAKURAI, Tatsuyuki;	Expert / Quality Inspection System
(4)	YAMAUCHI, Masafumi;	Expert / Contractor Selection and Registration System
(5)	KURAJI, Kentaro;	Expert / Construction Supervisor Qualification System
(6)	IWASHITA, Akira;	Expert / Site Manager Qualification System
(7)	TAKEUCHI, Jun;	Expert / Contractor Evaluation System
(8)	USAMI, Makoto;	Expert / Construction Safety Management
(9)	AKABANE, Etsuko (Ms.) / MIYAKAWA, Akiko (Ms.);	Expert / Human Capacity Development

(10) NAKAJIMA, Iwao/ TANOGUCHI, Taiji;	Expert / Architecture Technology
(11) ABE, Shuji;	Expert / Building Work Maintenance Technologies
(12) KUNIMASA, Yoshiro;	Expert / Registration and Evaluation System Development
(13) TANAKA, Takuya;	Expert / Administration System / Quality Management System

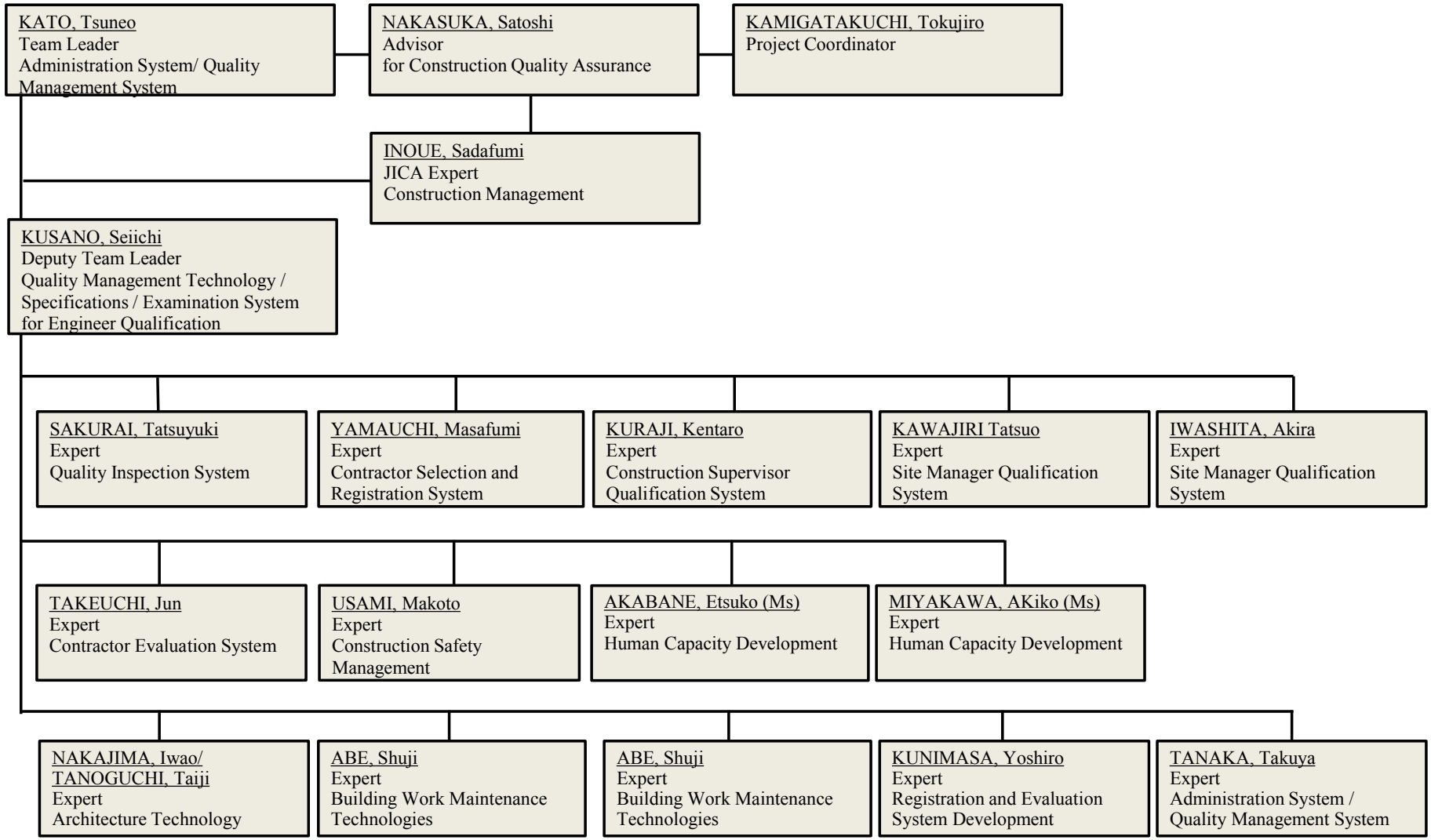


Figure 1.4.1 Project Team Organization Structure

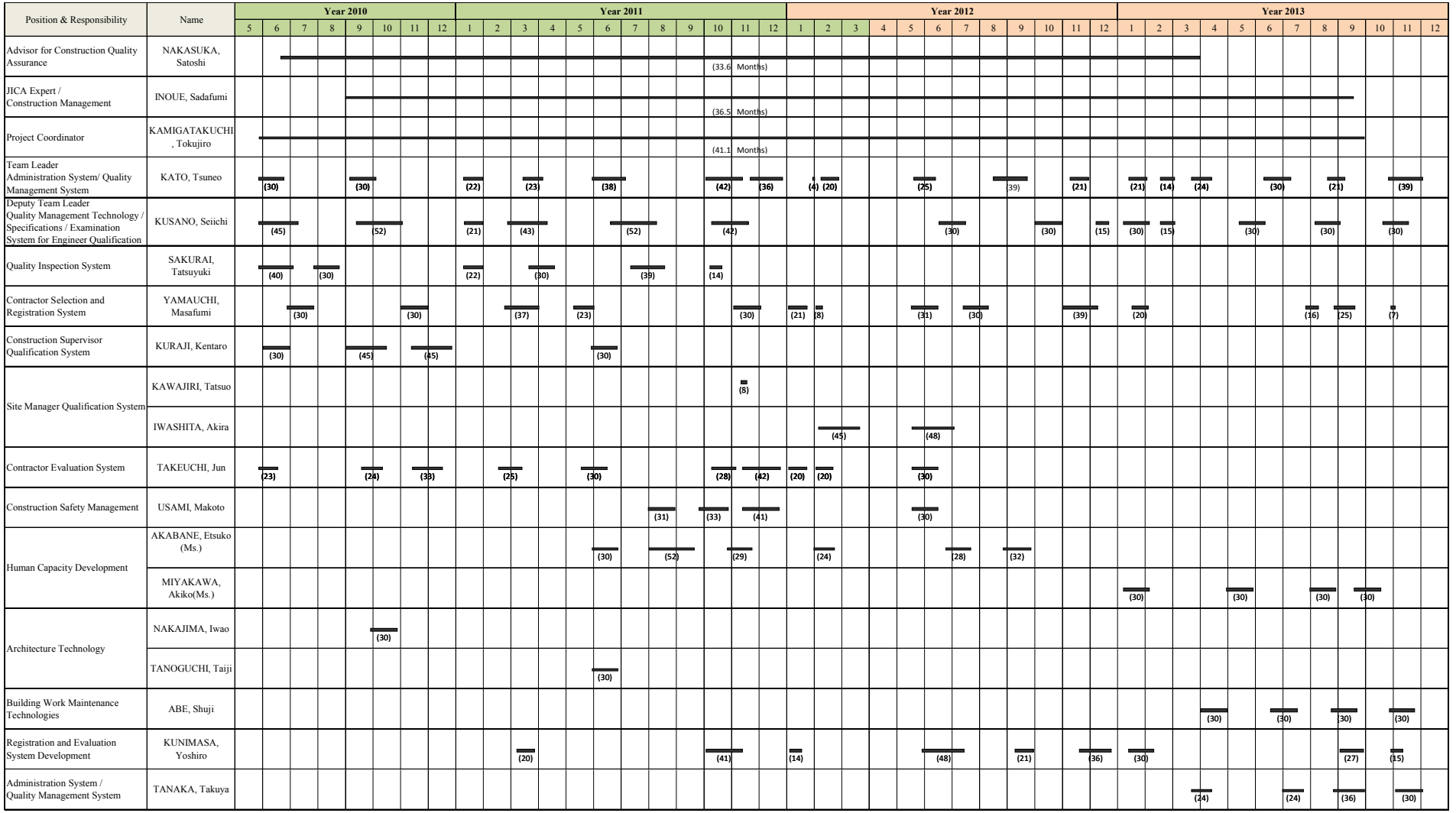


Figure 1.4.2 Advisor and Expert Work Assignment

1.5 MOC COUNTERPART TEAM

The member list of the MOC counterpart Team is listed in **Table 1.5.1**.

Table 1.5.1 Counterpart Member List

Activity				Expert	Supporting Staff
Activity 1	Improve project management methods and clarify responsibilities between stakeholders (Project owners, employers, CS consultants and contractors) focusing on construction quality assurance.	1.1	Enhance responsibility assignment between stakeholders	Mr. Hoang Tho Vinh *Deputy General Director-Construction Activities Management (CAMD)-(MOC)*	Mr. Do Quoc Khanh *Construction Techical Infrastructure field-(MOC)*
		1.2	Improve contract management to accelerate procedures	Mr. Le Van Thinh *Head of Inspection Division No.1 (SACQI)- (MOC)*	Mr. Phan Quang Hien *Transport Engineering Construction and Quality Management Bureau (Transport Sector)- (MOT)*
		1.3	Strengthen institutions for construction facility maintenance.	Mr. Pham Duc Toan *Lecturer-Hanoi Construction University*	Mr. Nguyen Huy Quang *Transport Engineering Construction and Quality Management Bureau (Transport Sector)- (MOT)*
		1.4	Support revising regulations including Construction Law, Decree No.12 and Circulars relevant to Decree No.15		Mr. Le Dinh Tuan *Quality Assurance (Irrigation Sector)-(MOARD)*
Activity 2	Improve state agencies' (especially MOC) inspection system for construction quality assurance	2.1	Strengthen state management audit system to project owners	Mr. Tran Chung *Senior expert;* *Head of Construction Quality Division- Vietnam Federation of Civil Engineering Association*	Mr. Do Ba Dai *Legal affair-(MOC)*
		2.2	Strengthen CQM training functions.	Mr. Le Van Thinh *Head of Inspection Division No.1 (SACQI) -(MOC)*	Mr. Phan Quang Hien *Quality Assurance (Transport Sector)- (MOT)*
		2.3	Strengthen sanctions against contractor's improper construction project management	Mr. Nguyen Gia Chinh *Deputy General Director-Legal Affair Department-(MOC)* Mr. Ngo Lam *Deputy General Director of SACQI-(MOC)*	Mr. Nguyen Huy Quang *Transport Engineering Construction and Quality Management Bureau (Transport Sector)- (MOT)*
Activity 3	Develop and Apply Contractor Registration and Evaluation	3.1	Develop and apply company registration systems for	Mr. Nguyen Viet Hung *Senior expert, former general director of Bidding Management Department -*	Mr. Le Quoc Anh *SACQI- (MOC)* *(Data integration & IT)*

Activity				Expert	Supporting Staff
			construction companies and consultants.	*(MPI)*	
		3.2	Develop and apply contractor work performance evaluation system and conduct trial studies registration system.	Mr. Hoang Tho Vinh *Deputy General Director-Construction Activities Management (CAMD)-(MOC)* Mr. Ngo Lam *Deputy General Director of SACQI-(MOC)* Mr. Duong Minh Nghia *Deputy Head of Office of National Acceptance Council (SACQI)- (MOC)* Mr. Nguyen Kim Duc *Deputy Head of Inspection Division No.2 (SACQI)-(MOC)*	Mr. Nguyen Ngoc Minh *CAMD-(MOC)* *(Data integration & IT)* Mr. Tran Minh Phu *CAMD-(MOC)* *(Official)*
Activity 4	Improve Existing Engineer Qualification System	4.1	Enhance existing construction supervisor qualifications	Mr. Hoang Tho Vinh *Deputy General Director-Construction Activities Management (CAMD)-(MOC)*	Mr. Pham Duc Ky *Office of National Acceptance Council - SACQI-(MOC)*
		4.2	Enhance site manager qualifications	Mr Nguyen Gia Chinh *Deputy General Director-Legal Affair Department-(MOC)*	
		4.3	Develop examination system for the evaluation of engineer qualifications	Ms. Nguyen Thi Thu Ha *Head of General Affair-CAMD-(MOC)* Mr. Phan Vu Anh *Vice Head of Inspection No. 1- SACQI-(MOC)*	
Activity 5	Develop project management technologgies in construction quality assurance	5.1	Develop the framework for a construction quality manual	Mr. Tran Chung *Senior expert;* *Head of Construction Quality Division- Vietnam Federation of Civil Engineering Association*	Mr. Nguyen Huy Quang *Transport Engineering Construction and Quality Management Bureau (Transpor Sector)- (MOT)*
		5.2	Develop the framework for a standard construction work specification	Mr. Nguyen Dai Minh *Director of Industrial and Infrastructure Engineering - Vietnam Institute for Building Science and Technology-(IBST)*	Mr. Le Dinh Tuan *Quality Assurance (Irrigation Sector)-Department of Facilities Construction Management-(MOARD)*

Activity				Expert	Supporting Staff
				Mr. Tran Huu Ha *Deputy General Director-Science, Technology and Environment - (MOC)* Mr. Nguyen Ngoc Long *Permanent Vice Chairman of Vietnam Bridge and Road Association (VBRA)-(MOT)*	
		5.3	Develop a consultant user's guideline for preparing building facility maintenance procedure manuals	Mr. Le Dac Dinh *Official - SACQI-(MOC)* Mr. Nguyen Tuan Ngoc Tu *Official of Inspection No. 3-SACQI-(MOC)*	
Activity 6	Develop construction work safety manual.	6.1	Develop a construction work safety manual	Mr. Phan Dang Tho *Deputy Chief of Inspector-(MOLISA)*	
		6.2	Develop case studies for construction work near-miss incidents	Mr. Pham Duc Toan *Lecturer-Hanoi Construction University* Mr. Pham Duc Hinh *Head of Division-Construction Safety Works (CAMD)- (MOC)*	
Activity 7	Provide training opportunities to spread out project outcomes/equipment			Mr. Nguyen Van Tien *Organization & Personnel Department -(MOC)* Mr. Nguyen Xuan Phuong *Vice Head of Admin Office - SACQI-(MOC)* Mr. Nguyen Anh Tuan *Head of Divison-CQM (Training course development)- (MOC)*	

1.6 PROJECT SCHEDULE

The Project commenced in May, 2010 and finish in December 2013. The general time schedule of the Project is shown in **Figure 1.7.1**.

1.7 REPORTING

Table 1.7.1 shows types of reports and date of issue. The report will be submitted to MOC and JICA through JCC meeting to be held each year.

Table 1.7.1 Reports

Name	Date of Issue	Language
WORK PLAN (W/P)	October, 2010	English
PROGRESS REPORT (P/R)	March, 2011	English
INTERIM REPORT (IT/R)	March, 2012	English
INTERIM REPORT II (IT/R II)	February, 2013	English
FINAL REPORT	December, 2013	English

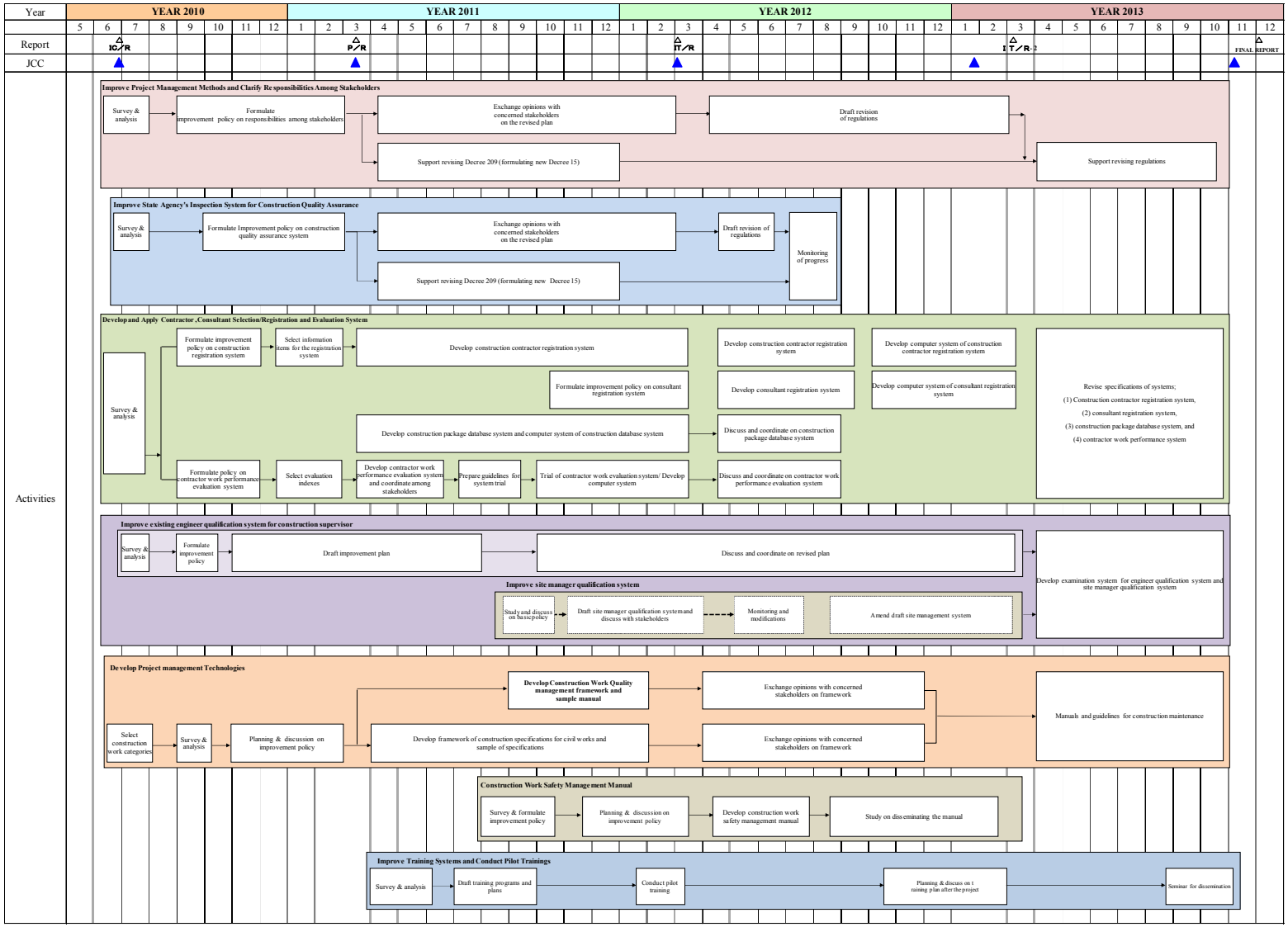


Figure 1.7.1 General Flow of the Project

CHAPTER 2 SCOPE OF PROJECT AND METHODOLOGIES

2.1 SCOPE OF PROJECT

The Project Team has implemented the following activities. The details of the activities are elaborated on in **CHAPTER 4**.

Activity 1: Improve project management methods and clarify responsibilities between stakeholders (Project owners, employers, Construction Supervise (CS) consultants and contractors) focusing on construction quality assurance.

Activity 2: Improve state agencies' (especially MOC) inspection system for construction quality assurance

Activity 3: Develop and apply company registration for construction company and consultant. Develop and apply contractor work performance evaluation system and conduct trial studies.

Activity 4: Improve existing engineer qualification system

Activity 5: Develop the framework for Construction quality manual and Standard construction work specification
Develop a manual guiding maintenance for facilities

Activity 6: Develop construction work safety manuals.

Activity 7: Develop training system, draft training plans and implement training programs

2.2 PARTICULAR NOTE

(1) In implementing the project, there are two policies set in advance of making agreement on M/M.

- Policy (1): Improve existing construction quality assurance systems which include inspection systems, contractor selection and registration systems, and engineer qualification systems
- Policy (2): Improve existing technologies for construction work quality assurance which include standardization of technical specifications and work quality management manuals

(2) State Authority of Construction Quality Inspection (SACQI), is the main counterpart of the project. As the authority, delegated by MOC, needs to direct the various infrastructure construction projects implemented by other ministries and by provincial people's committee, Administration function of construction quality assurance by MOC becomes to require wider perspective and becomes more important than initially expected. In this

project, taking this situation into consideration, more focuses are placed on the Policy (1), the capacity enhancement in construction quality assurance, rather than on the Policy (2).

(3) As this project aims to enhance the capacity of the government administration functions of infrastructure quality assurance, the Project Team introduces overseas advanced programs including the practices of Japan and other advanced countries.

(4) Recommendations of improvement plans should not contradict or infringe on the existing regulations concerning construction quality assurance. Also, much attention should be directed to the improvement of existing regulations rather than introducing new regulations. Thus, the project team develop recommendations with clear apprehension of the existing regulations, and confer with concerned parties.

(5) Under this technical assistance project, technical transfer to counterparts is an integral part of the project. Thus the Project implements technical transfer to the MOC counterparts.

CHAPTER 3 CURRENT STATUS OF INFRASTRUCTURE DEVELOPMENT IN VIETNAM

3.1 OVERVIEW OF INFRASTRUCTURE INVESTMENT

In Vietnam, infrastructure development by economic sector falls into the following five categories;

(1) Civil work infrastructure

(2) Industrial infrastructure

(3) Transportation infrastructure

(4) Agriculture infrastructure

(5) Urban technical infrastructure

Table 3.1.1 shows magnitudes of investment over the past five years from 2008 to 2012. Likewise,

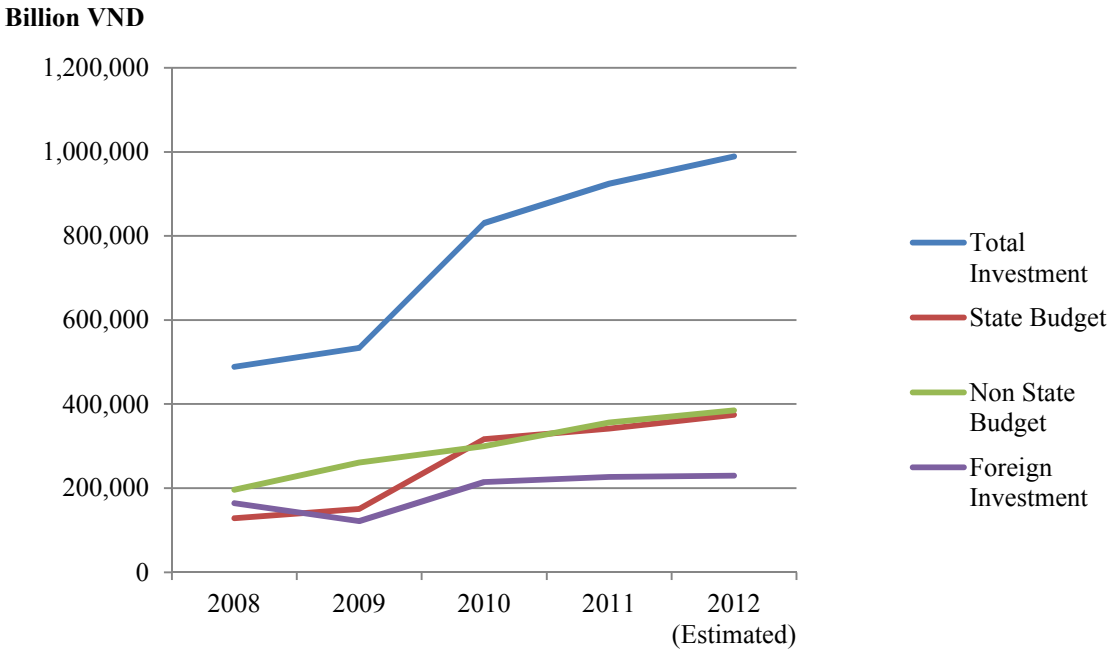
Figure 3.1.1 shows the growth of infrastructure investment. As seen in the tables, non-state budget projects show rapid growth in investment and surpassed investment in the state-budget projects, except in 2010. Of all infrastructure investment, those in the industry sector occupy 38% and the civil work sector occupy 42%, followed by the investment in the transport sector (12%), the urban technical infrastructure (3%) and the agriculture (5%), although analysis was based on estimated total investment in 2012. Looking at breakdowns in the civil work investment, the housing investment is dominant, occupying 85% of all investment and surpassing school (9%) and hospital investment (6%). Likewise, road, bridge and port investment occupy a large proportion of 72% among all transport sector investment.

Table 3.1.1 Infrastructure investment by economic sectors

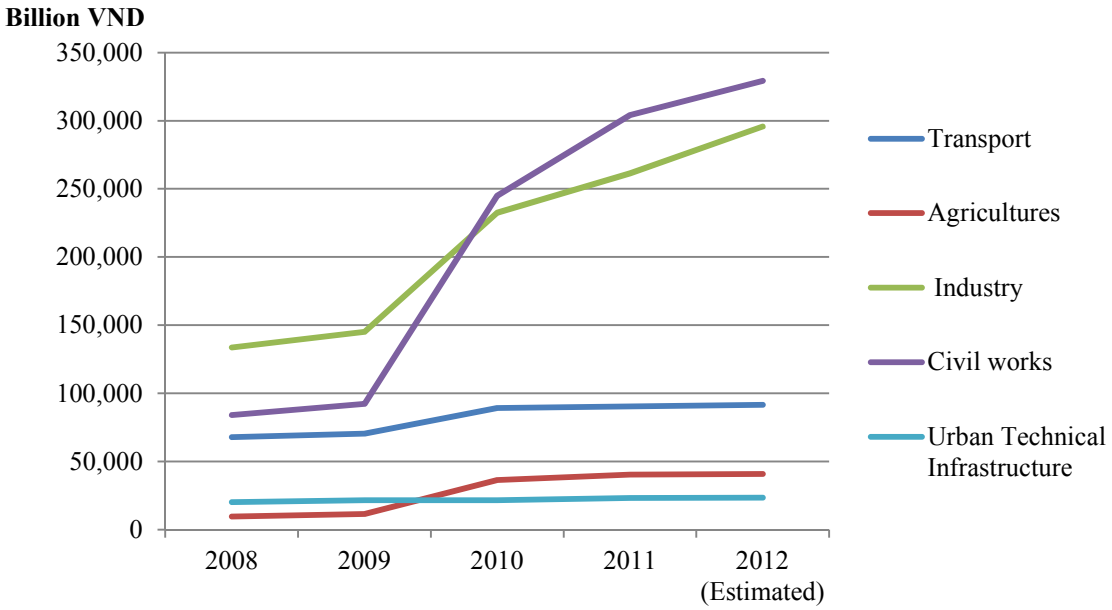
Unit: Billion VND

No	Economic Sector	Year				
		2008	2009	2010	2011	2012 (Estimated)
Total Investment		**488,701**	**533,369**	**830,278**	**924,495**	**989,300**
State Budget		128,367	150,754	316,285	341,555	374,300
Non State Budget		196,248	260,755	299,487	356,049	385,025
Foreign Investment		164,086	121,860	214,506	226,891	229,975
Wherein: Investment in some sectors		**315,478**	**366,546**	**624,633**	**719,613**	**780,669**
1. Transport		**67,966**	**70,540**	**89,174**	**90,372**	**91,553**
1.1	Roads, bridges and Ports	66,776	69,236	65,222	66,111	66,054

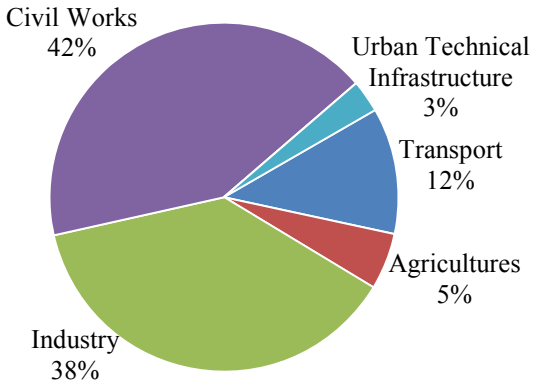
No	Economic Sector	Year				
		2008	2009	2010	2011	2012 (Estimated)
1.2	Airports	510	324	13,752	13,911	14,362
1.3	Railways	680	980	10,200	10,350	11,137
2. Agricultures		**9,524**	**11,531**	**36,500**	**40,484**	**40,896**
2.1	Irrigations	7,424	9,231	25,150	28,321	28,563
2.3	Channels, pumping stations, internal irrigation gates, etc.	2,100	2,300	11,350	12,163	12,333
3. Industry		**133,723**	**145,114**	**232,395**	**261,355**	**295,603**
3.1	Energies (hydro-power, thermal-power, etc.)	43,981	52,689	70,491	75,347	77,660
3.2	Processing industry	89,742	92,425	161,904	186,008	217,943
4. Civil works		**84,083**	**92,246**	**245,060**	**304,105**	**329,171**
4.1	Housing	58,630	64,590	209,441	261,577	279,805
4.2	Schools	16,521	17,426	23,580	27,273	30,767
4.3	Hospitals	8,932	10,230	12,039	15,255	18,599
5. Urban Technical Infrastructure		**20,182**	**21,527**	**21,504**	**23,297**	**23,446**
5.1	Water supply and drainage. Sewage treatment (cleanup works, etc.)	20,182	21,527	21,504	23,297	23,446



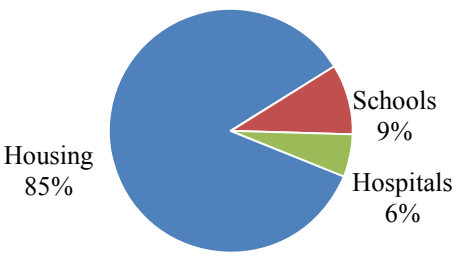
(a) Growth by Budget



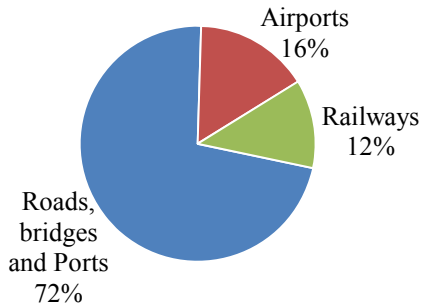
(b) Growth by Type



(c) Breakdown of Investment (2012)



(d) Civil Work (2012)



(e) Transport (2012)

Figure 3.1.1 Investment Rates (Samples)

3.2 DECENTRALIZATION POLICY

On June 30th 2004, the government issued Resolution No. 08/2004/NQ-CP [1] aiming to decentralize management from the central government to the provinces and centrally-administered cities. Stepping up the State management decentralization between the Government and the provincial-level administrations and among local administrations of all levels, enable to bring the dynamism, creativeness, autonomy and self-responsibility of local administrations on the basis of clearly defined tasks, powers and responsibilities of each level apparatuses of the state. This is achieved through ensuring the concentrated, uniformed and smooth management of the Government with enhanced administrative disciplines. Thus it expects to raise the state management effectiveness and efficiency in service of the people's demands and interests and encourage the socio-economic development in each locality in the transition to a socialist-oriented market economy.

In line with this policy, authority on the infrastructure construction has also been delegated to the provincial-level administrations and among local administrations of all levels from the central Government.

3.3 PROJECT CATEGORIES

(1) Project Category by Capital

Decree No.12/2009/NĐ-CP [2] stipulates the categories of construction investment projects (CIPs). **Appendix_ 3-1-1** explains further details of this category.

(a) Projects financed by the state budget;

(b) Projects financed with credit guaranteed by the State and credit for investment and development by the state;

(c) Projects financed by capital for investment and development of the State;

(d) Projects financed from other sources, inclusive of private capital or joint venture capital.

(2) Project Category by Scale

Decree No.12/2009/NĐ-CP also provides further categories of Construction Investment Projects (CIPs) as shown below, which are based on the magnitude of investment and particularity of the project. Of these, the important projects whose investment decisions are made by the National Assembly.

[1] Resolution No. 08/2004/NQ-CP of June 30, 2004 on further stepping up the State management decentralization between the Government and the provincial/municipal administrations

[2] Decree No.12/2009/NĐ-CP of February 10, 2009, on Management of Construction Investment Projects (CIPs)

(a) Important national project;

(b) Group A project;

(c) Group B project;

(d) Group C project

(3) Project Category by Technical Function

In addition, Decree 15/2013/NĐ-CP[1] stipulates project grades by technical function. The project grade falls into five categories as shown below, based on the functional criteria such as height and total area for architecture and building cases. **Appendix_ 3-1-2** explains the classification and grading of civil works.

3.4 PROJECT PLANNING

(1) Planning Procedures

The Government unifies the management on planning in the nationwide. The Ministries coordinate with MPI to formulate the sector development plan and submit to the Prime Minister for approval. The Prime Minister directly makes the decision on the national plans including the socio-economic development plans; the infrastructure development plans with important strategic significance; the master plans for developing sectors and economic regions, the master plan of urban development (grade II or higher); the development plans of industrial and high-tech zones. Upon approvals, the Ministers decide the detail development planning of the sectors as the assignment of the Government.

Based on the overall planning of country, industry, and economic region, the presidents of the PPC will formulate the local-level planning, including: planning of economic-social development of the province, of the sub-regions of the provinces the affiliated units and; sector development planning in the area; planning of urban development (grade III or below), the province's rural projects and submit to the People's Council at the same level for approval before making decision.

(2) Construction Plans

Following the procedures stated above, each Minister drafts a sector development plan. In particular, the Minister of Construction takes responsibility for drafting the following national plans in accordance with the Construction law, while the chairmen of the People's

[1] Decree No.15/2013/NĐ-CP, February 6th, 2013, on quality management of construction facilities

Committees take responsibility for planning regional-level plans in line with the national plans.

(a) Regional construction plans;

(b) Urban construction plans;

(c) Rural population quarter construction plans.

3.5 LEGAL FRAMEWORK OF CONSTRUCTION PROJECT MANAGEMENT

Table 3.5.1 shows regulations stipulating detailed processes shown in **Figure 3.5.1**. In principle, all these regulations have been widely applied to various infrastructure construction projects. However, focuses have been placed more on the infrastructure construction, there have been quite a few maintenance regulations prepared in the past.

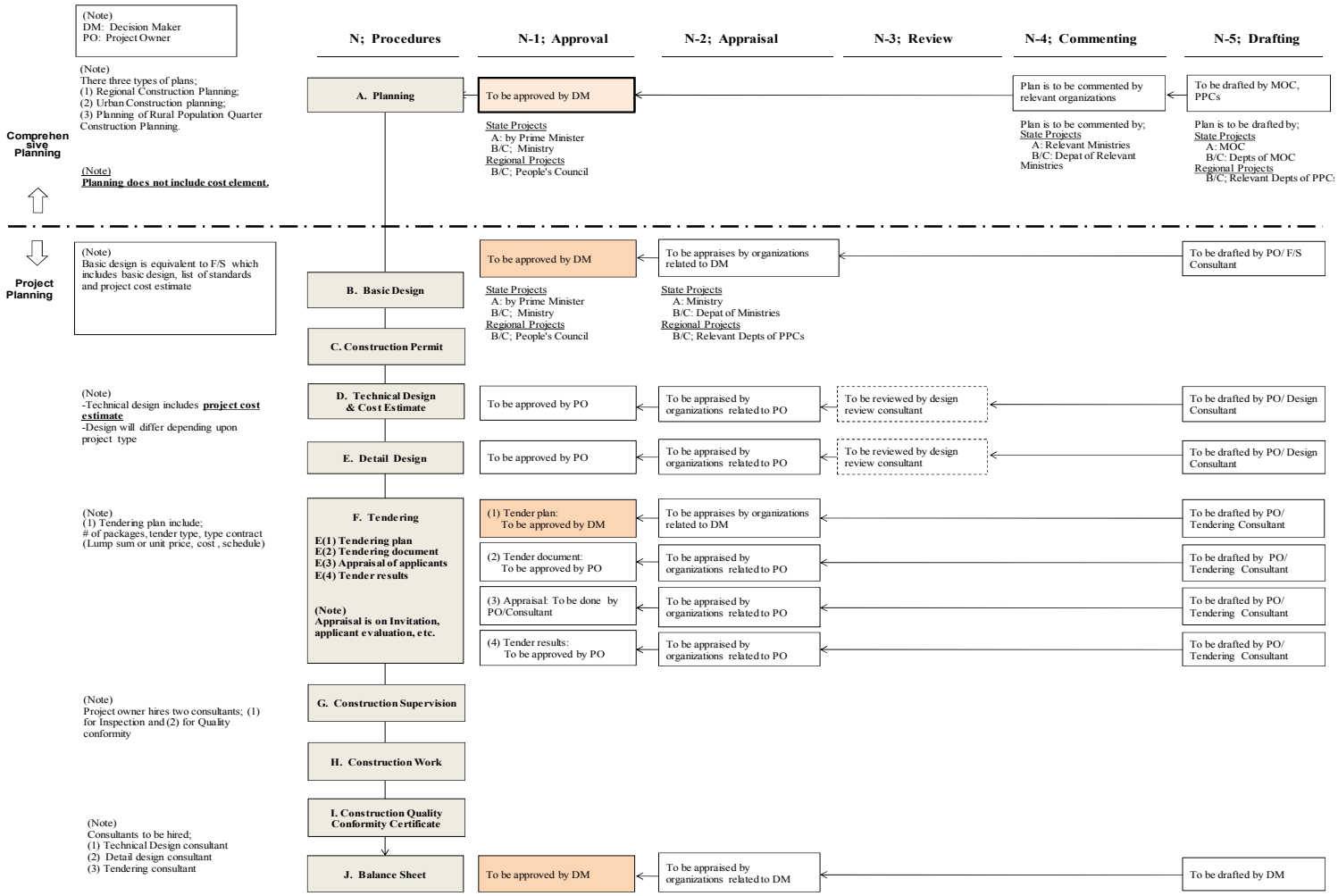


Figure 3.5.1 Construction Project Planning and Implementation Procedures

Table 3.5.1 Laws and Regulations for Construction Project Planning and Implementation

Procedure	Category & Description	Approval	Appraisal
Planning			
1. Regional construction planning	Tasks	Law on Construction Art 15 Law on Construction Art 11-Item4 Decree 08/2005/ND-CP Art 11	Law on Construction Art 15 Law on Construction Art 11 – Item 4 Decree 08/2005/ND-CP Art 11
	Design	Law on Construction Art 17 Decree 08/2005/ND-CP Art 11	Law on Construction Art 17 Decree 08/2005/ND-CP Art 11
2. Urban construction planning	Tasks	Law on Urban Planning Art 44 to 45 Decree 37/2010/ND-CP Art 31 to 34	Law on Urban Planning Art 41 to 43 Decree 37/2010/ND-CP Art 31 to 34
	Design	Law on Urban Planning Art 44 to 45 Decree 37/2010/ND-CP Art 31 to 34	Law on Urban Planning Art 41 to 43 Decree 37/2010/ND-CP Art 31 to 34
	Organization and management	Law on Urban Planning Art 53 to 73 Decree 37/2010/ND-CP Art 35 to 47	
3. Rural population Quarter construction Planning	Tasks	Law on Construction Art 30 Decree 08/2005/ND-CP Art 36	Law on Construction Art 30 Decree 08/2005/ND-CP Art 36
	Design	Law on Construction Art 30 Decree 08/2005/ND-CP Art 36	
Basic Design			
1. Tasks and survey methods		Law on Construction Art 50, 51 Decree 209/2004/ND-CP Chap. III Art 6,9,12 Circular 06/2006/TT-BXD Part III	
2. Basic design and project explanatory documents		Law on Construction Chap III Art 39, 40a, 41, 44 Decree 12/2009/ND-CP Chap II Art 5, 12 Circular 03/2009/TT-BXD Art 2, 3	Law on Construction Chap III Art 39, 44 Decree 12/2009/ND-CP Chap II Art 9, 10, 11 Circular 03/2009/TT-BXD Art 2, 3
3. Total investment capital		Decree 112/2009/ND-CP Art 6, 7 Circular 04/2010/TT-BXD Art 12, 13	Decree 112/2009/ND-CP Art 6 Circular 04/2010/TT-BXD Art 12
Construction Permit		Decree 64/2012/ND-CP	
Design			
1. Design 2. Technical Design 3. Detail Design		Law on Construction Chap IV Art 57, 59, 60 Decree 12/2009/ND-CP Art 18 Decree 209/2004/ND-CP Chap. IV Art 16 Circular 27/2009/TT-BXD Chap III Art 9 Circular 02/2006/TT-BXD	Law on Construction Chap IV Art 57, 59 Decree 12/2009/ND-CP Art 18 Decree 209/2004/ND-CP Chap IV, Art 16 Circular 27/2009/TT-BXD Chap III, Art 9
1. Cost estimate		Dec.112/2009/ND-CP: Art 10, 11, 24, 25, 26, 27 Circular 04/2010/TT-BXD Art 14, 15	Decree 112/2009/ND-CP Art 10, 24, 25, 26, 27 Circular 04/2010/TT-BXD Art 14 Appendix 7

Procedure	Category & Description	Approval	Appraisal
Tendering		Law on Construction Chap IV Art 95 to 106	
2. Tendering Plan		Law on Tendering Art 6 Decree 85/2009/ND-CP Art 11, 12 Law on Tendering Art 6	Law on Tendering Art 4 Item 39 Law on Tendering Art 6, 59 Decree 85/2009/ND-CP Art 11,12
3. Tendering Document			Decree 85/2009/ND-CP Art 72 Law on Tendering Art 6, 59
4. Evaluation of Applicants			Decree 85/2009/ND-CP Art 20, 31, 39 Decree 85/2009/ND-CP Art 72, 73 Law on Tendering Art 6, 59
5. Tendering Results		Law on Tendering Art 40, 41 Decree 85/2009/ND-CP Art 20, 31, 39, 71	Law on Tendering Art 6, 59
Construction			
1.Construction Work		Law on Construction Art 72 to 80, 84 Decree 12/2009/ND-CP Art 27 to 32 Decree 209/2004/ND-CP Art18, 19, 20 Circular 27/2009/TT-BXD Art 12 to 19	
2. Construction Supervision		Law on Construction Art 75 to 90 Decree 12/2009/ND-CP Art 27 to 32 Decree 209/2004/ND-CP Art 3 Decree 209/2004/ND-CP Art18, 20, 21 Circular 27/2009/TT-BXD Art 14	
3. Inspection		Circular 27/2009/TT-BXD Art.14, 19	
4. Acceptance		Law on Construction Art 80 Decree 209/2004/ND-CP Art 23 to 27 Circular 27/2009/TT-BXD Art 13, 17, 18	
5. Authority Inspection		Law on Construction Art 111 to 118 Circular 27/2009/TT-BXD Art.19 Circular 35/2009/TT-BXD	
6. Quality conformity		Decree 209/2004/ND-CP Art 28 Circular 16/2008/TT-BXD	
7. Warranty		Law on Construction Art.76, 82 Decree 209/2004/ND-CP Art 29, 30 Decree 48/2010/ND-CP Art.10,16, 42, 45	
Construction Quality Conformity Certificate		Circular 16/2008/TT-BXD	
Balance Sheet		Law on Construction Art 81 Decree 112/2009/ND-CP Art 28, 29, 30	Decision 56/2008/QD-BXD Circular 86/2011/TT-BTC

Procedure	Category & Description	Approval	Appraisal
		Decree 48/2010/NĐ-CP Art.17 to .22.	Circular 209/2009/TT-BTC Decree 297/QĐ-KBNN Decree 1243/QĐ-KBNN Decree 1539/QĐ-KBNN Decree 25/QĐ-KBNN
Maintenance		Law on Construction Art 83 Decree 114/2010/ND-CP Circular 02/2012/TT-BXD	

(Source) JICA Project Team - as of October/2012

3.6 STAKEHOLDERS OF CONSTRUCTION PROJECTS

(1) MOC

Decree No.17/2008/ND-CP [1] defines that the Ministry of Construction (MOC) is a governmental agency which performs the function of state management of construction; construction planning; technical infrastructure in urban centers, industrial parks, economic zones and hi-tech parks; urban development; dwelling houses and office buildings; real estate business; and construction materials and performs the state management of public services in the domains falling under its state management in accordance with law. Decree No.27/2009/TT-BXD[2] stipulates MOC responsibilities for construction quality management. Some of major responsibilities are stated below;

- Issue and guide legal documents on quality management of construction works.
- Inspect the state management of quality of construction works by ministries, branches and local administrations; inspect the observance of legal provisions on quality management of construction works by organizations and individuals when necessary; propose the handling of, and handle, violations of quality regulations under law.
- Guide, organize or designate consultancy organizations which are capable of assessing the quality or incidents of construction works at the request of the Prime Minister, localities, ministries, ministerial-level agencies or branches.
- Annually or irregularly review and report on the actual quality and quality management of construction works nationwide to the Prime Minister upon request. The State Authority for Construction Quality Inspection shall assist the Minister of Construction in performing the above responsibilities.

Figure 3.6.2 explains the MOC organization structure. In order to perform its duties, MOC established SACQI for the state management of construction quality and CAMD for the state management on construction projects in the organization. The following outlines the major responsibilities of these organizations.

1) SACQI

State Authority of Construction Quality Inspection (SACQI) has the assistance function to support the Minister in state management on construction quality and to organize the state inspection of construction quality according to the assignment from the Government and the

[1] Decree No.17/2008/ND-CP, February 4th 2008, Defining the functions, tasks, powers and organizational structure of the Ministry of Construction

[2] Decree No.27/2009/TT-BXD, July 31, 2009 on GUIDING A NUMBER OF PROVISIONS ON QUALITY MANAGEMENT OF CONSTRUCTION WORKS

Prime Minister. SACQI is the class-II Department, with the juridical capacity, with the stamp for operation, and can open the account at State Treasury and bank under the provision of law. The tasks and authorities are stipulated in detail under Decision No. 988/QD-BXD[1].

Major responsibilities of SACQI include; to study and propose policies, programs, projects, regulations and guidelines on construction quality management and inspection; to guide and supervise the quality management in construction survey, design, execution, acceptance, and handing-over and guide and supervise state construction inspection; to organize the implementation of state inspection of construction quality for constructions under the responsibilities of MOC; and to organize or nominate the inspection organization which has eligibilities to do the quality inspection, state inspection for the construction incident according to the request of the Prime Minister, the MOC Minister or the competent state authorities; to implement the tasks of standing agency of the State Committee of Construction Acceptance, and so forth.

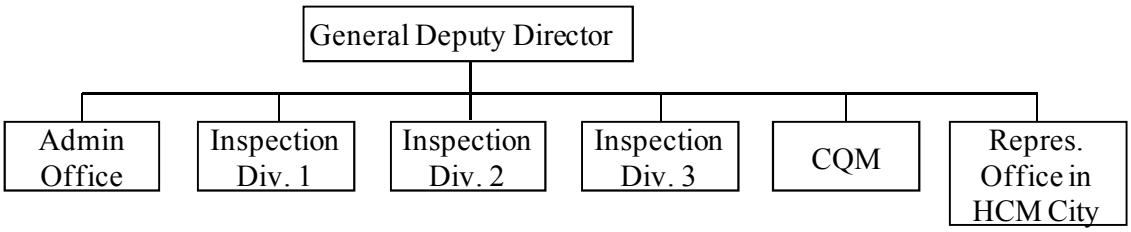


Figure 3.6.1 SACQI Organization

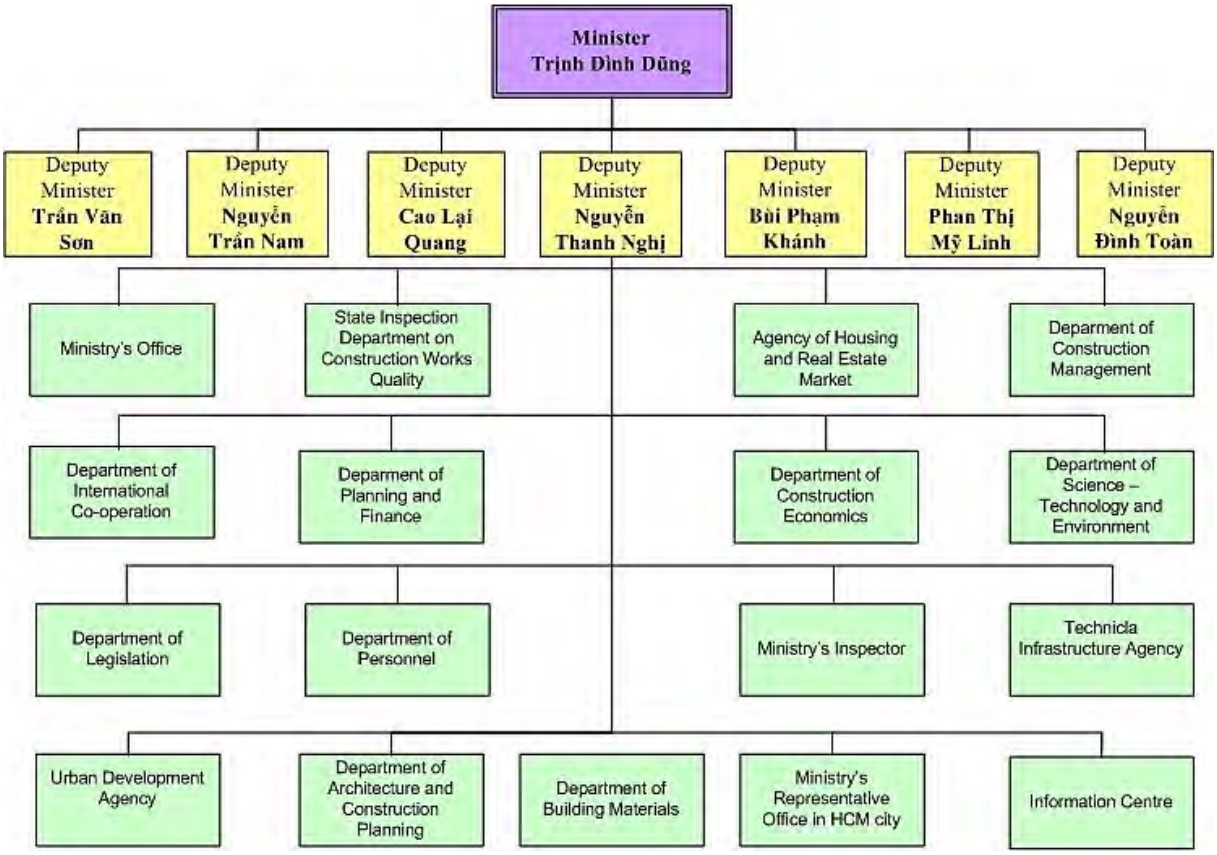
2) CAMD

Construction Activity Management Department (CAMD) is a counselor agency that supports the Minister to perform the state management on construction activities including: formulating the feasibility study and project management, construction survey, design, construction implementation, and state management on enterprises, co-operatives of all economic types operating in fields that under the state management of MOC. The tasks and authorities are stipulated in detail in DecisionNo: 463 /QD-BXD[2].

Major tasks and responsibilities of CAMD include; to study and propose policies, strategies, planning, plan, regulations, and guidelines on formulating the feasibility study (F/S), project management, construction survey, design, and construction implementation; to guide and supervise the implementation of regulations in construction activities; to coordinate with other agencies and organizations, localities to implement the state management in construction activities; to guide and control the issuance and revocation of construction permits; to guide and control the implementation of regulations on eligibilities of individuals and organizations

[1] Decision No. 988/QD-BXD, 29th October, 2010 Regulating the functions, tasks, authorities and organizational structure of the State Authority of Construction Quality Inspection (SACQI).
[2] DecisionNo: 463 /QD-BXD, 2nd April, 2008, on the establishment and regulation on the function, tasks, authority, organizational structure of CAMD

in construction activities, including: F/S formulations; construction survey; design; construction implementation; construction supervision; project management; to guide and control the issuance and management of practice qualifications in construction, to guide and control the job of selection contractors and consultants in construction activities.



(Source) http://www.moc.gov.vn

Figure 3.6.2 MOC Organization

(2) MPI

The Ministry of Planning and Investment (MPI) is a government agency and functions to perform the state management of planning, development investment and statistics, covering the provision of advice on national socio-economic development strategies and plans; development planning on and mechanisms and policies for general economic management and some specific domains; domestic investment, foreign investment in Vietnam and Vietnam's offshore investment; economic zones (including industrial parks, border economic zones, hi-tech parks and other forms of economic zones); management of official development assistance (ODA) and foreign non-governmental aid; bidding; establishment and development of enterprises, collective economies and cooperatives; statistics; state management of public services in branches and domain under the Ministry's management

according to law. MPI's tasks and responsibilities are stipulated in detail under Decree No.116/2008/ND-CP[1].

(3) MOF

The Ministry of Finance (MOF) is a government agency and functions to perform the state management of finance (including state budget, taxes, fees, charges and other state budget revenues, state reserves, state assets, state financial funds, financial investment, corporate finance, cooperative finance and collective economy); customs; accounting; independent audit; pricing; securities; insurance; financial and other services under its state management; and represents the owner of state capital portions in enterprises according to law. Tasks and responsibilities of MOF are stipulated in detail in Decree No. 118/2008/ND-CP[2].

(4) PPCs/Cities/Districts

Decree No.27/2009/TT-BXD also stipulates the responsibilities of Department of Construction (DOCs), provincial-level People's Committee (PPCs) on construction quality management as follows;

- To guide the implementation of legal documents on quality management of construction works in their localities;
- To guide and inspect the state management of the quality of construction works by provincial-level Departments and district- and commune-level People's Committees. To inspect the observance of legal provisions on quality management of construction works by organizations and individuals when necessary. To handle violations of quality regulations under law.
- To guide and organize or designate consultancy organizations which are capable of assessing the quality or incidents of construction works in their localities.
- To review and send biannual and annual reports (before June 15th and December 15th) to MOC on the quality and quality management of construction works in their localities, and irregular reports, made according to the form provided in Appendix 2 of this Circular (not printed herein).
- To assign or decentralize the responsibility for state management of the quality of construction works to provincial-level Departments and district- and commune-level People's Committees under MOC and MOHA Joint Circular No. 20/2008/TTLT-BXD-BNV of December 16th 2008, guiding functions, tasks, powers and organizational

[1] Decree No.116/2008/ND-CP, November 14, 2008
[2] Decree No. 118/2008/ND-CP, November 27, 2008, on Defining the Functions, Tasks, Powers and Organization Structure of the Ministry of Finance

structure of specialized agencies of provincial- and district-level People's Committees, and tasks and powers of commune-level People's Committees in the state management of the construction sector.

3.7 DECISION MAKER AND PROJECT OWNER

There are three stakeholders as shown in Table 3.7.1.

Table 3.7.1 Key Players in Construction Projects

Responsibility	Ministry-level Projects		Provincial Projects		District-Projects	PPP/ BOT	Others Private Project
	Important Projects	Project A, B, C	Important Projects	Project A, B, C	Project B, C	Private Financing	
Decision Maker	Prime Minister	Ministers	Prime Minister	Chairman of PPC	Head of District	Government	Private company
Project Owner	Ministers	Ministry Dept.	PPC	PPC Dept.	District Dept.	Private company	Private company
Employer	Ministry Dept./ PMU	PMU	PPC Dept./ PMU	PMU	PMU	Private company	Private company

(1) Decision Maker

Decision maker's responsibilities for the state budget construction projects are stipulated in Decree 12/2009/ND-CP. The following states the outline their responsibilities;

- Prime Minister decides to invest important national projects pursuant to Resolution of National Assembly and other important projects;
- Ministers, Heads of Ministerial bodies decide investment of projects in group A, B, C. They are also entitled to authorize their direct under-ministerial bodies to decide the investment;
- Chairmen of People's Committees decide the investment of group A, B, C project within their scope and local budget, and district people's committee are entitled to make decision on the investment of group B and C project. Chairman of provincial people's committee regulates in details for district-level and commune-level investment projects.
- For the projects financed by other sources, the owner decides the investment and takes responsibility for them.

(2) Project Owner

Project owner's responsibilities are also stipulated in Decree 12/2009/ND-CP. In the Decree, the project owner is defined as a capital owner or a person who is authorized to manage and to utilize the CIP capital.

- For state budget projects, the project owner is decided by the decision-maker before setting up CIP projects.
- For projects that Prime Minister is the decision-maker on investment, the project owner is one of the following organizations:
  - Ministries;
  - Ministerial bodies;
  - Provincial people's committees;
  - State enterprises.
- For projects that Ministers, Heads of ministerial bodies, Chairmen of people's committees are the decision-makers on investment, the project owner is the body who manages and develops the project. When the body is not appointed or is not qualified for the appointment, the decision-maker can appoint other bodies who are more capable.
- For projects financed by credit source, the borrower is the project owner.
- For projects financed by other sources, the project owner is the capital owner or the representative complied with regulations of the law.

3.8 CONSTRUCTION QUALITY INSPECTION

Inspections conducted in accordance with relevant regulations are summarized in **Table 3.8.1**.

Among these various inspections, the following topics are excluded from the discussions of this paper considering its relevancy.

- Inspection conducted by the National Auditor: The main focus is proper use of budget and not quality inspection.
- Inspections conducted by the Inspectorate of MOC: It focuses on the violation of construction-related legislations, and not on construction quality.
- Inspection by the facility user of the facility: This is considered to be supplementary or additional to the inspection by project owner and discussion on the inspection by project owner can cover the problems associated with this inspection.

Table 3.8.1 List of Inspections Conducted by Various Institutions

No.	Inspection Organization	Purpose of Inspection	Legal Frame	Remarks
Quality Inspection by Project Owner and Contactor (as stipulated in Construction Law and Decree 209)				
1	• Project Owner	• To assure the quality specified in technical specification /contract is achieved.	• Arts. 75, 80 & 87, Const. Law • Art. 21 & 30, Decree 209	• Primary responsibility of quality inspection rests with PO.
2	• Contractor	• To assure the required quality as specified in technical specification /contract	• Art. 23, Decree 209	
State Management of Construction				
3	• MOC, SACQI • Inspection Div.	• To survey actual situation of construction quality • To check actual construction quality and advise improvement to the project owner and contractor if any problems is found.	• Art. 37, Decree 209 • Art. 2, Decree 17/2008/ND-CP • Decision 988/QD-BXD (2010)	
	• MOC, SACQI, CQM	• To examine the quality of construction works in detail when necessity arises	• Decision 249/2006/QD-BXD • Decision 1071/2009/QD-BXD	
4	• MOC, CAMD	• To survey the actual situation of compliance to the various regulations on construction and feedback the information for necessary revision of regulations etc.	• Art. 2, Decree 17/2008/ND-CP • Decision 463/QD-BXD (2008)	
5	• MOC, Inspectorate	• To find out illegal construction procedure and take penal action, if necessary.	• Art. 113, Const. Law • Decision 25/2005/QD-BXD	• Main focus is not quality inspection
6	• PPC (DOC)	• To survey actual situation of construction quality in the province and report to MOC • To check the quality of construction projects implemented by the province • To assure the facility in the said province is in accordance with the construction plan of the Province	• Item 1 & 2: Art. 37 Decree 209; Art. 3, Circular 27/2009/TT-BXD	• Major objective is not quality.
7	• State Council of Acceptance	• To monitor implementation of 'Projects of National Importance', including quality of construction	• Decision 68/2006 & Resolution 66/2006	• SACQI acts as the secretariat of the Council.
Other Inspection Related to Construction Quality				
8	• Inspection and Certification of Full Satisfaction of Force- Bearing Safety Conditions	• To assure that the facility is structurally safe and can be used.	• Circular 16/2008/TT-BXD	
9	• Checking for Certification of Construction Quality	• To quality of the constructed facility is in conformity with the relevant standards.	• Circular 16/2008/TT-BXD	
Other Inspection				
10	• National Auditor	• To assure proper use of public fund		
11	• Use Manger of Facility	• To assure that the quality of the facility is satisfactory	• Art. 30, Decree 209	• Together with project owner?

(Source) JICA Project Team

3.8.1 Quality Inspection by Project Owner and Contractor

Project owner and contractor are primarily responsible for quality management and inspection. This is clear from the stipulations of Construction Law, Decree 209 and other relevant legislations. The project owner needs to conduct quality inspection so that the quality of the constructed facility (or a part of it) is in well compliance with the specification for his payment amount. On the side of contractor, quality inspection is a part of his tasks in order to assure that the quality of the facility that he is constructing satisfies the specifications or other conditions stipulated in the contract. This principle is same in many countries.

3.8.2 Quality Inspection as State Management and Organizations in Charge

(1) Quality Inspection by MOC

SACQI is the authority in charge of construction quality inspection. Three Inspection Divisions of SACQI are tasked with the state management of quality inspection of construction works. The outline of the quality inspection carried out by SACQI is summarized as table based on the discussion between the officials of SACQI and JICA Team.

Table 3.8.2 Outline of Inspection by SACQI

Outline	Contents
Types & Nos. of projects inspected	• About 70 Projects of National Importance: SACQI joins the National Acceptance Committee (as secretariat or task force). • Projects implemented by Ministries: About 20 projects/year • Projects implemented by PPC: About 100 projects/year (1 to 2 projects per 1 province: About 30 provinces are inspected every year.)
Purposes of Inspection	• Projects of National Importance: To confirm the safety of the facility when used; Check conformity to design, standards etc before hand over • Projects of Ministries and PPCs: To get overview on the situation of construction quality; as state management activity
Method of selecting the projects to be inspected	• The province to be inspected is selected considering the following factors. • Geographical location: north, central and south, • Topographical region: mountain or plain, • Degree of urbanization: urban or rural. • The project actually inspected is recommended by the DOC of the selected province.
Items checked	• Quality management system at the site • Capacity/qualification of engineer/technician involved in quality management • Eye-examination of the facility under construction • Document of quality control/management (Note: The inspection is usually done during construction.)
Action taken when defects are found	Unofficially advise the contractor or the project owner, depending on the contract.
Report of inspection is sent to:	Project Owner and DOC

1) Function of CQM

CQM is a division of SACQI. Among the duties of CQM, stipulated in Decision 249/2006/QD-BXD, two tasks are noted; (i) operation of VNBAC and (ii) quality inspection in special cases. Especially, VNBAC can play important roles in upgrading the capacities of CICs, consultants and other stakeholders of quality inspection. This will be discussed later.

2) Function of VNBAC

VNBAC (Vietnam Network of Bodies for Assessing Construction Quality Conformity) is an association of organizations, including consultants, and public authorities which has been established to enhance the capacity of the members in assessment of construction quality. Operation of VNBAC is one of the official tasks of CQM. As discussed later, enhancement of capacity of consultants and Construction Inspection Centers (CICs) is one of the major issues in this Project. There is a strong possibility that VNBAC can play very important and effective role in this aspect. This subject is discussed in the future in the course of discussing improvement measures for quality inspection.

3) Inspection by CAMD

CAMD also conduct inspections of construction works to survey the situation of regulation and find out any necessity of revision of regulations. The outline of such inspections done by CAMD is summarized in table below based on the discussion between the officials of SACQI and JICA Team.

Table 3.8.3 Inspection by CAMD

	Contents
Objective	• To check and survey the situation of regulation and find out any necessity of revision of regulations etc. (as state management)
No. of projects inspected	• 20 – 30 projects per year (Cannot be increased because of manpower and other constraints.)
Criteria for selecting projects to be inspected	• Type of facility (Architecture, Transport, etc.) • Locality: Select provinces where big projects are implemented
Items checked	• Implementation procedure of the project • Selection of contractor, eligibility of the selected contractor with regard to the grade of the project • Management system of quality and safety • Organization and report
Action taken if problem is found	• Serious problem is handled by the inspectorate of DOC, who has an authority to take penal action.
Reports are sent to:	• DOC, project owner & contractor

As shown on the table above, the main objective of inspection by CAMD is to survey the actual situation of regulations and not to inspect the quality of construction works.

(2) Quality Inspection by DOC and CIC

Basically, Department of Construction (DOC), with assistance of CICs, conducts quality inspection on the projects implemented in each province. The main features of inspections conducted by DOC are as listed below:

Inspections are conducted as the state management of construction in accordance with the stipulation of Art. 3, Circular 27/2009/TT-BXD.

- The objectives, contents and methods of inspections are similar to those of MOC.
- The inspected projects are those implemented in the province of each DOC/PPC.
- DOC is often assisted by CIC in technical matters.
- DOC and CIC cooperate with MOC in performing inspections conducted in its province.

(3) Inspection and Certification of Full Satisfaction of Force-Bearing Safety Conditions and Certification of Quality Standard Conformity of Constructions

Circular No. 16/2008/TT-BXD gives guidelines on the inspection and certification of force-bearing safety and quality standard conformity. These certifications are important step before the facility is put into use. However, the methodology or procedure used in the examinations for checking force-bearing capacity and compliance to quality standards are similar to those used in quality inspection. Therefore, this subject will be discussed as a part of quality inspection.

(4) Inspection of the Projects of National Importance

A document titled 'Appraisal of Activity Situation in Year 2010; Some main Solutions to Intensify Management and Improve Construction Quality in Year 2011' dated 8th January 2011 was prepared by SACQI.

The document states that the quality management and quality inspection of the Projects of National Importance has fewer problems than ordinary projects, and does not focus on inspections of these projects.

3.9 CONTRACTOR SELECTION

Contractor selection in Vietnam for infrastructure construction is carried out in accordance with the Tender Law and other legal regulations including the Construction Law, decrees, circulars and decisions etc. The Government of Vietnam participated in the World Trade Organization (WTO) in January 2007 and since then MPI and MOC have made efforts to improve tendering systems aiming to ensure transparency and fairness of tendering procedures.

In order to study on the current practices of contractor selection in the tendering process in Vietnam, the meetings and discussions with various organizations were arranged and carried out. From the meetings and the literature survey including legal regulations, the current practices in Vietnam in regard to construction contractor selection and registration are summarized hereinafter.

In addition, during the JCC Meeting held in March 2011, Vietnamese counterparts requested the Project to incorporate construction consultant registration system. Since then, the request was discussed between the counterparts and the Project team and eventually JICA agreed in September 2011 to include construction consultant registration system into the TOR. In this regard, the Project team commenced to search the current situation of construction consultant registration system in Vietnam as well as in Japan and Singapore and compiled them together.

(1) Company Registration

To begin with, the followings are the outlines of company registration in Vietnam;

- Construction companies intending to participate in construction business in Vietnam shall register to the Department of Planning and Investment (DPIs) which belongs to PPCs;
- Foreign construction companies intending to participate by a project basis are not required to register to DPIs of PPCs;
- Prequalification (PQ) is applied to major projects and to those which require advanced technologies;
- At PQ and at tender stage, bidders are required to submit documents on their past experiences, technical capabilities (number of engineers and equipment etc.) and a financial report of the company in each package;
- When foreign construction company is awarded the package, the company shall apply for a contracting license to MOC and subsequently shall submit construction reports to MOC or to DOCs of PPCs every six months until completion;
- Construction companies having registered to DPIs of PPCs are not required to apply for the contracting license and to submit the reports to MOC or DOCs of PPCs;
- Project Management Unit (PMUs) shall regularly submit monthly project reports to top management in its organization and the top management shall deliver those to MOC every six months in regard to quality.

(2) CAMD Construction Company Registration

Besides the above company registration system, CAMD of MOC collects construction company data based on Decision No.02/2008/QD-BXD, intending to systematize construction

company registration. However, the system has not been in operation as planned due to various reasons. The followings are the outline of the system;

- CAMD is responsible for the operation of this system and in charge of collecting and inputting data;
- CAMD system is intended to classify construction companies and to provide ranking to each company on the basis of the registered data. Thus selection of contractors will be made by referring to their rankings;
- Currently, registration is not compulsory and companies now voluntarily register the data following the guidance. Application of sanction regulations is also under consideration for those who do not properly register information to the system;
- Information Center of MOC has been involved in developing its computer system on its own without any technical support. Two operators from CAMD are stationed at the Information Center to input data.
- Besides the MOC system, MPI is developing a contractor information system for proper bidder selection for all types of state-funded projects, while the purpose of MOC is to use contractor information for planning, bidding and implementation.

The followings are configurations for the system;

- The software has been customized since several years ago;
- SQL server is applied to the system and ASP is used for program language. With this SQL server, registered contractor data is convertible to the excel form;
- The construction contractors and consultants can directly fill in entry form on the website and after completion the data are sent to CAMD. In addition, they can also send hard-copy information directly to CAMD by post. Upon receiving data, CAMD confirms the data and request the Information Center to upload the data on the website;
- Currently, the system does not have any serious operational problems;
- The number of registered construction contractor is 73 and consultant is 57 as of October 2010;
- The data consists of two categories; basic data (1 to 6) and additional data (7 to 15). The data items for registration are as follows.

Table 3.9.1 List of Data Requirement for CAMD System

No.	Items	No.	Items	No.	Items
1	Name of contractor	6	Activity Fields	10	Quality Management System
2	Address of Head Office	7	Financial Figures	11	Typical Works in Recent Three Years
	Province		Charter Capital	12	Implementing Works
	Telephone		1st Year Turnover	13	Strong Fields
	Fax		2nd Year Turnover	14	Prize-won Works
	Website		3rd Year Turnover		Name of Information Sender
3	Representative Office		1st Year Revenue after Tax	15	Title
	Decision of Establishment		2nd Year Revenue after Tax		Telephone
4	No.		3rd Year Revenue after Tax		Email
	Date of Issue		Total Number of Staff		
	Issued by		Site Manger		
	Business Registration	8	University Graduate		
	No.		College Intermediate Graduate		
5	Date of Issue		Skilled Technician		
	Issued by	9	Owned Machinery and Equipment		

**Item 9 is excluded for construction consultant registration system, as unnecessary*

(3) SACQI Consultant Company Registration

SACQI of MOC has commenced collection of consultant company data for fields of inspection, assessment and certification of force-bearing safety conditions and quality standard conformity of construction works based on Circular No. 03/2011/TT-BXD. The followings are the outline of the system.

- SACQI is responsible for the operation of this system and in charge of collecting and inputting data.
- Currently, the system is not compulsory and as of November 2011, 40 companies voluntarily submit applications, which are under review by SACQI.

The data to be provided for the system are quite similar to the CAMD system shown in the **Table 3.9.1**.

(4) Construction Package Data

Construction package data are kept in MPI / DPI at the time of tender and award. As-built data are kept in each project owner and top management in its organization (decision maker). There is not nation-wide system or consistent / comparative data.

3.10 CONSTRUCTION CONTRACTOR PERFORMANCE EVALUATION

Unlike the construction company registration system stated above, MOC yet equips contractor's work performance evaluation system, but makes judgment on whether constructed work is acceptable or not in accordance with relevant decrees and circulars.

3.11 CONSTRUCTION SUPERVISOR QUALIFICATION SYSTEM

(1) Vietnamese Four Engineer Qualifications

In Vietnam, there are three engineer qualifications of architect, construction engineer, and supervisor, and construction cost estimator added as the 4th qualification in 2010. This project focused on the qualification of "supervisor", because capability of supervisor influences significantly on the construction quality assurance.

(2) Qualifications for Supervisor

There are two qualifications for supervisor available. One of them named GS1 is for supervisor who graduated university, and the other named GS2 is for supervisor who graduated junior college or high school. GS1 holders are qualified to supervise all construction works, but GS2 holders can supervise only level-four construction projects. Qualification holders need to renew their qualifications every 5 year. Certificates given to GS1 and GS2 holders are stated in Decree12 and Circular 12.

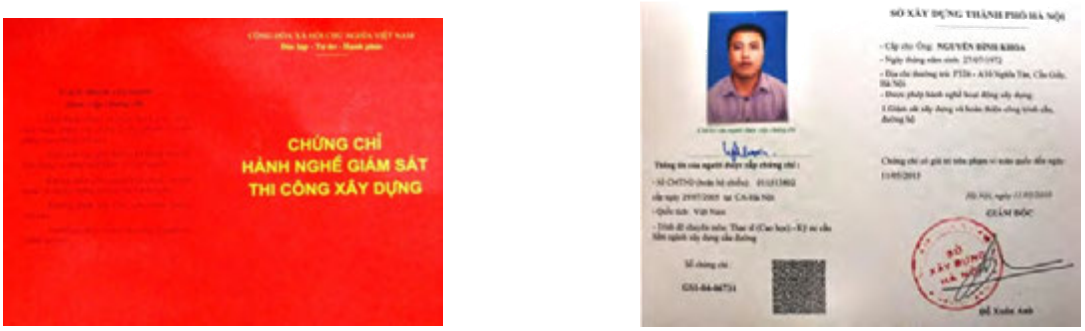


Figure 3.11.1 Sample Qualification Card for Supervisor (GS1)

(3) Valid Fields of the Qualification

Valid fields of the qualification are shown on the qualification card. The field is decided based on the applicant's work experience. There are four valid fields as shown below:

- Supervision of construction survey
- Supervision of construction and finish works
- Supervision of equipment installation works
- Supervision of technological equipment installation

(4) Acquisition Procedures of the Qualification

In acquiring construction engineer qualification, supervisor qualification obliges applicants to take a compulsory training course and short exams. Training centers authorized by MOC provide the compulsory training course and short exams. DOCs of PPCs issues the qualification to the applicants who submit both working experience and the certificate issued by the authorized training center.

Figure 3.11.2 Current Qualification Issuance Process (GS1 and GS2)

(5) Authorized Training Center and Training Course

Organizations including universities, training institutes, consultants, and MOC (SACQI CQM) are authorized by MOC as providers of the compulsory training course to the applicants of GS1 and GS2. As of March 2013, there are 50 authorized training centers. **Figure 3.11.3** shows location maps of these training centers. Of which, 33 centers are located in Hanoi, one in Quang Ninh, one in Nam Dinh, two in Da Nang, two in Phu Yen, one in Binh Duong, one in Vinh Long and the other nine are in and around Ho Chi Minh City. Although there are many authorized training centers, most of them are located in and around three big cities in Vietnam. On the other hand, in Japan, although there are only 13 locations designated as the examination venues of 2nd-class Architect Construction Management Engineer, these locations are widespread across the nationwide. Although some training centers which send lecturers to remote areas to provide the training courses, applicants living in a remote area are forced to stay in a large city as shown in the figure for a few weeks to take training courses.

Figure 3.11.3 Distribution of Exam Locations in Vietnam and Japan

Same training programs and short exams are provided to the applicants of GS1 and GS2. The training program consists of four modules. Module 1 is compulsory and the others are elective programs.

- Module 1: Legal regulations and general issues on construction supervision (32 classes + 30 minutes exam)
- Module 2: Construction supervision of civil, industrial and infrastructural works (40 classes + 30 minutes exam)
- Module 3: Construction supervision of transportation works (32 classes + 30 minutes exam)
- Module 4: Construction supervision of irrigational and hydropower works (32 classes + 30 minutes exam)

Curriculum and duration of the training course and the short exams are regulated in the Circular 25. Each authorized training center prepares for textbooks and exams for applicants. Difficulty of exams differs between training centers. Exam pass rate is almost 100%, and applicants are classified into three levels by the result, which is also printed on their qualification.

(6) Role for DOCs and Council in the Qualification Issuance

Vietnamese engineer qualifications are available nationwide, which are issued by 63 DOCs in Vietnam. Frequency of issuance depends on the number of applicants. For instance, DOC of Hanoi City issues the qualification of supervisor twice a month, and issues two thousands qualifications for GS1 and GS2 every year.

According to the Circular 12, directors of DOCs need to establish a council to review applications submitted by the applicants. Members of the council are comprised of experienced and qualified supervisors, DOC staffs of relevant departments, and staffs of occupational associations.

(7) Role for MOC in the Qualification System

CAMD and SACQI are main authorities on qualifications under MOC. CAMD administrates authorized training centers and MOC revises the Circular 25 and the Circular 12. Each DOC has to inform the state of qualification issuance to CAMD twice a year. CAMD forwards the data to Information Center to upload them on the MOC website. According to the survey carried out by the Project Team, the website has not been well updated, however, this is not regarded as a serious issue in MOC. Tasks are shared between SACQI in charge of technical aspects of the qualifications, and CAMD in charge of revising the Circular 25 and the circular 12. All technical contents are written by SACQI with support from other departments.

3.12 VIOLATION REPORT

CAMD currently releases information on the violation in construction activities through website, so that the public can access to get information. URL of the website is http://vipham.xaydung.gov.vn.

MOC encourages organizations and individuals to provide information on violation in construction activities. The behaviors regarded as violation are; construction work with slow progress; poor quality of construction work due to technical problems; construction works with insufficient consideration on labor safety, sanitation, fire safety, labor accidents during construction and environmental pollution, when they are informed by organizations or individuals with accurate full names, titles, addresses and ID card numbers. The report is normally made by DOCs of PPCs and sent to CAMD in MOC. CAMD checks contents and submit Information Center to upload them on the website. These internal reports are not compulsory at this moment, and MOC is now on the process to establish a new regulation. Also, DOCs have the authority of sanctioning against violation, while MOC does not have the authority. Relevant information being disclosed on the website is stated in **Table 3.12.1.** Table 3.12.2 shows sample violation reports on the website.

Table 3.12.1 Violation Cases

No	Violation Case	The number of Cases
1	Insufficient supervision which caused structural defects.	22
2	Insufficient safety management which caused injury and fatality accidents.	26
3	Slow progress running behind the schedule	5
Total		**43**

Table 3.12.2 Sample Violation Reports on the Website

TT	Name of project	Content violations	Units relevant	Status
1	Commercial center Crescen in Phu My Hung	At About 8 am on 01/09/2010 at the site of 1st floor there is a collapsed area of about 200m2 when many workers are working at the 1st floor	TTNC Industrial & equipment industry - University of Technology HCMC , Sino Pacific Consulting Construction Company , Chinese Limited Construction Company	
2	mixture building construction works Song Da - Ha Dong , Ha Noi	Around 15:30 pm on 24 / 8 , scaffolding with height about 30 m at the building 34 - storey has suddenly poured down the living quarter of University Architecture (Nguyen Trai street , Hanoi) .	- Investor: Corporation Song Da .	damaging directly two houses of No. 14 and No. 16 at the B dormitory of University of Architecture .
3	works of Hall CPC Doi Binh commune, Ung Hoa, Ha Noi .	11 am on 12 / 8 , when tens of tons of concrete was put up , along with the weight of more than 30 participants in the roof concrete pouring , in addition to vibration the 3 machine hoists that the entire roof of the building collapsed .	Construction Unit: Hai Lam Construction Joint stock Company. Unit supervision : West Thang Long Company	Making a worker killed and seven other workers were injured .

3.13 CONSTRUCTION PROJECT INFORMATION MANAGEMENT

CAMD in MOC does not have project information system that manages the data including contactor, staff, cost, term, staff, and evaluation results. MPI also does not directly manage project information. Only each project owner directly manages basic information of projects such as past projects, contractor, staff, cost, term, and evaluation results.

3.14 SPECIFICATIONS AND TECHNICAL STANDARDS

(1) Specifications

1) Transport and Agriculture Sector Construction Projects

Contract dossiers are in general made up of five documents; (1) Instruction to Bidders, (2) Conditions of Contracts, (3) Technical Specifications, (4) Drawings, and (5) Bill of Quantity. Technical Specifications stipulate important points in the construction works, supplementing the conditions of contracts. The points to be prescribed include general requirement, material specifications, technical standards to be applied, construction methods, field and laboratory tests, measurements of completed structures, ways of payment and so forth.

Technical Specifications have been prepared independently for each construction project. Therefore, a project owner or an employer needs to prepare a specification each time before going into the tendering process. The specifications have yet to be standardized in any of the construction fields in Vietnam, so that it has led to variance and inconsistency in context even in same infrastructure construction. Recent survey has reported that provisions in a specification accounts for more than 200 in number, but another accounts for only 50 items for a road project. Furthermore, some of domestic project specifications prescribe only the names of relevant decrees or circulars.

2) Civil work (Building work) Projects

In the civil work construction, which includes schools, residences, hospitals, specifications have never been applied to the construction contracts unlike transport and agriculture sector projects. Instead, necessary information including those on technical standards to be applied is all prescribed in the drawings.

(2) Technical Codes and Standards

Vietnamese construction standards have been prepared for stipulating management and technical issues of construction projects. The number of standards edited in the past accounts for over 1,000 in total.

MOC promulgates construction codes and construction standards for civil construction works including public works and dwelling houses. Meanwhile, authority of promulgating standards, not codes, is also given to the Ministries in charge of specialized construction works in order to manage quality of specialized construction works nationwide. They are the Ministry of Industry and Trade, the Ministry of Agriculture and Rural Development and the Ministry of Transportation (Decree No.209/2004/ND-CP, Circular No.27/2009/ TT-BXD). They are allowed to promulgate standards on condition of close coordination with MOC.

1) Construction Codes

The construction codes are defined in the Law on Construction, No.16/2003/QH11, as regulations to be compulsorily applied to construction activities, promulgated by the State management agencies in charge of construction. **Table 3.14.1** summarizes construction codes.

2) Technical Standards

The construction standards are explained in the same Law as regulations on technical standards, economic-technical norms, order for performing technical jobs, targets, technical indexes and natural indexes, promulgated or recognized by competent agencies or organizations for application in construction activities. Construction standards include compulsory standards and standards encouraged to be applied.

There used to be many technical standards imported from foreign countries, such as Russia, France, Germany, the US, and Japan. It is often said that some of them have already turned old in context and need to be updated. Also, some seem to be no longer applicable to the Vietnam environment. MOC is wishing to develop its own technical standards.

Table 3.14.2 shows the numbers of construction standards. **Appendix_3-2-1** provides further information including names of standards.

Table 3.14.1 Codes

No	Code Number	Code Name
1		Code of Internal Water Supply & Drainage Systems
2	QCXDVN 01:2002/BXD	Building Code of Construction Accessibility for People with Disabilities
3	QCXDVN 09:2005/BXD	Vietnam Building Code-Buildings use Effective Energy
4	QCXDVN 01:2008/BXD(*1)	Vietnam Building Code: Regional and urban planning and rural residential planning
5	QCXDVN 05:2008/BXD	Dwellings and Public Buildings - Occupational Health and Safety
6	QCVN 02:2009/BXD	Vietnam Building Code - Natural Physical & Climatic Data for Construction
7	QCVN 03:2009/BXD	Vietnam Building Code on Classifications and Grading of Civil and Industrial Buildings and Urban Infrastructures
8	QCVN 08:2009/BXD	Vietnam Building Code for Urban Underground Structures
9	QCVN 14:2009/BXD	Vietnam Building Code- Rural Residential Planning
10	QCVN 06:2010/BXD	Vietnam Building Code on fire safety of buildings
11	QCVN 07:2010/BXD	Vietnam Building Code- Urban Engineering Infrastructures

Table 3.14.2 Technical Standards

No	Name of Standard	Number
VOLUME 1: STANDARDS ON CONSTRUCTION PLANNINGS, SURVEY, GEODESY		
I	URBAN AND RURAL PLANNINGS	8
II	CONSTRUCTION SURVEY	17
III	GEODESY	10
VOLUME 2: STANDARDS ON GENERAL REGULATIONS IN CONSTRUCTION DESIGN		
I	CONSTRUCTION AND ARCHITECTURE DRAWINGS	45
II	TERMINOLOGY - CLASSIFICATION OF CONSTRUCTIONS AND DESIGN PARAMETER	15
III	GENERAL STANDARDS ON DESIGN	25
VOLUME 3: STANDARDS ON CONSTRUCTION DESIGN		
I	DWELLINGS AND PUBLIC HOUSES	25
II	INDUSTRIAL, AGRICULTURAL AND IRRIGATION CONSTRUCTION	13
III	TRANSPORTATION CONSTRUCTION	6
VOLUME 4: STANDARDS ON CONSTRUCTION STRUCTURE DESIGN		
I	REINFORCED CONCRETE STRUCTURES	25
II	STEEL STRUCTURES	9
III	WOOD, BRICKS AND OTHER KIND OF STRUCTURES	9
VOLUME 5: STANDARDS ON DESIGN AND INSTALLATION OF TECHNICAL EQUIPMENTS IN CONSTRUCTION		
I	WATER SUPPLY AND DRAINAGE	11
II	ELECTRICITY DESIGN AND INSTALLATION IN CONSTRUCTION	16
III	DESIGN AND INSTALLATION OF CONSTRUCTION LIGHTING	13
IV	DESIGN AND INSTALLATION OF EQUIPMENTS FOR VENTILATION, AIR CONDITIONER, HEATING SYSTEM AND SOUND STUDIO	4
VOLUME 6: STANDARDS ON CONSTRUCTION MATERIALS AND COMPONENTS		

No	Name of Standard	Number
I	CEMENT	23
II	CONCRETE AND CONCRETE COMPONENTS	27
III	LIME, MORTAL, BRICK AND CONSTRUCTION PORCELAIN	36
IV	REFRACTORIES	10
V	CONSTRUCTION GLASS	17
VI	PLASTIC PIPE	17
VII	WATERPROOFING MATERIALS AND PAINT	11
VIII	WOOD AND DOORS	11
IX	STEEL AND METAL	36
VOLUME 7: FIRE AND EXPLOSION PREVENTION AND CONSTRUCTION SAFETY		
I	FIRE AND EXPLOSION PREVENTION	21
II	CONSTRUCTION SAFETY	26
III	SAFETY IN CONSTRUCTION EXECUTION AND MANUFACTURING	49
VOLUME 8: STANDARDS ON CONSTRUCTION EXECUTION AND ACCEPTANCE		
I	DOCUMENTS IN CONSTRUCTION EXECUTION AND ACCEPTANCE	12
II	EXECUTION AND ACCEPTANCE OF CONSTRUCTION ACTIVITIES AND STRUCTURES	35
III	MACHINERY AND EQUIPMENTS FOR CONSTRUCTION EXECUTION	18
VOLUME 9: STANDARDS ON EXECUTION AND ACCEPTANCE OF STEEL AND REINFORCEMENT CONCRETE STRUCTURE		
I	EXECUTION TECHNOLOGY OF METAL STRUCTURE	13
II	EXECUTION AND ACCEPTANCE OF REINFORCEMENT CONCRETE	31
III	TOLERANCE IN CONSTRUCTION	17
VOLUME 10: STANDARDS ON QUALITY OF SOIL, WATER, AIR AND TEST METHOD		
I	Soil test method	69
II	WATER QUALITY AND TEST METHODS	66
III	AIR QUALITY AND METHODS OF DETERMINATION	18
VOLUME 11: STANDARDS ON TEST METHODS FOR CONSTRUCTION MATERIALS		
I	TEST METHODS FOR CEMENT	16
II	TEST METHODS FOR SAND, ROCK AND GRAIL	16
III	TEST METHODS FOR MORTAR	12
IV	TEST METHODS FOR BRICK, ROOF TILE AND SANITARY PORCELAIN	42
VI	TEST METHOD FOR METAL, STEEL AND WELD	12
VII	TEST METHODS FOR TIMBER AND DOORS	22
VIII	TEST METHOD FOR PLASTIC PIPE	12
IX	TEST METHOD FOR GLASS	26
X	TEST METHODS FOR PAINT, BITUMEN AND GEOTEXTILE FABRIC	16
XI	TEST METHODS ON FOR REFRACTORS	22
	Total Number of Standards	**1,010**

CHAPTER 4 MAJOR FINDINGS

4.1 GENERAL

The Project conducted a current status survey on the institutional issues of construction project management and construction quality assurance in Vietnam, which includes interview surveys and literature surveys. The results of the survey are briefly summarized as described below; In summarizing the current status survey, the Project also referred to Summary Report of the Survey on Current Situation and Proposal to Enhance Construction Quality management, March 2010, SACQI, MOC (Hereinafter called as SACQI Report).

4.2 RESPONSIBILITY ASSIGNMENTS BETWEEN STAKEHOLDERS

(1) Project Owners

Current status survey conducted in the Project has clarified that the rapid increase in project created many project owners in the regions who should play a key role in management construction projects and construction quality. Of these project owners, those who are unfamiliar to the construction projects and who are not capable enough of managing construction quality assurance are increasing rapidly. This trend is more likely seen in the civil works (building works) including school and hospital construction.

Also, some POs (or PMUs) directly manage projects but they are not capable and experienced. They are lack of professional skills in the inspection and assurance of facility quality. This will result in risks for the facility quality during the construction process. In addition, SACQI report has clarified the following problems.

- PO directs consultants to formulate technical-economic reports of construction and FS, and try to persuade decision makers to approve the project. POs also impose their viewpoints on the design, especially architectural design and they don't respect professional opinions.
- Due to the limited qualification and capability, POs don't know how to manage consultants such as giving unreasonable demands and orders. In addition, POs cannot properly evaluate the results of surveys and designs, in particular in the large scale construction works (facilities) with complicated technique. Design verification and survey results are usually treated as unimportant and survey supervision is also not paid sufficient attention.

(2) PMU Construction Work Supervision

SACQI Report has clarified that due to the lack of qualification and professional skill in managing projects, POs have to establish PMUs for hire Project Management Consultants (PMCs) to support them. However, unclearly responsibility assignment between PMUs and POs is leading to the fact that PMUs cannot appreciate the capital they manage, but consider the capital a fund for them to freely use. PMUs are not only in charge of professional matters but they have also become a kind of administration agencies with much power and little responsibility.

4.3 CONSTRUCTION WORK MANAGEMENT

In Vietnam, construction companies, in particular excellent companies, are less likely pleased to participate in the state-budget construction projects in Vietnam and more likely willing to participate in private projects. The field survey conducted in the Project has clarified the following reasons for this; construction contracts are unfair to the contractors; acceptance and payment take long time to complete; many document requirements for construction quality assurance; delay in land clearance, hardness of changing design and construction methods, an inoperable dispute board and so forth. With these, improvement of the contract environment which is more favorable to attract excellent contractors is required.

4.4 FACILITY MAINTENANCE

The maintenance plays a very important role in assuring facility quality during a long course of maintenance. Facility maintenance is mainly conducted for large scale construction facilities of transport, irrigation and industry. However, sufficient attention hasn't been paid on the maintenance. Many construction facilities degraded quickly because the work of repair and maintenance is not promptly and timely conducted. In many cases, especially facilities of condominium, schools and hospitals, there is no plan and capital for maintenance prepared.

Most of owners and users of construction facilities funded with State budget, State guaranteed credit budget don't pay attention on facility maintenance. The formulation of maintenance procedure manuals also confused design consultants. With these reasons, a large number of construction works (facilities) have been suffering from degradation just after a few years of use.

4.5 STATE MANAGEMENT

SACQI Report has clarified that DOCs have conducted the inspection on the compliance with the law on the quality management of construction project by organizations and individuals. However, the number of projects that inspections are conducted is not high, which accounts for only 10% of the total.

There are many inconsistences between Laws, Decrees, and Circulars… And the stipulations in regulations are not so clear to be easily misinterpreted.

Regulations on sanctions against violations during quality management are not in detail and how information on violated contractors be announced to public.

4.6 CONTRACTOR SELECTION SYSTEM

Contractor selection is a key factor of successful implementation of construction supervision. But, due to the lack of capacity, POs are not capable of selecting eligible contractors. Besides, POs get difficulties in getting reliable data on the capacities of contractors and consultants.

- It is well recognized in Vietnam that low-performance contractors can repeatedly get awards of construction packages. This is due to the fact that evaluation on the contractor's construction work performance has not been employed in the official processes of construction management. There is no way for the employers to know contractor's past work performance.
- Construction package information management system for the individual state-budget project whose contract was made has not been established, so that it is hard to understand its project outlines. Construction package data are preserved by implementing agencies like PMUs and have never been delivered to other organizations nationwide.
- There is no unified system that can provide at PQ and tender stage reliable information on capabilities of construction contractors/consultants with evaluated past records.

4.7 ENGINEER QUALIFICATION SYSTEM

Currently, engineer qualifications in construction sector in Vietnam are only the sorts of vocational qualifications with employment restriction. There is no grading of qualification. Eligibility of supervisor-class or manager-class is examined based on their academic records and past experiences. The system is now separately handling design and supervision. Contractors are not required to have engineer qualifications in managing construction works in the fields.

The current status survey clarified that in the current construction supervisor qualification system, much focus is placed on the trainings rather on the examinations. Examination is very useful in judging the eligibility of applicants.

4.8 TECHNICAL SPECIFICATION AND STANDARDS IN CONSTRUCTION QUALITY ASSURANCE

(1) Specifications

Specification has been applied to transport sector and agriculture sector projects. In these projects, specifications have been made by project independently, so that there seem to be variance and inconsistency in context between projects, even in the provision of "General Specification".

There are many project owners who are not capable of making or checking specifications in particular in the provincial-level construction projects. However, standardization of specification has never been made.

(2) Technical Codes, Standards and Construction Quality Management Manuals

Technical standards are also the key for managing quality of construction and they have been developed well in Vietnam. However, in the architecture design and in the building construction projects, there still remain many old standards which are no longer applicable to the work.

There seem to be contractors who do not know well about technical standards, in particular subcontractors. The development of construction work quality manuals that are suited for each construction work has never been conducted yet and the use of these manuals is not popular.

4.9 LABOR SAFETY AND SANITATION DURING CONSTRUCTION WORKS

Many regulations as well as national standards are already published on labor safety in construction. However, complexity and inconsistency of regulations makes it difficult for contractors to quote information from related regulations in preparing labor safety and health measures for their construction site. Meanwhile, it's not easy for workers to approach the information on relevant regulations and labor safety measures.

4.10 CAPACITY BUILDING (TRAINING PROGRAMS)

CQM training programs have been playing an important role in disseminating regulations, however, CQM training is not sufficient enough to cover all regions. Attention has not been paid to the training for project managers and POs, a large number of POs are not professionals and familiar to construction project management.

CHAPTER 5 IMPROVE PROJECT MANAGEMENT METHODS AND CLARIFY RESPONSIBILITIES BETWEEN STAKEHOLDERS (PROJECT OWNERS, EMPLOYERS, CONSTRUCTION CONSULTANTS AND CONTRACTORS) FOCUSING ON CONSTRUCTION QUALITY ASSURANCE (ACTIVITY-1)

5.1 FRAMEWORK OF IMPROVEMENT

Frameworks of improvement for this activity are developed in line with Work Plans authorized in the JCC on March 29th, 2011 and the Minutes of Meeting signed on December 28th 2012 between JICA and MOC.

5.1.1 Enhance Responsibility Assignments between Project Owners and PMUs

(1) Concept for Improvement

In order to enhance construction quality assurance, it is essential to enhance the quality of construction project management. There are mainly five (5) stakeholders; (1) decision maker, (2) project owner, (3) PMUs, (4) supervision consultants and (5) construction contractors. Of which, the project owners and the PMUs have been playing an important role in managing construction projects from the view point of construction administration. In particular, the project owner's role is the most essential in taking whole responsibility in managing construction projects and in ensuring accountability to the decision maker. The responsibilities required for the project owner include; (1) over all construction project management and (2) inspection to PMUs.

1) Construction Project Management

Major components of construction project management include the following functions;

- Manage construction budgets and expenses
- Manage construction periods.
- Manage construction quality in conformity with specifications
- Manage labor safety including third-party accidents and preserve environment

The above managements are now becoming harder every year. An instance for this is that there increase in construction projects whose construction periods end up with longer than the initial schedule due to difficulty in right-of-way acquisition and utility relocation. Delay in operation caused by the construction delay may cause huge loss of operational income to the society in the cases of mass transits, trains, expressways, power stations, factories and so forth.

Timely operation by good project management is mandatory for the project owner. With these reasons, the project owner is required to anytime equip with capacity of coping with any changes happening during construction.

2) Inspection to PMUs

The other important responsibility for the project owner is to monitor PMU's performance in construction project management including inspection to their qualities. A schematic view is illustrated in **Figure 5.1.1.** Also, a large portion of project management responsibility is given to the PMUs, but project owner' inspection to PMUs does not function well. This occasionally allows misconducts in their construction project management.

To cope with this situation, it is recommended to review responsibility assignments between project owners and PMUs, and then reinforce project owner's responsibility for the supervision or inspection to PMUs.

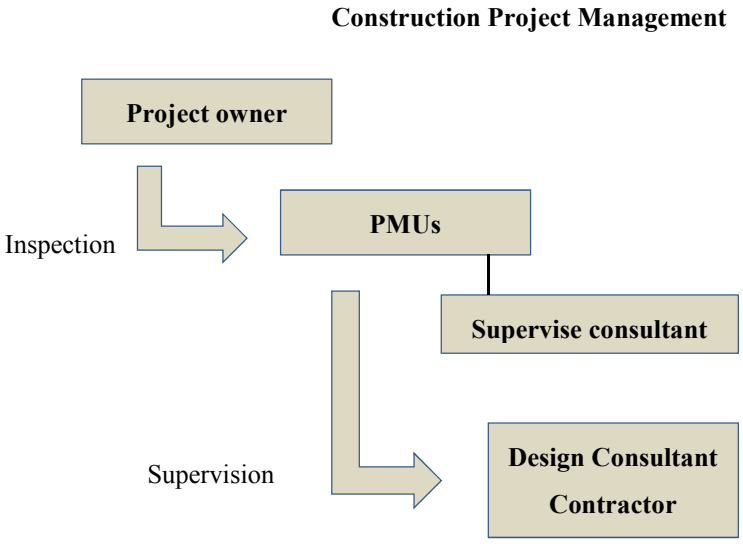


Figure 5.1.1 Inspection and Supervision to the Stakeholders

(2) Methodology

The Project discusses with the counterpart group on the above issues for the ministerial-level stakeholders and the provincial-level stakeholders. Recommendations on the improvement plans are then summarized.

(3) Outputs

Improvement plans for institutions of construction project management and maintenance

5.1.2 Improve Contract Management to Speed up Procedures

(1) Concept for Improvement

Selection of a good contractor is the key for quality management of construction works. However, it is often said that good contractors are less likely willing to participate in the state-budget construction projects. They seem to prefer private projects rather than state-budget projects. Contractors who were interviewed pointed out the reasons as follows; state-budget contracts are generally government-driven and unfair to the private companies; it generally takes too much time to reach conclusion when construction methods need to be changed; interim payments are generally under evaluated and too many documents are requested for the construction quality management and acceptance, and so forth. However, good contractor is considered as a key for providing high construction quality, so that the Government should make efforts to eliminate barriers in the contracts, improving the current contract practices.

With reasons stated above, the plan recommends to improve management methods of construction quality, focusing on the following issues;

1) Enhance Flexibility in Changing Construction Methods

As infrastructure construction changes its physical nature, changes in construction work methods are inevitable without sticking to the original design and construction methods. Of importance for the project management is to ensure quality of construction by flexibly selecting best suited construction work methods to any changes in the natural conditions. Also, changes in construction methods may occur when acquisition of right-of-way becomes delayed. Changes in structure or work methods often become favorable to preventing extension of construction period. Project owner is required to make decisions on the selection of construction methods at right timings as needed.

It should note that maintenance risks may go up when original design is kept maintained without changing design, nevertheless it is required. This may induce structural damages and accelerate structural deterioration, shortening life cycle of facility and causing uneconomic to the society. The Project recommends that project owner's authority in making decisions on the changes of construction works be strengthened.

2) Enhance Inspection Functions and Simplify Acceptance Procedures

Current practices of construction management explain that inspection and acceptance are done simultaneously, and often cause delay in payment to the construction companies. Delay in payment often causes difficulty in fund management for contractors, and should be avoided unless there are unavoidable reasons. In particular, delay in procedures which are often seen

in processing construction work changes should be avoided by accelerating decision-making processes.

The plan recommends to strengthen inspections and then to simplify the processes for acceptance in order to speed up payment without leveling down the quality of construction. With this, it is recommended to employ staged inspections, focusing more on the construction process management. The Project also recommends project owner's direct involvement in the inspection. If project owner found poor performance in the products, he should immediately instruct contractors to repair them, so that the purpose of inspection is to find out poor quality of construction products and to take prompt action to the problems. Staged inspection can eventually simplify acceptance procedure, thereby shorten procedures for payments.

(2) Methodology

The Project is to discuss with the counterpart group on the above issues and summarize recommendations on the improvement plans.

(3) Outputs

Recommendation on the improvement of inspection and acceptance procedures

5.1.3 Strength Institutions for Constructed Facility Maintenance

(1) Concept for Improvement

In Vietnam, much focus has been placed on infrastructure construction rather than on infrastructure maintenance. However, infrastructure is an invaluable national asset that should be taken over from generation to generation in a sound condition. Unless proper actions are taken for maintenance, it would shorten the lifecycle of the constructed facility and impose huge expenses to the next generation. Shorter life cycle incurs huge expenses on big repair works in the long run. As a maintenance period is much longer than the construction period, attention equal to construction should also be paid for the maintenance.

Principle of maintenance is to detect deficiency and deterioration promptly and to apply right works to the right places at the right timings, and thus to ensure best economy over a long maintenance period. To comply with this principle, administrator is anytime required to strength institutions and to enhance maintenance technologies and human capacity for maintenance, besides obtaining an appropriate amount of maintenance budget.

The Project recommends to strengthen institutions which are in charge of maintenance and to clarify their responsibilities. The Project particularly recommends provincial-level DOC and District involvement in making decisions on the diagnosis of structure deterioration and in

planning maintenance plans for civil works maintenance (Building and urban facilities) . Also, it is advised to regulate responsibilities for MOT, MOA and MOI to prepare guidelines in standardizing maintenance procedures and in formulating maintenance plans regarding infrastructures under their jurisdictions.

(2) Methodology

The Project is to discuss with the counterpart group on the reinforcement of institutions and their responsibility assignments for maintenance.

(3) Outputs

Recommendation on the reinforcement of institutions and responsibility assignments for maintenance

5.1.4 Support Revising Regulations in Infrastructure Construction

(1) Contents of Support

MOC is a state authority in charge of enforcing laws and regulations relevant to construction works. The laws and regulations play an important role in guiding various administration procedures for construction project management, contracts, work quality assurance and facility maintenance to all types of infrastructure construction projects. In addition, outcomes of this Project are expected to be stipulated in regulations and then disseminated to the end users in the whole country. The major regulations deeply concerned with construction works include: (1) Construction Law, (2) Decree No.12, (3) Decree No.209 and (4) Decree No.48. In the years from 2012 to 2013, MOC plans to revise Decree 209, Decree 12 and relevant circulars guiding implementation procedures of these decrees. Decree 209 is the regulation stipulating construction work quality management and Decree 12 stipulating construction project management of infrastructure development in Vietnam.

Upon MOC request of cooperation, JICA Project supports drafting of the revision plan of these regulations.

(2) Methodologies

(a) Introduce practices in Japan on the legalization of construction work management and quality management

(b) Recommend legal frameworks

(c) Participate in the discussion and issue comments on the draft version of regulations

(3) Outputs

- Revised version of regulations
- Draft version of circulars

5.2 CLARIFICATION OF RESPONSIBILITY ASSIGNMENTS BETWEEN STAKEHOLDERS

5.2.1 Current Status in Vietnam

(1) Insufficient User's Understanding of Regulations

Many of the regulations concerning duties and obligations for decision makers and project owners have been already well stipulated in Vietnam. However, the baseline survey has clarified that there still remain unlawful acts against the regulations. This explains the fact that the regulations have not been effectively disseminated to end users. This is partly because of the lack of guidelines interpreting these regulations and insufficient checking of law conformity. In particular, it is often said that it is dubious if project owners fully understand their duties and obligations stipulated in the regulations.

(2) Existence of Non-Professional Project Owners

Decree 209 explains that everyone can be a project owner (PO), if appointed by decision maker. However, the regulations relevant to construction works provide POs with responsibilities for playing a key role in project management and quality management for construction works, and therefore big authorities are given to POs as seen in **Table 5.2.1.** It explains that PO's responsibilities range fairly wide and deep, so that they need to equip with not only professional knowledge and expertise in construction work, but also efficient institutions to manage construction works as seen in **Figure 5.2.1.**

Table 5.2.1 Responsibility Assignments to Project Owners

Categories	Regulations	Authority Assign to the Project owners
Project management	Construction Law	Negotiate, sign and supervise the performance of, contract (A75)
		Select contractors with appropriate capability (A75).
		Assume the prime responsibility for clearing and handing over the construction grounds to the contractors (A75)
		Organize the supervision of construction work (A75)
		Examine the measures to ensure the safety and environmental sanitation (A75)
		Organize the pre-acceptance test, payment and settlement of works (A75).
		Hire consultants having capability to test the quality of works when necessary (A75).
		Examine and decide on contractors' proposals related to designs (A75).
		Make compensations for damage caused by contract breaches to the contractors (A75).
		Organize the pre-acceptance test and reception of works (A80).
		Make payment to the contractors according to the pre-acceptance tested volumes(A81)

Categories	Regulations	Authority Assign to the Project owners
		Make the settlement of work investment capital within 12 months after the works are handed over
	Decree No.12	Take obligation from preparation, implementation to hand-over and develop the project.(A34/A35)
		Select capable consultants for project management.(A35)
		Check and supervise performance of the consultant (A35).
	Circular No.3	Set up project management units (PMUs) or use existing PMUs (A11)
		Appoint persons in the PO's organization to inspect PMUs (A11)
		Take full responsibility for the jobs PMU performs (A11).
		Hire project management consultants (PMCs)(A12)
		Appoint PO's staff and assign tasks to their PMCs to exercise the power of investors (A12)
Construction Supervision	Decree No.209	Check the conditions for commencement of construction work (A21).
		Check contractor's capabilities to the bid dossiers and construction contracts.
	Circular No.27	Check and supervise the quality of supplies, materials, equipment (A21)
		Directly manage construction projects or hire consultants to manage them (A4)
		Manage the quality of construction works from preparation and implementation to takeover test, handover and putting of works into operation (A4)
Contractor selection	Construction Law/A104 Tender Law/A61	Request bidders to supply necessary information for selecting contractors (A104)
		Select bid-winning contractors or cancel results of the selection of contractors (A104)
		Compile bidding dossiers and bidding plans (A104)
		Examine the capability for construction capability, construction professions and financial status (A104).
		Publicize bid-winning units and bid-winning prices for construction works funded with the State capital after contractor selection (A104)
		To purchase insurance for work (A104)
		To make compensations for damage incurred due to their faults (A104)
		Make a decision on the re-qualification of tenderers. (A61)
		Approve a list of participating tenderers (A61).
		Establish an expert tendering group (A61)
		Approve the list of tenderers and the list ranking the tenderers (A61)
		Be liable for the contents of contracts, for signing a contract and for fulfilling undertakings in the contract (A61)

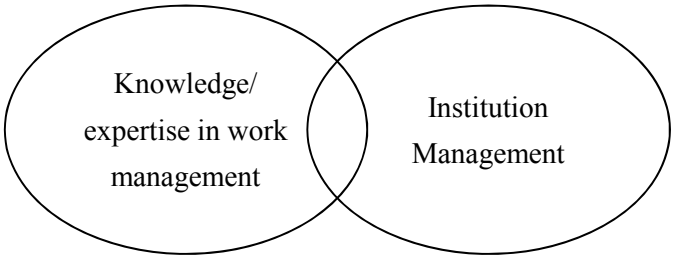


Figure 5.2.1 Competence in Work Management

Figure 5.2.2 and **Figure 5.2.3** illustrate organizations deemed non-professional in construction work management for the central government and for the provincial-level people's committees. Those encircled with dotted line are deemed non-professional project owners which are mostly responsible for the operation of schools, hospitals and office facilities. Other organizations shown in the figures are deemed professional project owners. Much attention should be paid to the non-professional POs, trying to find out eligible POs.

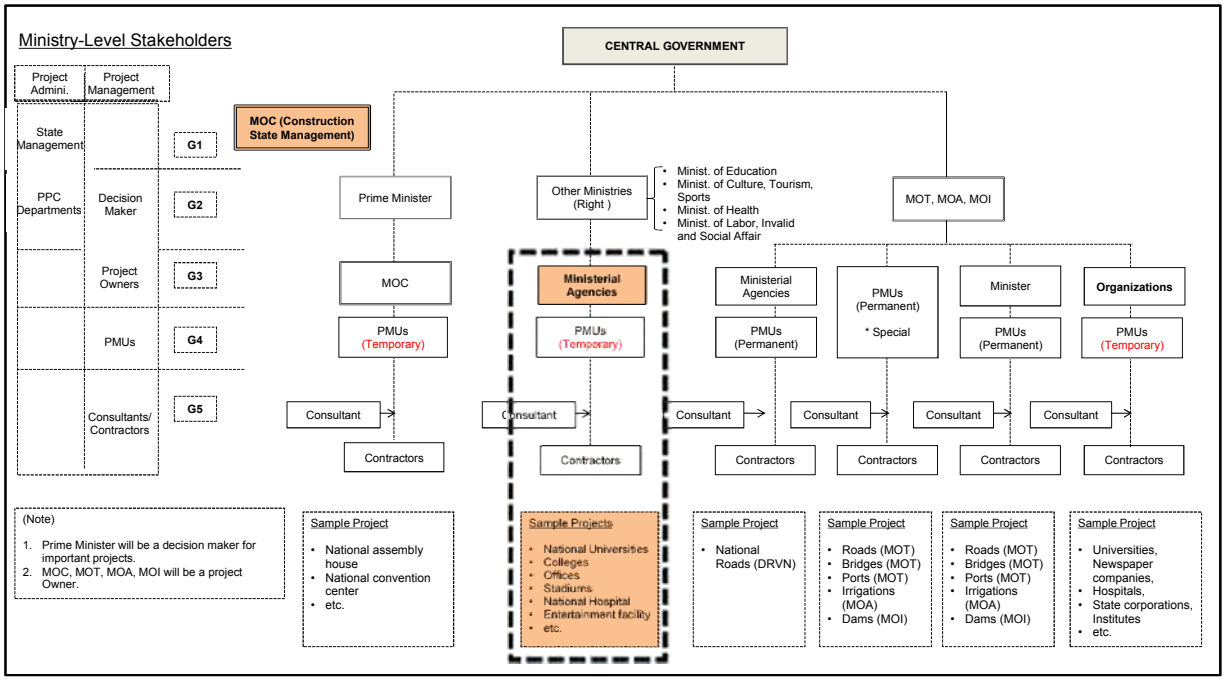


Figure 5.2.2 Central Government

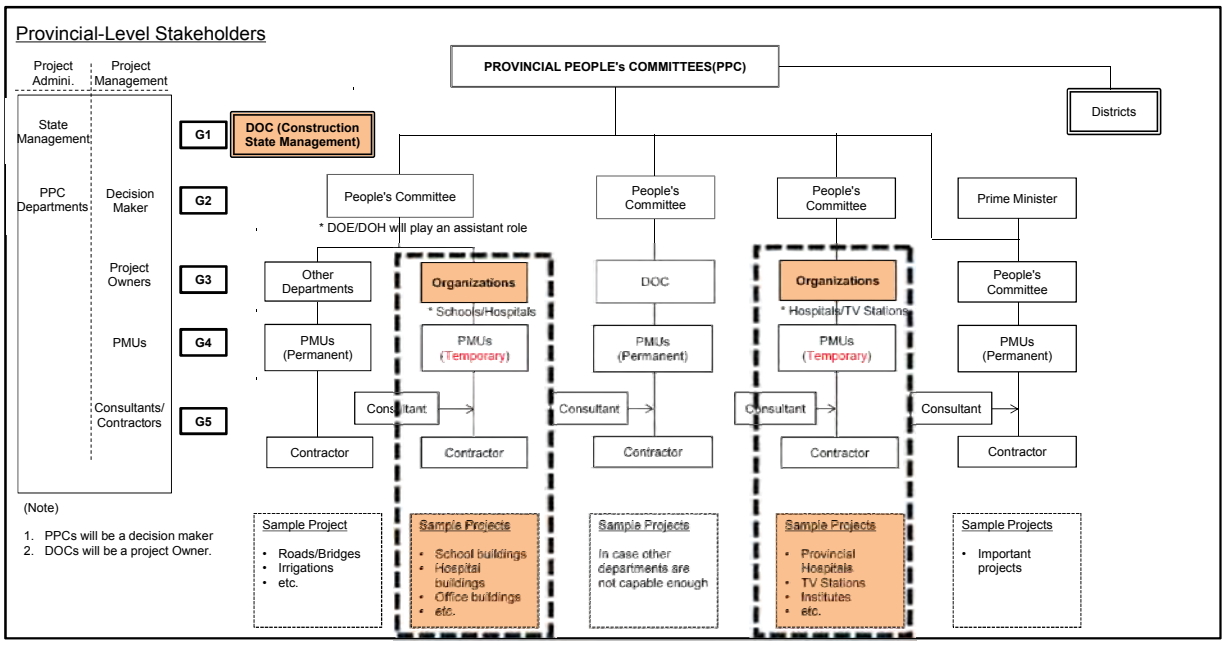


Figure 5.2.3 Provincial People's Committee

(3) Unclear Responsibility Assignment between Project Owners and PMUs

Construction work supervision directly influences on construction quality management. **Table 5.2.2** shows the practices in Vietnam. Currently there are many cases in which PMUs perform responsibility for construction work supervision, but their legal status is not defined in the Law on Organization of the Government, No.32/2001/QH10, 25 December 2001, but decided in ministerial Decisions, not to mention responsibility assignment between project owners and

PMUs. In addition, Construction Law does not articulately show any guidelines of responsibility assignments in construction supervision between project owners and PMUs.

(4) Improper Selection of Project Owners

According to the Circular No.03, Article1, decision maker has authority of nominating eligible project owners on a project basis. However, it is said that the selection has never been properly done in some civil work projects (Building work projects), and ineligible project owners seem to be often selected such as facility owners unfamiliar with construction project management and regulations relevant to construction project and quality management.

This is partly because the current PO selection method of assigning one PO to one construction project, leads to a high demand for project owners in total. However, to secure many qualified project owners is very challenging that potential of selecting incompetent project owners would increase. The incompetent project owners acknowledge in the Project fall into the following categories;

- Project owners who are not familiar with construction project and construction quality assurance
- Project owners who do not fully understand the regulations relevant to the construction project management and quality assurance
- Project owners who disregard the regulations intentionally

Table 5.2.2 Responsibility assignment in Construction Project Management (Vietnam Practice)

Processes	Decision Maker	Project owner	PMU/ PMC	Consultant	Contractor	Standards
F/S	Appraise & approve FS	Check F/S report				
		Check basic design		Design basic designs		
		Check cost estimate		Estimate construction costs		Cost estimate standard
Tendering plan	Appraise & approve tender Plan	Prepare the tendering plan				
Design and cost estimation		Approve technical design Approve cost estimation		Design technical designs Estimate construction costs		Design standards Cost estimate standard
Tender Documents		Approve the tender documents		Prepare tender documents		
Tendering		Tendering				
Contracts		Contract with contractors				Standard contract conditions
Shop Drawings		Approve shop drawing		Check shop drawings	Prepare shop drawings	Design standards
		Construction work supervision		Supervise construction works		
Design changes	Appraise & approve big design changes (*1)	Check big design changes		Check design changes	Propose design changes	
		Approve small design changes (*2)		Check design changes	Propose design changes	
Payment		Approve payment		Check interim payments	Propose design changes	
Job/stage acceptance				Approve job/ stage acceptance (*3)	Propose acceptance	
Final acceptance and		Approve final acceptance and take-over			Propose acceptance	

Processes	Decision Maker	Project owner	PMU/ PMC	Consultant	Contractor	Standards
hand-over		Approve as-built drawings		Certify as-built drawings	Prepare as-built drawings	
		Take-over facilities from contractors				
		Opening of facilities				
Settlement of project final account	Approve Balance sheet	Prepare the Balance sheet				
		Final payment to contractors			Propose final payment	

(Note)

*(*1); For big design changes that will cause change to location, planning, objectives, scale of the project or exceed the approved total investment.*

*(*2);For small design changes that will not cause change to location, planning, objectives, scale of the project or exceed the approved total investment.*

*(*3): If consultants are not hired, PO's own staffs perform job and stage acceptances.*

(5) High Concentration of Duties and Obligations to Some PMUs

The Circular No.03, Article 1 stipulates that decision makers are allowed to assign PO's roles to PMUs, hence there seem to be PMUs who have fairly large responsibilities including those for POs and PMUs.

(6) Insufficient PO's Inspection to PMU

In the large-scale public work projects, including roads, bridges, dams and irrigations, project owners play a focal point of construction project management and are given fairly big duties and responsibilities. Regulations stipulate that project owners can assign a part of their duties to PMUs on the condition that POs perform supervision on the PMU performance. However, it is reported that PO's supervision (inspections) to PMUs have never been fully implemented.

5.2.2 Overseas Practices – Practices in Japan

(1) Institutional Arrangement

Figure 5.2.4 shows the construction project formation used for the construction projects by the Ministry of Land, Infrastructure, Transport and Tourism in Japan, followed by the brief outline shown below;

- Each regional bureau (Project owner) has about 10 subordinate offices which have construction supervision functions and maintenance functions.
- Each bureau consists of 80 management and engineering staff
- Each construction office (PMU) supervise more than 10 projects
- Each office consists of more than 60 qualified engineering staff.

As a result, each Regional bureau performs over 100 construction projects management.

- Constructed facility is taken over to the maintenance section in the same bureau.
- Management and engineering staff are exchanged regularly between construction and maintenance sections, so that the staff can be equipped with knowledge and experiences for both construction and maintenance.

Responsibility assignment between the regional bureau and the construction office is clearly demarcated in intra-MLIT regulations including rewards and punishments.

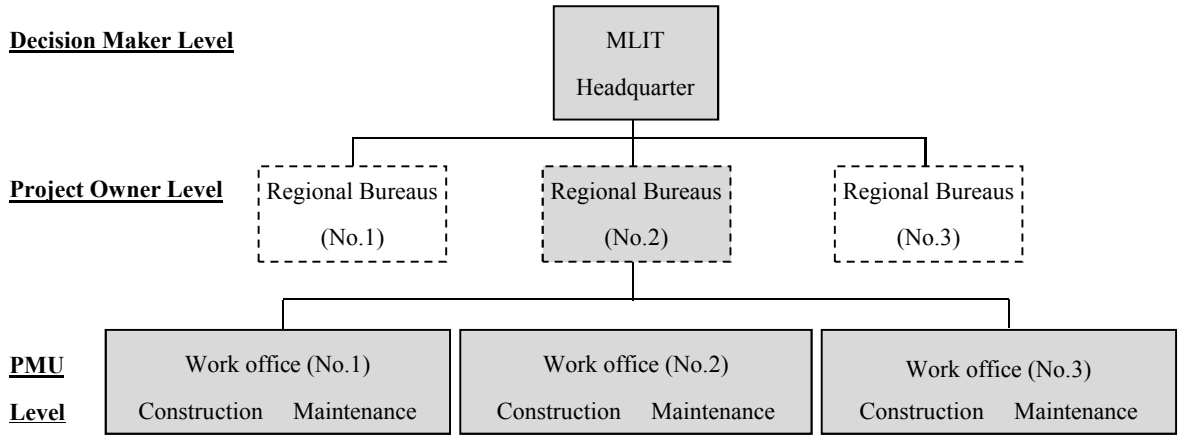


Figure 5.2.4 Construction Management Structure (MLIT Case in Japan)

(2) Responsibility Sharing between Management Levels

- Decision makers approve F/S, but focuses are placed on locations, scale of projects, construction schedule, total investment, cost/benefit analysis rather than on basic designs.
- After the step of the F/S, decision makers approve project implementation plans compiled by project owners. Contents of the approval focus on budget plans, construction cost estimate, state of land acquisition and technical designs. Construction offices provide technical support to project owners, appraising technical designs and preparing detailed data on cost estimate. Technical design is carried out in line with the concept of basic design, but does not stick to the basic design, intending to enhance quality. The implementation plan will substantially play a ground plan for making contracts and supervision to be done hereafter.
- Bureaus and construction offices play a leading role in construction work and quality management. Bureaus take a responsibility for making contracts with contractors as project owners, and construction offices for supervising construction works and quality management as supervisors.
- Construction offices are equipped with their own engineering staff capable enough to perform their management tasks including design appraisal, inspection, quantity check and so forth. However, the independent jobs including surveys, boring surveys, structural design, supervision support etc. are generally outsourced to consultants.
- Consultants are basically in-house and provide supporting services to supervisors (construction offices), so that consultants perform their duties with instruction given by construction offices.
- Final account settlement is done before conducting final inspection and acceptance. If facilities are accepted, they are immediately taken over to project owners, followed by the final payment to contractors.

(3) Construction Project Management

Table 5.2.3 shows the practice of responsibility assignment in Japan (MLIT case). As seen in the table, construction offices, which are equivalent roles to PMUs, play an important role in construction work management, and clear responsibility assignment is defined between project owners and construction offices.

Table 5.2.3 Responsibility assignment in Construction Project Management (MLIT and Ministerial Agencies)

Processes	Decision Maker	Project owner (Bureau)	Construction Office (Survey Office)	Consultant	Contractor	Standards
F/S	Approve FS	Compile F/S report				
	Location, project scale, schedule, B/C	Financial data, technical data, evaluation data				
		Basic designs (Supporting Data)	Check basic designs	Design basic designs		Survey/ design /quantity calculation manual
		Approve benefit & cost estimate	Estimate benefit & cost			B/C manual
		Approve preliminary technical designs	Check pre-technical designs	Design preliminary technical designs		Survey/ design /quantity calculation manual
Implementation plan	Approve implementation plan	Compile implementation plans	Support data preparation			
	Whole plans, but focuses more on budget plans	Budget Plan/ land procurement/ construction schedule	Prepare data for budget plan			
		Approve cost estimate	Prepare data for cost estimate			Cost calculation by computer software
		Approve technical designs	Appraise technical design	Design technical designs		Design manual
Tender document		Compile tender documents	Prepare tender documents (BOQ, Specifications)			Standard technical specifications
Tendering		Tendering				Standard tender plans
Contract		Sign contract with contractor				Standard contract conditions
			Approve shop drawings	Appraise shop drawings	Prepare shop drawings	
			Supervise construction works	Check routine qualities	Implement construction works	Construction supervision manual (Quality, safety, tests, inspection)
Design change	Approve design changes which exceeds approved investment budget	Approve big design changes	Appraise design changes Approve small changes	Check design changes	Prepare design change	
Interim payment		Approve interim payments and pay	Appraise interim payments	Check quantity for interim payments	Propose interim payments	
Final account settlement		Approve final settlement of contract amount	Appraise final settlement of contract amount	Check final quantity	Propose final payments	
Final inspection		Conduct final inspection & accept completion of construction			Propose a final inspection	Inspection manual
		As-built drawings	Check as-built drawings		Prepare as-built	As-built drawing manual

Processes	Decision Maker	Project owner (Bureau)	Construction Office (Survey Office)	Consultant	Contractor	Standards
					drawing	
Take-over facilities		Take-over facilities from contractors				
Preopening Inspection	Preopening Inspection (*1)					
Hand-over to maintenance		Hand-over to maintenance				
Opening of facility	Opening of facilities (*2)	Opening of facilities				

(Note)

(1): Important project cases. In MLIT, preopening inspection is in general carried out at the stage of final inspection in case of the projects implemented by Bureaus, MLIT.*

(2): Important project cases other than MLIT like expressways.*

5.2.3 Capacity Enhancement Plans for Construction Work Implementation

(1) Short-term Improvement Plan for Decision Maker's Responsibilities

1) Approval of Overall Work Implementation Plan

As technical elements of basic designs may change as survey and designs progress, it is recommended that approval on F/S by decision makers be limited on location, project scale, construction schedule, benefits and Costs, total investment (B/C) and contingencies. Basic design should be set out of decision maker's approval.

In order to set a definite ground of construction works, it is recommended that decision makers approve entire work implementation plans before calling for contractors, not only F/S contents and tender plans. The implementation plans should include construction cost estimate, technical designs, tendering methods and construction schedule. Upon approval by decision makers, implementation plans should be the base of construction work to be implemented hereafter

2) Settlement of Project Final Account

It is recommended to shorten the time period from final acceptance up to the final payment to contractors. It is said that the balance sheet to be approved by decision makers should include all relevant expenses besides construction costs. However, these are basically state authority's internal procedures including decision makers, so that the processing time should be shortened to a great extent in order to settle the final payment to contractors promptly after final acceptance.

(2) Short-term Improvement Plan for Project Owner's Responsibility

1) Review Responsibility for Signing Construction Work Contracts

Large responsibilities for managing construction works are given to project owners not only by the Law on Construction but by Decree No.12. Making contracts with contractors is a key responsibility in construction work management (Article 75, Construction Law). However, it is known that this responsibility is often delegated to PMUs by inter-ministerial decisions in the case of some sector management ministries, despite the fact that PMU's legal status is not defined in the Laws on Organization unlike other departments belonging to the central and provincial governments.

With these reasons, project owners are recommended to take responsibilities for making contracts on their own without delegating them to PMUs.

Following is a reference.

Institutional issues of the government organizations are in principle stipulated in the Law on Organization of the Government, No.32/2001/QH10. Likewise, those of the provincial peoples committees are also stipulated in the Law on Organization of the Peoples Councils and the People's Committees, No.11/2003/QH11.

2) Reinforce Provisions Related to Project Owner's Land Clearance Responsibilities

The Law on Construction stipulates that project owners assume the prime responsibility for clearing and handing over the construction grounds to the contractors (Article 75). However, it is often said that delay in land clearance comes to a cause of delay in construction works. It is recommended to confirm the status of land clearance before making contracts with contractors and to strengthen project owner's responsibilities for checking the status of land clearance in order to eliminate delay in construction works.

3) Conduct Inspections to Non-Professional Project Owners

Project owners are now given big authority including capital management, contract management, project formulation, design and construction project management. As long as they are spending state budgets, their performance should be periodically monitored and inspected. In particular, the Project recommends that monitoring and inspections should be directed first to non-professional project owners (P-1 in **Table 5.2.4)**, then to the stand-alone projects managed by PMUs (P-2, P-3 in **Table 5.2.4**).

4) Conduct Monitoring and Inspections to PMUs

As regards the P-4 projects shown in **Table 5.2.4**, it is recommended that the project owner for these projects should be obliged to set up a PMU Monitoring and Inspection committee under the project owner and conduct regular monitoring and inspection to its subordinate PMUs. This shows an alternative way of state audits in construction to project owners. Also, the results of the inspection should be reported to the state management in construction and are preferably disseminated to other project owners to raise their awareness to their construction project management.

5) Preparation of PO's Guideline or Manuals

Under the current construction formations, it is hard to select a large number of qualified project owners, so that it is necessary to prepare supports to the Project owner's activities.

It is seen that project owner's duties and obligations are stipulated in various regulations from the Law on Construction, Tendering Law, Decrees, Circulars and Decisions, which may need

a guideline consolidating information in a booklet format. It is recommended to prepare and to distribute the guideline to the non-professional project owners as a support.

6) Provide Regular Training Courses

In order to enhance Project owner's capacity, MOC and its subordinate organizations are encouraged to provide training opportunities to the Project owners.

(3) Short-term Improvement Plans for Project owner's Responsibilities

1) To Eliminate Overlapping of Responsibilities between PMUs and Supervision Consultants

Review of the responsibility assignments between PMUs and supervision consultants is needed to eliminate the overlapping of responsibilities and to minimize processing time of construction supervision.

2) Supervision of PMU's Performance

With above measures, it is recommended to reinforce a regular inspection to PMUs by setting up a PMU Supervision Committee under the project owner, which comprises members from the relevant Departments and the external organizations. The committee is specialized for assessing and inspecting PMU performance.

3) To Enhance Human Capacities

It is necessary to reinforce trainings to PMU staff.

(4) Long-term Improvement Plans for Project Owner's Responsibilities

1) Reduce Demand for Project Owners

Under the current practice of selecting project owners, if construction projects increases at a current speed, the Government would be faced with a serious shortage of qualified project owners in the near future. However, enhancement of project owner's capacities is not an easy task, but it will take long time to accomplish. With these reasons, it is recommended that project formation should be reviewed and restructured, in an attempt to reduce the high demand for project owners and to ensure management quality by assigning a small number of qualified project owners to construction projects.

The range of construction projects is fairly wide from small-scale building projects to large-scale public work projects such as roads, bridges, irrigations and dams. Selecting qualified

project owners is favorable, but it is not realistic to find out qualified project owners and apply them to many construction projects. **Table 5.2.4** shows the construction project formations currently employed in Vietnam, categorizing them into four (4) patterns. The table also includes brief evaluation of these patterns. Also, sample construction projects for each case are summarized in **Table 5.2.5.** The Project recommends the following;

Table 5.2.4 Evaluation of Current Project Formations in Vietnam

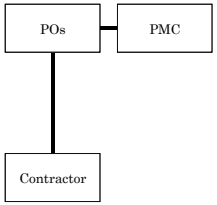
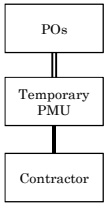
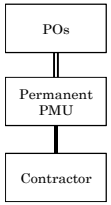
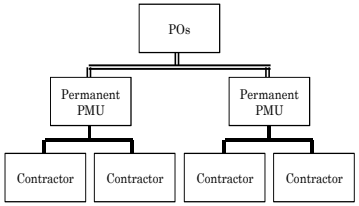
Classification	P-1: With PMC	With PMU		
		P-2: Temporary PMU	P-3: Permanent PMU	P-4: Multiple Permanent PMUs
Project Formation				
Current practices	• Public projects • Private projects	• Public projects	• Public projects	• Public projects
Advantages	• Quick decision making • Low management cost	• PMU is needed only for the project period. • PMU can provide professional knowledge and expertise rather than PMCs.	• Professional knowledge and expertise can be accumulated to PMUs. • PMU can shift to a maintenance body when construction is over.	• It can reduce the number of POs and PMUs. • Professional knowledge and expertise can be accumulated to PMUs. • PMU can shift to a maintenance body when construction is over.
Disadvantages	• PO should be assigned for each project • It cannot meet technically professional demands.	• PO should be assigned for each project. • It is hard to assemble qualified staff to PMU temporary. • Professional knowledge and expertise cannot be accumulated to PMUs • Maintenance body should be set up separately when construction is over.	• PO should be assigned for each project • Responsibility assignments between PO and PMUs sometimes become unclear. • PMU may get a big power more than professional duties unless responsibilities are clearly demarcated.	• PO should be capable enough to manage PMUs.
Applicable Projects	• Small stand-alone projects which do not require professional management and much maintenance.	• Medium stand-alone projects which require professional management, but do not require much maintenance.	• Large-scale continuous projects	• Multiple large-scale continuous projects • High technology projects

Table 5.2.5 Current Project Formations by Project Types

	Sample Projects	Decision Maker	Project owner	PMUs
Central Level	National Assembly House National Convention Center	Prime Minister	MOC	Temporary
	National University Offices Stadium National Hospital Entertainment Facility	Ministries	Ministerial Agencies	Temporary
	Expressways (MOT) National Roads/Bridges (MOT) Ports (MOT) Irrigations (MOA) Dams (MOI)	Prime Minister MOT MOA MOI	MOT Ministerial Agencies	Permanent (*1)
	News Paper Company State Corporations State Institutes	Ministries	Organizations	Temporary
Provincial Level	Provincial Roads/Bridges Irrigations	Provincial People's Committees	DOT DOA	Permanent (*1)
	Schools Hospitals Office buildings	Provincial People's Committees	Organizations	Temporary
	Provincial Hospitals TV Stations Institutes	Provincial People's Committees	Organizations	Temporary
	Important projects	Provincial People's Committees	Provincial People's Committees	Permanent
	In case other departments are not capable enough	Provincial People's Committees	DOC	Permanents

*(Notes) (*1); PMUs sometimes own PO's duties and obligations (Circular No.03 Art.1).*

2) Integration of Construction Projects

P-4 pattern in **Table 5.2.4** illustrates a sample formation of PO integration, which is already incorporated in the large-scale public works (traffic infrastructures, irrigations and dam projects). The Project recommends that this P-4 pattern be applied for provincial-level building construction projects. As shown in **Figure 5.2.5**, DOCs in PPCs are recommended to play a role of POs with their staff strengthened. This can reduce the number of construction projects (P-2 and P-3) and thus qualified project owners.

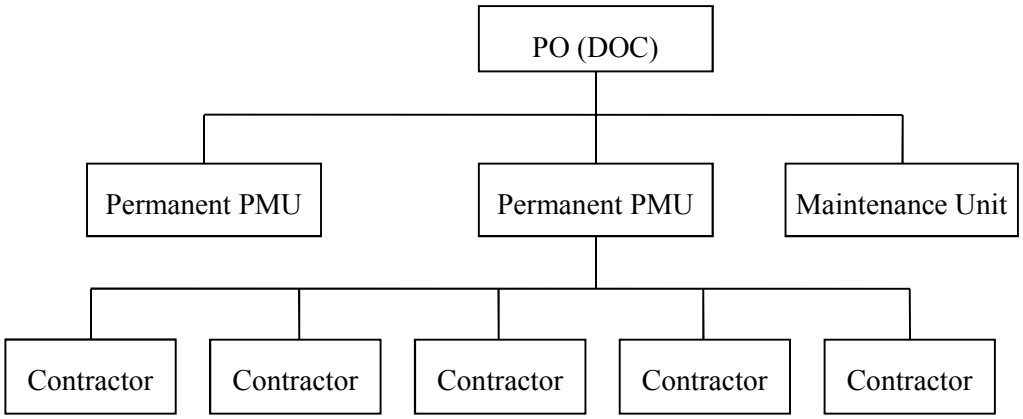


Figure 5.2.5 Integration of PO Functions (Example)

3) Fixed Project Owners rather than Project-by-Project Assignment by Decision Maker

In order to enhance project owner's selection by decision makers, it is necessary to change the current system. An example is shown in the above **Figure 5.2.5.** Due to this scheme, the roles of project owners can be automatically integrated to the government organizations without appointing project owners project by project. It is also recommended to give authority to DOCs to evaluate the feasibility study of construction projects. For the better approach to this system, barriers lying between relevant Departments should be removed and a new rule on project implementation should be worked out.

4) Change Project Implementation Formation

P-1 Pattern in the previous **Table 5.2.4** can be applied to the small-scale projects, such as building construction projects, which do not necessarily require PMUs and thus qualified project owners in construction project management. P-3 and P-4 pattern should be applied to the large-scale projects, such as public works including road, bridges, irrigations and dams, which require qualified project owners.

This is because small-scale building projects, which are similar to the private building construction projects, are ones which do not require frequent changes of design, but require the projects to be implemented in accordance with their designs. On the other hands, public works including road, bridges, irrigations and dams are exposed to the frequent changes of original designs which may provide serious impacts on the construction costs and the construction period, thereby professional judgment is anytime needed.

5) Reduce the Number of Non-Professional Project owners (Potential Non-Professional POs)

In order to enhance quality of construction works, it is necessary to assign eligible POs to construction works. In particular, significance of the management institution becomes bigger and bigger with the growth in investment scales and amounts. It is well known that for large-scale works like roads, dams and ports, efficient management institution is quite mandatory, but instead, for small-scale works like building works, the roles of the management institutions turn to be smaller and may possibly be reinforced by outsourcing part of the works to Project Management Consultants (PMCs). However, to fully assign POs responsibilities to PMCs is impossible, because POs are required to make various administrative judgments while managing construction works and PMCs are nothing more than the supports to POs based on the contracts, so that big responsibilities still remain with POs.

With these reasons, it is necessary to assign eligible POs to construction projects. Also, their eligibilities should be focused more on management institutions rather than on knowledge and expertise for individual POs.

6) Review Criteria of Selecting Non-Professional Project Owners

In order to find out eligible project owners, it is recommended to apply criteria similar to those applied to important projects. Decree No.12 stipulates the two types of concepts; one for important projects and the other for Type-A, B and C projects. For important projects, professional organizations who are Ministries, Ministerial-agencies, Provincial-level People's Committees are in principle assigned to construction projects.

A recommended criterion is to expand the concept for important projects to other projects, expanding the range of work investments and applying the criterion to Type-A and Type-B projects, as seen in **Table 5.2.6.** For instance as shown in the table, for large-scale construction works, whose investment amounts to over 75 billion VND, shown in the table as Class-1, the construction works shall be assigned to the professional project owners who are the heads of organizations in which professional departments in construction management are stationed. The professional department should not be temporal and should be capable enough to manage construction works with their own staff without assistance of management consultants (PMCs).

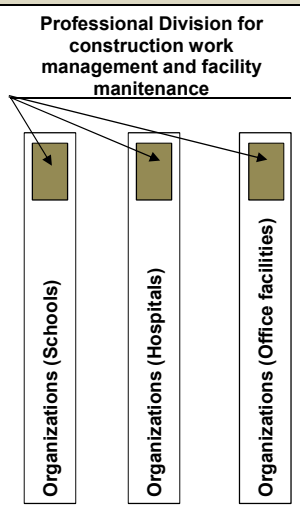
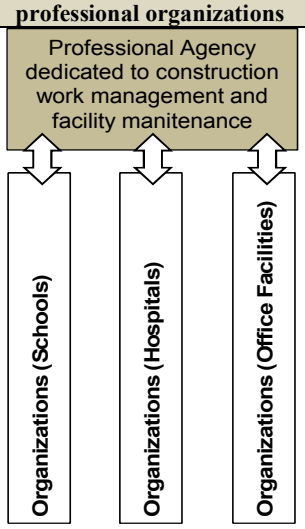
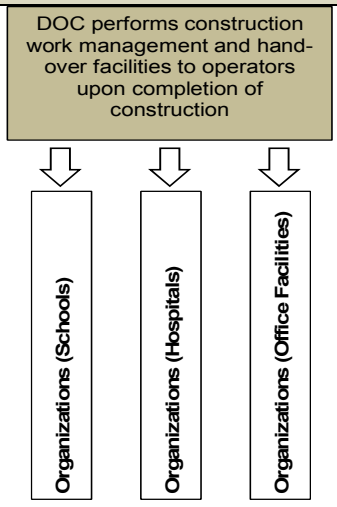
Table 5.2.6 Investment Criteria

Grade of Project	Project Types			
	Type C	Type B	Type A	Important
-25 bn VND	CLASS-2			
25-50 bn VND				
50-75 bn VND				
75-100 bn VND	CLASS-1			
100-250 bn VND				
250-500 bn VND				
500-750 bn VND				
750-1000 bn VND				
1000-1500 bn VND				
1500- bn VND				

7) Review Project Owner's Eligibility

In conjunction with the above measures, the eligibility of project owners can be reviewed as those; who are facility users and have professional in-house departments (Option-1 in **Table 5.2.7)** and those who have affiliated organizations dedicated to construction management and maintenance, which should not be temporal, but permanent organizations (Option-2). In case that such project owner cannot be identified or are ineligible, decision makers may assign other project owners to act as project owner (Option-3).

Table 5.2.7 Eligible POs

Option-1 Assign to POs equipped with in-house professional departments	Option-2 Assign to POs which have professional affiliated professional organizations	Option-3 Assign to other eligible POs
		
(Sample works)	Schools Hospitals Office Facilities	

8) Small-scale Construction Works

However, the above measures are not applied to rather small-scale construction works. For small-scale construction works, whose investment amounts to less than 75 billion VND, the construction works do not necessarily require professional project owners who are eligible enough in construction work management. The works can be manageable with assistance of PMC as stipulated in the existing regulations.

9) Future Vision

Currently, decision makers have no option but to select non-professional Project owners, due to the weakness in institutions and the shortage of professional staff. However, to cope with future increase in projects, it is essential for non-professional project owners to have their own professionalism for construction works for their specialized sectors and accumulate management methods and technologies inside state authorities. In-house professional departments or subordinate professional organizations specialized for construction works will be ones of solutions.

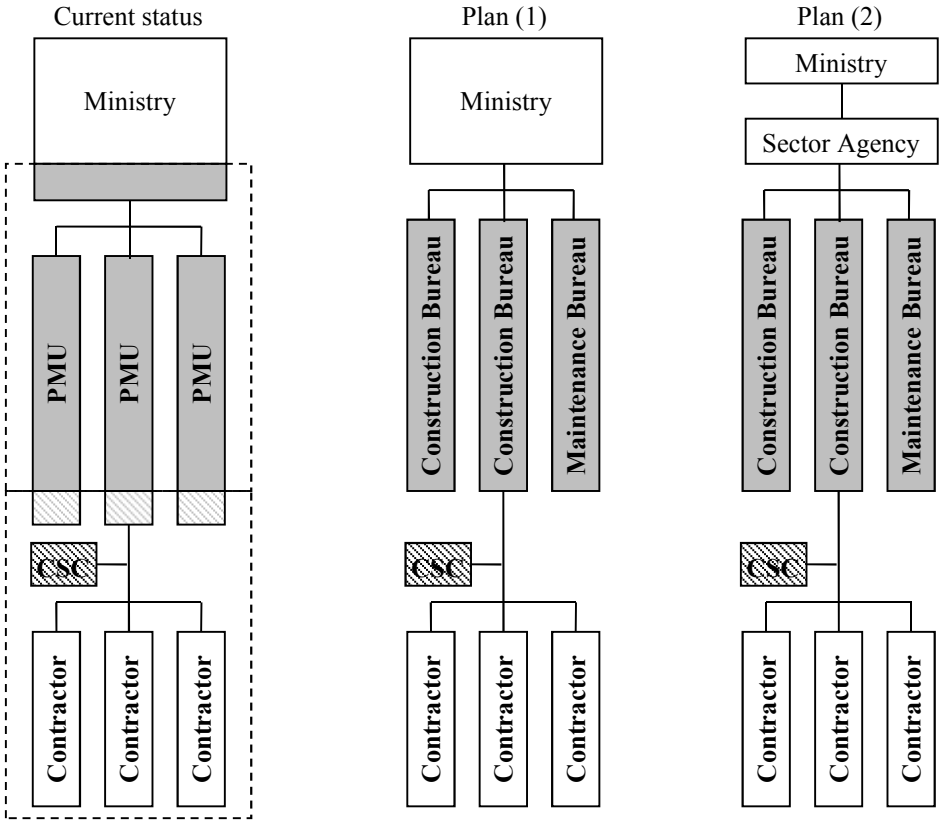
(5) Long-term Improvement Plan for PMU's Responsibilities

1) Minimize the Use of Temporary PMUs

Objectives of using PMUs are to ensure professionalism in construction work supervision, to accumulate knowledge and expertise on construction work supervision in PMUs and to enhance engineering staff with more qualification and talent. With these objectives, use of temporary PMUs, which is currently employed in the provincial-level construction works, should be ruled out from options of project implementation formations.

2) Give Clear Legal Status to PMUs

Figure 5.2.6 shows conceptual plans of institutional structures for the central government and DOCs of PPCs. Both the construction bureaus and the maintenance bureaus are government organizations in charge of performing construction and maintenance management. Responsibilities to be assigned to the bureaus may include project planning, feasibility studies, design, cost estimate, procurement, financial and account management, and construction and maintenance management. With this plan, knowledge and experiences which are accumulated through construction supervision can be easily transferred to the Maintenance Bureau.



(Note) CSC; Construction Supervision Consultant

Figure 5.2.6 Central Government Project Implementation Formation

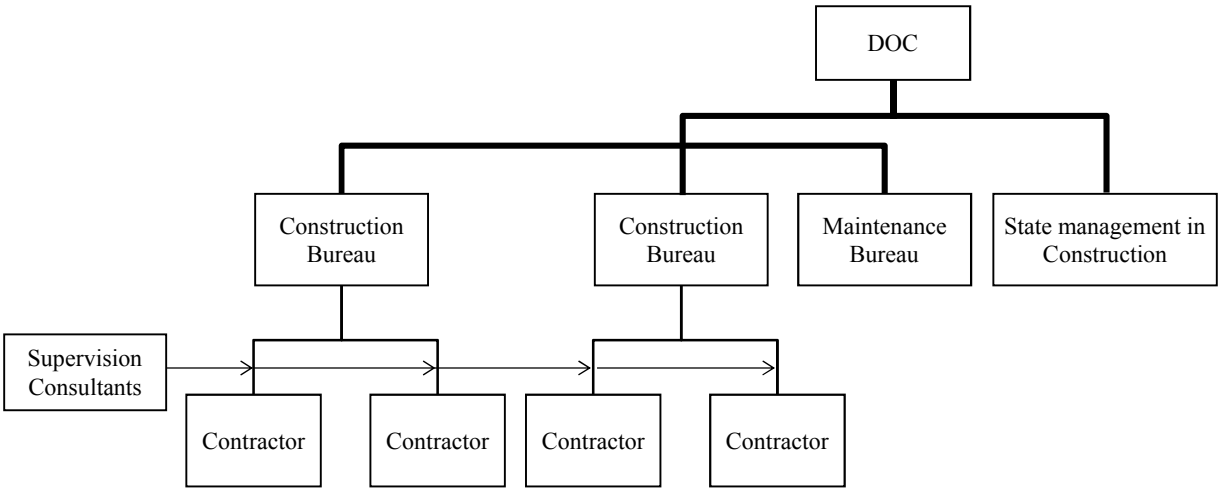


Figure 5.2.7 Provincial DOC Project Implementation Formation

(6) Construction Project Management by PMU and PMC

Brief evaluation was done for the project management conducted by PMUs and PMCs. **Table 5.2.8** shows the brief comparison between PMU and PMC. Also,

Table 5.2.9 shows the results of advantage/disadvantage analysis and shows that each management has more or less advantages and disadvantages. However, the analysis has concluded that PMU is more suited to the management of large-scale and long-term construction projects such as public-work projects (roads, bridges, irrigations, dams, etc.). Also PMC is more suited to small-scale, short-term, and stand-alone projects such as civil-work sector project (building work projects).

Table 5.2.8 Comparison between PMU and PMC

Items	Project Management Units (PMUs)	Project Management Consultants (PMCs)
Type of entity	• Government Entity	• Existing public entity (like CQM) with business license, or • Existing private entity
Relation with POs	• Task assignments by POs	• Contracts with POs
Staff employment	• Mostly from the government and subordinate institutes, and a few from private sector.	• From many entities; the government organizations, public institutes, consultants, academies, universities, contractors etc.

Table 5.2.9 Advantage and Disadvantages

Items	Project Management Units (PMUs)	Project Management Consultants (PMCs)
Advantages	• It is possible to accumulate knowledge and experience of project management to the government bodies. • It is possible to get qualified and experienced engineers for project management. • Construction management technologies can be taken over to the maintenance stage. • PMUs can be transferable to maintenance units. • It is suited to the management of large-scale and long-term construction projects.	• Contract-based consultant procurement makes it easy to get technical competence. • Market competition makes it possible to procure low-cost project management competence. • It is more suited to temporal, short-term, and stand-alone projects.
Disadvantages	• Mobility of PMU assignment is not high, but needs anytime a planned assignment. • It does not fit temporal, short-term, and stand-alone projects due to its low mobility.	• It is not appropriate for public entities to participate in the market competition, in particular for large-scale state projects. • It is dubious if there are private consultants willing to participate in the long-term project management due to its low profitability compared with survey and design tasks. • Assistance to the state project management is so special that it is hard to get a large number of qualified and experienced engineers from private consultants. • It is hard to accumulate experience and knowledge of project management to government entities.
Overall evaluation	• It is more suited to the management of large-scale and long-term construction projects. • Public work sector project (Roads, bridges, irrigations, dams, etc.)	• It is more suited to temporal, short-term, and stand-alone projects. • Civil work sector project (Building projects)

5.3 IMPROVE CONSTRUCTION WORK MANAGEMENT

5.3.1 Enhancement of Design Classification

(1) Rationale

- Details of construction work planning including drawings and construction cost estimate need to be upgraded step-by-step in accordance with the progress of construction work planning.
- Basic concept of F/S is to make judgment on investment, focusing more on whether the construction works are in line with national socio-economic plans and worth investing, so that basic designs do not necessarily elaborate details in technologies but are detailed enough to make judgment on investment. Particular note here is that basic designs cannot be the ground of construction works.
- Technical designs are in principle the parts of contract dossiers, thereby they are regarded as the ground of construction work management and construction work quality assurance. They should be detailed enough to be used among project owners, supervision consultants and contractors in the course of construction works.
- Step-by-step detailing also needs to be applied to construction cost estimate. F/S should be detailed enough to make judgment on the rationale of investment. Technical design should elaborate construction works and should be detailed enough to make contracts, to implement construction works and construction supervision and to assure construction quality.

(2) Foreign Practices (MLIT Practice in Japan)

1) Roads/Bridges (Public Works)

- **Table 5.3.1** explains the fundamental structures of design methods currently employed by MLIT in Japan.
- However, flexible design methods have been applied to construction projects. For large-scale projects with high technologies, two-staged design methods are often applied not only to basic design and but to technical design.
- In parallel with advances in designing, the depth of survey including a land survey and a geological survey also go into detail. In the feasibility study, a small number of boring surveys are carried out, but numbers increase as designs go into detail. MLIT generally carries out a land survey and a geological survey separately from the design contracts.

- Project cost calculation applied to F/S use an approximate and a higher cost estimate in order to supplement missing items. Detailed cost estimate is carried out by project owners on the basis of technical design before tendering.

Table 5.3.1 Survey Outline in Japan (MLIT Road Infrastructure Case)

Type of Stage	Feasibility Study (F/S) Stage	Implementation Stage	
Type of Design	Basic Design (B/D)	Technical Design (in case of 2 steps)	
		First-step	Second-Step
Objectives	• Compare 3 alternative routes • Decide the best suited route among alternatives, evaluating economy and socioeconomic impacts.	• Based on the selected route, compare plan and profile geometric designs • Evaluate economy, construction methods, drivability, maintenance, safety and environmental impacts • Fix road center line and coordinates • Decide locations, approximate designs, approximate dimensions for major structures	• Based on Basic design, make design details for facilities • Prepare design dossiers for contracts
Survey Contents	• Site survey • Route selection • Compare road alignments, profiles, structure types • Planning of major structures • Find control points for designing • Design (Stated below) • Approximate Cost estimates • Estimate approximate construction costs, right-of-way costs	• Site survey • Detail route selection taking account of major structures • Design (Stated below) • Approximate construction cost estimates	• Site survey • Plan and profile design • Cross-section design • Miscellaneous structure design • Structure design • Drainage design • Planning of construction works • Quantity estimation
Design Elements	• Route map (1/2500-1/25,000) • Plan design (1/2,500-1/5,000) • Profile design • (V=1/250-1/500, H=1/2,500-1/5000) • Standard cross-sections (1/100-1/200) • Cross-sections (1/200-1/500) • Major structure design • (1/500-1/1,000)	• Route map (1/2500-1/25,000) • Plan design (1/1,000) • Profile design • (V=1/100-1/200, H=1/1,000) • Standard cross-sections (1/50-1/100) • Cross-sections (1/100-1/200) • Major structure design • (1/200-1/500) • Drainage design (1/1000) • Right-of-way design	• Route map (1/2500-1/25,000) • Plan design (1/500-1/1,000) • Profile design • (V=1/100-1/200, H=1/1,000-1/1,500) • Standard cross-sections (1/50-1/100) • Cross-sections (1/100-1/200) • Major structure design • (as specified separately) • Drainage design (1/500-1/1000) • Right-of-way map • Mass curve • Temporary structures
Design check	• By Inspection Engineer	• By Inspection Engineer	• By Inspection Engineer

2) Building Works (For Public & Private Works)

- The Building Standards Law obliges building owners to get building design certificates, same as the construction permit in Vietnam, before they start to construct the building facilities as shown in **Figure 5.3.1** below. Also**, Table 5.3.2** shows the outline of provisions.
- Building owners should obtain building design certificates in case of new facility construction, extensions, renovations, transfer, large-scale repairs and large-scale reforms. Building owners cannot start construction without the building design certificate.
- The building design certificate is in principle proposed to the building officers stationed in municipal governments or to the private entities designated by municipal governments.
- There are two types of designs in use for the building works; (1) Basic design and (2) Execution design.
- Basic design is to check fundamental dimensions of design and construction costs and to get agreement with customers on the designs. At this stage, several alternative designs are also shown.
- Execution of design, which is technical design in Vietnam, is to check architectural designs, structure designs, structure calculation, facility designs, technical specifications, detailed cost estimates and documents for the proposal of building certificate. Examination on the building design certificate is generally carried out on the basis of this execution design.

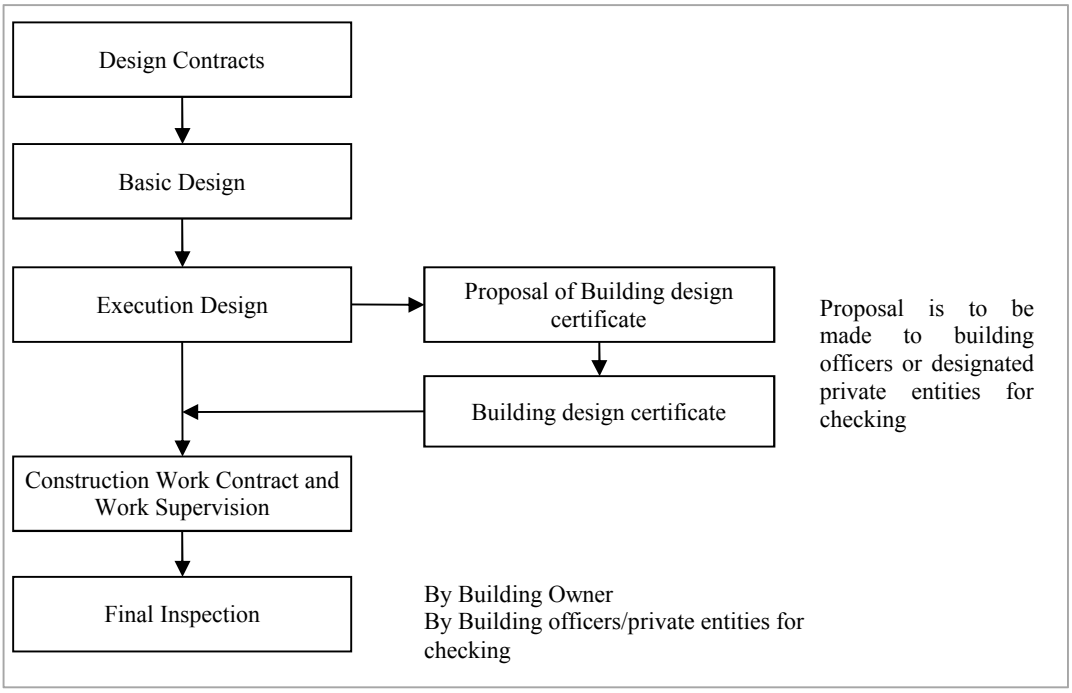


Figure 5.3.1 Flow of Building Work Implementation

Table 5.3.2 Building Work Types and Building Design Certificates in Japan

Classification Applicable area	Applicable Area	Provisions of Building Standard Law	Building Type		Building scale	Work Types which need building certificates					
						New construction	Extention	Renovation	Transfer	Large-scale Repair	Large-scale Reform
							Other than fire prevention areas with floor area less than 10 m2				
Buildings	All Area	Article 6, Clause 1	Class-1	Special (School etc.)	Structures with floor area of over 100 m2	X	X	X	X	X	X
			Class-2	Large-scale (Wood structures)	Structures with over 3 stories or with floor area of over 500 m2 and with the height of over 13 meters.						
			Class-3	Large-scale except for wood structures)	Structures with 2 stories and with floor area of over 200 m2.						
	Urban plan area		Class-3	Except for the above structures		X	X	X	X		
Facilities	All area	Article88, Clause1.	Class-1	Chimneys with the height of 6 meters Bill boards with the height of 4 meters		X					
			Class-2	Elevators for sightseeing Rotational playing facilities with motors		X					
	Urban plan area		Class-3	Production facilities, Storage facilities, playing facilities		X					
Lifts		Article 87, Clause2		Elevators, escalators		X					

(Note)

(1) "X": Types of works which need proposals for building design certificates following the Building Standards Law.

(2) The building certificate is to check conformity of building designs with the Building Standards Law.

(3) Capacity Enhancement Plans

1) Roles of Basic Design

Basic design aims at providing the macroscopic views of the structures, so that it is recommended to clearly stipulate in the Decree209 that the basic design is the one which do not control technical design coming after the basic design, but show the fundamental guideline in structures to the technical design. In order to enhance construction quality, it is more important to use reasonable and well-grounded technical design as a base of contract dossiers.

2) Decision Maker's Approval of Overall Project Implementation Plans

Flexible design change sometimes causes increase in total investment including contingency, so project owners should inspect technical designs and request decision maker to re-appraise and re-approve investment in construction works whenever necessary. It is therefore recommended that decision makers should approve overall project implementation plans before making construction contracts, not only the technical designs but also total investments, cost estimates, technical designs, tendering methods, construction schedules and the state of land clearance. Upon approval by the decision maker, project owners should take full responsibility for the technical designs.

3) Project Owner's Approval of Technical Design

Project owners are recommended to anytime inspect and approve technical design as contract signers (The Employer), since technical design inspection is closely linked to tendering. However, if the technical design comes out to be more than the frameworks approved by decision makers in F/S, project owners is recommended to propose decision makers to reappraise the projects. Project owners, as the Employers, should take full responsibilities for preparation of contracts.

4) Cost Estimate in Accordance with Design Levels

It is also recommended to change cost estimates in accordance with the depth of designs, in particular for F/S. Cost estimate for F/S is in principle rather general than that for technical design, so that a higher rate of contingencies is given to F/S rather than to technical design. Therefore, flexibility in design within the framework of total cost approved by F/S should be ensured, taking account of contingencies. Ministries concerned are recommended to prepare base cost elements which can be applied to F/S.

5.4 ENHANCEMENT OF DESIGN CHANGE

(1) Rationale

In order to ensure construction work quality, design change should be carried out properly. In principle, construction facilities shall be built on the site conditions including topographic and environmental conditions. Timely and proper design change should be made whenever differences may arise in between actual and design conditions at the proposed construction sites. Proper design change shall contribute to minimize problems occurring in the maintenance stage.

(2) Capacity Enhancement Plans

1) Project Owners' Responsibility for Design Changes

Any changes in design shall be approved by project owners, as project owners are capital owners. In case design changes require decision makers' approval, project owners shall bear responsibility in obtaining approval from decision makers beforehand project owners' approval. Project owner shall play a center role of design change.

2) Decision Makers' Approval of Design Changes

When changes in technical design need to change in F/S conditions and surpass approved budgets for the construction works, project owners should request approval to decision makers before project owners approve them. Decision makers are requested to decide detailed criteria of their approval and inform them to project owners.

3) Delegate Responsibilities for Approving Small Design Changes to PMUs

In order to accelerate procedures for design change, PMUs shall be given responsibilities for approving small design changes and those for emergency cases. Small design changes should include activities such as transfer of utilities found during construction works which may need quick processing in order not to hamper project progress. Project owners are requested to decide detailed criteria of such design changes to be delegated to PMUs.

5.5 ENHANCEMENT OF CONSTRUCTION PERMITS

(1) Rationale

Responsibility for design inspections basically belongs to project owners. In particular, technical designs plays an important role, because they are to be incorporated into contractor selection and contracts with contractors, and likewise they becomes the ground of

construction works to be implemented after the contracts was made. However, project owners are not always professional under the current project assignment system in Vietnam. It is therefore recommended to strengthen the design inspections, and to classify design inspections into the following;

(1) Design inspection for private construction works

(2) Design inspection for state budget projects to be implemented by professional state authorities

(3) Design inspection for state budget projects to be implemented by non-professional state authorities

Also, it should be noted that Decree No.12 and Decree No.209 clearly stipulate designs are not the single components to be approved by decision makers, in particular in the F/S stage.

(2) Foreign Practices (MLIT Practice in Japan)

1) Roads/Bridges/Ports/Irrigations/Dams (Public Works)

Project owners in general take whole responsibilities for inspecting designs. Project owners use their engineering departments to examine designs prepared by consultants. This is applied to all state budget projects.

2) Building Works (Public & Private Works)

Design inspections are carried out in line with the Law on Building Standards (May 24, 1950). The flowchart is shown in **Figure 5.5.1**. The Law obliges project owners should propose local government to conduct design checks, as shown in **Table 5.5.1**, and structure calculation checks, as shown in **Table 5.2.2.**

Then, building design certificates, same as the construction permits in Vietnam, are issued to the project owners after the checks by local governments. These design inspection are applied for both state budget and non-state budget projects.

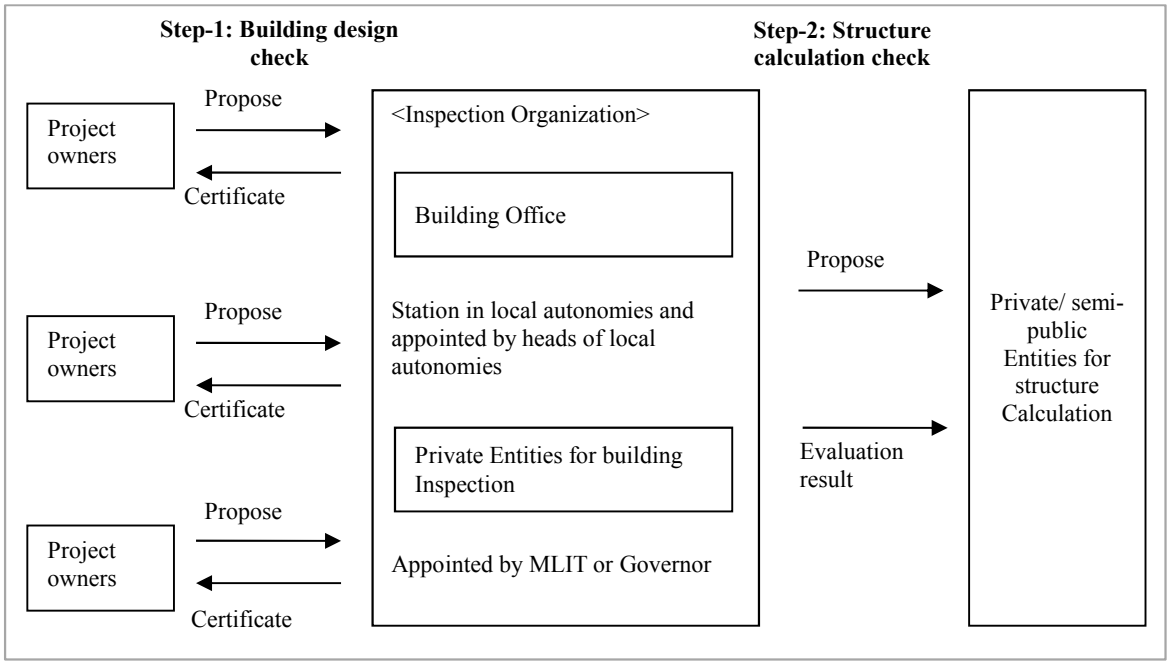


Figure 5.5.1 Flow of Certifying Building Projects

Table 5.5.1 Details of Design Check

Proposed by	**All project owners including those for state budget projects and non-state budget projects**
Checking organizations	**(1)** Building officers stationed in local autonomies • Who passed a special examination • Also, appointed by heads of local autonomies • Applicants should be 1st Grade Architect. **(2)** Private entities for checking building design • Privatization of checking functions aiming to accelerate procedures (2001) • Appointed by MLIT or Governors Design certificate should be published with 35 days.
Designs to be checked	Building designs for new construction and renovation which exceed specified scales. (Ex. Over 2 stories non-wooden structures)
Check points	Facilities, land and equipment in conformity with the Law on Building Standards

Table 5.5.2 Details of Structure Calculation Check

Proposed by	**Design check organizations (not project owners)**
Checking organizations	Semi-public and private entities specialized for structure calculation check. • New system to reinforce building design check(2006) • Appointed by Governors • Evaluation certificate is issued to design check organizations who proposed • Costs of checking are born by local municipal bodies • MLIT provides standard software for structure calculation.
Designs to be checked	Building designs for new construction and renovation which exceed specified scales.
Check Items	• Structure safety • Structure calculation consisting of 90 items.

(3) Capacity Enhancement Plans

1) State-Budget Project by Professional Project Owner

- Roads, Bridges, Ports, Irrigation, Dams and other public works done by MOT, MOI, MOA, DOT, DOI, DOA etc.
- Basic design is already approved by decision maker.
- Decree 209 should encourage project owners to conduct design checks by their professional departments or Ministry-level organizations. Checking contract designs is part of contract preparation, so project owners, as contract signers, are anytime obliged to check designs before making contracts. If they are incompetent in design check, it is necessary to strength their capacity by hiring consultants.

2) State-Budget Project by Non-Professional Project Owner

- Building works done by MOE, MOH, DOE, DOH, etc.,
- It is recommended to make best use of existing rules rather than creating new rules. It is therefore recommended to strengthen the procedures of construction permits and apply them not only to private projects but also to these state-budget projects.
- With this measure, MOC is recommended to take responsibility for issuing construction permits to Ministry-level building construction projects, and DOC to provincial-level building construction projects.
- Technical design should be the ground of examination before the issuance of construction permits.
- Examination of technical designs should be carried out by state authorities as stipulated in regulations on the construction permits. The way of examination should be strengthened including design check.

3) Other Projects where above Measures are Hard to Apply

Regarding building works implemented by MOE, MOH, DOE, DOH, etc. MOC is recommended to encourage these organizations to enhance self-management capacity of construction projects in order to cope with future expansion of construction projects.

To enhance self-management capacity, they are encouraged to install professional in-house engineering departments or subordinate organizations specialized for professional construction and maintenance jobs.

Another alternative measure is to choose professional organizations to assign construction works and to hand over facilities to the original facility users upon completion of construction

works. **Table 5.5.3** shows potential organizations to take responsibilities for construction works.

Table 5.5.3 Demarcation of Responsibility

Construction Management	Facility Users
MOC	MOE, MOH
DOC	DOE, DOH

5.6 ENHANCEMENT OF INSPECTION BEFORE PUTTING FACILITIES INTO OPERATION

(1) Rationale

Final inspection before putting facilities into use is different inspection from the acceptance of construction works. Their focuses should be placed on whether the facilities can be put into operation from safety viewpoints to facility users, so it should be handled separately from acceptances. Final inspection should be a formal procedure by state authority or by decision maker to transfer facilities from construction stage to maintenance stage. MOC is kindly requested to prepare guidelines for this inspection.

Procedures for putting facilities into operation may differ between the following construction works; (1) construction works with project approval (mostly government public works) and (2) construction works with construction permit (mostly private building works).

(2) Capacity Enhancement Plans

1) Construction Project with Project Approval (mostly government public works)

In order to put these facilities into use, two steps are employed.

- Step-1; Hand-over of the facilities from contractors to project owners upon completion of construction (Final Acceptance).
- Step-2; Hand-over of the facilities from project owners to decision makers upon completion of the hand-over to project owners (Final Inspection).

Project owners are given authority of construction work management from project approval to the hand-over of constructed facilities from contractors, but in general they are not given authority of facility maintenance and operation. Decision maker should take responsibilities for assigning appropriate organizations to carry out maintenance and operation of the facilities, so it is necessary that project owners should hand over the facilities to decision makers or to state authorities upon completion of the hand-over from contractors.

With these, if constructed facilities are put into operation without hand-over from contractors to project owners, dispute may arise between project owners and contractors about the handling of consequences like damages given by accidents after the opening. Constructed facilities should be properly handed over to project owners before opening of facilities upon completion of construction works.

Also, if constructed facilities are taken over to project owners with acceptance certificates and are put into operation without taking over the facilities to decision makers, project owners should take whole responsibilities for any consequences after the hand-over from contractors.

It should be considered that responsibility for putting constructed facilities into use belong to decision makers or state authority. It is important to clearly define responsibilities for the transitional period from construction to maintenance.

2) Construction Works with Construction Permit (mostly private building works).

For these construction works, state authorities which have given construction permits to private companies is requested to carry out final inspections before opening of the facilities. It is not appropriate to put facilities into operation without final certificates of inspection. If current regulations did not stipulate such responsibility for the state authority, the regulations should be reinforced to assign inspection responsibilities to state authorities.

5.7 ENCOURAGEMENT TO SATE AUTHORITIES TO STANDARDIZE QUALITY MANAGEMENT TECHNOLOGIES FOR THEIR SPECIALIZED SECTORS

(1) Rationale

Regulations to perform construction works, including those for administration procedures and for quality management procedures, have been prepared by MOC in a cross-cutting way as seen in **Figure 5.7.1** However, construction work and quality management technologies are substantially different between sectors as seen in technical specifications and in acceptance document requirements. In fact, this makes it difficult for MOC to set up uniform management technologies common over all sectors. Professional views are indispensable for further developing project and quality management technologies in the construction sites.

With these reasons, MOC is advised to encourage state authorities (MOC, MOT, MOI and MOA) to standardize quality management technologies for their own specialized sector projects.

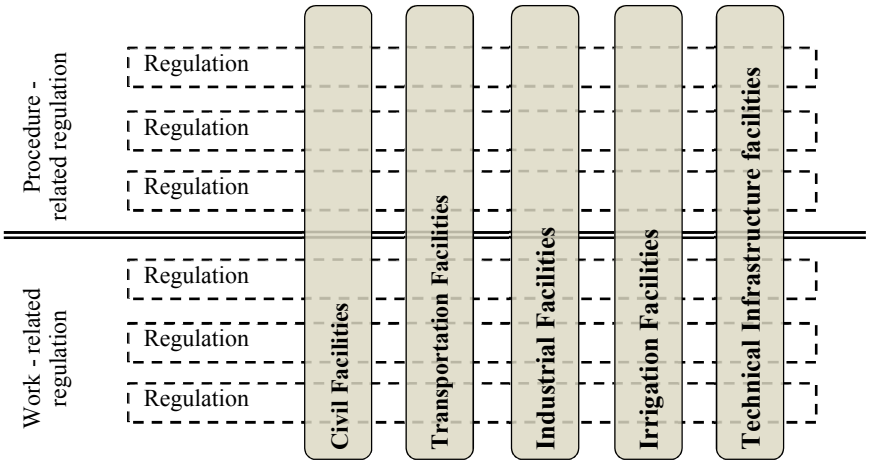


Figure 5.7.1 Current Regulations

(2) Capacity Enhancement Plans

1) To Encourage MOC, MOT, MOI and MOA to Develop Quality Management Technologies for their Specialized Construction Works

- Quality management technologies to be developed include standard technical specifications for their sector management projects, document requirements for acceptance and interim payments and cost estimate manuals.
- MOC is recommended to focus on procedure-related (administration procedures) regulations and to encourage these ministries to develop their work-related (Technological procedures) regulations for their specialized sector projects as seen in **Figure 5.7.2**.

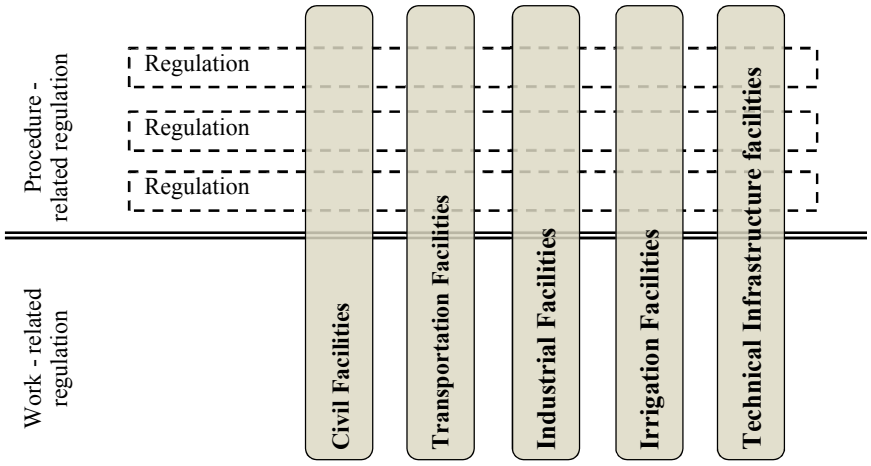


Figure 5.7.2 Change of Regulations

2) To Obligate MOC, MOT, MOI and MOA to Support Regional Construction

- The above sector management ministries are recommended to take a leading role in developing the technologies specialized for their sector management and providing technical supports to other organizations involved in the same sector projects including the Provincial People's Committees and non-professional Project owners
- MOC building work-related departments are advised to support construction permits by the Provincial People's Committees and to provide technical assistance to non-professional project owners.

5.8 IMPROVEMENT OF CONSTRUCTION WORK CONTRACT MANAGEMENT

5.8.1 Enhancement of Acceptance

(1) Rationale

1) Approach to the Internationally Standardized Construction Work Management

In order to make existing regulations compatible with WTO commitments, it is recommended to make construction management compatible with internationally standardized methods step by step. Acceptance in Vietnam is seen to be quite unique to international standards. In the foreign countries, the word "acceptance" is widely used as a procedure handing over the facilities upon completion of a construction project, but in Vietnam acceptance is used as an alternative ways of daily management of construction works. Also, similar procedures to the overseas final acceptance have been applied to the job acceptance and the stage/parts acceptance including documents preparation. **Table 5.8.1** shows comparison of inspections between Japan and Vietnam. Attention should be directed to the simplification of job acceptance and stage/parts acceptance.

Table 5.8.1 Comparison of Checking and Acceptance between Japan and Vietnam

			→ Work Progress →		
Japan (MLIT)	Regulatory Procedures		Daily Inspection (Supervision)	Inspection on the completed parts of works for interim payments	Inspection on the completed parts or works to take over facilities Final Inspection
	Implementation bodies		Supervision consultants	Construction supervisor	Project owners (the Employer)
	Proposed by		Upon request of contractors	Upon request of contractors	Upon request of contractors
	Facility Take-over		Not	Not	Yes
	Outputs		Approval	Approval	Approval

Vietnam	Regulatory Procedures	Supervision	a/ Acceptance of each construction jobs (= Quality management)	b/ Acceptance of construction parts or stages (=Process management)	c/ Acceptance of completed construction items or works (=Final acceptance)
	Implementation bodies		Construction supervisors of Project owners(including supervision consultants)	Project owners supervision section staffs (including supervision consultants)	Project owner's representatives at-law, and Project owner's supervision section staff, and Supervision consultants
	Proposed by		Upon request of contractors	Upon request of contractors	Upon request of contractors
	Facility Take-over		Not	Not	Yes
	Outputs		Acceptance Minutes (= Certificate)	Acceptance Minutes (= Certificate)	Acceptance Minutes (= Certificate)

(Note) a/, b/, c/ Acceptance; Article 24, 25 and 26. Decree 209

(2) Capacity Enhancement Plans

1) Improve Job Acceptance (Decree 209, Article 24)

a. Assign acceptance responsibility to supervision consultants

To cope with high frequency of the acceptance, it is necessary for project owners to take prompt actions to the contractors' acceptance requests, so it is recommended to delegate part of tasks to supervising consultants to ensure prompt mobilization. The tasks which belong to supervising consultants shall include implementation of acceptance, approval of the results of acceptance, preservation of data with signatures, report of the results of acceptance to project owners and delivery of the data to contractors.

b. Standardize acceptance formats

To ensure smooth implementation, it is important to simplify acceptance procedures including formats. Four Ministries (MOC, MOT, MOT and MOI) are encouraged to standardize acceptance formats for their sector facilities in consistent with their technical standards. It is also important to agree these formats prior to the works. Decree 209 is requested to prepare provisions which encourage the standardization of acceptance formats for their sector management.

The baseline survey has clarified that there are some project owners who seemingly apply rather simplified and more practical acceptance procedures to their construction projects than those stipulated in Decree 209.

2) Acceptance of Parts/stage Acceptance (Decree 209, Article 25)

a. Delegate tasks to supervision consultants

It is also recommended to assign the approval of the acceptance to supervision consultants, since the parts/stage acceptance stands in line with the job acceptance. It is therefore more practical to consider that supervising consultants take responsibility for implementing both job acceptance and parts/stage acceptance.

b. Simplify document requirement for acceptance

Figure 5.8.1 and **Figure 5.8.2** show a conceptual schedule of job acceptance and stage/parts acceptances. Currently, contractors proposing stage/parts acceptances to project owners are requested to submit all documents same as those for the past job acceptances. However, parts/stage acceptance aims to make sure the progress of construction works, in particular whether construction works are allowed to move into the next stages and whether the hidden parts are properly constructed. However, parts/stage acceptance is nothing but confirmation of work progress. Once having completed job acceptances and published job acceptance minutes,

project owners or supervising consultants should preserve them and should no longer oblige contractors to submit all relevant documents again. Instead, only a summary sheet including a list of past job acceptances should be the ground of parts/stage acceptance. This could reduce workload on document preparation for contractors.

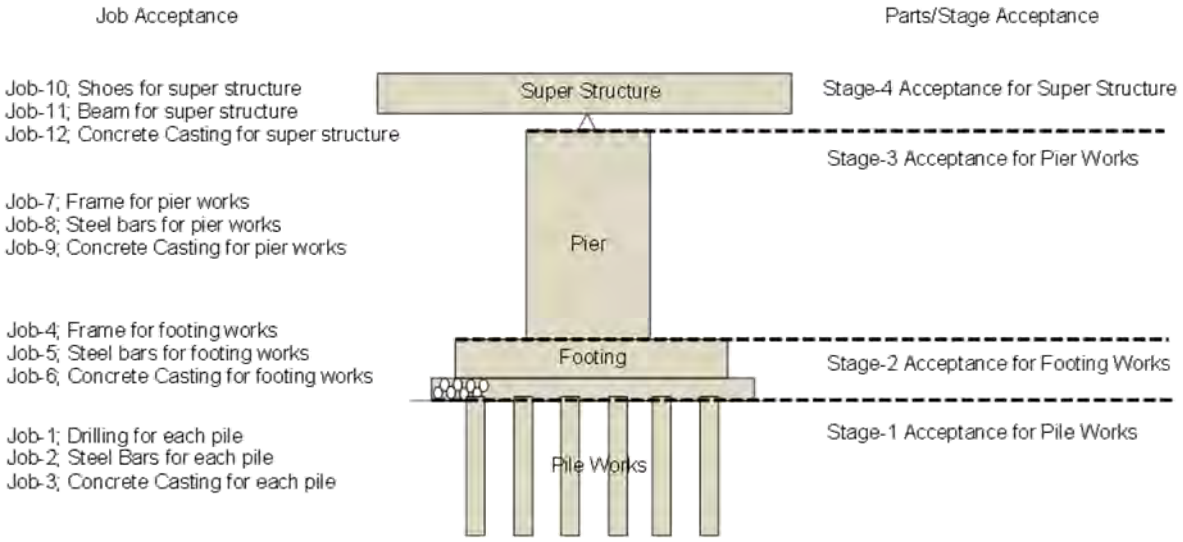


Figure 5.8.1 Job Acceptance and Parts/Stage Acceptance (1)

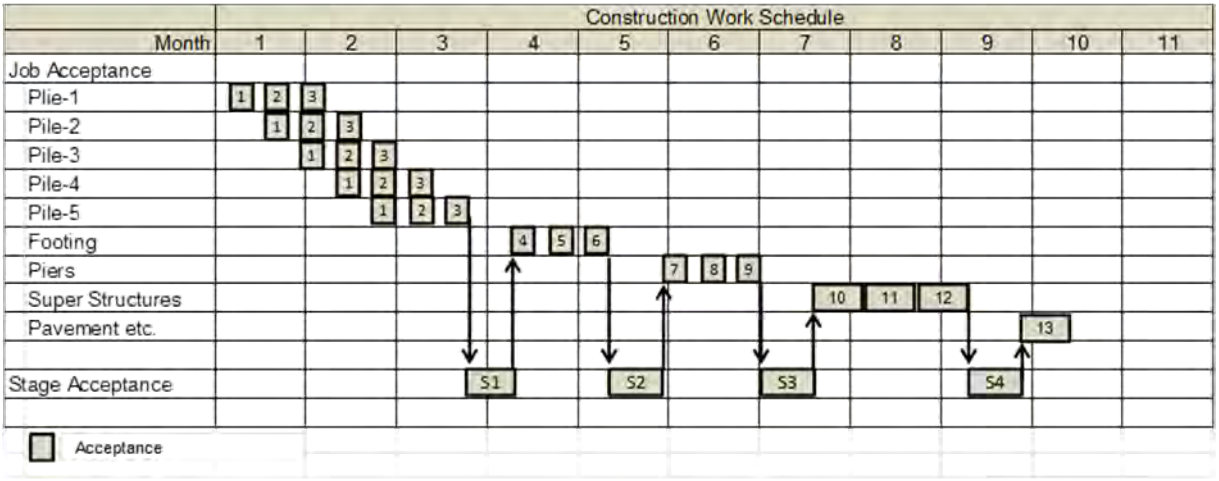


Figure 5.8.2 Job Acceptance and Parts/Stage Acceptance (2)

5.8.2 Change As-built Drawing Requirement Policy

Law on construction requested contractors to make as-built drawings in particular for hidden parts of works before their subsequent job are carried out. However, as-built drawings are in general made after the acceptance of completed construction items or works. The as-built drawings are those showing the final shapes of works, so it is impractical to record staged data in the drawings. Rather, it is appropriate to attach drawings showing the range of jobs, parts and the stage to be examined in the acceptance.

5.9 ENHANCEMENT OF INTERIM PAYMENT

5.9.1 Rationale of Improvement

In order to enhance construction quality, it is necessary to prepare circumstances where superior contractors are willing to participate in the state-budget projects. Construction contracts oblige contractors to perform their duties. On the other hand, they also oblige project owners to implement payments properly to contractors including interim and final payments without delay. Relevant regulations are requested to ensure payments without causing any delay in payment.

5.9.2 Capacity Enhancement Plans

(1) Timely Payment after Parts/Stage Acceptance

In the construction work management, management of payment is also an essential element in observing contracts with contractors. Upon completion of parts/stage acceptance, interim payments should be processed immediately. FIDIC explains a guidance requesting the Employer to pay interim payments within 56 days after the Engineer receives the statement. Delay in interim payments would jeopardize company finance, in particular cash flow.

(2) Reduce Documents Requirements for Interim Payment

Payment conditions are clearly shown in the Article 8.7, Circular No.09/2011/TT-BXD, dated 28/6/2011 and the contract form attached to the Circular. The Circular requests contractors to prepare the following three (3) documents before payment;

- Acceptance minutes of the completed actual volume
- Volume of works for payment
- Payment request of the contractor

Regarding acceptance minutes to be prepared, the survey on the current status clarified that contractors are requested to prepare all acceptance minutes relevant to job and parts/stage acceptances including check sheets as seen in **Figure 5.9.1**. However, contractors are claiming project owners to reduce evidence documents for the payment. In fact, job acceptance minutes are published after examining check sheets by supervision consultants. It no longer needs to attach check sheets to the acceptance minutes of parts/stage acceptance as shown in the figure bellow.

Table 5.9.1 shows the document requirement for acceptance, which is extracted from Decree No.209. In taking above issues into consideration, it is highly recommended to review document requirements in the Decree209 and to keep the documents in to a minimum in order to let contractors concentrate more on their construction supervision works.

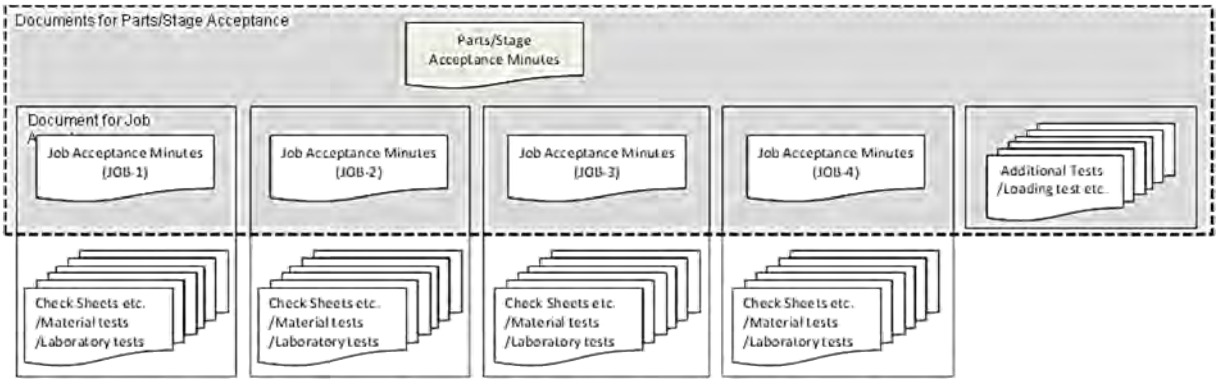


Figure 5.9.1 Documents Requirements for Job and Parts/Stage Acceptance

Table 5.9.1 Ground for Acceptance

Ground for Acceptance	a/ Acceptance of each construction jobs	b/ Acceptance of construction parts or stage	c/ Acceptance of completed construction items or works
Decree No.209 Art.24 - 26	**= Daily- level acceptance**	**= Stage- level acceptance**	**= Final acceptance**
Written checking and acceptance requests of construction contractors;	X	X	X
Technical design dossiers approved by project owners and approved design changes	X	X	
Applied construction rules and standards;	X	X	X
Technical instruction manuals enclosed with construction contracts;	X	X	X
Results of material and equipment quality checks and tests performed in the course of construction;	X	X	X
Construction diaries, supervision diaries of investors and other documents related to the checked and accepted objects;	X	X	X
Reports on the construction contractors' internal acceptance of construction jobs	X		
Reports on the checking and acceptance of jobs belonging to construction stages to be checked and accepted;		X	
Construction completion drawings of construction parts;		X	
Reports on the checking and acceptance of completed construction stages, conducted internally by construction contractor;		X	
Preparatory work for deployment of subsequent construction stages.		X	
Reports on the checking and acceptance of construction stages;			X
Results of experiments, adjustment, and multi-action load operation of the technological equipment system;			X
Construction completion drawings of construction works;			X
Reports on the checking and acceptance of completed construction items or construction contractors;			X
Competent State bodies' written approvals regarding fire and explosion prevention and fighting; environmental safety and operation safety according to regulations			X
Law on Construction			
For hidden parts of works, the acceptance and as-built drawings must be made before the subsequent jobs are carried out	X	X	X

5.10 ENHANCEMENT OF CONSTRUCTION CONTRACTS

5.10.1 Rationale

In order to make existing regulations compatible with WTO commitments, it is recommended to simplify project management procedures including payments to promote eligible contractor's participation into state-budget construction projects.

Use of internationally standardized contracts will not only allow foreign eligible companies to participate in the construction projects in Vietnam, but also to enhance domestic company's capacities to the international levels.

5.10.2 Capacity Enhancement Plans

(1) Simplification of Contract Management Procedures

It is recommended to simplify the following procedures step by step, paving the way to establish the internationally standardized contract management.

- Delegation of powers and duties to PMU and CS Consultant (when Project owners sign construction work contracts)
- Inspections and tests
- Acceptances
- Interim payments

(2) Need Step-by-Step Approach to the International Standard Contract, FIDIC

It is also recommended to apply an internationally standardized contract, FIDIC, or to develop a contract compatible to FIDIC as a future vision.

5.11 REINFORCEMENT OF INSTITUTIONS FOR CONSTRUCTION FACILITY MAINTENANCE

5.11.1 Background and Basic Concept of Facility Maintenance

(1) Background

In Vietnam, construction of social infrastructure has grown rapidly in a recent decade and social interest has been directed to the enhancement of construction quality rather than infrastructure maintenance. However, social infrastructures are among important national assets to be taken over from generation to generation. Also, maintenance period is much

longer than construction period. Moreover, maintenance budgets are often influenced by the economic status of the times. This may cause difficulty in ensuring stability of the budgets over the long course of infrastructure maintenance. It seems to be a common phenomenon among European countries, USA, Japan etc. It is therefore recommended for Vietnam to set out the study on the capacity enhancement of facility maintenance at an early stage.

(2) Objectives

Objectives of this study are to review the current facility maintenance activities in Vietnam, to identify the problems lying behind its maintenance operation and to recommend capacity enhancement plans for facility maintenance. Also, the principles of facility maintenance are discussed for private building facilities and for public facilities. In particular, taking road facility maintenance in the public facility maintenance as an example, in-depth study was also carried out from the viewpoints of legal framework, organization and staff, maintenance plan/project formulation and approval, budget proposal and approval, cost estimate, technical standards, etc. As a conclusion, recommendations were summarized on the capacity enhancement plans of facility maintenance.

(3) Basic Concept of Facility Maintenance

Maintenance facilities in Vietnam fall into two categories; private facilities and public facilities as shown in **Table 5.11.1.** Prior to construction private facilities need to have construction permits and public facilities need to have project approval. With this difference in mind, two concept plans, one for private building maintenance and the other for public facility maintenance, are developed in the following sections.

Table 5.11.1 Facility Owner by Facility Type

Facility Owner	Project Approval	Examples	Person In-Charge of Maintenance
1.Private sectors	**Construction Permit (CP)**	• Office buildings • Commercial centers • Theaters • Apartments	• Majority of the private works • Facility owner • (Mostly non-professional)
		• Dams owned by private sector • Others	• Facility owner • (Mostly non-professional)
2.Public sectors	**Project Approval (PA)**	• Roads. Bridges • Ports, • Irrigations, dams • Urban facilities • (Lighting, sewage etc.)	• Majority of the public works • Facility owner (Professional) • Authorized person/ organization • (Professional)
		• Hospitals • Universities, Schools • Government Offices • TV stations, etc.	• Facility owner • (Mostly non-professional) • Authorized person/organization • (Mostly non-professional)

5.11.2 Building Facility Maintenance

(1) Basic Concept

Basic concept for the private-sector building construction is to oblige facility owners to conduct facility maintenance by regulations. The following are the subjects which need to be regulated.

1) Maintenance Activities which Need to be Regulated

- To oblige facility owners to conduct regular inspections
- To oblige facility owners to report the results of inspections
- To oblige facility owners to maintain safety of the facilities.

2) Further Specifications for the above Inspections

- To specify the building facilities to apply the above inspections.
- To specify the frequency of the above inspections.
- To specify the eligibility of inspectors for the above inspections.
- To specify the points of the above inspections.

(2) Current Status of Building Facility Maintenance in Vietnam

In Vietnam, private sector projects containing roads, hydraulic power stations, building works and others, should get construction permits (CPs) from DOCs of PPCs prior to implementation. The examination on CPs is a sole procedure which can evaluate appropriateness of the projects. Decree 114 stipulates the maintenance activities for the private sector projects as shown below;

- Design consultants should be responsible for formulating maintenance procedure manuals.
- Facility owners should be responsible for accepting maintenance procedure manuals produced by consultants and for adjusting the manual when revision is needed. Facility owner should be also responsible for mapping out maintenance plans on the basis of this procedures manual.
- The facility owner or authorized person should prepare annual report on the implementation of construction facility maintenance and its safety for those of grade II upward and facilities upon occurrence of incidents to the agencies stipulated in Article 26 of this Decree. (Article 17);

- When signs of quality degradation are detected which unable to ensure safety for operation or use, the facility owner or authorized person should undertake the followings (Article 18):
  - Checking the facility or inspecting its quality;
  - Deciding to take safety measures such as limiting its use, suspending its operation, evacuating people and properties if necessary
  - Fixing damages that may affect safe use, safe operation of the facilities
- Provincial People's Committees should be responsible for coordinating with specialized Ministries stipulated in Article 26 of this Decree in conducting check regulation compliance:
  - Taking random check for all facilities;
  - Taking periodical check, at least once every 5 years, for facilities of grade II upward and when incidents occur.

As seen in these articles, the facility owner's responsibilities for maintaining their facilities are well stipulated. However, there still remain some points which may need improvement such as; (1) to clarify the points to be inspected, and (2) to stipulate inspector's eligibility for performing inspections. Also, it is necessary to implement inspections on the status of regulation conformity relevant to the above issues, before further improving facility owner's responsibilities.

(3) Overseas Practices– Practices in Japan

Act on Building Standards in Japan stipulates the obligations of facility maintenance for private building facilities as shown in **Table 5.11.2**.

Table 5.11.2 Obligations for Facility Owners

Tasks and Obligations	Practice in Japan
• Tasks obligated to facility owners; • To conduct inspections, to report inspection results, to maintain safety and to repair damages.	• Stipulated in the Act on Building Standards
• To specify building facilities to be inspected.	• Stipulated in the above Act. - Hotels, schools, theaters, etc.
• Inspection frequencies - Special building facilities (Hotels, hospitals, schools, theaters etc.) - Ventilation system, smoke-extraction system, emergency light - Elevator, escalator, playing facilities	• Stipulated in the above Act. - Once/3 years - Once/Year - Once/year
• Inspector's eligibility - For special building inspector - For safety facility inspector	• 1st/2nd Class Architect or inspector qualifications specialized for each work

Tasks and Obligations	Practice in Japan
- For lift facility inspector	
• Points of inspections	• Structural safety and durability • Fire resistance, fire protection • Durability, weather resistance • Safety in use, safety for evacuation • Protection of environment

5.12 PUBLIC FACILITY MAINTENANCE

The basic concept for public facility maintenance is summarized here in this section. In order to develop maintenance concepts for public facilities, A road facility was selected as a sample of public facilities in order to develop maintenance concepts, to analyze the current status, and then to make recommendations.

5.12.1 Definitions of Public Facility Maintenance

Table 5.12.1 shows a general structure of maintenance works for road maintenance currently seen in many countries, followed by the brief explanation of activities. Road maintenance incorporates four (4) major maintenance activities in general with different objectives as seen in the table.

Table 5.12.1 Maintenance Works and Their Objectives

Maintenance Works	Maintain Service ability	Retard Aging	Maintain Strength	Increase Capacity	Activities
1. Routine Maintenance	X				- Cleaning of facilities - Small repair works - (Reactive maintenance) - Temporary restoration from the damaged of disasters or accidents etc.
2. Periodic Maintenance	X	X			- Medium/big repair works - (Proactive maintenance)
3. Rehabilitation	X	X	X		- Replacement of facilities without functional upgrade
4. Reconstruction	X	X	X	X	- Reconstruction of facilities with functional upgrade

1) Routine Maintenance

- Routine maintenance has an objective to maintain serviceability including safety of the infrastructure facilities so that maintenance is promptly implemented in response to deficiencies causing negative impacts to the safe and efficient operation of facilities.

- Main activities categorized in routine maintenance include patrolling, cleaning of facilities, small repair works and disaster and accident restoration works, so that the quick detection and the early repair of failures are the key for success of this maintenance.
- Small repair works are categorized as ex post fact maintenance works which are reactive and not proactive to the failures, and are performed aiming to restore a facility to an acceptable level of service. They are not regarded as measures which give serious impacts on the facility service life, the strength and functions of the facilities.
- Unscheduled maintenance works are those aiming to return facilities back to a minimum level of service, while permanent full-scale restoration is generally carried out later stage of the rehabilitation or reconstruction process.
- Sample small repair works applied for road routine maintenance include pavement pothole repair works which fill potholes with asphalt repair materials to ensure smoothness in driving and safety.

2) Periodic Maintenance

- Periodic maintenance is a planned strategy of cost-effective treatments for existing facilities. It has objectives of preserving the facilities, retarding structure deterioration, extending facility life-cycle, thereby maintaining or improving the functional conditions of the facilities (without significantly increasing the structural capacity).
- Periodic maintenance is a key maintenance activity which can retard the aging of facilities until the time of expensive rehabilitation, thereby contributes to reduce overall maintenance investments. However, it requires strategic and proactive measures in planning and implementation.
- Main activities consist of medium-scale or large-scale repair works to cope with facility deterioration and to reinforce structures, which generally require large spending on the works.
- In order to ensure efficiency in planning and in implementation, a middle-term or a long-term maintenance plan is generally incorporated as a base of planning in order to find out locations to repair, repair works and repair timings in the long course of maintenance. Also, these maintenance plans are expected to contribute to stabilizing maintenance budgets and investments in the course of maintenance.
- Sample works applied for periodic road maintenance include a pavement overlay which places a new pavement with the thickness of about 3 to 5 centimeters or equivalent on the existing damaged pavements.

3) Rehabilitation

- Rehabilitation is to restore the strength of facilities by replacing a large part of facilities with the equivalent structure without functional upgrade in general, thereby maintaining the strength of facilities. Rehabilitation is applied to the facilities which have failed in function or become functionally obsolete.
- Rehabilitation results in a large investment, so that project formulation, design, contract, and work supervision in principle follow the construction procedures stipulated in the relevant regulations.
- Sample rehabilitation works applied for road maintenance include pavement replacement in a certain section of roadway which demolishes existing damaged pavements and constructs new pavements.

4) Reconstruction

- Reconstruction aims to upgrade infrastructure facilities in conformity with the latest technical standards and to make additional functions to the original facilities such as adding two more lanes on a roadway as an example.
- Reconstruction results in a large investment, so that project formulation, design, contract, and work supervision in principle follow the construction procedures stipulated in the relevant regulations.

5.12.2 General Framework of Public Facility Maintenance

Table 5.12.2 shows the general framework of maintenance works including missions, responsibilities, work types and functional requirements for each activity. The functional requirements explain functions to be equipped with in each activity in order to fulfill its missions and responsibilities.

5.12.3 Functional Requirement for Public Facility Maintenance

The functional requirements are listed in **Table 5.12.3**. Differences in functional requirements can be seen between routine maintenance and periodic maintenance. The objective of routine maintenance is to maintain serviceability, so that the functional requirement is more focused on ensuring mobility. On the other hand, periodic maintenance is focused on retarding aging which foresees a medium-term future and tries to find out the best investment strategy that can reduce life-cycle costs of facilities. In particular, much attention needs to be paid on the functional requirements for routine maintenance and periodic maintenance. It is noted that functional requirements for rehabilitation and reconstruction are basically same and follow procedures of capital construction projects, so that the columns are integrated into one.

Table 5.12.2 General Framework of Public Facility Maintenance

Functional Requirements	Routine Maintenance	Periodic Maintenance	Rehabilitation	Reconstruction
1. Missions and Responsibilities	- Quick detection of incidents - Quick countermeasures to the incidents	- Planned investment by asset management aiming to minimize facility life-cycle costs in the course of maintenance	- Maintain strength of facilities	- Upgrade functions of facilities
2. Work Types	- Daily Patrolling - Cleaning of facilities - Small repair works - Restoration works (Temporary)for the damages given by disasters and accidents	- Periodic inspection and data preservation - Planning middle-term and long-term maintenance plans - Medium/big repair works	- Detail survey and design by consultants - Construction project management and quality management, same as those for construction projects	- Detail survey and design by consultants - Construction project management and quality management, same as those for construction projects
3. Functional Requirements	- Functions specialized for the routine maintenance are required. i. Regal framework ii. Organization and staff iii. Project formulation and approval iv. Design standards v. Cost estimate manual vi. Budget proposal and approval vii. Contract management viii. Standards for work and quality management	- Functions specialized for the periodic maintenance are required. i. Regal framework ii. Institutional arrangement iii. Project formulation and approval iv. Design standards v. Cost estimate manual vi. Budget proposal and approval vii. Contract management viii. Standards for work and quality management	- Same functions as those for construction projects are required.	- Same functions as those for construction projects are required.

Table 5.12.3 Functional Requirements for Public Facility Maintenance

Functional Requirements	1. Routine Maintenance	2. Periodic Maintenance	3. Rehabilitation / 4.Reconstruction
1.1. Legal Framework	- Legal framework specialized for routine maintenance is needed.	- Legal framework specialized for periodic maintenance is needed	- Legal framework should follow those for construction projects
1.2. Institutional Arrangement 1.3. Organization and staff	- Maintenance units or taskforces are needed to take prompt action to the incidents, in particular facilities served to the public like roads and bridges.	- Planning department and planning staff capable of handling databases (PMS, BMS) and planning software for middle-term/ long-term maintenance plans.	- Same as construction projects
1.4. Maintenance Plan/ Projects Formulation and Approval	- Projects are formulated based on the projection of maintenance history. - Project approval should be issued on the overall framework only and should not be on the project basis, since individual projects may need to change their details frequently, depending upon incident types. - Facility owner should take responsibility for changing the projects flexibly.	- Middle-term maintenance plans (3 to 5 years plan) need to be approved as an alternative to FS for construction projects. - Recently, technology development is being carried out on the maintenance management system like PMS for road pavements and BMS for bridge structures, which can predict future structure deterioration on the basis of inspection data and formulate middle-term maintenance plans.	- Follow construction procedures
1.5. Environmental Assessment	- Not necessary since there is no big changes in facilities.	- Not necessary because periodic maintenance is not with functional upgrade.	- Not necessary for Rehabilitation without functional upgrade - If Reconstruction includes functional upgrade like the widening of a road from 2-lane to 4-lane facility, it may need FS and environmental assessment, in accordance with the scales of additional functions.
1.6. Design	- Design and work specifications on the small repair works should be standardized preliminary in the Routine Maintenance Standards for easy reference.	- Design and work specifications on the medium and big repair works should be standardized preliminary in the Periodic Maintenance Standards for easy reference. - The medium or big repair works often include the demolishment or the removal of deteriorated old facilities, which make it difficult to apply construction design standards.	- Follow construction procedures - Follow construction design standards
1.7. Cost estimation and Norms	- Cost Estimate Norm should be specialized for the routine maintenance works. - It is not appropriate to apply a Construction Cost Norm to the routine maintenance works due to the differences in construction volumes and in working conditions at the sites.	- The Work types of medium and big repair works often differ from general construction works as shown in 1.6, the cost estimate for these works should be based on the Cost Estimate Norm specialized for the periodic maintenance.	- Follow construction procedures - Follow cost estimate for construction projects

Functional Requirements	1. Routine Maintenance	2. Periodic Maintenance	3. Rehabilitation / 4.Reconstruction
1.8. Budget Proposal and Approval	- The budget framework for the routine maintenance and unscheduled maintenance works should be proposed and approved. The prosed amount should include the breakdown of works estimated on the projection of past trend. - Approval given to the routine maintenance budget should be only the overall framework of budgets, so that the authority of changing work breakdown is given to facility owners in order to ensure flexibility.	- Budget plan for periodic maintenance including medium and big repair works need to be proposed on a project basis, following the procedures for rehabilitation and reconstruction projects.	- Follow procedures for construction projects
1.9. Contractor Selection	- A call-for contract or an appointed contract is more desirable than a competitive bidding in order to ensure quick mobilization of contractors.	- Follow competitive bidding procedures	- Follow procedures for construction projects - Based on competitive bidding procedures
1.10. Technical Standards	- Work items and procedures needed for the routine maintenance are so special and wide that they should be standardized in the Technical Standards for the routine maintenance. - Routine Maintenance Standards should be authorized by relevant ministries. - Work items to be standardized are as follows; i. Inspection and survey ii. Diagnosis iii. Repair work selection iv. Repair work specifications v. Maintenance Service levels vi. Acceptance criteria vii. Data preservation for inspection and maintenance records	- Periodic inspection on the maintenance facilities should be standardized in the Routine Maintenance Technical Standards. - Design standards for the medium and big repair works should be specialized for the periodic maintenance, due to the difference in work types, including demolishment or removal of existing facilities.	- Follow design and technical standards for construction works
1.11. Work Supervision & Quality Management	- Follow the provisions of the Routine Maintenance Standards	- Follow procedures for construction projects	- Follow procedures for construction projects
1.12. Information and Data Management	- Maintenance data should be preserved in Road Maintenance Information System (RIMS) - Main databases needed facility maintenance consists of; i. Facility asset database ii. Maintenance history database iii. Inspection data base	- Infrastructure asset database - Inspection record database - PMS, BMS - Maintenance history database	- Follow procedures for construction projects

Functional Requirements	1. Routine Maintenance	2. Periodic Maintenance	3. Rehabilitation / 4.Reconstruction
	iv. Facility management and operation database v. Facility user database (Traffic volume etc.)		
1.13. Human Capacity Development	Patrol Routine maintenance technologies	Planning and DB management	Capacity development for planning and F/S, construction project management and work supervision.
Note;		- The works focus on facility maintenance with no additional facility improvement, so that FS and environmental assessment are not in general needed.	

5.12.4 Current Status of Public Facility Maintenance in Vietnam

As a sample analysis on the public facility maintenance, road maintenance is selected and further analysis is conducted here in this section. The viewpoints of the analysis are as follows;

(1) Legal framework

(2) Organization and staff

(3) Maintenance procedure manual

(4) Maintenance plan/project formulation and approval

(5) Budget proposal and approval

(6) Cost estimate

(7) Cost estimate norms for routine maintenance

(8) Contractor selection

(9) Technical standards

Major findings are stated hereinafter;

(1) Legal Framework

(Current Status)

- There are many regulations interrelated each other for the facility maintenance including laws, decrees, circulars and decisions, it is very hard for the users to find out information necessary for the facility maintenance.
- Decrees, Circulars and decisions are developed under the relevant laws, so that it is sometimes very hard to understand priority in judgment between similar provisions under different laws.
- There are only a small number of regulations specialized for the facility maintenance. Many regulations promulgated for the purpose of capital construction projects have been applied to the facility maintenance, so that there observed unclear statements, inconsistency in contents between regulations which may cause misunderstanding in interpretation.

(Comment)

Regulations should be established and integrated into maintenance manual with approval between relevant state authorities. According to the expert study on road maintenance, there seems to be over 30 regulations as shown in **Table 5.12.4**

Table 5.12.4 Legal Framework Concerning Road Maintenance

	Regulations	Title
1	Law on Government Organizations	
2	Law on State Budget	
3	Law on Tendering	
4	Law on Public Interest and Product	
5	Law on Construction	
6	Law on Road Traffic	
7	Law on Emergency Situation	
8	Decree No.12/2009/ND-CP, 12/FEB/2009	Management of investment projects on the construction works
9	Decree No.209/	Construction work quality management
10	Decree No. 31/2005/ND-CP, 11/MAR/2005	Production and supply of public-interest products and services
11	Decree No.71/2005/ND-CP, 6/JUN/2005	Investment management of specific works
12	Decree No.75/2008/ND-CP, 09/JUN/2008	Amending and supplementing a number of articles of the Governments Decree No.170/2003/ND-CP
13	Decree No. 114/2010/ND-CP, 6/DEC/2010	Maintenance of construction facilities
14	Decree No.170/2003/ND-CP, 25/DEC/2003	Detailing the implementation of a number of Articles of the Ordinance on prices
15	Decree No.85/2009/ND-CP	Guiding on implementation of Law on Tendering and selection of contractor in accordance with Law on Construction
16	Decree No.48/2010/ND-CP	Contract in construction activities
17	Joint Circular No.75/2011/ TTLT- BTC-BGTVT, 06/JUN/2011	Guiding elaboration and management of prices of public-interest products and services in management and maintenance of roads, inland waterway by method of ordering and assignning plan to use state budget funds.
18	Joint Circular No.86/2011/TT-BTC	Regulating management, payment of investment and non-business fund with investment nature of state budget.
19	Circular No.39/2011/TT-BGTVT	Guiding implementation of some articles in Decree No.11/2010/ND-CP
20	Circular No. 86/2011/TT-BTC, 17/JUN/2011	Stipulating management, payment of investment capital and non-business funds with investment nature of state budget
21	Circular No.19/2011/TT-BTC	Regulating accounting of completed projects under state budget
22	Circular No.04/2010/TT-BXD	Guiding formulation of management of construction work investment cost
23	Circular No.109/2000/TT-BTC	
24	Circular No.59/2003/TT-BTC	Guiding implementation of Decree No.60/2003/ND-CP
25	Decision No. 256/2006/ QD- TTg, 9/NOV/2006	Regulations of bidding, ordering, assigning plan to implement production and supply of public-interest products and services
26	Decision No. 957/QD-BXD, 09/SEP/2009	Promulgation of cost norm for project management and consultancy of investment in works construction
27	Decision No. 1129/2010/QD-BXD 22/DEC/2010	Guidance on conversion of the investment cost for construction works to the handing-over time
28	Decree No.11/2010/ND-CP	Regulating management and protection of road transport infrastructure
29	New Decree under preparation (*1)	Road asset management
30	Joint Circular No.10/2008/TTLTBTC-BGTVT), 30/JAN/2008	Guiding the regime of management, payment and settlement economic professional budget for management and maintenance of road
31	Circular No.10/2010/TT- BGTVT, 19/APR/ 2010	Providing for road administration and maintenance
32	Circular No.30/2010/TT-BTC, 05/MAR/2010	Guiding the financial management of the task of supplying public-utility products and services in road and inland waterway transport
33	Circular No.07/2010/TT-BGTVT	Regulating Loading and size of road.
34	Circular No.30/2010/TT-BGTVT	Regulating prevention and recovery of flood and storm damage in road sector.
35	Decision No.855/2011/QD-TTGg-BGTVT 6/June/2011	Decision of the Prime Minister on approval of the programs proposed on control of environmental pollution in transport & transportation activities.
36	Decision No. 1270/ QD- TCĐBVN, 28/JUL/2010	Authorization in implementing some rights and responsibilities of Director General of DRVN in works repair investment management on NH system using Road non-business budget and ferry fee
37	Decision No.3479/2001/ QD- BGTVT, 19/OCT/ 2001	Road Routine Maintenance Norm

(2) Organization and Staff

(Current Status)

- There used to be subordinate state-owned-enterprises (SOEs) under the state agency or under PPCs in the regions. The SOEs had shifted to the limited companies or the joint stock companies (RRMCs or PRRMCs) until July 2010 by the Law on Enterprise in line with the government decentralization policy.
- Due to this change, there are no field offices and task forces on the state agency sides which can be mobilized to incidents or emergencies on the roadway.

(Comment)

It is important for some infrastructures, like roads and bridges, to detect any incidents on the facilities as quickly as possible, to remove incidents, to restore facilities from emergency and maintain their serviceability to the users.

In order to ensure smooth and timely implementation of these activities, State agency is requested to maintain close relation with the maintenance companies by making contracts specialized for the routine maintenance works.

(3) Maintenance Procedure Manual

(Current Status)

- Decree No.114/2010/ND-CP stipulates a maintenance procedure manual as follows.
- Design consultants should be responsible for formulating maintenance procedure manuals. Construction facility maintenance plan should be made annually based on the approved maintenance procedure manual. Facility owners should accept the maintenance procedure manuals produced by consultants and adjust it when some difficulties arise in operation.
- This procedure can be suited to the building work maintenance whose facility owners or authorized persons are in general non-professional.

(Comment)

- Private-sector building works occupy a majority in the building construction sector unlike national asset maintenance, roads, bridges etc., so that the consultants dedicated to building design become capable enough of making a maintenance procedure manual for building facilities.
- Meanwhile, professional facility owners or authorized persons are in general assigned to the maintenance of national assets like traffic infrastructures, agriculture infrastructure and urban technical infrastructures. Overseas practices have explained that government

organizations in principle take whole responsibilities for the maintenance of such national assets and take a prime role in developing maintenance procedures as well as maintenance plans without relying on design consultants.

(4) Maintenance Plan/Project Formulation and Approval

(Current status)

- Decree 114 stipulates that the facility owner shall take responsibility for formulating facility maintenance plans, decide repair projects less than 500 million VND, and approve repair projects over 500 million VND.
- However, Decree 114 does not stipulate who will approve the routine maintenance plans.

(Comment)

a. Decree 114 stipulates the responsibility for formulating and revising maintenance plans.

- Construction facility maintenance plan should be made annually based on the approved maintenance procedure manual.
- The facility owner or authorized person shall be responsible for formulating and approving the facility maintenance plan.
- The construction facility maintenance plan may be revised, supplemented during implementation process. The facility owner or authorized person shall be authorized for deciding those revisions, supplements for the maintenance plan.

b. Decree 114 also stipulates that repair of facility using State budget, shall be conducted as follows depending on amount of expenses:

- For repair of facility with expenses under VND 500 million, the facility owner or authorized person shall decide repair projects.
- For repair of facility with expenses over VND 500 million, the facility owner or authorized person shall conduct formulation, verification and approval of economic and technical report (F/S) or construction investment project.

The above regulations are more likely suited to periodic maintenance including medium repairs and big repairs which are similar to general construction works stipulated in the Law on Construction. However, routine maintenance has absolutely different missions. It aims to take prompt action in response to any incidents happening on facilities, to restore damages, and thereby to maintain serviceability of facilities. Like roads and bridges, delay in response often causes serious consequences to facility users.

The facility owner or authorized person is recommended to approve and revise routine maintenance plans, if needed. Also, routine maintenance consists of patrolling, small repair works, emergency restoration works which are mostly small-scale, fixed pattern and sometimes unpredictable works like disaster restoration, so that it is not necessary to apply F/S, but to approve the overall framework of annual maintenance plans. This would ensure the flexibility of maintenance work selection and minimize delay to be caused by applying F/S.

Differences in plan formulation and budget proposal are summarized in **Table 5.12.5** as reference.

Table 5.12.5 Work Plan & Budget Proposal by Work Type

Maintenance Type	Work Types	Work Plan	Budget Proposal
Routine maintenance	- Cleaning - Small repair - Emergency restoration	- Comprehensive annual plan	- Comprehensive annual budgets proposal
Periodic maintenance	- Medium repair - Big repair	- Middle-term plan based (Alternative plan of F/S) - Technical design	- Budgets proposal for individual projects
Rehabilitation	- Replacement without functional upgrade	- F/S - Technical design	-Ditto-
Reconstruction	- Reconstruction with functional upgrade	-Ditto-	-Ditto-

(5) Budget Proposal and Approval

(Current status)

- Law on Budget and Circular 86 deals with conditions of budget proposal for capital construction projects including periodic maintenance (medium and big repairs), rehabilitation and reconstruction works.
- However, it does not stipulate the conditions of budget proposal for the routine maintenance works. Routine maintenance in general consists of small-scale, fixed pattern, many works and unpredictable works like disaster restoration, so that F/S report is not necessary and it is appropriate to approve overall framework of annual budgets rather than approving individual work-based budgets in order to ensure flexibility.

(Comment)

a. Law on Budget stipulates;

- Prior project formulation is necessary for capital construction project including medium and big repair works.

b. Also, Circular No.86/2011/TT-BTC stipulates the conditions of budget proposal as follows;

- The investment projects are funded by investment capital from the state budget every year.
- For investment projects, it is required to have investment decision prior to October 31st of the preceding year of the planned year.
- As basic documents for the domestic capital projects, employer must send project basic documents to the state treasury;
  - + Economic-technical reports for the projects (F/S Report),
  - + Investment decisions of the competent authority,
  - + Written approval of the contractor selection in accordance with the Bidding Law,
  - + The contract documents between employer and contractor, and cost estimate approval of the competent authority for each works.

(6) Cost Estimate

(Current Status)

- Remarkable progress has been seen in the facility maintenance and management technologies, such as minimizing facility life-cycle costs, prediction of facility deterioration and maintenance information technologies including databases.
- Methods of payment should follow the changes in technologies and should be flexibility applied to the payment of maintenance projects.

(Comment)

- Decree 114 stipulates that the method of estimating maintenance costs as follows;
  - Maintenance cost estimation should be made upon volumes of facility identified according to maintenance plan and construction unit price for carrying out those facility loads.
- Performance Based Contract (PBC) is currently under study by World Bank TA project to enhance capacity for road maintenance and management. However, PBC does not use a Quantity-based contract, but a Quality-based contract, so that this may need review and modification of Decree 114.

(7) Cost Estimate Norms for Routine Maintenance

(Current Status)

- Routine Maintenance Cost Norm, Decision No. 3479/2001/QD-BGTVT was promulgated 2001 and applied to the routine maintenance works.
- Inconsistency of information is observed between Technical Norms on Road Routine Maintenance 2003 (Technical Standards 2003) and Routine Maintenance Cost Norms 2001.
- Cost estimate for other maintenance activities including periodic maintenance, rehabilitation and reconstruction, construction cost estimate norms are applied. Works of design and cost estimate are carried out by consultants.

(Comment)

- The working environment between routine and periodic maintenance is different. With this, it is very important to develop a cost norm specialized for the routine and periodic maintenance works separately from construction cost norms.
- Review and revision of the contents of Technical Standards 2003 are now underway by DRVN in cooperation with JICA technical assistance.
- MOT is kindly requested to revise the Routine Maintenance Norms upon completion of the revision of the Technical Norms on Road Routine Maintenance 2003 in order to ensure consistency between two norms.
- Also, MOT is kindly requested to develop Periodic Maintenance Norms separately from the Routine Maintenance Norms and general construction norms.

(8) Contractor Selection

(Current Status)

- In Vietnam, the Law on Tendering stipulates contractor selection methods which can be applied to the selection of maintenance works. Article 20 of the Law on Tendering shows some incidents to which direct appointment of contractors can be applied; events of force majeure due to a natural disaster, war or a breakdown.
- However, further details of these applications are not elaborated not only in the Law on Tendering, but in Decree 209, in Decree 12 and in Decree No.71, so that it is hard to apply the direct appointments of contractors to routine maintenance.

(Comment)

- In performing the facility maintenance, it is necessary to select eligible contractors in accordance with maintenance work types, i.e. routine maintenance, periodic maintenance, rehabilitation and reconstruction.
- In Vietnam, the Law on Tendering stipulates contractor selection methods which can be applied to the selection of maintenance works. There are three main tendering methods applicable to the selection of maintenance work contractors; (1) open tendering, (2) limited tendering, and (3) direct appointment of contractors. Basically, the above (1) and (2) can be applied to the periodic maintenance, rehabilitation and reconstruction works. However, in the case of routine maintenance which contains many of incident responsive works such as small repair works, traffic safety measures and emergency restoration works, it is necessary to select contractors without spending a long time and to mobilize contractors to the incidents as quickly as possible.
- Article 20 of the Law on Tendering shows some incidents to which direct appointment of contractors can be applied; events of force majeure due to a natural disaster, war or a breakdown. Also, the investor or the body responsible for managing the building works or assets affected shall be permitted to immediately appoint a contractor to carry out the work.
- However, further details of these applications are not elaborated not only in the Law on Tendering, but in Decree 209, in Decree 12 and in Decree No.71.

(9) Technical Standards

(Current Status)

- MOT disseminated Technical Norms on Road Routine Maintenance; Decision No. 1527/2003/QD-BGTVT dated on 28/5/2003 and applied the Technical Norms to the routine maintenance works.
- Construction design standards have been applied to periodic maintenance works, rehabilitation works and reconstruction works, whose works are fairly large-scale rather than the routine maintenance works.
- Technical Norms on Road Routine Maintenance2003 is under revision by DRVN in cooperation with JICA technical assistance.

(Comment)

- Technical Norms stipulates the subjects relevant to road inspection, data preservation, diagnosis, selection of maintenance works, facility management levels, work acceptance, and so forth, which are essentials for implementing road routine maintenance.

- It is necessary to develop technical standards on routine and periodic maintenance separately from construction design standards for the facilities, since routine maintenance works are wide in range and small in scale from patrolling, small repairs and emergency restoration. Also, the periodic maintenance, including medium repairs and big repairs, may need the demolishment or the removal of existing facilities. Due to the difference in working environment and work types, construction design standards are hardly applied to the routine maintenance and periodic maintenance works.
- As regards other maintenance works including periodic maintenance, rehabilitation and reconstruction, construction standards can be applicable.

5.12.5 Recommendations

(1) Enhance Public Awareness on the Construction Facility Maintenance

It is recommended that state authorities involved in construction facility maintenance should enhance their awareness and acknowledgement to the importance of construction facility maintenance.

(2) Improve Building Facility Maintenance Owned by Private-sector

Decree 114 has already stipulated facility owner's responsibilities for private-sector projects, in particular in Article 17 and Article 18. In order to enhance maintenance capacity for private sector projects, it is recommended to improve the following provisions relevant to Decree114.

1) To Specify the Eligibility of Inspectors for the above Inspections

This is the issue to be discussed in conjunction with the improvement of engineer qualification systems. This is the recommendation intended to enhance quality of inspection.

2) To Specify the Points of the above Inspections

It is recommended to clearly define inspection points.

3) To Inspect Facility Owner's Responsibilities for the Compliance of Regulations

(3) Review and Define Public Facility Maintenance

It is recommended to review and classify existing maintenance works into the following activities shown below, whose further details are seen in **Table 5.12.1** and **Table 5.12.2**. On the basis of this classification, management procedures for each activity need to be developed in order to meet their requirements. The procedures to be developed should include legal frameworks, organization and staff, project formulation and approval, design, cost estimate

and norms, budget proposal and approval, contractor selection, technical standards and so forth as shown in **Table 5.12.3**.

- Routine maintenance
- Periodic maintenance
- Rehabilitation (without functional upgrade)
- Reconstruction (with functional upgrade)

(4) Improve the Legal Framework for Public Facility Maintenance

It is recommended that state authorities relevant to construction facility maintenance should acknowledge the objectives, missions and requirements for each of maintenance activities, and then improve the current legal framework in order to make them meet the requirements. The points to be focused on in working out provisions are as follows. The provisions need to be prepared for each maintenance activity, i.e. routine maintenance, periodic maintenance, rehabilitation and reconstruction. Key elements for the facility maintenance are summarized in **Table 5.12.6** by maintenance activity as reference.

- Institutional arrangement
- Formulation of maintenance plan/projects and approval
- Budget proposal and approval
- Cost estimate and cost estimate norms
- Contractor selection
- Technical standards

In addition, it is recommended that MOC and MOF which are institutional ministries promulgating regulations for facility maintenance should exchange views with state agencies in charge of facility maintenance on the requirements of regulations before drafting regulations.

Table 5.12.6 Summary of Functional Requirements for Public Facility Maintenance

Functional Requirements	Routine Maintenance	Periodic Maintenance	Rehabilitation / 4. Reconstruction
Legal Framework	- Legal framework specialized for routine maintenance is needed.	- Legal framework specialized for periodic maintenance is needed	- Legal framework should follow those for construction projects
Organization and staff	- Maintenance units or taskforces which can take prompt action to the incidents.	- Planning department and planning staff capable of handling databases (PMS, BMS) and planning software	- Same as construction projects
Maintenance Plan/ Projects Formulation and Approval	- Established based on the projection of maintenance history. - Approval on the framework of plans and not on the individual works. - Environmental assessment is not necessary.	- Middle-term maintenance plans (3 to 5 years plan) as an alternative to FS - Based on asset management concept aiming at minimizing the life-cycle costs. - Environmental assessment is not necessary.	- Follow construction procedures - Environmental assessment is not necessary for the rehabilitation without functional upgrade. If reconstruction includes functional upgrade, it may need FS and environmental assessment.
Cost estimation and Norms	- Estimated by the cost estimate norms specialized for the routine maintenance works.	- Estimated by the cost estimate norms specialized for the periodic maintenance.	- Follow construction procedures - Follow cost estimate for construction projects
Budget Proposal and Approval	- The overall framework of budgets is proposed and approved.	- Project-based budget proposal is proposed and approved.	- Follow procedures for construction projects
Contractor Selection	- A call-for contract or an appointed contract in order to ensure quick mobilization of contractors.	- Follow competitive bidding procedures	- Follow procedures for construction projects
Technical Standards	- Work items and procedures should be standardized in the Technical Standards for the routine maintenance.	- Periodic inspection on the facilities should be standardized. - Work items and procedures should be standardized in the Technical Standards for the periodic maintenance.	- Follow design and technical standards for construction works

(5) Simplify Procedures for Public Facility Maintenance

As shown in the case of road maintenance analyzed in this paper, about 30 regulations are closely related to maintenance, so that state agencies' much energy has been spent on the analysis of regulations rather than the enhancement of maintenance technologies at sites. Also, requirements of regulations may differ depending upon sector facilities and the number of regulations would increase as regulation goes into details.

With taking these into consideration, it is recommended to prepare maintenance manuals specialized for sector facilities and consolidate information on construction facility maintenance into the manuals in order to save time and to avoid misunderstanding and misinterpretation of the concerned regulations.

The manuals should be edited by the sector management ministries in cooperation with implementation agencies and authorized by institutional ministries like MOC and MOF. The following shows the manual structure as an example.

1) Manual for Facility Maintenance Management

The manual should covers administration procedures for facility maintenance including routine maintenance, periodic maintenance, rehabilitation and reconstruction. The subjects to be included are shown below;

- Plan/Project formulation and approval procedures
- Budget proposal and approval procedures
- Contract management focusing on facility maintenance

2) Technical Standards for Routine Maintenance

The standards need to cover routine maintenance works as well as periodic maintenance in principle. Rehabilitation and reconstruction works should follow construction design standards. The subjects to be included are shown below;

- Facility inspection standards
- Criteria of diagnosis
- Criteria of work selection
- Work operation guideline
- Work specification for routine maintenance works
- Data preservation in databases
- Acceptance criteria

- Facility management levels

3) Cost Estimate Norms for Routine Maintenance and Periodic Maintenance

- Routine maintenance cost norms
  - Cost estimate norms for maintenance patrolling
  - Cost estimate norms for facility cleaning
  - Cost estimate norms for small repair works
  - Cost estimate norms for emergency restoration
- Periodic maintenance cost norms
  - Cost estimate norms for periodic inspection
  - Cost estimate norms for medium repair works
  - Cost estimate norms for big repair works

5.13 DEVELOPMENT OF PROJECT OWNERS' MANUAL

5.13.1 Current status

In Vietnam, there is a large number of non-professional Project Owners who are delegated to manage and use the state budget for the investment of construction projects. They are given big authorities and responsibilities to implement and manage construction projects from the beginning to the end. They are from various sectors like education, tourism, heath… and they do not have profession knowledge and expertise in construction including construction project management and construction quality assurance.

Meanwhile, legal framework in construction project management and quality assurance in Vietnam seems to be fairly complicated for many of the non-professional POs. Various regulations related to construction projects have been prepared and promulgated by various organizations for various users. Interview surveys conducted in this project have clarified that provisions relevant to POs' roles and responsibilities have been dispersed over many regulations including Laws, Decrees and Circulars, Also, overlapping of information between regulations has been reported. In addition, there are frequent changes in provisions including revision of regulations and promulgation of new regulations. These make it difficult for POs to access to necessary information for their project management. Also, guidelines or manuals which can supplement interpretation of regulations are not currently available in Vietnam, so that this also makes it difficult for POs to find, refer and apply appropriate regulations.

5.13.2 Oversea practice (Japanese practice)

Technical specifications for surveys, designs and construction have been applied to most of the public-sector projects for the purpose of enhancing quality of specifications and alleviating workloads of POs to prepare tender documents.

In principle in Japan, sector management State Authorities plays a leading role in standardizing technical specifications and also in developing construction quality manuals. In addition, standardized technical specifications are also applied to local government projects. Local governments are allowed to develop their own specifications, but many tend to apply MLIT standardized technical specifications.

In order to support POs' construction project management and supervision, sector management ministries are requested to play a key role in developing guidelines or manuals specialized for POs' construction project management, supervision, testing and inspections for their project management. These manuals help stakeholders conduct their works easily, consistently and ensure good quality.

Table 5.13.1 shows the outline of one project management manual developed by Central Nippon Expressway Company Limited. With these guidelines or manuals, POs can easily understand the procedures and requirements of their activities without referring to various regulations by utilizing this manual.

Table 5.13.1 Outline of Management manual for civil engineering works

	Items
Chapter 1	General
Article 1	General rules
Article 2	Order of construction works
Article 3	Supplemental contents of construction documents
Article 4	Responsibilities of General Supervisor, Deputy Supervisor, Chief sub-supervisor, Sub-supervisor
Chapter 2	Management of construction works
Article 1	Management regarding change of contraction contents
Article 2	Management regarding suspending construction works
Article 3	Management regarding change of term of construction works
Article 4	Change of original contract price
Article 5	Advanced payment and partial payment in contract term (in case of multi-year construction works)
Article 6	Alteration of a contract
Article 7	Procedure for road maintenance works
Article 8	Matters in case of not reaching agreement of contract between project owner and contractor
Article 9	Matters of exception by nonconformity of design specifications
Article 10	Regarding Subcontractor, etc.
Article 11	Report of disaster or accident
Article 12	Considerations on entrustment of construction management
Article 13	Regarding account audit

	Items
Article 14	Matters of warranty against defects
Chapter 3	Inspections for construction works
Article 1	Purposes of inspections, kinds of inspections
Article 2	Final inspection and partial final inspection
Article 3	Inspection for partial completed construction works (by General supervisor)
Article 4	Inspection for use of completed construction portion
Article 5	Inspection for completed construction works
Article 6	Direction on quality control patrol
Article 7	Inspections regarding road maintenance works
Article 8	Use of work piece under construction
Article 9	Procedure of compensation for withered plants

(Source) Developed by Project team

5.13.3 Guidelines for Developing Project Owners' Manual

(1) Objectives

Project owners' manual is to show information on POs' roles and responsibilities for performing construction project management and construction quality assurance to POs, consolidating regulations with provisions for state budget projects into one manual. The manual is for non-professional POs who manage state budget projects.

(2) Time of Development

Under the current status, MOC focuses more on promulgating regulations than on preparing guidelines materials. However, under the situation that anybody can be a project owner if appointed by Decision maker, MOC is recommended to develop this kind of manual as soon as possible to make POs fully understand the regulations regarding construction project management. It will contribute to enhancing cost efficiency of state budget projects.

(3) Structures of Manual

The expected manual may consist of the following 15 chapters stipulating roles and responsibilities of POs and procedures of construction project management and quality assurance. Each chapter is focused on a different aspect of project management and operation.

- Chapter 1: Formulation, Appraisal, Approval and Adjustment of Feasibility Studies
- Chapter 2: Land Acquisition
- Chapter 3: Project management models
- Chapter 4: Cost management
- Chapter 5: Construction Survey

- Chapter 6: Design
- Chapter 7: Tendering, Contractor selection
- Chapter 8: Contracting
- Chapter 9: Construction works
- Chapter 10: Construction supervision
- Chapter 11: Labor safety, environment protection
- Chapter 12: Acceptance/ Handing over
- Chapter 13: Account disbursement, settlement in construction projects
- Chapter 14: Facility Maintenance
- Chapter 15: Investment monitoring and evaluation

Contents in each chapter will be taken up from Laws, Decrees, and Circulars in force. References to regulations (Laws, Decrees, Circulars, Decisions) are noted in the relevant contents, reference materials are to be listed in the last end of the manual. This will ensure the reliability of contents in the manual, and facilitate updating of manual in case of revised or new regulations are available.

Supplemental explanation is to be added for interpretation of regulations. The explanation can supplement information whenever regulations are found not clear enough. These explanations should be prepared by professional experts with deep understanding of regulations and construction project management.

In case contents are so specific and huge volume, there will be a reference to the original regulations for detail guidelines.

The annexes in each chapter include all necessary forms for each procedure which are also stipulated in regulations.

(4) Roles of Ministries

MOC requested to take responsibilities for preparing, publishing, updating and maintaining the manual. Sector ministries including local governments are encouraged to develop their own manual suited to their construction sectors.

(5) Maintaining manual and further development

Since there are frequent changes and revision of regulations, MOC is requested to frequently update the manual in an appropriate interval.

This manual can be divided into several sub-manuals dealing with specific subjects. This may contribute to saving time for preparing and updating the huge volume of comprehensive manual.

In the future, when Project Owner get used to use this manual, MOC is recommended to convert stipulations into manuals in order to simplify regulations. This would enhance the quality of regulations and the understanding of people about regulations including knowledge and experience of construction project implementation. This would lead to the efficiency of state budget construction investment projects.

(6) Sample of Project Owners' Manual

The Project has also prepared a sample Project Owners' Manual showing the detail information of some part of the manuals. MOC is recommended to follow this style to complete further development.

For more details on the Sample Manual, please refer to **"GUIDELINES AND MANUALS"**.

CHAPTER 6 IMPROVEMENT OF STATE AGENCIES INSPECTION SYSTEM FOR CONSTRUCTION QUALITY ASSURANCE (ACTIVITY-2)

6.1 FRAMEWORK OF IMPROVEMENT

The subjects studied in this activity include the following;

(1) Strengthen state management audit system to Project Owners

(2) Enhance inspection capacity for CICs

(3) Strengthen sanctions against improper construction quality management

6.1.1 Strengthen State Management Audit System to Project Owners

(1) Concept for Improvement

Project owner is playing a key role in construction project and construction quality management, so that his capacity needs to be strengthened in order to support his activities. In parallel with strengthening project owner's institutions and technical supports to them, it is important to reinforce state management audit functions (construction audit) to the project owners. As long as project owner should manage state-budget projects for constructing national infrastructures, status of his project management should be monitored and examined regularly. A schematic view is illustrated in **Figure 6.1.1**. The Project recommends reinforcing construction audits to the project owners.

The points of audit to be focused on will be as follows;

- Management of construction projects, in particular, on the conformity with specifications
- Management of labor safety and third-party accidents
- Management of construction budgets and expenses
- Management of construction periods

In order to enhance construction quality, project owner is now strongly recommended to accomplish these responsibilities.

The construction audits to be focused on in this Project include the following;

- MOC construction audits to the central projects and to the regional projects conducted by the Provincial-level People's Committees whose project owners are relevant departments of the Provincial People's Committees.
- Provincial-level construction audits to the regional projects whose project owners are appointed by the Provincial-level People's Committees.

- In the study, much focus will be placed on the civil work (building construction) project owners, as there are many small projects now going on in the whole country.

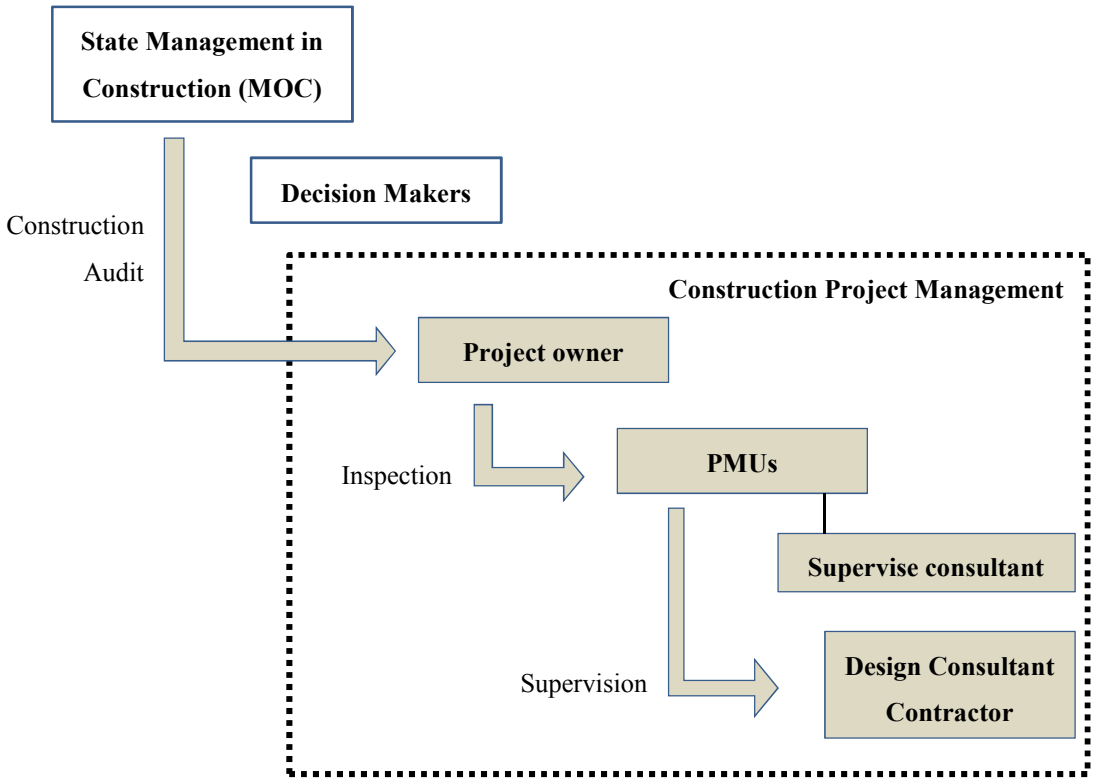


Figure 6.1.1 Construction Audit

(2) Methodology

The Project will discuss with the counterpart group on the following issues.

- Clarify the points of audits
- Clarify responsibilities for the auditors
- Task demarcation between MOC and Provincial-level People's Committees
- Clarify criteria of selecting projects to be focused on
- Reinforcement of institutional issues for audits

(3) Outputs

Recommendations on the strengthen of audit systems

6.1.2 Enhance Inspection capacity for CICs

(1) Concept for Improvement

Study on the current status on construction projects has clarified rapid growth in construction projects in the regions due to the progress in the Government decentralization policy. Many construction projects have been carried out in the regions. With this, the Project recommends that CIC's functions be strengthened to be a focal point of technical support in the regions and support project owners and regional construction projects.

1) Expected Roles to be prepared for CICs Include the Following;

- Technical supports to the regional audits recommended in the above plan which is to be carried out by Provincial-level Peoples Committee
- Technical supports to the project owners

The technical supports to the regional audits is intended to help support the audits from technical view points, such as those including checks on the conformity with technical standards and relevant procedures. Also, the technical supports to the project owners are to provide technical consultation to the project owners whenever technical problems may happen during construction projects.

2) Expected Functions to be Prepared at CICs Include the Following Functions;

- Research & Development
- Data Collection and preservation
- New technology assessment
- Consulting services
- Material testing services

(2) Methodology

The Project will discuss with the counterpart group on the plan.

(3) Outputs

Recommendations on the strengthen of CIC functions

6.1.3 Strengthen Sanctions against Improper Construction Quality Management

(1) Concept for Improvement

In accomplishing state-budget construction projects, the Government should prepare sanctions against improper construction management. The Decree No.23/2009/ ND-CP prescribes details of administrative violations to which the sanction should be applied. The regulation not only imposes sanctions, but also playing a role of raising contractor's awareness to their construction project management. However, it is said that the sanction regulation has seldom been applied to the real incidents in Vietnam.

The Project will detail application cases of sanctions, focusing on construction quality management.

(2) Methodology

The Project will introduce foreign practices and have discussions on the following issues to improve sanction applications;

- Incident types to which sanctions are to be applied
- Rationales of applications (Legal ground)
- Who is to be charged
- Sanction contents
- Information dissemination
- Other relevant

(3) Outputs

Recommendations on sanction applications

6.2 STRENGTHEN STATE MANAGEMENT AUDIT SYSTEM TO PROJECT OWNERS

6.2.1 Rationale

In the state-budget construction works, POs play important roles in managing the construction works including construction quality management as capital owners, given big authority to perform their duties.

It is a common practice that all organizations which engage in construction works and spend state budgets should be audited periodically for their performance in order to ensure their accountability to the public.

It is said that the Vietnam Government had spent a third of the state budget on public investment currently. In order to ensure efficiency and reduce extravagance in the state budget spending, it is mandatory to conduct construction audit to the project owners who own capitals for construction works.

6.2.2 Foreign Practices (Practices in Japan)

In general, two audit systems care currently employed in foreign countries; an internal audit system and an external audit system.

(1) Audit Board of Japan

1) Organization

As a constitutional organization that is independent of the Cabinet and belongs neither to the Diet nor to the Courts, the Board of Audit (hereinafter referred to as 'the Board') audits the State accounts as well as those of public organizations and other bodies as provided by laws, and also supervises of public accounting to ensure its adequacy. The organizations obliged to undertake the Board audit are as follows;

- Central Ministries spending state budgets
- Ministerial agencies which the government invests in
- Local autonomies which are undertaking government subsidies.

The Board is equipped with five bureaus, comprising about 1,280 staff. Its roles and responsibilities are stipulated by the Board of Audit Act as follows;

- The Board shall have an independent status of the Cabinet (Article 1).
- The Board shall audit the final accounts of expenditures and revenues of the State under the provision of Article 90 of the Constitution of Japan and also such accounts as are provided for by laws (Article 20).
- The Board shall constantly audit and supervision the public accounts to secure their adequacy and to rectify their defects.
- The Board shall conduct its audit from the aspects of accuracy, regularity, economy, efficiency and effectiveness, and from other necessary aspects of auditing.

2) Responsibilities

a. Supervision of the public accounting

The Board audits and supervises public accounting constantly to ensure its adequacy and to rectify its defects. When the Board finds cases of improper or unreasonable financial

transactions in the course of its audit, the Board not only points out these improper cases, but also performs a positive function of facilitating their rectification and improvements by identifying the cause of such improprieties.

For this reason, the Board is given powers to present its opinions or demand the auditees to take improvement measures on matters it deems to be in violation of laws and regulations or to be improper concerning financial transactions, or necessary to be improved with regard to laws and regulations, systems on administration.

b. Verification of the final accounts of the expenditures and revenues of the State

Verifying the final accounts of the expenditures and revenues of the State is another responsibility of audit by the Board. The Board has a duty to verify it based on the results of audit. Verification of the final accounts of the expenditures and revenues of the State means to declare completion of the audit after determining the accuracy of the statements and the adequacy of the State accounting.

The Constitution stipulates that the final accounts of the expenditure and revenues of the State shall be submitted by the Cabinet to the Diet together with the Audit Report of the Board, Thus, an official declaration of completion of the audit by the Board enables the submission of the final accounts of the expenditure and revenue of the State by the Cabinet to the Diet.

(2) Internal Audit System

The internal audit system is an inter-organizational audit system aiming to inspect whether responsibilities assigned to organizations are properly managed. Any governmental organizations are more or less equipped with this system in order to examine their activities to ensure accountability to the public. However, their audit functions are not limited to the construction activities, but are addressed to all activities that the organizations are currently in charge.

Figure 6.2.1 shows interrelation between the Audit Board of Japan and Intra-organizational Audits of local autonomies.

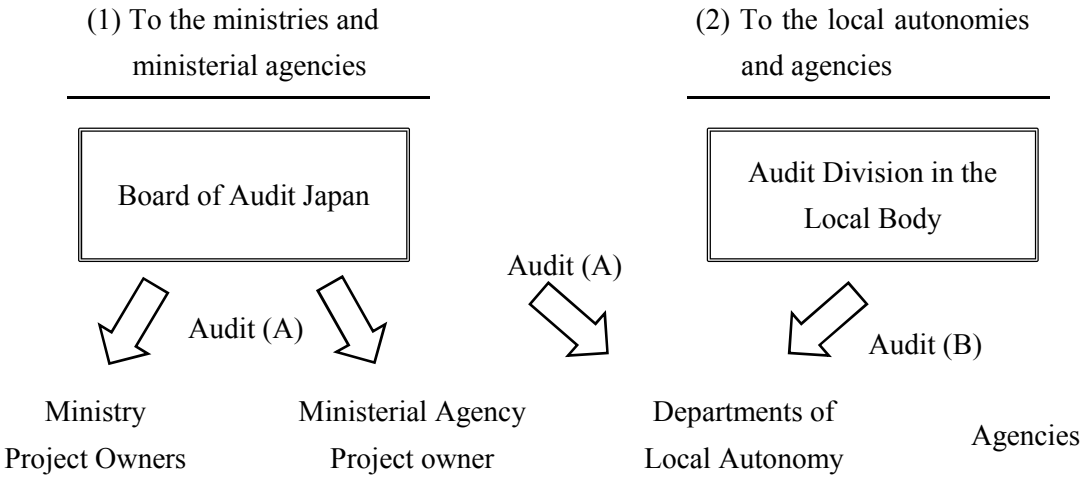


Figure 6.2.1 Comparison of Audit Systems

6.2.3 Practices in Vietnam

According to the prevailing regulations in Vietnam, there are three Ministries, MOF, MPI and MOC, which are given authorities to monitor and inspect budget spending (MOF), investment activities (MPI), conformity with the regulations in construction (MOC) and construction quality management (MOC). However, their inspection functions are limited to their responsible domains, unlike an independent and an integrated audit system over the ministries in Japan. The following are the provisions stipulating monitoring and inspection functions deemed similar to the audit system in Japan, although they are not translated as « audit ».

(1) Ministry of Finance (MOF) (Article 2, Decree No. 118/2008/ND-CP)

- To examine the allocation of budget estimates assigned to ministries, ministerial-level agencies, government-attached agencies and other central agencies; to guide ministries, branches and localities in managing and administering their budgets; to direct and examine ministries, ministerial-level agencies, government-attached agencies, other central agencies and localities in collecting and spending budgets.
- Every year, the State Audit will have the audit plan for the next year (For example, Decision No.01/2009/QD-KTNN explains the audit plan for the year 2009). The State Audit sends staffs to the selected projects to audit and then issues the official audit report to The National Assembly, the President, the Government and the Prime Minister. In 2009, only 19 projects were audited by the State Audit.
- The contents of the finance audit on construction projects consist of the following:
  - Audit the implementation of law, the regime of investment and construction management.

- Audit the validity and the effects of the investment project.
- Audit the completion balance-sheet of the investment capital.

(2) Ministry of Planning and Investment (MPI) (Article 2, Decree No.116/2008/ND-CP)

- To assume the prime responsibility for, and coordinate with concerned ministries and branches in, guiding, monitoring, inspecting and examining investment activities and proposing solutions to problems arising in the formulation and implementation of investment projects; to evaluate results and socio-economic efficiency of domestic and foreign investment activities; to examine, supervise and conduct overall evaluation of public investment activities. To report on the implementation of target programs and investment projects under the Prime Minister's investment decisions; to act as the key agency in organizing meetings at home and abroad between the Prime Minister and investors.

(3) Ministry of Construction (MOC) (Article 2, Decree No.17/2008/ND-CP)

- To guide and examine the implementation of legal provisions in the domain of construction, covering the stages of formulation and management of the implementation of work construction investment projects, survey, designing, construction, take-over test (both qualitative and quantitative), handover, warranty and maintenance of construction works.
- To guide and examine the management of construction work quality in the stages of survey, designing, construction, take-over test, handover, warranty and maintenance of construction works; to guide the evaluation of construction work quality and carry out state evaluation of construction work quality as decentralized by the Government or assigned by the Prime Minister.

6.2.4 Basic Concept

In principle, any project owners in charge of implementing state budget projects are obliged to undertake audits on whether state budgets are effectively spent without extravagance. The audits deemed effective in Vietnam may include; (1) State audits by state management and (2) intra-agency audits by decision makers. The former (hereinafter referred to as «Construction Audit») is to audit project owners from the state management view points and the latter (hereinafter referred to as « Technical Audit ») from the decision maker’s viewpoints. Due to the difference in nature, these audit systems are not comparable, but are preferably practiced together. In order to enhance project accountability to the public, it is most important to apply these audits to any of the state budget projects.

(1) Construction Audit by MOC

There is no integrated national audit system in Vietnam, but there exist alternative inspection systems which look quite similar to the national audit in Japan. These inspections have been practiced by state management including MOF, MPI and MOC. With this reason, it would be more practical to strengthen the MOC state management inspection and upgrade it to the construction audit rather than to newly establish a new rule.

However, it is clear to understand that the state audit has limitation in implementation. It cannot cover whole construction projects due to institutional constraints, so that preferential treatment is necessary to the projects which are especially focused on. Also capacity enhancement plans should avoid overlapping in functions with existing state audits stated above.

(2) Technical Audit by Decision Maker

The technical audit is an intra-organizational audit system. Any government organizations should hold responsibility for deploying and enhancing their technical audit functions regardless of specialties in the scope of works, so the enhancement of the technical audit is in high priority rather than the development of the state audit system.

However, as far as the construction domain is concerned, there are two types of project owners; professional project owners and non-professional project owners. It will be rather important for non-professional project owners to enhance their self-control capacities in construction project management before enhancing technical audit function. However, this may need a long time to do.

With these reasons, it would be more practical to enhance technical audits for professional project owners and to enhance state audits for non-professional project owners rather than realizing both audits at the same time.

6.2.5 Capacity Enhancement Plans

With the above reasons, the Project recommends that audit systems be enhanced step by step with the short-term and medium-term view points as follows;

(1) Short-term Plan

The Project recommends two (2) short-term plans to be practiced in high priority. The audit systems are briefly outlined below;

PLAN-1; Central-level construction audit by state management (MOC)

PLAN-2; Provincial-level construction audit by state management (DOC)

Each of the above audit system is explained below. Also, Figure 6.2.2 and Figure 6.2.3 outlines these plans.

1) Construction Audit by MOC

Objective of this construction audit system is to inspect non-professional project owners in the central government. In the central level, there are two main types of construction works being practiced; those by MOT, MOI and MOA including ministerial agencies, and those by non-professional ministries in construction, e.g. MOE, MOH etc., including ministerial agencies.

MOT, MOI and MOA are known to be specialized organizations for implementing their own sector construction works. With this, their institutions for implementing construction works have been well prepared for their large-scale construction works with huge investment.

With this reason, the construction audit by MOC needs to be addressed to other construction projects which are rather small-scale construction works practices by non-professional organizations. Further details are described in **Table 6.2.1**. The audit system is a sort of external audit to be implemented over the ministries, so that it may need some institutional, personnel and legal reinforcements before its implementation to other ministries.

2) Construction Audit by DOCs in Provincial-level People's Committees

Objective of this construction audit system is to inspect non-professional project owners in the provincial level with the same reason stated above. As DOCs belong to provincial peoples committees, this audit system engulfs two functions; one as an intra-PPC audit function and the other as a state management audit function.

Table 6.2.1 Construction Audit (PLAN-1 & PLAN-2)

ITEMS	PLAN-1	PLAN-2
Types of audit	Construction Audit by State Management (MOC)	Construction audit by State management (DOC)
Classification	External Audit	Internal audit
Implementation Bodies	MOC	DOCs
Examinees	In principle, all of POs in the central-level construction projects, but more focus should be placed on the non-professional POs.	In principle, all of the POs in the provincial-level, but more focus should be placed on the non-professional POs in the provincial-level.
Timings and Frequencies of Audit	Once in the middle of construction works	Once in the middle of construction works

Points of Audit	**Common to PLAN-1 and PLAN-2.** Focuses should be placed on project management and quality management. All the following examinations should be conducted in conformity with regulations, contract documents, and technical standards. 1) Examine work schedule and progress of construction works 2) Examine land clearance 3) Examine acceptance procedures 4) Examine design change during construction works 5) Examine interim payments to contractors 6) Examine construction safety and work quality management	
Reporting	• Reporting to the Minister of MOC • Reporting to the concerned ministries and organizations	• Reporting to the Chairmen of PPCs • Reporting to MOC
Institutional procedures	• Stipulate responsibilities for the audit in the Decree No.12 • Detailed guidance by Circular. • Strengthen MOC institutions and personnel for implementation	• Stipulate responsibilities for the audit in the Decree No.12 • Detailed guidance by Circular. • Strengthen DOC institutions and personnel for implementation
Others	**Common to PLAN-1 & PLAN-2** • Audit should focus on construction work management and have different views from state inspectorate.	
Future Plan	**Common to PLAN-1 & PLAN-2** • When technical audit systems come to function well, construction audits by state management should be limited to the special cases, events and incidents.	

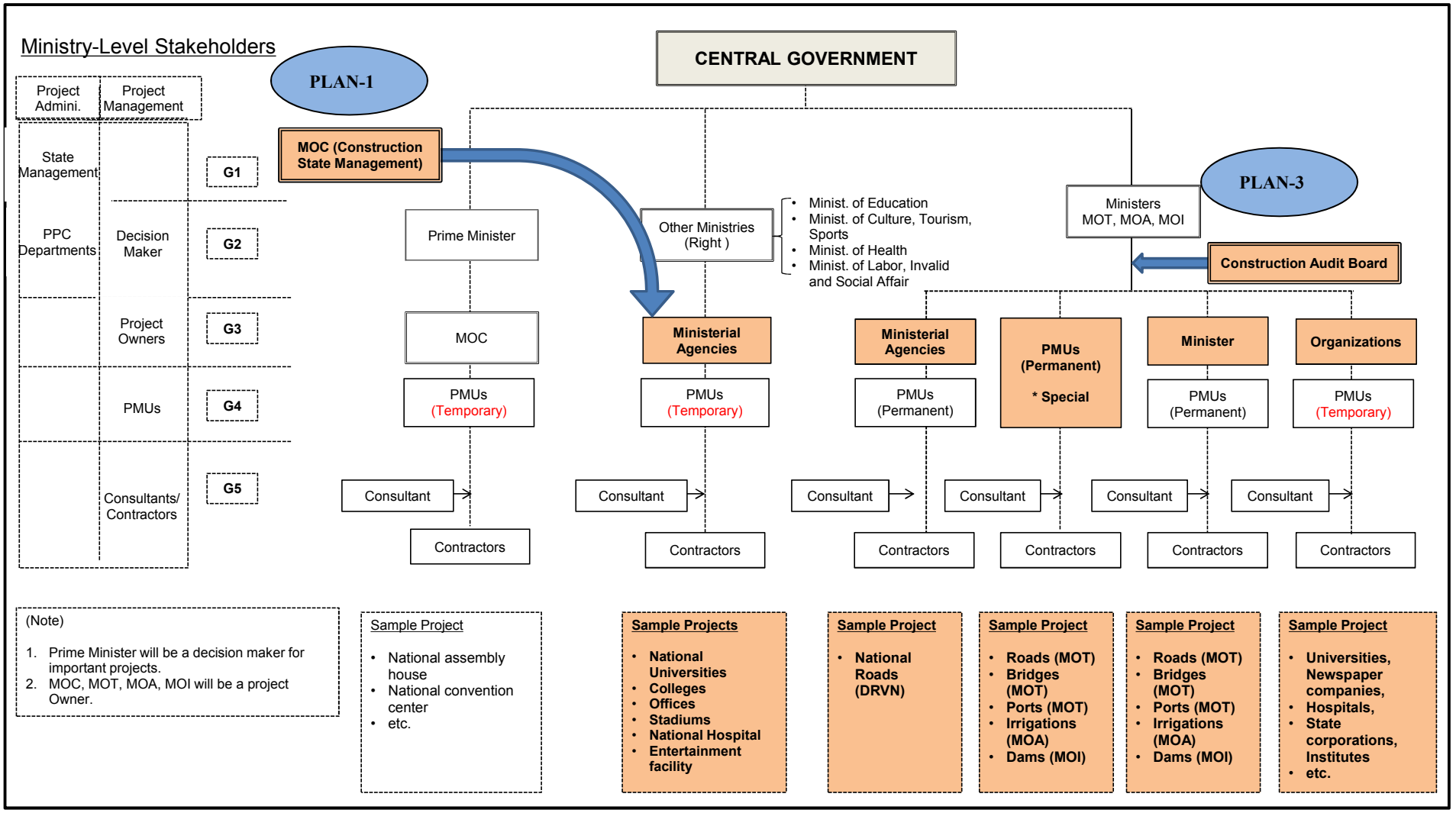


Figure 6.2.2 Construction Audit to Central-level Project Owners

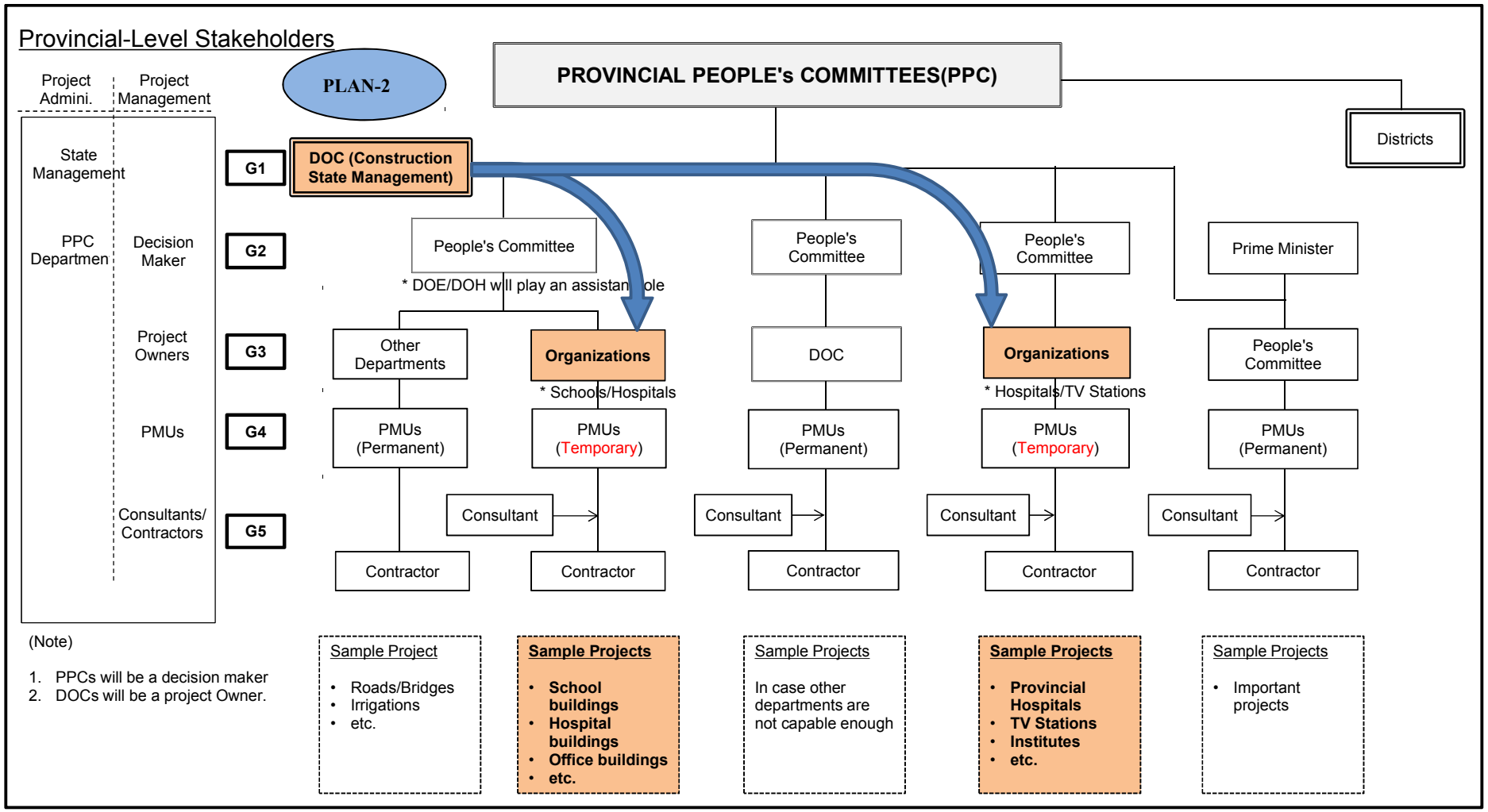


Figure 6.2.3 Construction Audit to Provincial-level Project Owners

(2) Medium-term Plan

PLAN-3; Technical audits within MOC, MOT, MOI, MOA.

Unlike the construction audits stated above, this technical audit is a sort of self-audit within ministries, MOC, MOT, MOI and MOA, which are deemed professional organizations specialized for sector construction projects. It is recommended to set up internal audit boards for construction projects under decision makers, inviting some members from external organizations, and to carry out the audit to their project owners including ministerial agencies.

In addition, the organizations with publicly approved legal status including public entities are encouraged to install audit boards for the purpose of inspecting their activities to enhance their own discipline. In particular, the need of such audit board is much higher in the government entities in order to ensure accountability to the public. Outline of the technical audit is described in **Table 6.2.2.**

Table 6.2.2 Technical Audit (PLAN-3)

ITEMS	PLAN-3
Types of audit	Technical Audit by MOT, MOA and MOI
Classification	Internal-organizational audit
Implementation Bodies	Construction Audit Boards consisting of members appointed by the Ministers
Examinees	All POs under MOC, MOT, MOA and MOI
Timings and Frequencies of Audit	Regularly once a year
Points of Audit	Focuses should be placed on project management and quality management. All the following examinations should be conducted in conformity with regulations, contract documents, and technical standards. 1. Examine work schedule and progress of construction works 2. Examine land clearance 3. Examine acceptance procedures 4. Examine design change during construction works 5. Examine interim payments to contractors 6. Examine construction safety and work quality management
Reporting	• Reporting to their own Ministers of MOT, MOA, MOI • Reporting to MOC
Institutional procedures	• Obligate MOT, MOI and MOA to establish Internal Construction Audit Boards in Decree No.12. • Detailed guidance by Circular
Others	• Audit should focus on construction work management and have different views from state inspectorate.
Future Plan	• The intra-organization audit systems for the central ministries and provincial-level people's committees should be upgraded and reinforced to the level where they can manage discipline for themselves.

6.2.6 Long-term Plan

The following will be developed hereafter.

(a) Application of technical audits to non-professional ministries

(b) Application of technical audits to Provincial-level People's Committees

(c) Enhancement of construction audits

6.3 CONSTRUCTION INSPECTION CENTERS (CICS)

6.3.1 Rationale

Since infrastructure facilities are made up of the newest materials and state-of-the-art construction technologies, they also require professional knowledge and expertise in project management. On the other hand, project implementation bodies of the state budget projects in Vietnam are ministry-level organizations and Provincial-level People's Committees including agencies whose capacities are centered around administration tasks and not on professional engineering tasks. This means that professional engineering supports are indispensable to these organizations to perform their construction management, supervision, tests and inspections.

For the ministry-level projects in Vietnam, there are subordinate research institutes or alike which can provide professional engineering supports to the central-level project owners. On the other hand, regional projects have no options but to ask CICs to provide professional knowledge and expertise and to support to the regional-level project owners. With these reasons, better use of CICs should be preferentially studied in particular for the regional-level project owners.

6.3.2 Current Status of CICs

(1) Responsibilities

CICs are public entities, but are business units under the DOC management in the Provincial People's Committees. Their roles, responsibilities and institutions are prescribed by the Decisions enforced by Provincial People's Committees as is the case of Decision No.21/2004/QĐ-UBND, Da Nang City. CICs are functioned to support not only for the DOC activities, but also for entire activities of the Provincial People's Committee in construction quality; appraise and assess the quality of construction product for their jurisdictions. The following are the responsibility assignments prescribed in Decision No.21 of Da Nang City.

- To support the authorities that have functions in state management of construction quality,

- To support Project owners to perform inspections on the quality of constructions, the quality of the construction execution; state inspection of the quality of constructions, construction materials, construction components, construction products;
- To check the quality of constructions that need the renovation or that will change the issues.

(2) Major Tasks

The following are the typical tasks currently practiced by CICs;

- Construction Inspection (Technical supports to DOCs)
- Material and field tests (Soil, aggregate, steel bars, etc.)
- Survey and data preservation
- Consulting services (1) (Project management (PMC), Construction supervision (C/S))
- Consulting services (2) (Quality inspection & evaluation of force-bearing capacity for certificates)
- Trainings (those on rules and regulations)

Most common tasks are the support to the inspections of construction works and material tests/field tests. In case of the large cities, such as Hanoi and Ho Chi Minh, assistance to DOC includes research and development, data collection and preservation and assessment of new material and technology. On the other hand, there are many project owners wishing to have guarantees on construction materials issued by public organizations, thereby to ask CICs to conduct material tests.

(3) Business Style

Government organizations licensed to conduct businesses and to raise revenues are a peculiar business style in Vietnam. **Figure 6.3.1** shows the CIC's business fields by nature. They are made up of public services and private consultant services. The figure shows that material tests and consulting services seem to be carried out with business licenses, nevertheless there are currently many private consultants in these business domains, which may cause fierce competition between CICs and private consultants.

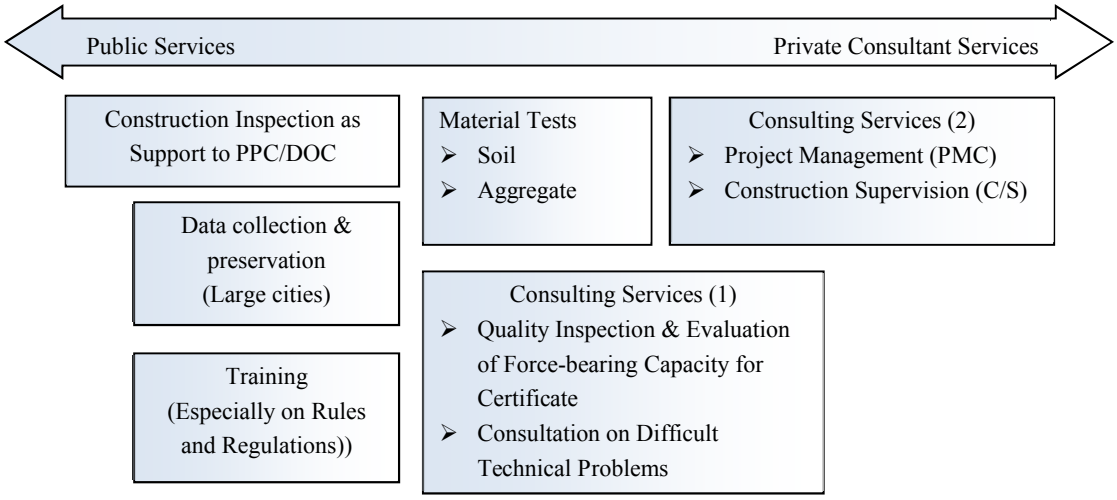


Figure 6.3.1 Classification of CIC's Tasks

(4) Identified Problems

From the results of interview surveys to the representative CICs as well as to CQM, major problems seemingly common to CICs are summarized as follows:

1) Fierce Competition with Private Consultant Firms

Private consultant firms offer lower price for the same services that CICs are providing, such as material tests and consultant services. Some CICs have pointed out that lower price offered by private consultant firms sometimes leads to substandard services, resulting in substandard quality of construction.

2) Severe Financial Situation

Many officials of CICs which the JICA Project Team visited have stated that they are in difficult financial conditions. Main reasons for this are; (1) severe competition with private consultant firms and less chances of winning contracts, and (2) insufficient or no financial assistance from PPC. This results in difficulty in purchasing new testing equipment and renovating/ constructing facilities.

3) Insufficient Number of Competent Staff

One of the reasons for this is that superior engineering staffs tend to leave CICs and move out to private firms after they had experiences in CICs. This is attributed to the lower salary level of public servants than that of private firms. In particular in far remote provinces, CICs have difficulties in recruiting young engineers with capacity, due to their remoteness.

These problems are not independent with each other. Rather, they are connected and some problems are the causes of other problems.

6.3.3 Overseas Practices (Practices in Japan)

In Japan, it is not too much to say that regional engineering centers have greatly contributed to the infrastructure development in Japan. Not only regional municipal bodies, but also nation-wide organizations have deployed regional engineering offices/centers in order to cope with technical problems in the regions.

(1) MLIT Practices

MLIT is in charge of developing national infrastructures throughout Japan. MLIT has eight regional bureaus under its headquarters in major regional cities. Each regional bureau has an engineering office which is similar to the work office. The purpose of this engineering office is to provide technical supports to the regional bureaus, conducting surveys, data collection, and research on the regional construction problems.

(2) Expressway Corporation Practices

Japan Highway Public Corporation was established in 1956 for the purpose of developing inter-city expressway networks in Japan. Right after its establishment, the Corporation founded a road test center in 1957 in order to conduct material test, construction work experiment, field tests and other related activities. About 20 years later, the road test center was upgraded to the road test and research center. In addition, in order to help support regional construction activities, the Corporation deployed engineering offices under the regional bureaus as is the case of MLIT.

(3) Prefectural-level Practices

There used to be many prefectures which have own research centers in order to tackle regional engineering problems. These research centers are currently changing their status to environment centers or to customer service centers in accordance with the changes in social demands.

6.3.4 Capacity Enhancement Plans

Assuming that the Da Nang CIC case is a standard format of CICs, institutional issues of CICs, including their responsibilities and tasks, have already been well defined in the regulations However, due to the shortage of financial resources and competent engineering staffs, their functions have never been fully utilized. With these issues, recommendations are made on the further developing CIC capacities as shown below.

(1) Basic Concept

- As long as infrastructure investments remain active in the regions in line with national socio-economic development plans CICs are expected to continue supporting regional infrastructure development. It is therefore recommended to make best use of CIC functions as a base of regional technical centers.
- Of their functions, public service functions should be strengthened in highly priority, which include technical supports to the state management and project owners in the regions. Through these tasks, it will become feasible to accumulate public service technologies to the CICs which will be the base of future facility maintenance.
- Consultant services should be reduced step by step in order to avoid competition with private sectors. However, CIC's consulting services can be justified in the remote areas for the time being where it is hard to find out competent consultants to perform construction project and quality management. On the other hand, in the urban areas there exist many consultants capable of providing such services with lower prices and with high technologies. In the long run, CIC's private consulting services should be minimized as much as possible.

(2) Short-term/Medium-term Plans (Refer to Table 6.3.1)

1) Enhancement of Public Service Functions

Of the public service functions, it is recommended to strengthen technical support functions to the regional state authorities and project owners as described below. Details are summarized in **Table 6.3.1.**

a. Technical supports to the regional state authorities and decision makers

- To strengthen inspection on technical designs and cost estimates of the regional construction projects, following the latest revision of Decree No.209.
- To strengthen examination procedures for construction permits (CPs).
- To implement middle-term and final inspections to building construction projects to which construction permits were awarded.
- To provide technical supports to Construction Audit and Technical Audits which are recommended in Activity-2 of this Project.

Strengthening the capacity of construction permit procedures may need special trainings to the CIC staff and institutional reinforcement for inspection, since deign inspection for building works often requires high knowledge and expertise specialized for building works.

It is preferable to strengthen CP functions at least in the following provinces where building construction is currently robust.

- Hanoi City CIC
- Ho Chi Minh City CIC
- Lao Cai Province CIC
- Nghe An Province CIC
- KhanhHoa Province CIC
- DakLak Province CIC
- Can Tho Province CIC

Note;

In Japan, (1) building officers stationed in local autonomies or (2) private entities specialized for building inspections appointed by MLIT or governors take responsibility for implementing building design examination before publishing building design certificates. They are architect qualification holders and their capacities are strictly examined in advance.

b. Training Courses

- To hold training course for inspectors for material testing

c. Provide technical supports to regional project owners

- To conduct material and field tests.

d. To provide technical support during construction works

In order to justify CIC's material/field tests, it is preferable that CICs have some specialties in testing which private sectors can hardly get involved. Also, equipment costs are in general fairly expensive in procurement and maintenance, so job demarcation of tests with other research institutes and universities would save investment in test equipment.

2) Enhancement of Financial Support

In general, it is very hard for such test centers as CICs to run their institutions on their own without government financial supports because of irregular job opportunities, so that it is necessary for the government to provide financial supports to CICs. Government financial supports, which are worthwhile to the public service activities of CICs, will make their institutional management more stable. As a balanced point of revenue between profits making activities and government financial supports may differ depending upon regions, it is recommended to carefully examine the activities, revenues and OM costs, and to find out a balanced point fit to the regions.

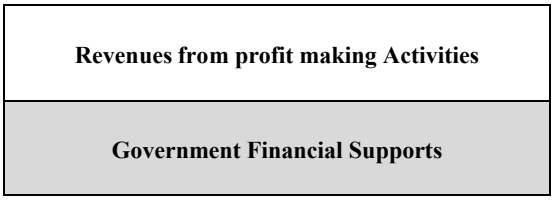


Figure 6.3.2 Balance of Revenues

(3) Long-term Plans

- General market mechanism explains that the government participation into private sector activities is not favorable, because government support is predominant in power and considered interference to private sector activities. In light of this market mechanism, it is recommended to reduce participating in the consulting service activities in the long run, when private consultants grow and become capable enough to manage consulting service activities.
- When economy keeps growing, regional imbalance in infrastructure investment may arise in the future. Under such a situation, CICs in the major cities could change their status to regional research centers. On the other hand, some of the regional CICs need to be united to a block-based regional engineering center.

Table 6.3.1 Short-term / Middle-term Capacity Enhancement Plans

	Fields	Services	Outlines	Financial Sources
Public Services ↕ Consultant Services	1. Technical Supports to regional state authorities and project owners	1.1. Inspection on technical designs and cost estimates	• To assist decision makers to inspect technical designs and cost estimates for regional projects	• Budget allocation or • Contracts with state authorities
		1.2. Examination on construction permits (CPs)	• To examine design documents for construction permits of building works under DOC instructions. • Following recommendations in Activity-1.	• Budget allocation or • Examination fees paid by private investors
		1.3. Implementation of mid-term and final inspections to building construction projects awarded CPs.	• Following recommendations in Activity-1	• Budget allocation or • Contracts with state authorities
		1.4. Technical support to Construction Audit (by DOC)(*01)	• To support DOCs to implement construction audits to non-professional project owners. • Following recommendations in Activity-1.	• Budget allocation
		1.5. Technical support to Technical Audit (*02)	• To support DOCs to implement construction audits to non-professional project owners. • Following recommendations in Activity-1.	• Budget allocation
	2. Training	2.1. Inspector training and education	• To hold training courses for material test inspectors	• Budget allocation or • Training fees
	3. Technical Supports to project owners	3.1. Material Tests/Field Tests	•	• Contracts with project owners or Contracts with contractors
		3.2. Technical support during construction works	• Survey, problem identification and solution finding for the incidents arising during construction works	• Contracts with project owners or Contracts with contractors
	4. Consulting services	4.1. Construction project management (PMC)	• Project management support to regional project owners	• Contracts with project owners
		4.2. Construction project supervision (C/S)	• Project supervision support to regional project owners	• Contracts with project owners

(Note) *(*01); Construction audit; Audit system to non-professional project owners by DOC state management.*

*(*02); Technical Audit; Intra-organization audit system for Provincial-level People's Committee*

6.4 IMPROVEMENT OF SANCTIONS

6.4.1 Background

The Project has studied so far the enhancement of construction project and construction quality management, in particular focusing on the subjects of clarification of responsibility assignments between stakeholders, improvement of project management methods, state agencies' inspection system, contractor registration and evaluation system, and engineer qualification system.

In addition to raise the management capacities of these subjects, sanctions can also contribute to enhancing the capacity of construction companies. Regarding sanctions as a positive tool of capacity enhancement plans, the Project will make recommendations on the capacity enhancement of the sanction system in Vietnam.

6.4.2 Objectives

The Project analyzed the current status of sanctions in Vietnam, introduce Japanese practices of sanctions as foreign a representative, analyze difference in sanction management between two countries. Based on the results of analysis, recommendations were made for the enhancement of sanctions systems in Vietnam.

6.4.3 Current status of sanctions in Vietnam

(1) Regulations

Administrative sanctions including legal penalties against regulations are stipulated in detail in **Table 6.4.1**. Outline of each regulation is briefly described under the table.

Table 6.4.1 Legal Framework of Sanctions

No.	Regulations	Title
1	Decree No.23/2009/ND-CP	Sanctioning on administrative violations in construction activities; real estate business; exploitation, production and trading of construction materials; management of technical infrastructure; and management of development of houses and offices
2	Circular No.24/2009/TT-BXD	Detailing a number of provisions of the governments Decree No.23/2009/ND-CP
3	Decree No.64/2012/ND-CP	Construction Permit
4	Decree No.180/2007/ND-CP	Violations against urban rules
5	Decree No.34/2011/ND-CP	Regulations on disciplines against civil servants

Outline of these regulations are briefly shown as follows;

1) Decree No.23/2009/ND-CP on sanctioning on administrative violations in construction activities; real estate business; exploitation, production and trading of construction materials; management of technical infrastructure; and management of development of houses and offices

Decree 23 was established in pursuant to Law No. 32/2001/QH10 on Organization of the Government, Construction Law No. 16/2003/QH11, Housing Law No. 56/2005/QH11, Law No. 63/2006/QH11 on Real Estate Business and Ordinances.

Administrative sanctions against violations on Construction Law are detailed, applying 25 articles. Articles show administration sanctions of fines by violation types as shown in **Table 6.4.4,** falling violators into the following classifications.

- Project owner
- Project owner for state-funded projects
- Facility owner
- Contractor
- Consultant
- Surveyor
- Construction Planning Consultant
- Construction supervision consultant
- Electricity and water suppliers or neighboring households
- Other organization and individuals

Administration sanctions, given in the form of fines, are decided ranging from a minimum of 1,000,000 VND to a maximum of 500,000,000 VND.

2) Circular No.24/2009/TT-BXD detailing a number of provisions of the governments Decree No.23/2009/ND-CP

Circular 24 is supplementing a number of provisions of Decree 23 including guidelines and procedures to put Decree 23 into practical use.

3) Decree No.64/2012/ND-CP on Construction Permit

Regarding the sanctions on the violations against construction permits, Decree 64 independently stipulates sanctions consisting of revocation and cancelation of construction permits in the Decree. However, for the sanctions against construction permits, Decree 23 also stipulates sanctions to be imposed on POs in the Clause 1, 2, 3 and 4 of Article 11, and those on contractors in Article 25.

4) Decree No.180/2007/ND-CP on violations against urban rules

Violations are categorized as follows:

- Construction works prescribed by law to have construction permits but having no construction permit
- Construction works built in violation of construction permits granted by competent agencies.
- Construction works built in violation of designs already appraised and approved by competent agencies; in violation of 1/500-scale detailed construction plans already approved by competent agencies (for construction works exempted from obtaining a construction permit).
- Construction works affecting the quality of adjacent ones or the environment and communities.

Types of sanctions stipulated in the Decree are as follows:

- Suspension of building activities.
- Termination of building activities, application of measures of ceasing the supply of electricity and water; notifying competent agencies not to provide electricity and water services, business activities and other services for construction works in violation.
- Enforcement of dismantlement of works in violation.
- Forced compensation for damage caused by acts of violation.
- Sanctioning of administrative violations in building activities. Serious violations may be handled in accordance with the penal law.
- Information is released on the website of the Ministry of Construction and the mass media.

5) Decree No.34/2011/ND-CP, Regulations on disciplines against civil servants

Decree 34 stipulates regulations on disciplines against civil servants. In the Decree, violations are classifies into the following:

- Violations in executing duty, ethics and communication custom by civil servants during duty execution; prohibitions stipulated in Law on Civil servants.
- Law violations that are sentenced by courts.
- Violations on anti-corruption; saving practice; gender equality; anti-prostitution and other regulations related to civil servants, but not yet at the level of criminal prosecution.

Types of disciplines stipulated in the Decree are as follows:

- For manager or above class

- Reprimand
- Warning
- Wage reduction
- Demotion
- Dismissal

- For non-manager class
  - Reprimand
  - Warning
  - Wage reduction
  - Dismissal

(2) Information release on violations and incidents through MOC website

CAMD currently releases information on the violation in the construction activities to the public through computer website, so that the public can access there and get information. URL of the website is http://vipham.xaydung.gov.vn. These information is provided by the public, not by regular inspection by CAMD. The behaviors regarded as violation are as follows;

- Construction work with slow progress
- Poor construction work quality due to technical problems
- Construction works with insufficient consideration on labor safety, sanitation, fire safety, labor accidents during construction and environmental pollution

Table 6.4.2 shows violation categories and **Table 6.4.3** shows sample data for each category taken up from the MOC website.

Table 6.4.2 Violation Category on Web Information

No	Cause	Number of Case
1	Delay	11
2	Occurrence of accidents	29
3	Fail of labor safety	27
4	Fail of environment protection	0
	Total	67

(Note) From MOC Website, June 26, 2013

Table 6.4.3 Violation Information (Sample cases)

No	Project Name	Violation	Related Entity	Status	Remedy
Sample-1	Drainage and Sewage treatment Project in Can Tho city	1 year delay	Project owner: Water Supply and Sewerage Company of Can Tho	Not remedied yet	
Sample-2	Dap Ke reservoir in Ha Tinh province	Collapse of dam on June 5th, 2009	Huong Khe District People's Committee, Ha Tinh city	Not remedied yet	Ha Tinh PPC established the council to identify the cause of accident, hiring Institute of Water resources to assess the causes and find remedies
Sample-3	Meeting hall in Doi Binh commune, Hanoi	At 11am in August 12th, the whole roof collapse with tons of concrete and 30 people	Contractor: Hai Lam company Supervision consultant: Tay Thang Long company	1 dead, 7 injured	
Sample-4	Private house in Mai Thi Luu street, Ho Chi Minh city	Collapse of wall in March 29th 2009	Owner: Pham Van Hai	Not remedied yet	Ward police and Construction Inspectorate sealed of the project and now conducting inspection.

(Note) From MOC Website, June 26, 2013

(3) Development of new system

CAMD now is preparing a circular on contractors/consultants registration (expected to be issued in September 2013) with a software system. Information of violations will be incorporated in this new system, and will replace this website. Currently, MOC Construction Inspectorate (and DOC Construction Inspectorate) have the role of imposing sanctions against violations.

(4) Problem Identification

MOC has reported that it is difficult to apply sanctions to violations due to lack of concreteness in application.

MOC report[1] pointed out that it is necessary to strengthen sanctions against collusions between POs and contractors (consultants or construction contractors), imposing fine, administrative discipline or prohibitting them from participating in construction activities in a certain period and also publicize information by means of the MOC and MPI system.

[1] Summary report on the survey on current situation and proposal to enhance construction quality management, March 2010.

Table 6.4.4 Administrative Sanctions in Vietnam based on Decree 23/2009/ND-CP

Article	Violator	Violations	Sanction (thousand VND)	Note
Art 6	Project Owners	■ Violation on construction survey · Failing to approve construction survey tasks, technical plans on survey or plans · Letting landmarks or height-point marks lost · Organizing take-over tests of survey results · Failing to archive survey results	10,000 - 20,000	
		■ Violation on construction survey · Conducting construction survey without satisfying the specified capabilities; · Failing to supervise construction survey · Failing to organize take-over tests	30,000 - 40,000	
Art 7	Project Owners	■ Violation on formulation of work construction investment projects · Do not satisfy the specified capability condition but formulate work construction investment projects	30,000 - 40,000	
Art 8	Project Owners	■ Violation on work designs and construction cost estimates · Evaluating and approving work designs and construction cost estimates · Failing to archive work designing and construction cost estimation dossiers · Modifying or supplementing designs, changing basic designs or technical designs, without obtaining consent of designing contractors.	20,000 – 30,000	
		■ Violation on work designs and construction cost estimates · Do not satisfy capability conditions but make construction designs	30,000 - 40,000	
Art 9	Project Owners for state-funded investment projects	■ Violations on management of construction investment projects · Incapable of managing projects but fail to set up project management units	20,000 – 30,000	
		■ Violations on management of construction investment projects · Modifying project details	40,000 - 50,000	
Art 10	Project Owners	■ Violations on the commencement of construction works · Failing to notify in writing 7 days in advance the date of construction commencement	500 - 2,000	
		■ Violations on the commencement of construction works · Commencing construction works without satisfying all conditions	15,000 - 20,000	
Art 11	Project Owner	■ Violations on construction orders · Implement construction works at variance with licenses	2,000 – 30,000	
		· Implement construction works without licenses	2,000 – 40,000	
		· Implement construction works with unapproved designs	30,000 - 40,000	
		· Implement construction works without fencing the site, drop construction materials or store material at improper places.	1,000 – 10,000	
		· Causing subsidence or cracking of adjacent works by unapproved construction works	1,000 – 20,000	

Article	Violator	Violations	Sanction (thousand VND)	Note
		· Causing collapse or posing a threat by improper construction quality management	5,000 – 30,000	
Art 12	Project Owners	■ Improper ground clearance for construction work · Organizing unplanned construction ground clearance	10,000 - 15,000	
		· Paying compensation for illegal construction ground clearance	10,000 - 15,000	
Art 13	Project Owners	■ Violations on construction supervision · Failing to put up signboards at construction sites · Failing to archive construction supervision results; · Failing to inspect the consistency of the actual capability, in terms of manpower, construction equipment, quality management system, permits for use of machinery and equipment, quality of supplies, materials and equipment to be installed in works, of construction contractors with that stated in their bid dossiers and construction contracts. · Failing to inspect construction measures applied by contractors, keep work construction supervision diaries or append certification seals on working plans before construction starts.	10,000 - 20,000	
		· Implement construction supervision without capacity · Failing construction supervision	30,000 - 40,000	
Art 14	Project Owners	■ Violations on construction quality management · Failing to send reports on results of certification of construction work quality · Failing to archive construction work dossiers · Failing to send biannual and annual reports on quality of construction works	5,000 - 10,000	
		· Failing to report on work incidents	10,000 - 15,000	
		· Failing to give certificates of construction work quality standard conformity · Failing to purchase insurance for their works	15,000 – 20,000	
		· Failing to inspect and certify force-bearing safety conditions before putting facilities into use	20,000 – 30,000	
		· Fail to hire capable consulting organizations to assess the quality of works in case of incidents.	30,000 – 40,000	
		· Carry out construction works at variance with technical standards specified in design dossiers.	50,000 – 60,000	
Art 15	Facility Owners Or Managers	■ Violations on facility maintenance · Failing to maintain their facilities in accordance with maintenance procedures set out by construction designing contractors.	20,000 – 30,000	
Art 16	Project Owners	■ Violation on take-over test and payment for completed volumes and final settlement of costs of state-funded construction works · Failing to organize take-over tests within time limits indicated by construction contractors · Organizing take-over tests in contravention of regulations.	5,000 - 10,000	
		· Late preparation of dossiers for final settlement of costs after works pass take-over tests and put into operation:	20,000 - 30,000	
		· Late payment of completed volumes to contractors that have made valid dossiers for take-over tests and	30,000 – 40,000	

Article	Violator	Violations	Sanction (thousand VND)	Note
		volume payment		
		· Putting completed construction works into use without take-over tests.	50,000 – 60,000	
		· Organizing take-over tests for uncompleted volumes.	70,000 – 80,000	
Art 17	Contractors/ Consultants	■ Violations of eligibility requirements for construction works · Borrowing or lending, renting or leasing practice licenses · Operating beyond their practice capability or at variance with their practice certificates or without practice certificates.	5,000 – 10,000	
		· Appointing persons possessing no practice certificates or unqualified for the works including construction plan chief designer, manager of specialized designing of construction plans, construction survey managers, work construction chief designer or designing manager, work construction supervisor, project formulation manager, project management consultancy director, construction site chief commander, design verification manager or work design evaluation manager · Conducting construction activities beyond their capability.	30,000 – 40,000	
Art 18	Contractors/ Consultants	■ Breaches of contents of bid dossiers and contracts · Arrange personnel or equipment not in accordance with successful bid dossiers and contracts without investors' consent.	20,000 - 30,000	
Art 19	Contractors/ Consultants	■ Violations on the use of invalid data and documents · Using experiment results provided by unaccredited laboratories	10,000 – 15,000	
		· Using data and documents which are of unidentified origin or inaccurate or lack legal grounds	15,000 – 20,000	
		· Improperly applying construction regulations and standards.	50,000 – 60,000	
Art 20	Contractors/ Consultants	■ Violation of liability insurance · Fail to purchase professional liability insurance	10,000 – 15,000	
Art 21	Contractors/ Consultants	■ Violations on acceptance and payment of construction works · Failing to organize take-over tests or organizing acceptance of construction works · Failing to make documents, papers or drawings for foreign investors or contractors.	10,000 – 15,000	
		· Delay in completing dossiers or documents acceptance, payment or final settlement under regulations;	15,000 – 20,000	
		· Organizing acceptance of uncompleted works · Organizing the handover of works without having organized acceptance	80,000 – 100,000	
Art 22	Surveyor	■ Violation on construction survey · Using unaccredited laboratories for surveys; · Failing to take measures to assure survey and traffic safety and environmental protection in surveyed areas.	20,000 - 30,000	
		· Making survey plans with insufficient contents · Conducting surveys without having construction survey tasks or plans approved · Failing to perform the approved survey tasks.	30,000 - 40,000	

Article	Violator	Violations	Sanction (thousand VND)	Note
		・ Reporting untruthful or invalid survey documents and data	80,000 – 100,000	
Art 23	Construction planning consultants	■ Violations on period of construction planning preparation ・ Prolong the preparation of requirement statement of construction planning requirements	80,000 – 100,000	
		・ Prolonging the preparation of construction plans ・ Providing consultancy on making plan dossiers and work construction site plans	15,000 – 20,000	
Art 24	Design consultants	■ Violation on construction designs ・ Make design dossiers in contravention of regulations.	80,000 – 100,000	
		・ Distribute design dossiers inconsistent with geological survey results or without having obtained these results	30,000 – 40,000	
		・ Failing to conduct author supervision under regulations ・ Performing contracts on supervision of construction of state-funded works that they designed ・ Failing to participate in acceptance activities requested by POs ・ Performing the next designing step when the previous step is not yet approved.	15,000 – 20,000	
		・ Designating construction supplies, material and equipment manufacturers in design dossiers.	20,000 - 30,000	
		・ Failing to include technical standards and utilities of construction equipment, materials and components in design dossiers ・ Failing to prepare a maintenance procedures manuals for works for which such a process is required.	30,000 – 40,000	
Art 25	Contractors or organizations and individuals	■ Violation on construction rules ・ Implement construction works inconsistent with licenses	1,000 – 30,000	
		・ Implement construct works without construction licenses	2,000 – 30,000	
		・ Conduct construction at variance with approved designs	30,000 – 40,000	
		・ Implement construction disregarding work suspension order	300,000- 500,000	
		・ Failing to cover construction sites, let construction materials drop in surrounding areas or store construction materials not at prescribed places:	1,000 – 10,000	
		・ Organizing construction works in violation of regulations on construction, resulting in subsidence or cracks of adjacent works:	2,000 – 30,000	
		・ Organizing construction works in violation of regulations on work quality management, resulting in collapse of adjacent works:	5,000 – 40,000	
Art 26	Construction contractors	■ Violation on safety of construction ・ Failing to equip sufficient labor protection devices ・ Failing to devising technical solutions and organizing construction without taking labor protection assurance measures ・ Failing to put up safety signboards or construction site covers; ・ Failing to purchase insurance as required.	20,000 – 30,000	
		・ Violating regulations on dismantlement of construction works	30,000 – 40,000	

Article	Violator	Violations	Sanction (thousand VND)	Note
Art 27	Construction contractors	■ Violation of regulations on construction quality management ・ Failing to inspect the quality of construction materials or components or use inspection results of unaccredited laboratories;	10,000 – 15,000	
		・ Committing any of the following acts: failing to make construction completion drawings as required or make construction completion drawings not true to actual construction; keeping no construction diaries as required; failing to compile or archive quality management documents as required; or violating regulations on construction warranty	15,000 – 20,000	
		・ Using construction materials or components or technological equipment without certificates	10,000 – 20,000	
		・ Failing to set up quality management systems or organize the construction supervision.	80,000 – 100,000	
Article 28	Construction supervision consultants	■ Violation of regulation on construction supervision ・ Failing to conduct construction supervision under signed contracts	20,000 – 30,000	
		・ Falsifying supervision results.	40,000 – 50,000	
Art 29	Other contractors/consultants, organizations and individuals	■ Violations ・ Conducting quality inspection without satisfying the specified eligibility requirements ・ Certifying the satisfaction of the force-bearing safety condition or quality standard conformity of construction works	30,000 – 40,000	
		・ Conducting experimenting activities without satisfying the specified eligibility requirements ・ Performing experiments, supplying experimental data and results ・ Failing to archive dossiers in the process of experiment, sample receipts and experimental result slips	30,000 – 40,000	
		・ Conducting verification without satisfying specified eligibility requirements ・ Conducting verifications in contravention of regulations ・ Reporting inaccurate verification results.	30,000 – 40,000	
	Electricity or water suppliers or neighboring households	・ Continuing supply of electricity or water to works under violation of construction rules	20,000 – 30,000	
	Organizations and Individuals	・ Organizing trainings on construction supervision or cost estimation skills and grant certificates of training in contravention of regulations	30,000 – 40,000	
	Organizations and Individuals	・ Organize training on construction supervision skills or cost estimation and grant certificates of training without permission of the MOC	50,000 – 60,000	
Art 30	Organizations and Individuals	■ Violation on the selection of contractors/consultants	Articles 65 and 66 of Decree 58/2008	

(Note) Prepared by JICA Project Team

6.4.4 Overseas practices – MLIT practices in Japan

There are administrative sanctions and penalties prepared for construction company's dishonest behaviors which fall into the following categories.

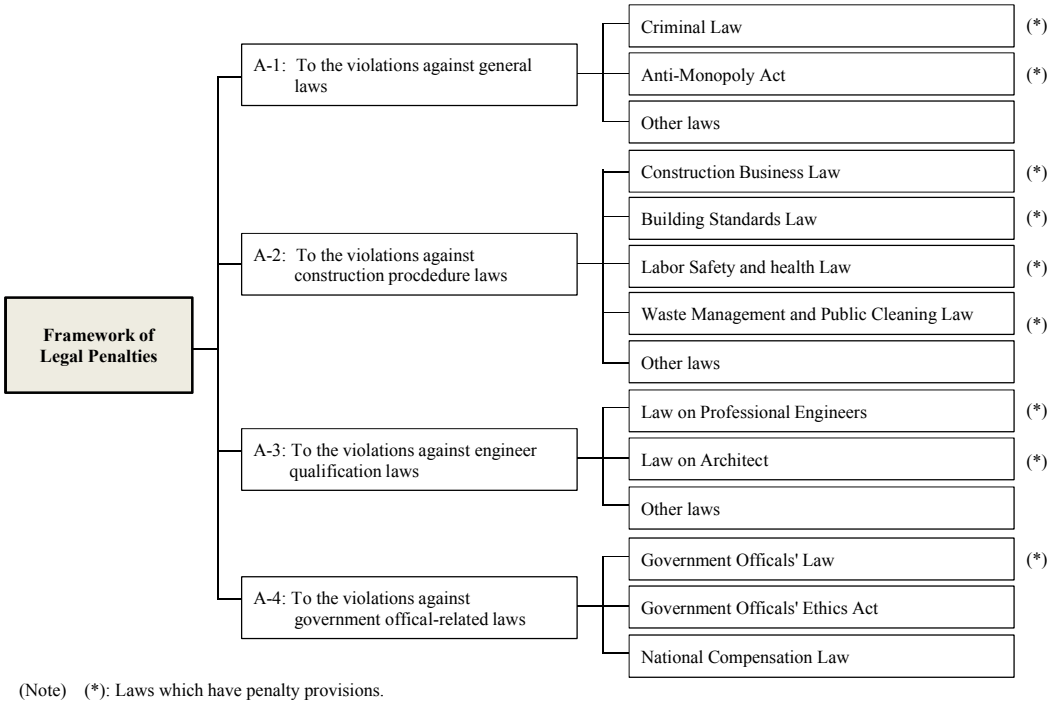
(1) Framework of legal penalties

1) Framework

Penalties against law violations in infrastructure construction fall into the following four categories. They are developed in accordance with the roles and the responsibilities of stakeholders.

- Penalties to the violations against general laws
- Penalties to the violations against construction procedures
- Penalties to the violations against engineer qualifications
- Penalties to the violations against government official-related laws

Representing violations against laws are criminal penalties against criminal acts which is processed by police, inspectors and a court of law. A principle of the legal penalty is to give penalties against illegal behaviors in the past. Penalties are in general sentenced by courts based on the penalty clause prescribed in the law. As seen in **Figure 6.4.1**, laws deemed to represent each category are illustrated in the figure. Sections following the figure explains the outlines and the penalties prescribed in these laws.



(Note) (*): Laws which have penalty provisions.

Figure 6.4.1 Framework of Legal Penalties (Practices in Japan)

2) General Law Penalties (A-1)

Of many general laws, laws including regulations relevant to infrastructure construction are shown below;

a. Criminal Law

The law stipulates penalties against obstruction of competitive bidding, illegal bid-rigging, bribery, fraud and other violations.

b. Law on Prohibition of Private Monopolization and Assurance of Fair Trade (Anti-monopoly Law)

The law stipulates the principles of how to assure fair and competitive commercial activities in the market mechanism and prescribes penalties against illegal behaviors. The framework of this law is shown in **Table 6.4.5**, **Table 6.4.6** also shows penalties prescribed in the law.

Table 6.4.5 Framework of Anti-monopoly Law (Practices in Japan)

Chapter	Section	Articles	Provisions
Chapter 1		Art 1 – Art 2	General Provisions
Chapter 2		Art 3 – Art 7.2	Prohibition of private monopolization and unfair trade
Chapter 3		Art 8 – Art 8.3	Business entities
Chapter 3.2		Art 8.4	State of monopolization
Chapter 4		Art 9 – Art 18	Share hold, executives with concurrent posts, merge and absorption and business transfer
Chapter 5		Art 19 – Art 20	Unfair trade
Chapter 6		Art 21 – Art 23	Exe mption of application
Chapter 7		Art 24 – Art 26	Proposal of injunction and damage compensation
Chapter 8			The Fair Trade Commission of Japan
	Section 1	Art 27 – Art 44	Foundation, roles and organizations
	Section 2	Art 45 – Art 70.22	Procedures
	Sections 3	Art 71 – Art 76	Miscellaneous
Chapter 9		Art 77 – Art 88	Law suite
Chapter 10		Art 88.2	Miscellaneous
Chapter 11		Art 89 – Art 100	Penalties
Chapter 12		Art 101 – Art 118	Survey on violations

(Note) Prepared by JICA Project Team

Table 6.4.6 Penalties prescribed in Anti-monopoly Law (Practices in Japan)

Articles	Violations or Misconducts	Objective Person	Sanctions
Art 45	• Accept bribes in conjunction with company management status evaluations, etc.	• Registered agencies for the evaluation of company operation	• 3 years to 7 years in imprisonment
Art 46	• Offer bribes in conjunction with company management evaluations, etc.	• Anyone who offer bribes.	• Less than 3 years imprisonment, or • Less than 2 million JPY fine
Art 89	• Persons who commit private monopolization or unfair trade. • Person who limit competition in dealing trade	• Anyone	• Less than 3 years in imprisonment or • Less than 5 million JPY fine
Art 90	• Persons who made unfair international trade	• Anyone	· Less than 2 years in imprisonment or · Less than 3 million JPY fine
Art 90	• Companies which procure stocks against provisions • Executives who got concurrent posts • Others	• Company	· Less than 1 years in imprisonment or · Less than 2 million JPY fine
Art 90.2	· Improper procedures or false statement	· Anyone	· Less than 2 million JPY fine
Art 95	· Violations against Article 89 provisions which include commitment of private monopolization and unfair trade	· Companies	· Less than 500 million JPY fine
	· Violations against Article 90, item 3 provisions regarding violations against cease and desist order	· Companies	· Less than 300 million JPY fine

(Note) Prepared by JICA Project Team

3) Construction-related Law Penalties (A-2)

The following laws stipulate procedures of infrastructure construction including penalties;

a. Construction business law

Construction business law aims to enhance the capacity of construction companies and the quality of construction contracts, thereby encourage sound construction businesses, assure construction work quality and protect clients. The law proposes all construction companies to take construction business permissions before entering the business as shown in Chapter 2 of **Table 6.4.7** which shows the framework of this law. **Table 6.4.8** also shows penalties prescribed in the law.

Table 6.4.7 Framework of Law on Construction Businesses (Practices in Japan)

Chapter	Section	Articles	Provisions
Chapter 1		Art 1 - Art 2	General Provisions
Chapter 2			Permission of construction businesses
	Section-1	Art 3 - Art 4	General
	Section-2	Art 5 - Art 14	Permission of general construction businesses
	Section-3	Art 3 & Art 4	Permission of designated construction businesses
Chapter 3			Construction work contracts
	Section-1	Art 18 - Art 24	General
	Section-2	Art 24.2 – Art 24.7	Responsibilities for main contractors
Chapter 3.2		Art 25 – Art 25.26	Settlement of Dispute in construction work contracts
Chapter 4		Art 25.27 – Art 27.22	Construction work quality assurance (Designation of Technical Supervisor or Chief Engineer)
Chapter 4.2		Art 27.23 – Art 27.36	Examination of construction company management
Chapter 4.3		Art 27.37 – Art 27.38	Foundations and associations
Chapter 5		Art 28 – Art 32	Supervision
Chapter 6		Art 33 – Art 39.3	Central Council on Construction Businesses
Chapter 7		Art 39.4 – Art 44.5	Miscellaneous
Chapter 8		Art 45 – Art 55	Penalties
Supplement			

(Note) Prepared by JICA Project Team

Table 6.4.8 Penalties prescribed in Construction Business Law (Practices in Japan)

Articles	Violations or Misconducts	Objective Person	Penalties
Art 45	• Accept bribes in conjunction with company management status evaluations, etc.	• Registered agencies for the evaluation of company operation	• 3 years to 7 years in imprisonment
Art 46	• Offer bribes in conjunction with company management evaluations, etc.	• Anyone who offer bribes.	• Less than 3 years imprisonment, or • Less than 2 million JPY fine
Art 47	• Violations of construction business deals without business permission • Improper contracts with subcontractors • Improper businesses deals against business suspension • Improper business deals against business prohibition • Construction business permits with false statements, etc.	• Construction companies	• Less than 3 years imprisonment, or • Less than 3 million JPY fine
Art 48	· Violations against preservation of confidences related to engineer qualification examination · Violations against preservation of	· Registered agencies for engineer qualification examinations and lectures.	· Less than 1 years imprisonment, or · Less than 1 million JPY fine

Articles	Violations or Misconducts	Objective Person	Penalties
	confidences related to company management status evaluations, etc.		
Art 49	· Violations at registered examination organizations, etc.	· Registered agencies for the evaluation of company operation. · Registered agencies for engineer qualification examinations and lectures.	· Less than 1 years imprisonment, or · Less than 1 million JPY fine
Art 50	· False statement on general construction business permits, etc.	· Construction companies	· Less than 6 months imprisonment, or · Less than 1 million JPY fine
Art 51	· Violations of training organizations, etc.	· Managing directors of registered agencies for engineer qualification examinations and lectures.	· Less than 500 thousand JPY fine
Art 52	· Violations of not assigning chief engineer or supervising engineer to their construction projects, etc. · Violation of submitting false statement to company management status evaluation, etc.	· Construction companies	· Less than 1 million JPY fine
Art 53	· Violations of making subcontracts of the works without business permission, etc.	· Managing directors of companies concerned with violations	(Against companies) · Less than 100 million JPY fine
Art 54 Art 55	· Improper management of accounting documents, etc. · Others	· Construction companies	· Less than 100 thousand JPY fine

(Note) Violations or misconducts show some of the representatives in the Law and do not show all contents.
Prepared by JICA Project Team

b. Building Standards Law

Building Standard Law stipulates minimum standards about building areas, facilities, structures and the purposes of use in order to protect lives, health and properties of the people. Framework of the law is shown in **Table 6.4.9** and the clauses of penalties are shown in Error! Reference source not found.**Table 6.4.10.**

Table 6.4.9 Framework of Building Standards Law (Practices in Japan)

Chapter	Section	Articles	Provisions
Chapter 1		Art 1 – Art 18.3	General Provisions
Chapter 2		Art 19 – Art 41	Building site, building structures, building facilities
Chapter 3			Land use zone of city planning area
	Section 1	Art 41.2 – Art 42	General
	Section 2	Art 43 – Art 47	Distance between building facilities and roads/walls
	Section 3	Art 48 – Art 51	Use of building facilities
	Section 4	Art 52 – Art 60	Building site and structures

Chapter	Section	Articles	Provisions
	Section 4.2	Art 60.2	Urban renewal special area
	Section 5	Art 61 – Art 67	Fire prevention zone
	Section 5.2	Art 67.2	Special disaster prevention district
	Section 6	Art 68	Landscape preservation zone
	Section 7	Art 68.2 – Art 68.8	District planning area
	Section 8	Art 68.9	Building site, building structures, building facilities for the areas other than city planning area or semi city planning area.
Chapter 3.2		Art 68.10 – Art 68.26	Examination on building facility design conformity (same as design certificate (same as construction permit))
Chapter 4		Art 69 – 77	Agreement on the land use for building facility
Chapter 4.2			Designated organization for design verification for design certificate and others
	Section 1	Art 77.2 – Art 77.17	Building officer for design verification
	Section 2	Art 77.18-Art 77.35	Designated organization for design verification
	Section 3	Art 77.35(2) – 77.35 (15)	Designated organization for structure check
	Section 4	Art 77.36 – Art 77.55	Organization involved in design verification etc.
	Section 5	Art 77.56 – Art 77.57	Organization involved in structure check
Chapter 4.3		Art 57.58 – 77.65	Registration of organization for design verification
Chapter 5		Art 78 – Art 83	Building Work Review Council
Chapter 6		Art 84 – Art 97.6	Miscellaneous
Chapter 7		Art 98 – Art 106	Penalties
Supplement			

(Note) Prepared by JICA Project Team

Table 6.4.10 Penalties prescribed in Building Standards Law (Practices in Japan)

Articles	Violations or Misconducts	Those who are sanctioned	Penalties
Art 98	• Violations against administrative suspension order for construction works • Violations against technical standards for the facilities with specified heights. • Violations against fire-protection technical standards • Other violations	• Facility owners • Designers • Contractors	• Less than 3 years imprisonment, or • Less than 3 million JPY fine
Art 99 Art 100	• Violations against provisions relevant to construction permits, middle-term inspection, final inspection, suspension of use. • Violations against administrative order to illegal building facilities • Violations against technical standards on structural durability • Violations against technical standards on building facilities (floor, drainage, fire-extinguisher, water supply, stairways, ceiling etc. • Violations of the agencies registered for construction permit examination against improper examination and procedures • Other violations	• Facility owners • Contractors • Designers	• Less than 1 years imprisonment, or • Less than 1 million JPY fine

Articles	Violations or Misconducts	Those who are sanctioned	Penalties
Art 100	• Violation of construction business deals without business permission • Improper contracts with subcontractors • Improper businesses deals against business suspension • Improper business deals against business prohibition • Construction business permits with false statements, etc.	• Managing directors or staffs of the examination agencies responsible for selecting examiners of building design certificates • Managing directors or staffs of the registered agencies obliged to examine building facility structural safety.	• Less than 1 years imprisonment, or • Less than 1 million JPY fine
Art 101	· Violations against provisions stipulating that building design and construction should be managed by Architect qualification holders. · Violations against regular maintenance reporting on structural defects and deterioration for specified facilities · Violations against technical standards for specified facilities (ground height, window space, toilets, drainage, floor-area ratio, height limit, etc.) · Violation of building facility designer for improper application of technical standards · Violations against land use · Other violations	· Contractors · Facility owners · Designers	· Less than 1 million JPY fine
Art 102	· Violations against specified procedures · False statement of specified legal procedures · Other violations	· Contractors · Facility owners · Designers	· Less than 500 thousand JPY fine
Art 103	· Violations against specified procedures · Other violations	· Managing directors of the examination agencies responsible for selecting examiners of building design certificates ·	· Sanctions against managing directors who belong to the registered construction permit examinations agencies · Less than 500 thousand JPY fine
Art 104	· Violations against specified procedures · Other violations	· Representatives of companies concerned with violations	Serious violations: Less than 100 million JPY fine, · Other violations: Same as those stipulated in each Article.
Art 105	· Violations against specified procedures · False statement of specified legal procedures · Other violations	· Managing directors of the examination agencies responsible for selecting examiners of building design certificates	· Less than 300 thousand JPY fine

(Note) Violations or misconducts show some of the representatives in the Law and do not show all. Prepared by JICA Project Team

c. Labor Safety and Health Law

The law intends to establish labor safety standards, to define clear responsibilities between stakeholders and to encourage voluntary programs for promoting labor safety and health, thereby to enhance comprehensive plans of reducing labor accidents and to assure labor safety and health for labor. Framework of the law is shown in **Table 6.4.11** and penalties are shown in **Table 6.4.12.**

Table 6.4.11 Framework of Labor safety and Health Law (Practices in Japan)

Chapter	Section	Articles	Provisions
Chapter 1		Art 1 - Art 5	General provisions
Chapter 2		Art 6 – Art 9	Labor safety and health plans
Chapter 3		Art 10 – Art 19.3	Management structure for labor safety and health
Chapter 4		Art 20 – Art 36	Measures to prevent danger and health obstruction for labors
Chapter 5			Regulation on machinery and dangerous and harmful articles
	Section 1	Art 37 – Art 54.6	Regulation on machinery
	Section 2	Art 55 – Art 58	Regulation to handle dangerous and harmful articles
Chapter 6		Art 59 – Art 63	Measures for the work of labor
Chapter 7		Art 64 - Art 71	Measure to encourage health preservation
Chapter 7.2		Art 71.2 - Art 71.4	Measures to establish healthy workplace
Chapter 8		Art 72 – Art 77	License
Chapter 9			Labor safety and health improvement plan etc.
	Section 1	Art 78 – Art 80	Labor safety and health improvement plan
	Section 2	Art 81 - Art 87	Labor safety and health consultants
Chapter 10		Art 88 – Art 100	Supervision
Chapter 11		Art 101 – Art 115	Miscellaneous
Chapter 12		Art 115.2 - Art 123	Penalties

(Note) Prepared by JICA Project Team

Table 6.4.12 Penalties prescribed in Labor Safety and Health Law (Practices in Japan)

Articles	Violations or Misconducts	Objective Person	Penalties
Art 115.2-4	• Accept bribes in conjunction with inspection tasks.	• Board members or staffs of inspection agencies who received bribes.	• 5 years in imprisonment
Art 115.3	• Offer bribes in conjunction with inspection tasks	• Board members or staffs of inspection agencies who offered bribes.	• Less than 3 years imprisonment, or • Less than 2.5 million JPY fine
Art 116	• Violations of manufacturing, selling and providing specified toxic or harmful materials.	• Anyone who committed violations	• Less than 3 years imprisonment, or • Less than 3 million JPY fine
Art 119	· No assignment of comprehensive safety and health managers, safety managers and health managers to the tasks specified in the law.	· Project owners	· Less than 6 months imprisonment, or · Less than 500 thousand JPY fine
Art 120.4	· Rejection of on-the-spot inspections to be implemented by labor safety and health inspectors	· Anyone who committed violations	· Less than 500 thousand JPY fine

(Note) Violations or misconducts show some of the representatives in the Law and do not show all contents. Prepared by JICA Project Team

d. Waste Management and Public Cleaning Law (Waste Management Law)

Waste Management Law aims to control discharge and process of wastes in a proper way, thereby preserving living environment and and ensuring sanitation for the public. Framework of laws covers the handling procedures of two wastes including non-industrial and industrial wastes. Framework of the law is summarized in **Table 6.4.13** and **Table 6.4.14** shows the penalties prescribed in the law.

Table 6.4.13 Framework of Waste Management Law (Practices in Japan)

Chapter	Section	Articles	Provisions
Chapter 1		Art 1 - Art 5.8	General provisions
Chapter 2			Non-Industrial Waste
	Section 1	Art 6 – Art 6.3	Treatment of non-industrial waste
	Section 2	Art 7 – Art 7.5	Treatment business of non-industrial waste
	Section 3	Art 8 - Art 9.7	Treatment facilities of non-industrial waste
	Section 4	Art 9.8 – Art 9.10	Special case
	Section 5	Art 10	Export of non-industrial waste
Chapter 3		Art 20 – Art 36	Industrial Waste
	Section 1	Art 11 – Art 13	Treatment of industrial waste
	Section 2	Art 13.2 - Art 13.16	Treatment center of industrial waste
	Section 3	Art 14 – Art 14.3	Treatment business of industrial waste
	Section 4	Art 14.4 – Art 14.7	Treatment business of special industrial waste
	Section 5	Art 15 – Art 15.4	Treatment facilities of industrial waste
	Section 6	Art 15.4.2 – Art 15.4.4	Special case
	Section 7	Art 15.4.5 - Art 15.4.7	Import and export of industrial waste
Chapter 3.2		Art 15.5 – Art 15.16	Treatment center of waste
Chapter 3.3		Art 15.17 – Art 15.19	Changes in land use where waste is placed underground
Chapter 4		Art 16 – Art 24.6	Miscellaneous
Chapter 5		Art 25 - Art 34	Penalties

(Note) Prepared by JICA Project Team

Table 6.4.14 Penalties Prescribed in Waste Management Law (Practices in Japan)

Articles	Violations or Misconducts	Objective Person	Penalties
Art 25	• Violations of transporting, disposing exporting and treating non-industrial or industrial waste without permission	• Anyone who committed violations	• 5 years in imprisonment or • Less than 10 million JPY fine
Art 26	• Violations of committing treatment of non-industrial or industrial waste to others without following standards.	• Anyone who committed violations.	• Less than 3 years imprisonment, or • Less than 3 million JPY fine
Art 28	• Violations of changing land use without permission	• Anyone who committed violations	• Less than 1 years imprisonment, or • Less than 500 thousand JPY fine
Art 29	• Violation of using treatment facilities for non-industrial waste or industrial waste without permission	• Anyone who committed violations	• Less than 6 months imprisonment, or • Less than 500 thousand JPY fine
Art 30	• Violations of not assigning waste material treatment managers	• Anyone who committed violations	• Less than 300 thousand JPY fine
Art 31	• Violations of information management center or waste material treatment center	• Board members of the center or staffs who committed violations	• Less than 300 thousand JPY fine

(Note) Violations or misconducts show some of the representatives in the Law and do not show all -contents. Prepared by JICA Project Team

4) Penalties Shown in Engineer Qualification Laws (A-3)

Of many engineer qualifications applied to infrastructure construction in Japan, professional engineer qualifications and architect qualifications will be herein introduced as representing qualifications.

a. Professional Engineer Law

Professional engineer qualifications (PEs) aims at raising qualified engineers who can contribute to the enhancement of science and technologies and to the development of socio-economy in Japan with the names of professional engineers. Currently, the following 21 PE qualifications are available under Professional Engineer Law. Also, each of PE qualification has an Associate PE system, which is equivalent to the 2nd class qualification to the 1st class PE.

- Mechanical Engineering
- Marine and Ocean Engineering
- Aerospace Engineering
- Electrical & Electronics Engineering
- Chemistry Engineering
- Textiles Engineering
- Metals Engineering
- Mining Engineering
- Civil Engineering
- Water Supply & Sewerage Engineering
- Sanitary Engineering
- Agriculture Engineering
- Forest Engineering
- Fisheries Engineering
- Industrial Engineering
- Information Engineering
- Applied Science Engineering
- Biotechnology & Bioengineering
- Environment Engineering
- Nuclear & Radiation Engineering
- Comprehensive Technical Management

Table 6.4.15 shows the framework of the law and **Table 6.4.16** shows penalties prescribed in the law.

Table 6.4.15 Framework of Professional Engineer Law (Practices in Japan)

Chapter	Section	Articles	Provisions
Chapter 1		Art 1 – Art 3	General provisions
Chapter 2		Art 4 – Art 31	Professional engineer examinations
Chapter 2.1		Art 31.2	Particular cases of professional engineer qualifications
Chapter 3		Art 32 – Art 43	Registration of professional engineers
Chapter 4		Art 44 – Art 47.2	Roles and responsibilities for professional engineers
Chapter 5			Deleted
Chapter 6		Art 54 – Art 55.2	Japan Professional Engineer Association
Chapter 7		Art 56 – Art 58	Miscellaneous
Chapter 8		Art 59 – Art 64	Penalties

(Note) Prepared by JICA Project Team

Table 6.4.16 Penalties prescribed in Professional Engineer Law (Practices in Japan)

Articles	Violations or Misconducts	Those who are sanctioned	Penalties
Art 59	• Against preservation of confidentiality	• PEs who commit violations	• Less than 1 year imprisonment, or • Less than 450 thousand JPY fine
Art 60	· Against preservation of confidentiality	• Any examination agencies who commit violations	• Less than 1 year imprisonment, or • Less than 300 thousand JPY fine
Art 61	· Illegal use of PE's names	• Anyone who commits violations	• Less than 1 year imprisonment, or • Less than 300 thousand JPY fine
Art 62	• Illegal use of PE names	• Anyone who commits violations	• Less than 300 thousand JPY fine
Art 63 Art 64	• Illegal examination procedures	• Representatives and staffs of examination agencies who commit violations.	• Less than 200 thousand JPY fine

(Note) Violations or misconducts show some of the representatives in the Law and do not show all items. Prepared by JICA Project Team

b. Law on Architect

Architects are defined as vocational qualifications which allow engineers to design and to supervise construction works for building facilities with the name of architects. There are currently three (3) types of qualifications available; the first class architect, the second class architect and the wooden structure architect. **Table 6.4.17** shows the framework of the law and **Table 6.4.18** shows penalties prescribed in the law.

Table 6.4.17 Framework of Law on Architects (Practices in Japan)

Chapter	Section	Articles	Provisions
Chapter 1		Art 1 – Art 3.3	General provisions
Chapter 2		Art 4 – Art 11	Architect certificates
Chapter 3		Art 12 – Art 17	Examinations
Chapter 4		Art 18 – Art 22.3	Roles and responsibilities for architects
Chapter 5		Art 22.4	Japan Architect Association
Chapter 6		Art 23 – Art 27	Architect offices
Chapter 7		Art 27.2 – Art 27.5	Architect Office Association
Chapter 8		Art 28 – Art 33	Architect Review Committee
Chapter 9		Art 34 – Art 37	Miscellaneous
Chapter 10		Art 38 – Art 44	Penalties

(Note) Prepared by JICA Project Team

Table 6.4.18 Penalties stipulated in Architects Law (Practices in Japan)

Articles	Violations or Misconducts	Those who are sanctioned	Contents of Sanctions
Art 38	• Illegal use of Architect names in the businesses without holding Architect qualifications. • Illegal entitlement of Architect qualifications • Violations against responsibilities for Architect qualification holders • Illegal publication of design certificate without checking structural safety for specified facilities. • Illegal registration when opening architect offices. • Information leakage of examination contents of Architect qualifications,	• Anyone who commits violations. • Examination committee member • Architect offices	• Less than 1 year imprisonment, or • Less than 1 million JPY fine
Art 39	· Violations against Architect management procedures · Improper handling of examination management	• Architect management agency • Examination agencies for Architect qualifications	• Less than 1 year imprisonment, or • Less than 1 million JPY fine
Art 40	• Violations against Architect management procedures	• Architect management agency	• Less than 1 year imprisonment, or • Less than 1 million JPY fine
Art 41 Art 42 Art 43	• Improper handling of various procedures	• Anyone who commits violations	• Less than 300 thousand JPY fine
Art 44	• Improper handling of various procedures	• Anyone who commits violations	• Less than 100 thousand JPY fine

(Note) Violations or misconducts show some of the representatives in the Law and do not show all items. Prepared by JICA Project Team

5) Government official-related Law Penalties (A-4)

a. Government Official's Law

The Government Official's Law is that stipulating fundamentals for government officials including status, right and obligation, person empowered to appoint, personnel organization and so forth. To the violations caused by government officials, penalties prescribed in general laws will be first applied and then, penalties regulated in the government official's law and ethics law will be applied.

Table 6.4.19 Framework of Government Official's Law (Practices in Japan)

Chapter	Section	Articles	Provisions
Chapter 1		Art 1 – Art 2	General provisions
Chapter 2		Art 3 – Art 26	National Personnel Authority
Chapter 3			Public service regulations
	Section 1	Art 27 – Art 32	General
	Section 2	Art 33	Employment examinations
	Section 3	Art 62	Salaries
	Section 4	Art 70.2 – 70.4	Employee performance evaluation
	Section 5	Art 71 – Art 73	Efficiency
	Section 6	Art 74	Disciplinary punishment
	Section 7	Art 96 – Art 106	Public services
	Section 8	Art 106.2 – Art 106.22	Retirement
	Section 9	Art 107 – Art 108	Pension system
	Section 10	Art 108.2 – Art 108.7	Government staff association
Chapter 4		Art 109 – Art 113	Penalties

(Note) Prepared by JICA Project Team

Table 6.4.20 Penalties prescribed in Government Official's Law (Practices in Japan)

Articles	Violations or Misconducts	Those who are sanctioned	Penalties
Art 82	• Violations against Government Official's Ethics law • Inconsistent or negligence of duties • Improper behavior as government officials	• Anyone who committed violations	• Discharge from duties • Suspension of duties • Salary reduction • Warning
Art 109	· Violations against important official responsibilities	• Anyone who committed violations	• Less than 1 year imprisonment, or • Less than 500 thousand JPY fine
Art 112	· Official misconducts	• Anyone who committed violations	• Follow criminal law first • Less than 3 years imprisonment

(Note) Violations or misconducts show some of the representatives in the Law and do not show all items. (Note) Prepared by JICA Project Team

b. Government Official's Ethics Act

Government Official's Ethics Act intends to preserve ethics of government official over public works and assure public confidence towards public works. To the violence against ethics, penalties prescribed in Government Official's Law are in principle applied.

c. National Compensation Law

National Compensation Law stipulates that government organizations including agencies should take responsibilities of compensation for any losses caused by government officials to the public including those intentional and by professional negligence. This indicates that if public facilities, including roads, bridges, rivers, dams and so forth, are not properly managed in construction and maintenance and give damages to the public, government organizations including agencies should take responsibilities of compensation for for any losses caused by these defects.

(2) Framework of MLIT sanctions

- **Compiled in a guideline format and opened to the public**

In addition to the above-mentioned penalties against the violations of laws, MLIT developed its own sanction guidelines and published information to the public, to cope with violations in construction. In fact, these are the intra-organization guidelines for MLIT including its related agencies, however, many local governments including their agencies agree to apply these guidelines to their violation incidents. Some have developed their own guidelines similar to MLIT guidelines.

- **Consisting of two sanctions**

MLIT sanctions consist of the following two sanctions, as shown in **Figure 6.1.1**; (1) Suspension of construction business operation, and (2) Suspension of new project participation.

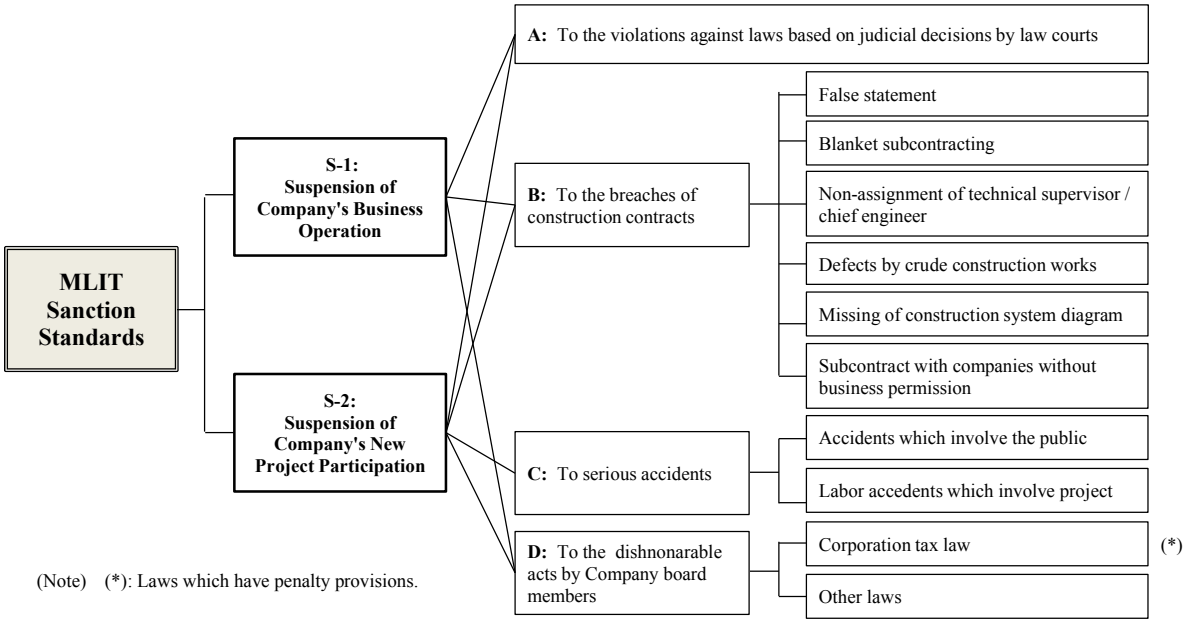


Figure 6.4.2 MLIT Sanction Guidelines (S-1 & S-2)

- **Applied to the same violations and accidents**

In principle, both sanctions are applied to the following violations and accidents;

- Breaches of construction contracts (B case in the figure),
- Serious accidents (C case), and
- Dishonorable behaviors by company's board members (D case).

In addition, they are also applied to the legal violations (A case in the figure) in accordance with judicial decisions made by law courts. As seen in **Figure 6.4.2**, violations against laws in the figure are regarded as high priority issues to any other administrative sanctions. Further details of these sanctions are stated as follows:

1) Sanctions based on the suspension of construction business operation

MLIT including local government governors are given authority to give a business permission to construction companies as stipulated in Construction Business Law. A sanction of suspending business operation is applied to all companies which have business permissions on the basis of Construction Business Law. Periods of business suspension may vary dependent upon the magnitude of violations and accidents, as shown in **Table 6.4.22.**

2) Sanctions based on the suspension of new construction project participation

A sanction of suspending business operation is for all companies which wish to undertake MLIT construction projects and which registered in the MLIT company registration system. Types of violations and accidents to which sanctions are mobilized are shown in **Figure 6.4.2.**

Table 6.4.21 summarizes penalties and sanctions stated above. In the worst case, a company may receive all penalties and sanctions when they are given a construction business permission from MLIT or a local governor and when they are register as a company wishing to participate in state-budget construction projects. Examination on the penalties and the sanctions is conducted in order from STEP-1 to STEP-3 as shown in the table.

Table 6.4.21 Summary of Penalties and Sanctions (MLIT Practices in Japan)

Step	Violation type	Violator	Contents of penalties/sanctions	Decision Maker
STEP-1	・ Against general laws, construction procedure laws, engineer qualification laws and government-official-related laws (A)	Anybody who committed violations against laws	・ Imprisonment or fines	Judicial decision by law court based on penalty provisions prescribed in laws
STEP-2	・ Against general laws, construction procedure laws, engineer qualification laws and government-official-related laws (A) ・ Breaches of constructs (B) ・ Accidents/Incidents (C) ・ Dishonorable acts by company board members (D)	Company which received construction business permits from MLIT	・ Suspension of construction businesses for a specified period	MLIT decision based on MLIT sanction standards on business suspension
STEP-3	・ Against general laws, construction procedure laws, engineer qualification laws and government-official-related laws (A) ・ Breaches of constructs (B) ・ Accidents/Incidents (C) ・ Dishonorable acts by company board members (D)	Companies which registered as new construction project participants with MLIT.	・ Suspension of participation in the new construction projects for a specified period	MLIT decision based on MLIT sanction standards on construction project suspension

(Note) Prepared by JICA Project Team

*A: Violations against general laws, construction procedure laws, engineer qualification laws and government-official-related laws as shown in **Figure 6.4.1** and **Figure 6.4.2.***

*B/C/D: Violations shown in **Figure 6.4.2.***

Table 6.4.22 Administration Sanctions Against Construction Violations and Accidents (MLIT Practices in Japan)

Sanction: Suspension of Construction Businesses			Sanction: Suspension of Participation in the New Construction Projects		
Violation/Incident	Violator	Period	Violation/Incident	Violator	Period
• Against Criminal Law (Obstruction of competitive bidding, illegal bid-rigging, bribery, fraud and other violations. • Against Anti-Monopoly Law	Representatives	1 year	• Against Criminal Law (Obstruction of competitive bidding, illegal bid-rigging, bribery, fraud and other violations.	Representatives	4 – 12 months
	Other staffs	60 – 120 days		Other staffs	2 – 6 months
• Against Building Standards Law	Representative	More than 7 days	• Against Anti-Monopoly Law (Vicious case)	Companies	6 - 36 months
	Other staffs	More than 3 days	• Against Anti-Monopoly Law	Companies	2 - 9 months
• Against Labor Safety and Health Law • Against Waste Management Law • Other laws	Representative	More than 7 days	• Obstruction of competitive bidding, illegal bid-rigging	Companies	2 - 12 months
	Other staffs	More than 3 days	• Against Construction Business Law	Companies	1 - 9 months
• Dishonorable acts to construction contracts			• Dishonorable acts to construction contracts		
- False statement in tender documents	Companies	More than 15 days	- False statement in the contract dossiers	Companies	1 – 6 months
- False statement in company registration documents	Companies	More than 30 days	- Defects by low quality construction works	Companies	1 – 6 months
- Blanket subcontracting	Companies	More than 15 days	- Violation against construction contracts	Companies	2 weeks – 4 months
- Non assignment of supervising engineer or chief engineer	Companies	More than 15 days			
- Defects by low quality construction works	Companies	More than 7 days			
- Missing of construction system diagram	Companies	More than 7 days			
- Subcontracts with companies without business permissions	Companies	More than 7 days			
• Labor accidents			Labor accidents		
- Accidents involving the public	Companies	More than 7 days	Accidents involving the public	Companies	1 – 3 months
- Accidents involving project staff	Companies	More than 3 days	Accidents involving project staff	Companies	2 weeks – 4 months

(Note) Sanctions in the above table show representing information of the laws, so that they do not show all information. *Prepared by JICA Project Team*

6.4.5 Comparison of law penalty and sanctions between two countries

Comparison was made on the current practices from the viewpoints shown below, between Japan and Vietnam. **Table 6.4.23** shows the summary of comparison.

- Sanction structure
- Related laws
- Prescription
- Violation classifications
- Articles in Vietnam; based on Decree 23.
- Violators
- Contents of penalties and sanctions
- High priority violations
- Information release

Table 6.4.23 Comparison of Law Penalty and Sanction Rules between Two Countries

Focus Points	Practices in Vietnam	Practices in Japan
(1) Sanction structure	Sanctions are represented by law penalties shown in Decree 23, Decree 64 and Circular 24	Sanctions consists of law penalties and administration sanctions
(2) Related laws	・ Construction law ・ Law on Government Organization ・ Housing Law ・ Law on Real Estate Business ・ Law on Civil Servants ・ Government Ordinances	・ Criminal Law ・ Anti-monopoly Law ・ Construction Business Law ・ Building Standards Law ・ Labor Safety and Health Law ・ Waste management and Public Cleaning Law ・ Law on Professional Engineers ・ Law on Architect ・ Government Officer's Law ・ Government Officer's Ethics Acts ・ Other laws
(3) Prescription	Law penalties for all regulations under Construction Law are integrally prescribed in Decree 23 and Decree 24.	Law penalties are prescribed in each law. Administration sanctions were developed by MLIT in the form of guidelines and opened to the public in addition to law penalties.
(4) Violation classifications (Note) Articles in Vietnam; based on Decree 23.	・ Violation on construction investment formulation (Art 7) ・ Violation on work designs and cost estimates (Art 8) ・ Violation on construction investment project management (Art 9) ・ Violation on commencement of projects (Art 10) ・ Violation on construction orders (Art 11) ・ Violation on ground clearance (Art 12) ・ Violation on construction supervision (Art 13, 28) ・ Violation on construction work quality management (Art 27, 14) ・ Violation on facility maintenance (Art 15) ・ Violation on take-over test (Art 16) ・ Violation on engineer eligibility requirements (Art 17) ・ Breaches on bid and contract dossiers (Art 18) ・ Violation on the use of invalid data (Art 19) ・ Violation on acceptance and payment (Art 21) ・ Violation on construction survey (Art 6, 22) ・ Violation on construction planning (Art 23) ・ Violation on construction designs (Art 24) ・ Violation on construction procedures (Art 25, ・ Violation on construction safety (Art 26) ・ Violation on the selection of contractors/consultants (Art 30)	■ Law penalties (1) Violations against general laws ・ Obstruction of competitive bidding ・ Illegal bid-rigging ・ Bribery ・ Fraud (2) Violation against construction procedure Law ・ Construction business operation without licenses ・ Violation of registered examination agency ・ False statement to construction permits ・ Failing to assign chief engineers and technical supervisors ・ Violation on construction permits, mid-term and final inspection ・ Violation of design and supervision without architects. ・ Violation of not assigning safety professionals to sites. (3) Violations against engineer qualification laws ・ Illegal use of PE or Architect names ■ Administration sanction (MLIT case) (1) Above law violations (2) Breaches of construction contracts ・ False statement ・ Non-assignment of technical supervisors and chief engineers ・ Defects by crude construction works ・ Missing of construction diagram ・ Subcontract with companies without business permissions (3) Serious accidents

Focus Points	Practices in Vietnam	Practices in Japan
		・ Accidents involving the public ・ Accidents involving project staff (4) Dishonorable acts by company board members ・ Violation against corporation tax law
(5) Violators	・ Project owner ・ Project owner for state-funded projects ・ Facility owner ・ Contractor ・ Consultant ・ Surveyor ・ Construction Planning Consultant ・ Construction supervision consultant ・ Electricity and water suppliers or neighboring households ・ Other organization and individuals	・ Anyone who committed violations ・ Registered agency for company evaluation ・ Examination agencies (including representatives) ・ Construction companies ・ Consultant companies (including representatives) ・ Contractors ・ Facility owner ・ Professional engineers ・ Architects (Designers)
(6) Contents of penalties and sanctions	Fines	■ Law penalties ・ Imprisonment ・ Fines ■ Administration sanction (MLIT Case) ・ Suspension of business operation for a specified period ・ Suspension of new project participation for a specified period
(7) High priority violations	・ Organizing take-over tests for uncompleted volumes ・ Reporting untruthful or invalid survey documents and data ・ Violation on the period of construction planning preparation ・ Violation of construction designs ・ Implementation of construction works disregarding work suspension order ・ Failing to organize construction supervision ・ Organizing acceptance of uncompleted works ・ Conduct construction works at variance with specified technical standards ・ Improper application of construction regulations and standards	■ Law penalties ・ Bribes to company registration (for evaluation of company management) ・ Business operation without business licenses ・ Violations against building technical standards ・ Building construction without permission ・ Building facility operation without mid-term and final inspection. ・ Violation of manufacturing, selling and providing toxic materials. ・ Violations of transporting, disposing, exporting and treating non-industrial and industrial wastes. ・ Illegal use of PE and Architect names ■ Administration sanctions (MLIT case) Against Criminal Law, Anti-monopoly Law and Construction Business Law
(8) Information release	Information is released on MOC website.	Information is released on websites by MLIT, other ministries and ministerial agencies.

(Note) Prepared by JICA Project Team

6.4.6 Recommendations

Current status survey on the sanctions in Vietnam has clarified that the legal framework of sanctions under Construction Law in Vietnam have been well prepared. In this section, some recommendations are made on the enhancement of sanction systems based on the current status status survey and the comparison of sanctions system in between Japan and Vietnam.

(1) Review of purposes of sanctions

In general, a meaning of sanctions may provide negative impacts to the public. However, sanctions are expected to give positive effects not only to the society, but to the construction industry in encouraging healthy growth of construction industry, if they are properly applied. The following purposes are often incorporated in the relevant documents stipulating violations and sanctions.

It is therefore recommended to define the objectives of sanctions at the beginning of Decree 23, the General Provision.

- To punish misconducts and dishonorable act
- To raise credibility of the public to construction
- To prevent occurrence of misconducts and dishonorable acts
- To protect project and facility owners
- To encourage healthy growth of construction industry

(2) Enhancement of audit and inspection systems

Provisions on violations and sanctions in construction under Construction Law have been well stipulated as shown in Decree 23. It is therefore recommended to strengthen detection functions of violations by enhancing audit and inspection systems. However, it is impractical to apply audits or inspections to all construction projects, so that it is recommended to delegate functions to relevant stakeholders as shown in **Table 6.4.24**.

Table 6.4.24 Delegation of Audit and Inspection Functions

Audit/ inspection Body	Classification	Examinees	Points of audit/inspection
MOC	Construction Audit	・ Based on a random sampling ・ POs of central government important projects ・ POs of provincial-level People's Committee's important projects ・ Large-scale private-sector construction projects	・ Priority-1 inspection points
Delegation of inspections to Sector Management Ministries	Construction Inspection	・ Based on an inspection plan ・ In principle all POs ・ POs under sector management ministries ・ Private-sector projects	・ Priority-1 inspection points
Delegation of inspections to DOCs	Construction Inspection	・ Based on an inspection plan ・ POs under Provincial-level People's Committees other than important projects. ・ Private-sector projects other than large-scale projects.	・ Priority-1 inspection points

(Note) Prepared by JICA Project Team

(3) Preferential treatment of important violations

It is fairly hard to keep watching a large number of construction projects underway nationwide from wider viewpoints, so that preferential treatment of important violations is needed. Preferential treatment allows MOC to concentrate on important violations and to take a measure of step-by-step expansion of treatment. In this project, it is recommended to classify violations into the following three (3) categories and apply inspections explained in the previous section to the Priority-1 violations as preferential treatment.

1) Priority-1 Violations: Proactive sanctioning against violations with penalties

Actively monitor violations by means of an audit or inspections and apply sanctions if violations are detected. Priority-1 violations comprise important violations which may provide serious impacts on the public, surrounding environment and regional socio-economy, if violations have occurred. These violations include in general criminal violations, institutional violations and those related to permission/approval of procedures such as building projects construction permits and so forth, as described below. MOC is encouraged to monitor the violations by means of an audit or inspections and to make judgments on the imposition of sanctions. This may allow MOC to focus more on important violations and save its workload for inspections or an audit.

- Improper selection of contractors and consultants by private monopolization and unfair trade
- Give or accept bribes to give approval
- False statement for participating in bidding and signing construction contracts
- Construction of building facilities at variance with Construction permits
- Opening of building facilities without final inspections
- Other important violations

2) Priority-2 Violations: Reactive sanctioning against violations with penalties

Active monitoring is not applied, but apply sanctions if violations are detected. This can be applied to the violations of other than those in Priority-1.

3) Priority-3 Violations; Sanctioning by warning

Active monitoring is not applied, but provide warning if violations are detected.

(4) Review of sanction contents

It is recommended to review the contents of sanctions concerned with Priority-1 violations stated above. In general, a magnitude of sanction need to be set, taking account of expected damages, seriousness and impacts to the society. For example damages, seriousness and impacts to the society caused by those violations , of the priority-1 violations, those against the variance with the approved designs in construction permits are deemed serious, but current sanctions does not balance with expected.

(5) Enhancement of connectivity between violations and sanctions

Definitions of violations stipulated in Decree 23 are fairly wide and general and may need to be further broken down in order to enhance connectivity with sanctions. It is recommended to refer to the names of regulations, article numbers and item numbers which can specify violations.

(6) Simplify legal framework by delegating technical provisions to contract dossiers

It is recommended to delegate technical provisions, which are included in Construction Law, Decrees and Circulars and stipulate details of construction work procedures including construction work management and construction quality assurance, to contract dossiers including contract conditions, specifications, bill of quantities and drawings.

- This can simplify regulations under Construction Law and enhance public understanding to the regulations.
- Contract dossiers can define further information which is detailed enough and more suited to each construction project.
- It is possible to flexibly select contract conditions including specifications in response to project requirements.

In order to make it feasible, it is recommended to stipulate provisions which define items to be developed in the contract dossiers. Potential provisions to be transferred to contracts dossiers are as follows:

- Construction supervision
- Construction work quality management
- Take-over test
- Breaches on bid and contract dossiers
- Acceptance and payment
- Construction procedures
- Construction safety

(7) Define sanctions against breaches of contract dossiers

Under the current Construction Law, sanctions are to be imposed to the violations against regulations, but there are no sanctions to be imposed to the breaches of construction contracts, which lead to light look of construction contracts. Nowadays, making contracts and then clarifying all construction conditions is becoming important and indispensable for all construction projects., so that it is recommended to clearly define sanctions against breaches of contracts, in particular contract conditions and specifications.

(8) Enhance quality of sanctions to serious violations

Current regulation of sanctions, Decree 23, in principle impose fines to violators in the construction sector. Decree 64 stipulates sanctions against violations of construction permits separately, consisting of revocation and cancellation of construction permits. However, the amount of fine seems to be fairly low to the expected profits they could make in their construction projects. In addition, contractors, if they commit violations, they are allowed to participate in other construction projects immediately after they finish payments. It is therefore recommended to give violators more substantial and practical disciplines than fines.

The Project recommends to apply suspension of construction project participation, prohibiting construction companies from participating in the next projects for a specified time period, if they commit serious violations. It is important to select appropriate time periods balanced with the seriousness of violations. **Table 6.4.22** shows an example of application, containing interrelation between violations and suspension periods of construction project participation shown in the MLIT case in Japan.

CHAPTER 7 DEVELOPMENT OF CONSTRUCTION COMPANY REGISTRATION SYSTEM AND CONTRACTOR WORK PERFORMANCE EVALUATION SYSTEM (ACTIVITY - 3)

7.1 FRAMEWORK OF IMPROVEMENT

7.1.1 Development of Construction Company Registration System and Construction Package Database System

(1) Concept for Development

As contractors and consultants are key stakeholders in construction management and their competencies are most influential in the quality of construction, it is essential to select a capable construction contractor and consultant in construction quality management.

The Construction Activities Management Department (CAMD) of the Ministry of Construction (MOC) is planning to develop a construction contractor grading system as a future system, incorporating evaluation and grading of contractor's competence and then providing work opportunities to the companies accordingly to their given grades. CAMD has already got in touch with developing a construction contractor and consultant registration system, paving the way to the future contractor grading system. However, it is expected that the grading system will not work effectively unless the contractor registration system and a contractor performance evaluation system function well.

With this view point, the Project recommends to enhance the existing contractor/consultant selection system in Vietnam, employing a step-by-step approach shown below. Outputs of each step can eventually contribute to enhancing the quality of the existing contractor selection system by providing relevant information to the system. **Figure 7.1.1** also shows a schematic view of this plan.

- Step-1; Improve company registration systems, one for construction contractors and the other for construction consultants companies, and develop a construction package database system
- Step-2; Develop a construction contractor performance evaluation system
- Step-3; Develop a construction contractor grading system (Future plan)

It is noted that the contractor evaluation system should be built up on the construction package database system as shown in the figure. Also, **Table 7.1.1** shows a road map for the future development.

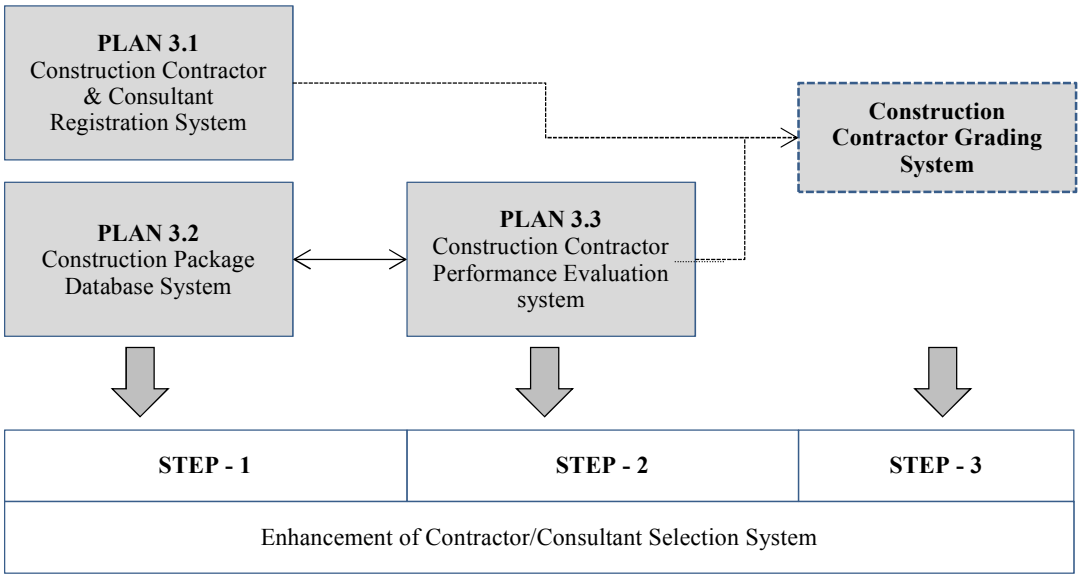


Figure 7.1.1 Step-by-Step Approach for Enhancing Contractor/Consultant Selection System

Table 7.1.1 Road Map

	Plan		Road Maps (Years)		
			1-2	3-4	5-
Activity-3 Enhance contractor/ consultant selection system	3.1	Improvement of construction contractor & consultant registration system			
	3.2	Develop construction package database system			
	3.3	Develop construction contractor performance evaluation system			
		Implementation of construction contractor grading system (Future plan)			

Figure 7.1.2 shows inter-relation between the above three systems. Three systems, which are inter-related each other, can not only contribute to the PQ and tendering processes, but also can be used in the planning and the implementation of construction projects.

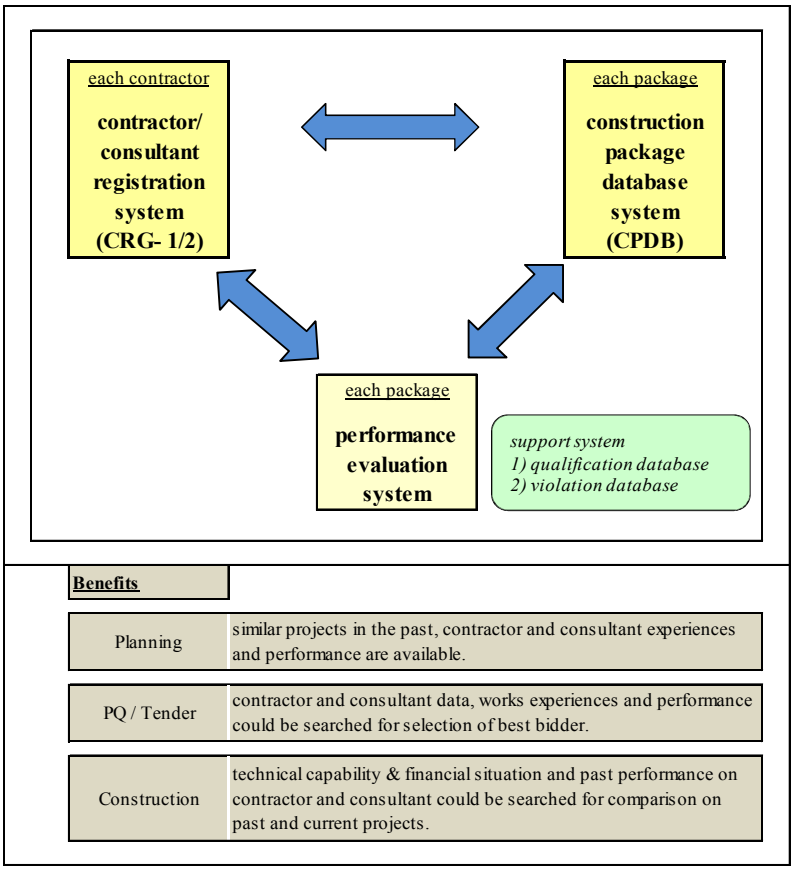


Figure 7.1.2 Synergy between Three Systems

(2) Methodology

The Project develops two company registration systems, one for construction contractor registration and the other for construction consultant registration, and a database system for construction package. The following are the outline of these systems. Also, **Table 7.1.2** summarizes the focus points of these systems.

1) Construction Contractor Registration System (CRG-1)

At present, a computer system for the purpose of construction contractor registration is already operational with computer web-site data registration in MOC. The following contains the methodologies to improve this system.

- Review the existing construction contractor registration system and analyze problems.
- Develop framework of improvement plans including a data verification method for enhancing data reliability
- Develop improvement plans including implementation guidelines
- Develop computer software for operation
- Develop software operation guidelines
- Implement trial case studies.

2) Construction Consultant Registration System (CRG-2)

As is the case of the above mentioned construction contractor registration system, currently a computer system for construction consultant registration is also operational in MOC with computer web-site data operation. Methodologies herein adopted follow those for the construction contractor registration system.

3) Construction Package Database System (CPDB)

The construction package database system is the most fundamental construction package data database which will play an important role in providing construction package information to construction contractor/construction consultant registration system and to contractor work performance evaluation system.

The Project develops a construction package database system including its database configurations, computer software and an operation guideline.

- Develop a framework of the database including system configurations
- Develop computer software
- Develop software operation guidelines

Table 7.1.2 Focuses of the Project

Activity-3.1	Activity-3.2
Construction Contractor & Consultant Registration System	**Construction Package Database System**
• Develop improvement plan for enhancing data reliability (Verification methods of company information) • Develop computer software for operation • Develop software operation guidelines • Conduct trial studies	• Develop improvement plans • Develop database configurations • Develop computer software • Develop software operation guideline • Conduct trial studies

(3) Outputs

Outputs for this activity are shown in **Table 7.1.3**.

Table 7.1.3 Project Outputs

Construction Contractor/Consultant Company Registration System	Construction Package Database System
• Recommendation on the improvement plans for the construction company registration system and the consultant company registration system. • New computer software for the two systems. • Operation guidelines	• Recommendation on the construction package database system • Computer software for the system operation • Software operation guidelines

7.1.2 Development of Contractor Work Performance Evaluation System

(1) Concept for Development

Contractor work performance evaluation system is to evaluate contractor's work performance with appropriate indexes prepared for the system and to feedback evaluation results to the contractor selection to be hereafter implemented for the purpose of preventing incompetent contractors from participating in the state-budget projects. It is also very much beneficial to raise contractor's awareness towards construction project management, quality management and safety management by giving the sense of being evaluated, and to raise project owner's awareness towards construction work supervision, directing their eyes to the construction projects.

With these reasons, much focuses of developing the system is placed on the selection of appropriate indexes for evaluation, standardization of evaluation formats, systematization of evaluation activities and development of synergy between relevant systems. Many stakeholders are expected to be involved in this evaluation system, so that all processes should be carefully developed in order to ensure efficiency of operation.

(2) Methodology

1) Selection of Evaluation Indexes

The Project recommends that evaluation indexes shown in **Table 7.1.4** shall be applied at an initial stage of implementation in order to mitigate work load to the evaluators. Evaluation indexes should be reviewed and adjusted after assessing implementation of evaluation.

Table 7.1.4 Evaluation Indexes

Category	Evaluation Index	Description
Manpower input	• Capacity of engineers	• Whether capable engineers were assigned in conformity with the contract document?
	• Capacity of managers	• Whether capable managers were assigned in conformity with the contract document?
Management capacity	• Schedule management	• Whether the project was managed on schedule?
	• Safety management	• Whether the project was managed without accidents?
Quality of products	• Dimensional tolerance	• Whether the products were constructed following technical standards?
	• Overall quality	• Whether the overall quality was ensured?
	• Workmanship	• Whether the products are in good appearance?

2) Develop Rating Methods of Contractor's Work Performance

Three to five-point rating system with scoring method was discussed in this Project, following overseas practices like Japan, Hong Kong and Malaysia. Discussion was made on the use of weighing factors to the MOC's focus points such as safety management and overall quality as needed.

3) Selection of Evaluator

In order to ensure quality and fairness of evaluation, the Project recommends the application of multiple evaluators, which consists of project owner, professional state authority member organization and so forth. Study will be made through discussion with MOC counterparts, trying to find out the most suitable evaluators based on the comparative study.

4) Selection of Construction Packages for Evaluation

Discussion will be done on the application of this evaluation to the big construction packages first which may require high in construction quality. A step-by-step expansion is recommended.

5) Management of Evaluation Data

To share the evaluation results as common information between stakeholders, it is recommended to centralize data management. MOC is recommended to be a focal point of information including data integration, management and dissemination to relevant stakeholders.

6) Development of Computer Software

To facilitate operation, computer software is developed to meet the following conditions; (1) to disseminate information of evaluation formats and evaluation guidelines to evaluators, (2) to register evaluation results, and (3) to manage and disseminate the results of evaluation to relevant stakeholders.

7) Trial Case Study

Trial case studies were implemented, selecting some infrastructure types and project owners. Detail plans of this trial study were discussed with MOC counterpart members.

(3) Outputs

Outputs for this activity are shown in **Table 7.1.5.**

Table 7.1.5 Project Outputs

Construction Contractor Performance Evaluation System
• Evaluation guidelines • Computer software • Software operation guidelines

7.2 DEVELOPMENT OF CONSTRUCTION CONTRACTOR REGISTRATION SYSTEM

7.2.1 Objectives

The followings are the objectives set out for the construction company registration and the construction package database system.

- To provide project owners/employers with general information on construction contractors and consultants as well as construction packages
- To assist project owners/employers and management agencies for selection of construction contractor and consultant at prequalification and tender stage by providing information on bidders as well as construction packages implemented by them
- To assist management agencies for managing project during planning, feasibility study, project management, survey, design, design verification, supervision, construction, inspection, certification and assessment by providing information on construction contractor / contractors or consultant / consultants (in case of joint venture) as well as construction packages implemented by them
- To assist to classify construction contractors and consultants into several groups in capability by providing information on construction contractors and consultants as well as construction packages implemented by them
- To improve capabilities and activities of construction contractors and consultants through submission of company information and construction package information by them
- To allow construction contractors and consultants with less papers to be submitted in prequalification & tender stage

7.2.2 Overseas Practices

In order to have improvement of construction contractor registration system, case studies were carried out by reviewing similar system in Japan and Singapore.

(1) Registration System in Japan

1) Registration System

There are two kinds of registration in Japan, which are as follows.

- Construction Business Permit: Article 3 in Construction Business Act
- Business Evaluation: Article 27 in Construction Business Act

2) Construction Business Permit

a. Business Permit

Anyone who wishes to start and engage in construction business of both public and private sectors needs to obtain a permit from the minister of Ministry of Land, Infrastructure, Transport and Tourism (MLIT) or the governor of prefecture where the business is operated. The permit of construction business is classified into 28 fields as below.

Table 7.2.1 Fields of Construction Business (28 fields)

Civil Works	Steel Metal Works
Building Works	Windowpane Works
Carpentries	Painting Works
Plaster	Waterproofing Works
Earthworks (incl. Scaffolding & Concrete Works)	Interior Finishing Works
Stonemasons	Equipment Installing Works
Roof Works	Thermal Protection Works
Electric Works	Telecommunication Works
Plumbing Works	Landscape Gardening Works
Masons	Boring Works
Steel Structural Works	Fixture Works
Reinforcement Works	Water Facilities Works
Paving Works	Fire Facilities Works
Dredging Works	Garbage Disposal Facilities Works

For a business to be able to operate in the administrative boundaries of more than 2 prefectures, companies must obtain permit from the minister of MLIT. And, the governor of prefecture issues the permit to business within the administrative boundary of the prefecture.

The following small-scale construction works do not require the permits.

- Building works of less than 15 million yen or wooden houses with total floor area of less than 150 m^2
- Other construction works with construction cost of less than 5 million yen

b. Classification of Permit

The permit is classified into 2 categories:

- Ordinary construction business permit; Other than the below
- Special construction business permit; This allows a subcontracting of more than 30 million yen.

c. Validity of Permit

- 5 years

d. Contents of Application for Permit

- Trade name or name of applicant
- Name and address of business office
- For a corporation, capital amount and names of directors
  For a private person, his /her name and name of manager, if any
- Construction business field to be applied for permit
- Type of the business, when an applicant operates other businesses

Documents to be submitted

- Record of past construction works
- Document showing the amount of the construction works executed in last 3 fiscal years
- Document showing number of employees
- Declaration that applicant has no criminal records and abide by laws and regulations concerned
- Others

e. Conditions for Permit

- Criteria 1 : Chief administrator

Applicant should assign a chief administrator for a construction work at a full time basis. The chief administrator should satisfy any one of the following requirements:

- To have more than 5 years management experience for the applied field of construction business;
- To have more than 7 year-management experience for fields other than the applied field of construction business;
- To have more than 7 year-experience as assistant manager for the applied field of construction business;

- Criteria 2: Technical expert

Applicant should assign a technical expert at each office on a full time basis. The technical expert should satisfy any one of the following requirements:

In case of ordinary construction business permit,

- To have completed designated school education of construction and have more than 5 years practical work experience for construction works after high school, and to have more than 3 years after university
- To have more than 10 years practical work experience for the applied field of construction works
- The minister recognizes applicant to possess equivalent qualifications (i.e. to have required national license, etc.)

In case of special construction business permit,

- In addition to the above criteria, to have more than 2 years practical work experience in supervising the construction works of more than 45 million yen
- To have passed technical qualification tests administered by the minister

- Criteria 3: Financial resources

  Applicant should have financial resources, which are sufficient and enable to carry out construction works.

  In case of ordinary construction business permit, the applicant should satisfy any one of the following requirements:

  - The share holders' equity is more than 5 million yen;
  - To be able to raise more than 5 million yen;
  - 5 years business career prior to an application

  In case of special construction business permit, applicant should satisfy all of the following requirements:

  - The deficit does not exceed 20 % of the capital.
  - The current ratio is more than 75 % of the capital.
  - The capital is more than 20 million yen, and the shareholders equity is more than 40 million yen.

- Criteria 4: Honesty

  Applicant should not undertake unfair or dishonest acts when entering and executing a contract.

- Disqualification criteria

  Application may not be accepted if false declarations are found in the application documents or if 5-year have not passed since revocation of their construction business permit.

3) Business Evaluation

In addition to obtaining the business permit, business evaluation is required to the contractors who wish to participate in public construction works.

(a) Contractors intending to participate in public works shall have business evaluation on their companies.

(b) Business evaluation shall be carried out in management scale, technical capability and social responsibility.

(c) Management scale shall be analyzed and evaluated by designated organizations, whereas rests (technical capability and social responsibility) shall be by contracting organizations.

(d) Management scale shall be evaluated with the items in page 1 of Appendix_7-1-1 and financial data (to be attached).

(e) Technical capability shall be evaluated with the items in pages 2 to 5 of Appendix_7-1-1 and other back-up data (to be attached).

(f) Social responsibility shall be evaluated with the items in page 6 of Appendix_7-1-1 and other papers (to be attached).

(g) Evaluation point shall be calculated with the formula below.

$$P = 0.25\ X_1 + 0.15\ X_2 + 0.2\ Y + 0.25\ Z + 0.15\ W$$

Where
- X_1; score based on total amount of projects completed
- X_2; score based on net worth and operation income
- Y; score calculated with figures representing financial situation (Y is calculated with another formula with eight sub items)
- Z; score based on number of technical staff with qualification and total amount of projects completed as prime contractor
- W; score based on social welfares etc.

(h) Evaluation is usually carried out with the data at the point of fiscal year end (majority of Japanese contractors end their fiscal year on March 31) and audited financial data is available three months after the end of fiscal year. Therefore, most applicants will submit application in July to September every year.

(i) Validity of the business evaluation is 1 year 7 months. As a fiscal year is 12 months, practically business evaluation shall be carried out every year.

(j) Contractors shall then be ranked with the business evaluation point and subjective evaluation by contracting organizations.

(k) When false information is provided by contractor for application of business evaluation and the result of evaluation is used for qualifying the contractor, such contractor shall be suspended for business in 30 to 45 days, depending on seriousness of false information.

(l) If false information is very serious and repeated, the contractor might be disqualified for tender participation.

Appendix_7-1-1 provides more information of Business Evaluation for Contractor Registration System in Japan.

(2) Registration System in Singapore

1) Function & Scope of Registration

(a) Registration is for public sector procurement only.

(b) Six major groups of registration:

- Construction Workheads (CW)
  - + CW 01 general building 7 grades
  - + CW 02 civil engineering 7 grades
- Construction Related Workheads (CR) 6 grades
- Mechanical & Electrical Workheads (ME) ditto
- Maintenance ((MW) ditto
- Supply Workheads (SY) ditto
- Regulatory Workheads (RW) no grade

As construction contractors are categorized in CW 01 and 02, those workheads are further explained in details below.

2) Application Details

- Procedure: to download application forms (about 8 pages) from website (www.bca.gov.sg) and submit them
- References: to submit references from auditors, bankers and clients/consultants supervising applicant
- Processing time: 2 weeks after receipt from applicant
- Outcome: Result is notified and published in registry website, if successful.

3) Registration Requirements

(a) Track Record and Performance;

- Track records in last three years with references from clients etc. Requirements for grades to be met (refer to **Table 7.2.2** below)

(b) Financial Capacity;

- Audited financial report to be submitted, which is issued within one year

(c) Personnel Resources;

- Full time personnel resources
- Requirements for grades to be met (refer to **Table 7.2.2** below)

(d) Registration to Account & Corporate Regulatory Authority

4) Conditions of Registration

- The Building and Construction Authority (BCA) under the Ministry of National Development (MND) shall process applications.
- Validity: three years
- Applicant shall submit declaration at application, including sentence "…false declaration or false information provided is a serious offence which may result in penalties including debarment of my firm from participating in public sector tenders". BCA may take the courses of action to false declaration or information, such as (a) downgrading of registration grades and (b) de-registration or suspension from the Contractors Registration System.

Table 7.2.2 Registration Requirements for CW

S$: Singapore Dollar, m: million

Grade	Financial status (paid-up capital & net worth)	Personnel & Management	Track records (three years)		Other requirements
			CW 01 (building)	CW 02 (civil)	
A 1	S$ 15.0m	16 degree professionals 8 technical qualifications ISO9001/14000 OHSAS18000	S$ 150.0m (of which 75.0m in Singapore)	S$ 150.0m (of which 75.0m in Singapore)	Financial accounts to submit annually
A 2	S$ 6.5m	8 degree professionals 4 technical qualifications ISO9001, OHSAS18000	S$ 65.0m (of which 32.5m in Singapore)	S$ 65.0m (of which 32.5m in Singapore)	Financial accounts to submit annually
B 1	S$ 3.0m	4 degree professionals 2 technical qualifications ISO9001,OHSAS18000	S$ 30.0m	S$ 30.0m	Financial accounts to submit annually
B 2	S$ 1.0m	2 degree professional 1 technical qualification ISO9001,OHSAS18000	S$ 10.0m	S$ 10.0m	Financial accounts to submit annually
C 1	S$ 0.3m	1 degree professional 1 technical qualification	S$ 3.0m	S$ 3.0m	
C 2	S$ 0.1m	1 degree professionals or 2 technical qualifications	S$ 1.0m	S$ 1.0m	
C 3	S$ 25,000	1 technical qualification	-	-	

Tendering limit for each grade is shown in **Table 7.2.3**.

Table 7.2.3 Tendering Limit for CW01 and CW02

S$: Singapore Dollar

Grade	A 1	A 2	B1	B 2	C 1	C 2	C 3
Tendering Limit (S$ million)	Unlimited	85.0	40.0	13.0	4.0	1.3	0.65

Appendix_7-1-2 provides more information of Contractor Registration System in Singapore.

7.2.3 Current Status in Vietnam

(1) Registration System

The Construction Activity Management Department (CAMD) of the Ministry of Construction (MOC) started to have construction related company registration system. The registration system is implemented, based on the Decision No. 02/2008/QD-BXD dated on February 20, 2008. The system has two data bases for contractors and consultants. As of October 2010, about 70 contractors have been registered. Registration was not implemented as compulsory system. Professional qualifications are not required to submit. Regulations relevant to the systems are shown below;

(a) There is stipulation in Article 36 of Decree 12 in regard to field of construction works;

- Construction

(b) There are stipulations for qualification of individuals and companies in Decree 12;

[Individual]

- Architect : Article 38
- Engineer : Article 39
- Supervision : Article 40
- Construction site chief commander: : Article 52

[Company]

- Construction organization: : Article 53

(2) Problem Identification

The followings are the problems identified in the current status survey (for both construction contractor and consultant registration system) conducted in this Project.

- It is not clear how the system is implemented and utilized (there is no benefit for registered contractors and consultants).
- Data provided by registered contractors and consultants are not consistent and therefore, those could not be compared among registered contractors and consultants.

- Data provided by registered contractors and consultants are not reliable, as there are no tools and back-ups to countercheck those data.
- Organization structure for managing and maintaining the system is insufficient, as there is not enough staff to assign for the system.
- Registration is mainly to be done through website.

7.2.4 Comparison of Contractor Registration Systems between Three Countries

Brief comparison of contractor registration systems between three countries, Vietnam, Japan and Singapore, is made and summarized in **Table 7.2.4** below.

Table 7.2.4 Comparison of Contractor Registration System

Items		Vietnam	Japan (permit)	Japan (evaluation)	Singapore
1	Name of company	Required	Required	Required	Required
2	Address, contact and website	Required	Required	Required	Required
3	Representative office	Required	Required	Required	Required
4	Decision of establishment	Required	-	-	-
5	Business registration certificate	MPI certificate	-	Business permit number	ACRA number
SIN	Type of company	-	-	-	Partnership/private limited /pubic listed/branch office
6	Activity fields	Select out of 5fields	Select out of 28 fields	Select out of 28 fields	Select out of 6 groups with certain grades
7	Financial figures a. charter capital b. Turnover of each year (three recent years) c. revenue after tax of each year (three recent year)	Required Financial statement not obliged to submit	Financial statement to be submitted	Financial statement to be submitted	Audited financial statement within a year Financial statement to be submitted every year
JPN	Certificate of tax payment	-	Required	-	-
JPN	Main banks	-	Required	-	-
8	Total number of staff management of construction site university degree or post university college – intermediate skillful technical staff	Required Backup data is not required	Chief administrator with experience A few technical experts with qualification Total number of staff	All technical experts with qualification	Certain number of technical experts with qualification and education certificate
9	Specialized machinery and execution equipment owned by the organization	Required	-	-	-
10	Quality management system	Required, if any	ISO is compulsory in public works	-	ISO is compulsory in public works for higher grades
11	Typical works in three recent years	Required	Total amount of completed projects in three years	Total amount of completed projects in three years Total amount as prime contractor	Certain track records with endorsement of employer
12	Implementing works	Required	-	-	-
13	Strong fields of organizations	Select out of 5 fields	-	-	-
14	Prize-won works	Required, if any	-	-	-
15	Violations in construction activities	Required, if any	-	Required	-
JPN	Other social matters	-	-	Social insurance etc.	-
JPN/SIN	Validity	-	5 years	1 year 7 months	3 years

7.2.5 Improvement of Existing Registration System in Vietnam

Improvement of the existing system is made, taking the following basic concepts of improvement into consideration (which are in common for contractor and consultant registration system);

- Project owners for public works are requested and for private works are encouraged to select construction contractors and consultants from the registered companies.
- New system will request applicants to provide data in accordance with the specified items, so that provided data are able to compare among registered contractors and consultants.
- New system will request applicants to submit back-up data (financial statement, copy of professional qualification, contract agreement, final acceptance etc.) in order to verify the important items by themselves, such as turn-over, profit, staff qualification, contract completion etc.
- Professional qualification database currently maintained by CAMD of MOC shall become solid enough to utilize it as checking system on submitted data.
- Submission may be allowed by several ways, such as through web-site, e-mails and / or post (hard copy basis).
- Fee will be collected from applicants in order to have financial base for managing organization to have sufficient staff for managing and maintaining the systems.

Table 7.2.5 summarizes recommendations developed in this Project.

Table 7.2.5 Recommendations of Registration System

Items		Contents	Remarks
System			
a	Registration	Compulsory	
b	Administration	CAMD of MOC	Same as consultant registration
c	Validity	1 year	
d	Ranks	-	To introduce later
Items to provide			
1	Name of company	Required	
2	Address, contact and website	Require	
3	Representative office	Required	
4	Decision of establishment	Required	
5	Business registration certificate	DPI certificate	Copy of latest certificate to be submitted
6	Investment certificate	Required	Copy of latest certificate to be submitted
7	Type of company (to be selected)	limited liability / share holdings / partnership / private enterprise / joint	

Items		Contents	Remarks
		venture / others	
8	Activity fields (to be selected)	building / industry / urban infrastructure / transport / agriculture & rural development	
9	Financial figures	a. Paid-up capital b. Equity c. Turnover d. Profit after income tax e. Enterprise income tax	Financial statement to be submitted Certificate of tax payment to be submitted
10	Staff information	Number (total, management, university decree etc.) Professional staff	Copy of certificate of qualifications (architect, engineer etc.) to be submitted
11	Construction site chief commander		Copy of certificate of qualifications to be submitted
12	Specialized machinery and execution equipment owned		
13	Quality management system	Own system / ISOs	Copy of certificate to be submitted
14	Typical works	Three packages in each field	Contract agreement and final acceptance to be submitted
15	Ongoing works	Three packages in each field	Contract agreement to be submitted
16	Prize-won works		
17	Others		Free statement
18	Name providing information		
19	Commitment		Commitment letter to be submitted

Related database:

- Qualification database (architect, engineer, construction supervision, project managers etc.)
- Construction Package Database System to be developed, which is detailed in **Section 7.4**

Recommendations of improvement on current CAMD system are shown below.

- Submitted data from contractors shall be verified by themselves with additional information, details of which are shown in the table above.
- Database for qualifications (architect, engineer etc.) and violation in construction activities will be useful tools for the system and shall be regularly updated and maintained.
- Database for construction packages will be proposed by the Project, which shall also be useful for the system.

The followings are the functional and database requirements recommended for the system.

(1) Functional Requirements

- Contractors shall register company information in accordance with items below, if those intend to tender for construction works.
- Company information consists of three data, such as [company basic data], [financial data] and [technical data], some of which shall be verified with back-up data to be submitted.
- Company information shall be renewed, when any changes in its management status, contact or any other pertinent particulars occur or when one year passes after registered / renewed.
- System shall be accessible only from limited organizations (project owners/employers in public and private works), whereas registered company names are seen in website.
- If information provided by construction contractor for registration is found false at later stage, such contractor may result to de-listing from the registration system.

(2) Database Requirements

1) Financial Data

- Financial statement (possibly audited one) shall be submitted.
- Important figures are 1) paid-up capital, 2) equity, 3) turnover in each construction field, 4) profit after income tax and 5) enterprise income tax with certificate of tax payment.
- The above figures will be criteria for contractor classification.

2) Professional Staff and Manager List

- The following items shall be included; 1) name, 2) ID, 3) university, 4) professional details, 5) works experiences (three works) and 6) years of experiences.
- Format of Professional Staff List is shown in **Table 7.2.6** below.
- Copy of certificate shall be enclosed.
- Number of qualified staff will be criteria for contractor classification.

3) Typical Works in Three Years

- The following items shall be included; 1) package name; 2) location; 3) project name; 4) project category, 5) work grade,6) JV details,7) contract amount,8) dates of commencement & completion, 9) project owner name and 10) result of evaluation at completion (if any).

- Copy of contract agreement and final acceptance shall be enclosed for verifying dates of commencement and completion.
- Format of List of Completed Works is shown in **Table 7.2.6** below.
- The amount of works will be criteria for contractor classification.

4) Ongoing Works

- The following items shall be included; 1) package name; 2) location; 3) project name; 4) project category, 5) work grade,6) JV details,7) contract amount,8) dates of commencement & completion and 9) project owner name.
- Copy of contract agreement shall be enclosed for verifying dates of commencement and completion.
- Format of List of Ongoing Works is similar to List of Completed Works.

***Appendix_7-1-3**: Draft Circular for Construction Contractor and Consultant Registration System

***Appendix_7-1-4**: Note & Format for Construction Contractor Registration System

Table 7.2.6 Format of Professional Staff List and List of Completed Works for Contractor Registration System

(Construction Contractor Name to insert) : PROFESSIONAL STAFF LIST

no	name	ID number	university	discipline	professional qualification	domain (Circular 12/TT-BXD)	certificate no.	work experience (three works)			years of work experience	remarks
								work name (1)	work name (2)	work name (3)		
1	Mr. A	12345678x	x university	engineer	engineer	*structural design*	*KS-xx-1234x*	X railway construction	Y dam construction	Z expressway construction	A years	
2	Ms B	23456789y	y university	architect	architect	*architectual design*	*KTS-xx-0000x*				B years	

(Construction Contractor Name to insert) : LIST OF COMPLTED WORKS

no	Construction package name	Location (province)	Project name	Project category	Work grade	JV details with shares	Contract amount (shared amount)	Commencement date	Completion date	Project owner name	Score of evaluation at completion	Remarks
[Civil works]												
1												
2												
3												
[Industry works]												
1												
2												
3												

7.2.6 MOC Proposal for Registration System in Vietnam

In accordance with the stipulation of new Decree 15 in 2013, MOC has prepared the circular (draft) on Publicized Management of Information on Capacities of Entities, Individuals Operating in Construction Sector for construction contractor and consultant. On the MOC draft, the following comments have been given based on the knowledge and proposal throughout the actions under the Project

(1) It is recommended to add the following sentence in clause c) of item 1 in Article 5.

… when finding the application dossiers insufficient, DOCs shall request the entities provide more information, which shall be reported to CAMD MOC.

(2) It is recommended to add the following sentence in clause c) of item 21 in Article 5.

During checking when CAMD finds the application dossiers insufficient, CAMD shall request the entities provide more information, which shall be informed to relevant DOCs.

(3) Item 1 in Article 6 stipulates that periodically in 6 months or …, entities and individuals are responsible to provide adjusted information as regulated in this Circular. It seems too often and it is recommended to extend the period to one year.

(4) It is strongly recommended to add the following sentence in item 3 in Article 8.

When CAMD considers necessary, CAMD shall request the entities provide back-up data for verification of the information already posted.

(5) Item 4 in Article 8 stipulates the cases of deletion of entities information from the registration list and it is recommended to add the following case.

… or without updating application one year after information publicized or…

(6) It is strongly recommended with the followings in Appendix 1;

- Data from contractors and consultants to be separated, as features of works are different. In this view, item 7. fields of activities, 10. numbers of specialized officials and 12. list of typical works shall be provided with two kinds of table (x-1for contractor and x-2 for consultants). Entities having department of contractor and consultant shall submit 7-1 & 7-2, 10-1 & 10-2 and 12-1 & 12-2 for contractor and consultant.
- Item 8: Information for financial matter shall be not only capital but also equity, turnover in each field, profit after tax and enterprise income tax (similar to those required in PQ and/or tender).
- Item 12: Works experience and on-going shall be separated in different tables.
- Item 12: Dates of commencement and completion shall be provided in each work, possibly together with back-up data (contract agreement and final acceptance).

- Item 12: Works experience and on-going shall be provided in each field, limited to certain number, say 3 works.

(7) It is strongly recommended with the followings in Appendix 2;

- Item 8: Information for financial matter shall be not only capital but also equity, turnover in each field, profit after tax and enterprise income tax (similar to those required in PQ and/or tender).
- Item 12: Works experience and on-going shall be separated in different tables.
- Item 12: Dates of commencement and completion shall be provided in each work, possibly together with back-up data (contract agreement and final acceptance).
- Item 12: Works experience and on-going shall be provided in each field, limited to certain number, say 3 works.

The latest draft circular with the above comments *(italic)* are shown below. It is expected that MOC would finalize the circular in due course.

CIRCULAR

ON PUBLICIZED MANAGEMENT OF INFORMATION
ON CAPACITIES OF ENTITIES OPERATING IN CONSTRUCTION SECTOR

Minister of Construction enforce the circular on publicized management of information on capacities of entities, individuals operating in construction sector:

Chapter 1 GENERAL PROVISIONS

Article 1. Scope of governing

This circular stipulates the provision, management, announcement and utilization of information on operating capacities of entities of domestic and abroad (hereinafter referred as "entities operating in construction sector") participating activities in construction sector as: FS formulation, Project management, Construction planning, Design, Design verification, Survey, Construction execution, Construction supervision, Construction testing, Inspection.

Article 2. Objects of governing

Entities of domestic and abroad who have registered for operating in construction sectors in Vietnam follow stipulations in this Circular to provide and publicize their information through MOC website.

Chapter 2 INFORMATION ON OPERATING CAPACITIES

Article 3. Principles in provision and utilization of information on operating capacities

1. Entities operating in construction sector in Vietnam are responsible for publicizing information on operating capacities as stipulated in Appendix of this Circular.
   Entities operating in construction sector are inclusive of:
   a) Enterprises, entities with business registration (business license) related to operations in construction sector in accordance with regulations.
   b) Other entities, such as: cooperatives; research institutes; profession schools, universities; Associations; Business Associations… that are established in accordance with regulations and those with operating functions related to activities in construction sector.
2. Information provided by entities operating in construction sector are directly related to their

operating capacities in construction sector.

3. Organizations, individuals are encouraged to refer to information on capabilities which is posted in DOCs' website and MOC website.
4. Information on operating capabilities of these entities which is posted in MOC website serves as the basis for PO's reference on capacities and experiences during contractor/consultant selection for state budget packages/services.

Article 4. Responsibility for providing information

1. The legal Representative of Entities operating in construction sector stipulated in Clause a, b Item 1 in Article 3 of this Circular is accountable for the truthfulness, exactness of information when providing information for posting in DOCs' website and MOC website.
2. Profession associations, entities, individuals are responsible for reporting to MOC on variation or inexactness of information from Entities operating in construction sectors.
3. Local DOCs are responsible for checking, reviewing dossiers of Entities operating in construction sector.
   ULR: www.moc.gov.vn

Article 5. Responsibility for posting information

1. Sequence of provision of information:
   a) Entities operating in construction sector send dossiers in writing to local DOC, and in soft file to that DOC's email address. (at the province where they obtained business license).
   b) Application dossiers are as following formats:
   - Appendix 1: For entities operating in construction sectors.
   - Appendix 2: For entities operating in Design Verification, Design Appraisal.
   - Appendix 3: For entities operating in Construction quality inspection (testing)
   c) After checking the truthfulness of application dossiers, *and when finding the application dossiers insufficient, DOCs shall request the entities provide more information, which shall be reported to CAMD MOC. Otherwise,* DOCs directly input data on the database of MOC website. Concurrently, DOCs send hard copy and soft copy to the following address:
   CAMD-MOC
   Address: 37 Le Dai Hanh, Hai Ba Trung Dist. Hanoi.
   Email: qlhdxd@moc.gov.vn
2. Posting information:
   a) All information, data is collected through documents in writing and attached soft file provided by entities.
   b) Within 30 working days since the receipt of sufficient application dossiers, DOCs directly input data into database system of MOC website and link this to DOCs' website.
   c) CAMD, act as contact point with the assistance of Information Center, conduct checking, review on application dossiers, checking and adjustment on data on entities' capabilities which is posted on MOC website. *During checking when CAMD finds the application dossiers insufficient, CAMD shall request the entities provide more information, which shall be informed to relevant DOCs.*

Article 6. Information renewal

1. Periodically in *one year* or when there is change in deputies and above, project managers, team leaders, site managers, entities and individuals are responsible to provide adjusted information as regulated in this Circular.
2. DOCs are responsible for updating information and sending application in hard copy and soft copy to CAMD to update and posting.

Chapter 3 IMPLEMENTATION

Article 7. Responsibilities of relevant stakeholders

1. MOC will take the prime responsibility and coordinate with relevant stakeholders in:

a) Receiving and posting information, data provided by entities operating in construction sectors.
b) Regularly keeping track, managing, checking the access, utilization and operation of information

system on capacities of entities, individuals participating in activities in construction sector through MOC website.

2. Ministries, sectors, PPCs cooperate with MOC to check relevant information on:
   a) Entities operating in construction sector which are under their jurisdiction.
   b) Violations by entities operating in construction sectors to construction projects under their jurisdiction.
   c) Violations by entities operating in construction sectors to construction projects under their local territories.

Article 8. Inspection and violation handling

1. CAMD-MOC is the focal point, takes prime responsibilities and coordinates with Ministries, sectors, localities, Associations, Business Associations, mass media to check, process information during posting information into MOC website.

2. DOC is the focal point assisting PPC, takes prime responsibilities and coordinates with relevant organizations to check the reliability of information of entities operating in construction sector in their territories and timely reports to MOC.

3. CAMD periodically conducts inspection on posted information in random manner in cooperation with DOCs. Inspection can be done with partners of registered entities, individuals. *When CAMD considers necessary, CAMD shall request the entities provide back-up data for verification of the information already posted.*

4. Entities, individuals participating in activities in construction sector shall be put in list of violations and be released in MOC website if they commit violation in activities in construction sector or provide false information. or without update applications *one year after information publicized or when changing status.*

Article 9. Transition handling

Based on guidance in this Circular, Entities that already provided information in accordance with Decision no. 02/2008/QD-BXD dated on February 20th, 2008 provide information and data again and send to MOC to continue publication.

Article 10. Enforcement

This Circular takes effect since……2013 and replaces Decision no.02/2008/QD-BXD.

During implementation, in case of problems or difficulties, entities, individuals are requested to send comments to MOC for studying and reasonable revision.

APPENDIX 1

ANNOUNCEMENT OF INFORMATION ON CAPACITIES OF ENTITIES/INDIVIDUALS IN CONSTRUCTION ACTIVITIES

1. Name of organization:

2. Address of headquarter:
   - Telephone No. Fax No.
   - Email: Website:

3. Address of representative office or branch office (if any):

4. Legal representative:
   - Full name:
   - Job title:

5. Decision of Establishment:
   - No.: , date of issue , Agency signing the decision:

6. Business Registration Certificate:
   - No.: , date of issue , Issuing Agency:

7. Fields of construction activities:

7.1 Construction contractors

Fields of activities / **Type of Construction Work**	***Construction Execution***
Buildings	
Industrial works	
Transport works	
Works of Agriculture and Rural Development	
Infrastructure works	

7.2 Construction consultants

Fields of activities / **Type of Construction Work**	***Formulation of FS***	***Management of Construction Investment Project***	***Design of Construction Planning***	***Design of Construction Work***	***Construction Survey***	***Construction Supervision***	***Specialized construction tests***	***Inspection (Testing) of construction work quality***
Buildings								
Industrial works								
Transport works								
Works of Agriculture and Rural Development								
Infrastructure works								

(Tick "✓" for the field of activities entities being involved in construction activities)

8. *Financial Figures:*
   (1) Charter capital,
   (2) Equity,
   (3) Turnover in each field and total,
   (4) Profit after enterprise income tax,
   (5) Enterprise income tax

9. Number of officials of the entity (only who engage in paying social insurance):…….persons
   Of which:
   + Those that have post-graduate education:
   + Those that have university education:

10. Number of specialized officials: …..persons

10.1 Construction Contractors

No.	***Fields of activities***	***Quantity***
1.	*Site Manager*	
2.	*Architect*	
3.	*Engineer*	
Total		

10.2 Construction Consultants

No	*Fields of activities*	*Class 1*	*Class 2*	*Quantity*
1.	*Team Leader of FS Formulation*			
2.	*Director of Project Management Consultancy*			
3.	*Survey Manager*			
4.	*Construction Design Manager*			
5.	*Construction Design Subject Manager*			
6.	*Manager of Design Verification*			
7.	*Architect*			
8.	*Engineer*			
9.	*Construction Supervisor*			
10.	*Head of Laboratory*			
Total				

11. Is quality management system available? ☐ Yes ☐ No
    - ISO No.
    - Certifying Agency:

12. *List of typical construction works which have completed in each field (maximum three works in each field)*

12.1 Construction Contractors

No.	*Name of Construction Work (CW)*	*Location*	*Scale*	*Type of CW*	*Grade of CW*	*Name of PO*	*Form of Participation*	*Work (Activity) to carry out*	*Value of the work*	*Commencement date*	*Completion date*

12.2 Construction consultants

No	*Name of Construction Work (CW)*	*Location*	*Scale*	*Type of CW*	*Grade of CW*	*Name of PO*	*Form of Participation*	*Work (Activity) to carry out*	*Value of the work*	*Commencement date*	*Completion date*

13. *List of typical construction works which are being implemented in each field (maximum three works in each field):*

13.1 Construction Contractors

No	*Name of Construction Work (CW)*	*Location*	*Scale*	*Type of CW*	*Grade of CW*	*Name of PO*	*Form of Participation*	*Work (Activity) to carry out*	*Value of the work*	*Commencement date*	*Planned Completion date*

13.2 Construction Consultants

No	*Name of Construction Work (CW)*	*Location*	*Scale*	*Type of CW*	*Grade of CW*	*Name of PO*	*Form of Participation*	*Work (Activity) to carry out*	*Value of the work*	*Commencement date*	*Planned Completion date*

14. Indicate the fields which are the entity's strong points:

15. Names of construction works which were awarded:

No.	Name of CW	Form of Award	Note

16. List the violations caused by consulting activities:

Entity, Individual commit that the above-mentioned information is true and take full accountability in case of variation.

OPINIONS OF DOC	NAME OF ENTITY
(Opinions, signatures, and stamp)	(Signature, stamp)

APPENDIX 2

ANNOUNCEMENT OF INFORMATION ON CAPACITIES OF ENTITIES/INDIVIDUALS IN CONSTRUCTION ACTIVITIES

1. Name of organization:

2. Address of headquarter:
   Telephone No. Fax No.
   Email: Website:

3. Address of representative office or branch office (if any):

4. Legal representative:
   - Full name:
   - Job title:

5. Decision of Establishment:
   No.: , date of issue , Agency signing the decision:

6. Business Registration Certificate:
   No.: , date of issue , Issuing Agency:

7. Fields of construction activities:

Field of activities / **Types of construction works**	**Verification on Basic Design**	**Verification on Technical Design**	**Appraisal on Technical Design**	**Verification on Detailed Design**
Buildings				
Industrial works				
Transport works				
Works of Agriculture and Rural Development				
Infrastructure works				

(Tick "✓" for the field of activities entities being involved in construction activities)

8. *Financial Figures:*
   (1) Charter capital,
   (2) Equity,
   (3) Turnover in each field and total,
   (4) Profit after enterprise income tax,
   (5) Enterprise income tax

9. Number of officials of the entity (only who engage in paying social insurance):…….persons
   Of which:
   + Those that have post-graduate education:
   + Those that have university education:

10. Number of specialized officials: …..persons

No	**Field of activities**	**Class 1**	**Class 2**	**Qualification no.**	**Issuing agency**	**Date of issuance**
1	Survey Manager					
2	Construction Design Manager					
3	Construction Design Subject Manager					
4	Manager of Design Verification					
5	Architect					
6	Engineer					

(Tick "✓" on Class 1 or Class 2)

11. Is quality management system available? ☐ Yes ☐ No
    - ISO No.
    - Certifying Agency:

12. *List of typical construction works which have completed (maximum three works in each field)*

No	***Name of Construction Work (CW)***	***Location***	***Scale***	***Type of CW***	***Grade of CW***	***Name of PO***	***Form of Participation***	***Work (Activity) to carry out***	***Value of the work***	***Commencement date***	***Completion date***

13. *List of typical on-going works (maximum three works in each field)*

No	*Name of Construction Work (CW)*	*Location*	*Scale*	*Type of CW*	*Grade of CW*	*Name of PO*	*Form of Participation*	*Work (Activity) to carry out*	*Value of the work*	*Commencement date*	*Planned Completion date*

14. Indicate the fields which are the entity's strong points:

15. Names of construction works which were awarded:

No.	Name of CW	Form of Award	Note

16. List the violations caused by consulting activities:

Entity, Individual commit that the above-mentioned information is true and take full accountability in case of variation.

OPINIONS OF DOC
(Opinions, signatures, and stamp)

NAME OF ENTITY
(Signature, stamp)

MOC is currently revising the construction law, which is targeted to approve in the assembly in year 2014 and the circular for registration system might be modified to fit with the revision of construction law. In addition, construction package database and contractor work performance evaluation system would be incorporated in the revised law.

7.3 DEVELOPMENT OF CONSTRUCTION CONSULTANT REGISTRATION SYSTEM

7.3.1 Objectives

The objectives for the construction consultant registration system are stated in **Section 7.2.1** together with those for the construction contractor registration and the construction package database system.

7.3.2 Overseas Practices

Case studies for improvement of construction consultant registration system were carried out by reviewing similar system in Japan and Singapore.

(1) Registration System in Japan

1) Criteria for Registration of Construction Consultants

- Consultant shall have a registered professional in each field of operation.*
- Consultant shall have capital 5 million yen and net worth 10 million yen as minimum.

* There are 21 fields of operation for consultant, such as 1) river, coastal & ocean engineering, 2) port, harbor & airport engineering, 3) electric power civil engineering, 4) road engineering, 5) railway engineering, 6) water supply & industrial water supply, 7) sewerage, 8) irrigation drainage& rural engineering, 9) forest civil engineering, 10) fisheries civil engineering, 11) waste management, 12) landscape engineering, 13) urban & regional planning, 14) geology, 15) soil mechanics & foundation, 16) materials & structure, 17) tunnel engineering, 18) construction planning, management & cost estimates, 19) environmental assessment &management for construction, 20) mechanical engineering, 21) electrical & electronics engineering.

2) Items to Submit for Registration

(a) Applicant profile: name, address, representatives etc.

(b) Business registration certificate

(c) Field of operation: to be selected from 21 fields* in the above

(d) Engineering managers: to be nominated in each field of operation with professional qualification

(e) Track records: 5 works in each field of operation in recent 3 years

(f) Yearly turnover: figures in each field of operation in recent 3 years

(g) Number of staff: number in each field of operation, classifying several qualification

(h) CVs of representatives of applicant

(i) Financial statement of most recent year

(j) Commitment

3) Application Procedure

(a) Applicant shall obtain application forms (18 pages) and after fill up, submit them together with back-up data to the Ministry of Land, Infrastructure, Transport and Tourism (MLIT).

(b) Application shall be reviewed and registered in registration within 90 days, which is managed and maintained in MLIT, if provided information is in order.

4) Consultant Duty after Register

(a) Consultant shall submit current status (similar items in application forms) every year within 4 months after fiscal year.

(b) Information in registration shall be updated time to time, when certain items are changed.

(c) Information in registration shall be renewed after 5 years from registration or renewal.

5) Other Important Matters

(a) Registration is not compulsory for consultants.

(b) MLIT manages and maintains registration data after those are submitted and registered.

(c) Central and local governments are allowed to request information of registered consultants, when selecting consultant.

(d) When there is false information and/or missing information for important items in application forms and supporting documents for Consultant Registration submitted by consultant, such consultant shall not be accepted for registration.

Appendix_7-1-5 provides more information of Consultant Registration System in Japan.

(2) Registration System in Singapore

1) Function & Scope of Public Sector Panels of Consultants (PSPC)

(a) Registration is for public sector procurement only.

(b) Five major disciplines in PSPC are as follows.

- Architectural (Arch) Consultancy 4 panels
- Civil & Structural (C&S) Engineering Consultancy 4 panels
- Mechanical & Electrical (M&E) Engineering Consultancy 4 panels
- Quantity Surveying (QS) Consultancy 4 panels
- Project Management (PM) Consultancy 2 panels

* Site Investigation Works are categorized in Construction Contractors as CR 15.

2) Application Details

- Procedure: to download application forms (13 pages) completely from website (www.bca.gov.sg), fill in and submit them
- Project performance assessment: to submit from clients of projects applicant undertook
- Processing time: 2 weeks after receipt from applicant
- Outcome: Result is notified and published in website (name only), if successful.

3) Registration Requirements

(a) Track Record and Performance;

- Track records in last five years with a Certificate of Statutory Completion (CSC) and performance assessment from clients
- Requirements for panels to be met (refer to **Table 7.3.1** below)

(b) Personnel Resources;

- Full time personnel resources
- Requirements for panels to be met (refer to **Table 7.3.1** below)

(c) Registration to Account & Corporate Regulatory Authority (ACRA)

(d) Additional Requirements:

- ISO certificate, professional indemnity insurance and training requirement for certain panels

4) Conditions of Listing

(a) The Building and Construction Authority (BCA) under the Ministry of National Development (MND) shall process applications.

(b) Validity: up to March 31 of each year

(c) Criteria of each panel for participating project size

(d) Applicant shall submit declaration at application, including sentence "…false declaration or false information is a serious offence and may also result in penalties to my firm including the suspension of my firm from participating in public sector tenders". BCA may take the courses of action to false declaration or information, such as (a) lowering the eligibility of firm from the current panel listed and (b) de-listing from the Public Sector Panels of Consultants.

Table 7.3.1 Listing Requirements for PSPC (1)

S$: Singapore Dollar, m: million

Panel	Architectural Consultancy		C&S Engineering Consultancy		Track Record (common)
Company for 1-4	Company to be licensed with Board of Architect.		Company to be licensed with Professional Engineers Board		
Other criteria	Personnel	Others	Personnel	Others	
1	• 4 registered professionals • 2 staffs attending training	• Professional indemnity insurance • ISO 9001/14001	• 4 registered professionals • 1 staff attending training	• Professional indemnity insurance • ISO 9001/14001	• S$ 15m / 5 years
2	• 3 registered professionals • 2 staff attending training	• ISO 9001	• 3 registered professionals • 1 staff attending training	• ISO 9001	• S$ 5m / 5 years
3	• 2 registered professionals • 1 staff attending training		• 2 registered professionals • 1 staff attending training		• S$ 1.5m / 5 years
4	• 1 registered professional • 1 professional		• 1 registered professional • 1 professional		

Listing Requirements for PSPC (2)

Panel	M&E Engineering Consultancy		Quantity Surveying Consultancy		Track Record (common)
Company for 1-4	Company to be licensed with Professional Engineers Board		-		
Other criteria	Personnel	Others	Personnel	Others	
1	• 4 registered professionals • 1 staff attending training	• professional indemnity insurance • ISO 9001/14001	• 4 degrees, 1 of which completed project above S$15m	• ISO 9001/14001	• S$ 15m • / 5 years
2	• 3 registered professionals • 1 staff attending training	• ISO 9001	• 3 degrees, 1 of which completed project above S$5m	• ISO 9001	• S$ 5m • / 5 years
3	• 2 registered professionals		• 2 degrees. 1 of which completed project above S$1.5m		• S$ 1.5m • / 5 years
4	• 1 registered professional • 1 professional		• 1 degree • 1 diploma		

Listing Requirements for PSPC (3)

Panel	Project Management Consultancy		Track Record
	Personnel	Others	
1	• 4 degrees, 1 of which completed project above S$50m	• ISO 9001/14001	• 3 projects (each more than 8m) / 5 years
2	• 3 degrees, 1 of which completed project above S$3m		

Tendering limit in each PSPC and panel is shown below.

Table 7.3.2 Tendering Limit

S$: Singapore Dollar, m: million

Panel	ARCH	C&S	M&E	QS	PM
1	• S$ 10 – 65million project				• any value
2	• S$ 3 – 10million project				• up to S$ 10million project
3	• up to S$ 10million project				
4	• up to S$ 3million project				
special	• more than S$ 65million project, depending on particular requirement				

Appendix_7-1-6 provides more information of Consultant Registration System in Singapore.

7.3.3 Current Status in Vietnam

(1) Registration System

(1) There are two systems for construction consultant registration currently implemented in Vietnam,

- One is the system for field of design, project management, formulation of FS, survey and supervision by CAMD based on Decision 02 of 2008.
- The other is the system for field of inspection, assessment and certification of force-bearing safety conditions & quality standard conformity of construction works by the State Authority of Construction Quality Inspection (SACQI) based on Circular 03 of 2011.

(2) CAMD system is not compulsory for consultants and as a result only about 60 companies have registered the system as of October 2010.

(3) SACQI system is also not compulsory and about 40 companies have submitted their application as of November 2011.

(4) There are stipulations in Article 36 of Decree 12 & 83 in regard to field of consultant works;

- Formulation and evaluation of project: feasibility study : within CAMD system
- Management of project: project management : within CAMD system
- Construction planning design: planning : within CAMD system
- Construction design: designing : within CAMD system
- Construction survey : within CAMD system
- Construction supervision : within CAMD system
- Specialized construction testing : within SACQI system
- Quality inspection : within SACQI system
- Certification of force-bearing safety : within SACQI system
- Certification of quality conformity : within SACQI system

(5) There are stipulations for qualification of individuals and companies in Decree 12;

[Individual]

- Architect : Article 38
- Engineer : Article 39
- Supervision : Article 40
- Project formulation manager : Article 41
- Construction survey manager : Article 45
- Construction design manager : Article 47 & 48

[Company]

- Project formulation consultant : Article 42
- Project management consultant : Article 43 & 44
- Construction survey consultant : Article 46
- Construction design consultant : Article 49 & 50
- Construction supervision consultant : Article 51

In order to understand differences between two systems, the comparison of data requirements in CAMD and SACQI system is shown in **Table 7.3.3**.

Table 7.3.3 Comparison of Data Requirements in CAMD and SACQI System

Decision 02: Consultant Registration System in CAMD (design, PM, FS, survey, supervision)			**Circular 03: Consultant Registration System in SACQI(inspection, assessment & certification)**		
1	Name of company		1	Name of company	
2	Address, contact & website		2	Address, contact & website	
3	Representative office		3	Representative office	
4	Decision of establishment		4	Decision of establishment	
5	Business registration certificate		5	Business registration certificate	
			6	Type of enterprise	Limited liability / share holdings / partnership /

Decision 02: Consultant Registration System in CAMD (design, PM, FS, survey, supervision)			Circular 03: Consultant Registration System in SACQI(inspection, assessment & certification)		
					private enterprise / joint venture / others
6	Field of operation (to be selected)	Design / PM / FS / survey / supervision / others	7	Field of operation (to be selected)	Inspection / certification / assessment / others
				Type of construction works (to be selected)	Building / industrial / transport / irrigation / infrastructure
7	Financial figures (three years)	a) charter capital b) turnover c) profit			
8	Number of staff	a) post university b) university c) college d) managing level	8	Number of staff	a) university b) qualification certificate c) managing level
9	Quality management system		9	Quality management system	
			10	Laboratory for inspection	a) code b) decision c) list of testing
10	Typical works (three years)	Three works in each field selected (work name / scope / location / investor)	11	Typical works (three years) for inspection, certification & assessment	a) work name b) location c) type / grade d) scope
11	Ongoing works				
12	Strong field (to be selected)	Design / PM/ FS / survey / supervision / others			
13	Prize-won works				
14	Name of registration	Position / contact		Commitment	Company representative

Based on the above comparison and consideration on general consultant works, Construction Consultant Registration System has been prepared with some improvements of CAMD system and reference to SACQI system.

(2) Problem Identification

The problems identified in the survey for both contractor and consultant registration system are shown in **Section 7.2.3**.

7.3.4 Comparison between Three Systems

Consultant registration systems in Vietnam, Japan and Singapore are compared in **Table 7.3.4.**

Table 7.3.4 Comparison of Consultant Registration System

Items		Vietnam (decision 02)	Japan	Singapore
System				
a	Registration	Voluntary	Voluntary	Compulsory for public works
b	Administration	CAMD of MOC	Regional Bureau of MLIT	BCA under MND
c	Validity	Not specified	5 years	March 31 of every year
d	Ranks	-	-	4 or 2 ranks
Items to provide				
1	Name of company	Required	Required	Required
2	Address, contact & website	Required	Required	Required
3	Representative office	Required	Required	Required
4	Decision of establishment	Required	-	-
5	Business registration certificate	DPI certificate	Business permit	ACRA number
5'	Type of enterprise	(required in system under circular 3)	Required	Required
6	Field of operation (to be selected)	5 fields (design / PM / FS / survey / SV)	21 fields (kind of works: refer to Japan system)	4 disciplines (Arch / C&S / M&E / QS / PM) (*submit individually)*
6'	Type of construction works	(required in system under circular 3)	-	-
7	Financial figures	Required	Required together with financial statement	Turn-over only in each field
8	Number of staff	a) education b) manager	a) education b) manager c) qualification (copy of qualifications)	a) education b) qualification (copy of qualification) c) training course
8'	Manager for engineering	-	Manager to be nominated in each fields	-
9	Quality management system	Own system	-	ISO 9001 / 14001 in higher rank
9'		ISO certificate required in system under circular 3)		
10	Typical works	Three works in each field in three / ten years	Total turn-over in each field in recent three years	Required together with "completion certificate" & "client's assessment"
11	Ongoing works	Required	-	-
12	Strong field (to be selected)	5 fields (design / PM / FS / survey / SV)	-	-
13	Prize-won works	Required	-	-
14	Name of registration	Required (commitment required in system under circular 3)	Required with commitment	Required with commitment

7.3.5 Improvement of Registration System

Based on the case studies and comparison among the current system in Vietnam, Japan and Singapore, the following **Table 7.3.5** is prepared, showing recommended ideas of the new consultant registration system in Vietnam. The basic concepts of improvement are similar to those applied to the construction contractor registration system stated in **Section7.2.5**.

Table 7.3.5 Recommendations of Registration System

Items		Contents	Remarks
System			
a	Registration	Compulsory	
b	Administration	CAMD of MOC	Same as contractor registration
c	Validity	1 year	
d	Ranks	-	*To introduce later*
Items to provide			
1	Name of company	Required	
2	Address, contact & website	Required	
3	Representative office	Required	
4	Decision of establishment	Required	
5	Business registration certificate	DPI Certificate	Copy of latest certificate to be submitted
6	Investment certificate	Required	Copy of latest certificate to be submitted
7	Type of company (to be selected)	Limited liability / share holdings / partnership / private enterprise / joint venture / others	
8	Field of operation (to be selected)	Planning / FS / PM / survey / design / design verification / SV / inspection / certification / assessment	
	Type of construction works (to be selected)	building / industry / urban infrastructure / transport / agriculture & rural development	
9	Financial figures	a. Paid-up capital b. Equity c. Turnover d. Profit after income tax e. Enterprise income tax	Financial statement to be submitted Certificate of tax payment to be submitted
10	Staff information	Number (total, management, university decree etc.) Number of Professional[*1] staff	
11	Manager[*2] for engineering	Number of each manager	Copy of certificate of qualifications to be submitted
12	Quality management system	Own system / ISOs	Copy of certificate to be submitted
13	Typical works	Three works in each field	Contract agreement and final acceptance to be submitted
14	Ongoing works	Three works in each field	Contract agreement to be

Items		Contents	Remarks
			submitted
15	Prize-won works		
16	Others		Free statement
17	Name proving information		
18	Commitment		Commitment letter to be submitted

**1: architect (article 38), engineer (ditto 39), supervisor (ditto 40), project manager and cost estimator set in decree 12.*

**2: FS manager (article 41), survey manager (ditto 45) and design manager (ditto 47/48) in decree 12.*

Recommendations of improvement on current CAMD system are shown below.

- Submitted data from consultants shall be verified by themselves with additional information, details of which are shown in the table above.
- Database for qualifications (architect, engineer, supervisors etc.) and violation in construction activities will be useful tools for the system and shall be regularly updated and maintained.
- Database for construction packages will be proposed by the Project, which shall also be useful for the system.

The followings are the functional and database requirements recommended for the system.

(1) Functional Requirements

(a) Consultants shall register company information in accordance with items below, if those intend to tender for construction works.

(b) Company information consists of three data, such as [company basic data], [financial data] and [technical data], some of which shall be verified with back-up data to be submitted.

(c) Company information shall be renewed, when any changes in its management status, contact or any other pertinent particulars occur or when one year passes after registered / renewed.

(d) System shall be accessible only from limited organizations (project owners/employers in public and private works), whereas registered company names are seen in website.

(e) If information provided by construction consultant for registration is found false at later stage, such consultant may result to de-listing from the registration system.

(2) Database Requirements

a. Financial Data

- Financial statement (possibly audited one) shall be submitted.
- Important figures are 1) paid-up capital, 2) equity, 3) turnover in each operation field, 4) profit after income tax and 5) enterprise income tax with certificate of tax payment.
- The above figures will be criteria for consultant classification.

b. Professional manager list

- The following items shall be included; 1) name, 2) ID, 3) university, 4) professional details, 5) works experiences (three works) and 6) years of experiences.
- Format of Manager List is shown in **Table 7.3.6** below.
- Copy of certificate shall be enclosed.
- Number of qualified staff will be criteria for consultant classification.

c. Typical Works in Three Years

- The following items shall be included; 1) package name; 2) location; 3) project name; 4) project category, 5) work type, 6)work grade,7) JV details,8) contract amount,9) dates of commencement & completion and10) project owner name.
- Copy of contract agreement and final acceptance shall be enclosed for verifying dates of commencement and completion.
- Format of List of Completed Works is shown in **Table 7.3.6** above.
- The amount of works will be criteria for consultant classification.

d. Ongoing Works

- The following items shall be included; 1) package name; 2) location; 3) project name; 4) project category, 5) work type, 6) work grade,7) JV details,8) contract amount,9) dates of commencement & completion and 10) project owner name.
- Copy of contract agreement shall be enclosed for verifying dates of commencement and completion.
- Format of List of Ongoing Works is similar to List of Completed Works.

***Appendix_7-1-3**: Draft Circular for Construction Contractor and Consultant Registration System

***Appendix_7-1-7**: Note &Format for Construction Consultant Registration System

7.3.6 MOC Proposal for Registration System in Vietnam

As stated in **Section 7.2.6** , MOC has prepared the draft circular on Publicized Management of Information on Capacities of Entities, Individuals Operating in Construction Sector for construction consultant as well.

Table 7.3.6 Format of Professional Manager List and List of Completed Works for Consultant Registration System

(Construction Consultant Name to insert) : **MANAGER LIST**

no	name	ID number	university	discipline	professional qualification	domain (Circular 12/TT-BXD)	certificate no.	work experience (three works)			years of work experience	remarks
								work name (1)	work name (2)	work name (3)		
[Feasibility study]												
1	Mr. A	12345678x	x university	engineer	PM		D.001/QLDA				A years	
2	Ms B	23456789y	y university	architect	architect	*architectural design*	*KTS-xx-0000x*				B years	
[Project management]												
1												
2												

(Construction Consultant Name to insert) : **LIST OF COMPLTED WORKS**

no	Package name	Location (province)	Project name	Project category	Work type	Work grade	JV details with shares	Contract amount (shared amount)	Commencement date	Completion date	Project owner name	Remarks
[Planning]												
1												
2												
3												
[Feasibility study]												
1												
2												
3												
[Project management]												
1												
2												
3												

7.4 DEVELOPMENT OF CONSTRUCTION PACKAGE DATABASE SYSTEM

7.4.1 Objectives

The objectives for the construction package database system are stated in **Section 7.2.1** together with those for the construction contractor and consultant registration system.

7.4.2 Overseas Practices

In order to formulate construction package database system, case studies were carried out by reviewing similar system in Japan and Singapore.

(1) Construction Package Database System in Japan

There are two systems, which are (1) Construction Records Information System (CORINS) and (2) Technical Consulting Records Information System (TECRIS) in Japan. These are managed and maintained by the Japan Construction Information Center (JACIC) authorized by MLIT.

1) CORINS:

- Construction records of the public works were started to provide in March 1994 for those contracts more than 50 million yen.
- Record collection was extended to the contract amount more than 25 million yen after 1997 and further extended to the contract amount more than 5 million yen after 2002.
- Retrieval system of construction engineer career for individual engineers has been operated since August 2005.
- As of March 2010, 131,000 contractors provide information and 3,188,000 packages are in database.
- Nine hundred twenty three (923) public organizations use the CORINS as of March 2010.

2) TECRIS:

- Research and design works in civil engineering field were started to provide in 1995 for those contracts more than 5 million yen.
- Technical consulting works and geographical survey works were added in 1993 and 1996 respectively.
- Record collection was extended to the contract amount more than 1 million yen from February 2008.

- As of March 2010, 10,000 consultant firms provide information and 940,000 service works are in database.
- Four hundred twenty four (424) public organizations use the TECRIS as of March 2010.

Figure 7.4.1 shows schematic diagram of CORINS and TECRIS in delivering information.

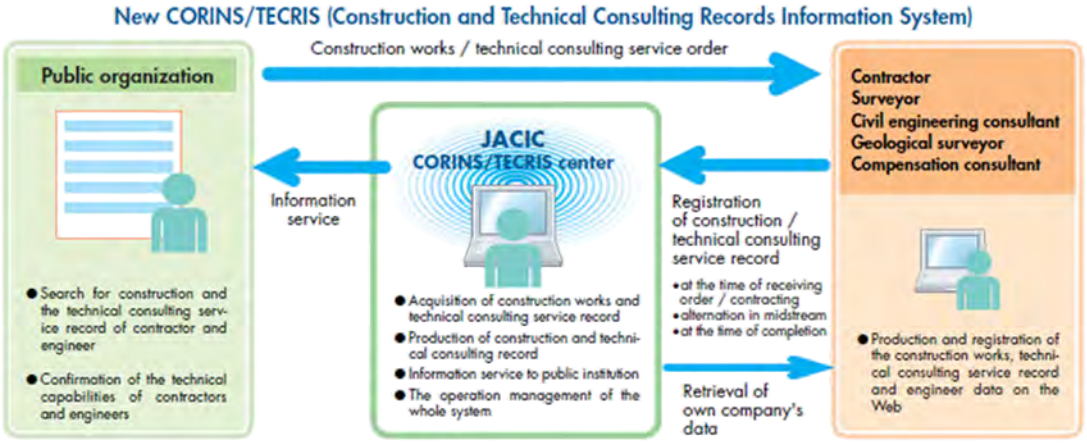


Figure 7.4.1 Construction and Technical Consulting Records Information System

Appendix_7-1-8 provides Brochure of JACIC, including Construction Package Database System in Japan.

(2) Construction Package Data in Singapore

- Tendering section in each project owner keeps general information on construction package, when contract is tendered and awarded.
- Project owners have detail information on construction packages, when awarded and probably when complete.
- Contents of information may vary package by package, so that those are difficult to compare.

7.4.3 Current Status in Vietnam

- Public Procurement Agency in MPI keeps general information on construction package, when contract is tendered and awarded.
- Project owners have detail information on construction packages, when awarded and probably when complete. The detail information may be delivered to their managements (decision makers) and state authorities, depending on project owners.
- Contents of information may vary package by package, so that those are difficult to compare.

7.4.4 System Development for Construction Package Database

Based on the studies on the foreign practices and current status in Vietnam, new Construction Package Database System was developed. The followings are the functional and database requirements recommended for the system;

(1) Functional Requirements

- Project owner /employer shall submit construction package information in accordance with items below.
- Package information consists of two data, [basic data] and [technical data], some of which shall be verified with back-up data to be submitted.
- Package information shall be provided by contractor or by all contractors (in case of joint venture) to project owner /employer, and then reviewed, supplemented and submitted by them, within one month after award.
- Package information shall be updated and provided by contractor or by all contractors (in case of joint venture), to project owner /employer, and then reviewed, supplemented and submitted by them, when contents in the database change substantially.
- Package information shall be finally revised, confirmed and provided by contractor or all contractors (in case of joint venture) to project owner /employer, and then reviewed, supplemented and submitted by them, when project is over.
- Database shall be accessible only from limited organizations (project owner/employer in public and private works), whereas construction package names are seen in website.

(2) Database Requirements

- Basic data consists of the followings; 1) construction package name, 2) type of construction work, 3) grade of construction work, 4) category of project, 5) location, 6) investor / employer, 7) design company; 8) supervision company,9)construction contractor including JV details, and 10) contract brief.
- Technical data consists of the followings; 1) features of construction package, 2) scope of construction package, 3) special features of construction package, 4) quantity of major works, 5) staff of contractors (assignment schedule to be enclosed), 6) subcontractors 7) contract amount (details to be enclosed), 8) detail schedule, 9) detail of land acquisition and 10) result of performance evaluation at completion, if any.
- Back-up data such as certificate of qualification for assigned staff, contract agreement and schedule shall be enclosed for verification.

***Appendix_7-1-9**: Draft Circular for Construction Package Database System

***Appendix_7-1-10**: Note & Format for Construction Package Database System

7.5 OPERATION AND ROADMAPS FOR CONSTRUCTION COMPANY REGISTRATION SYSTEM AND CONSTRUCTION PACKAGE DATABASE SYSTEM

(1) Operation Issues

In regard to operation issues for the systems, the Project recommends the followings, to which MOC proposes different ones in some extents, shown in **Table 7.5.1**. Further and detail discussion on the issues shall be made in MOC.

Table 7.5.1 Operation Issues

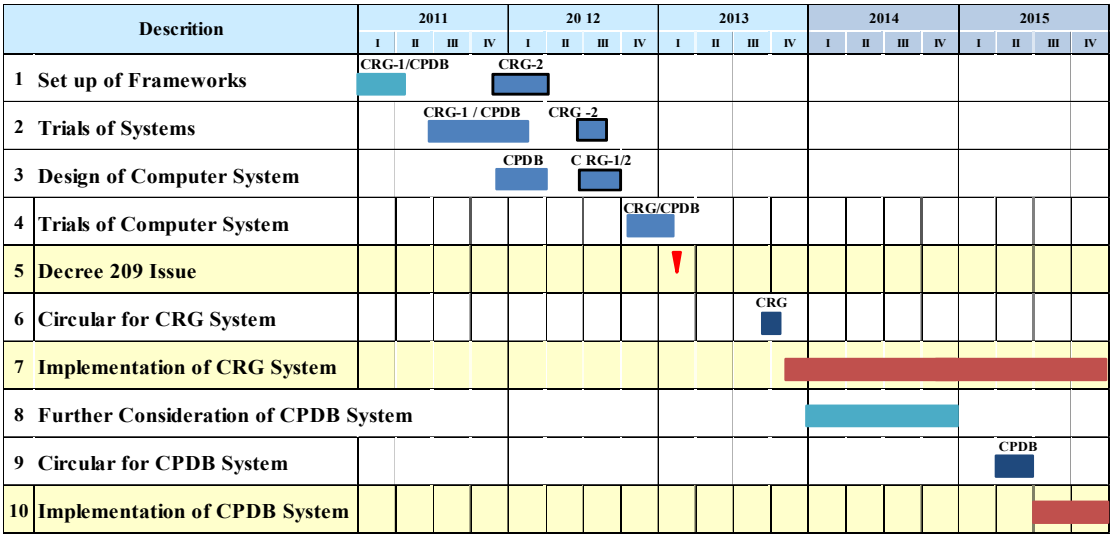
Issues		Project Recommendations	MOC Proposal
1	Verification of submitted data	Back-up data shall be submitted for important items, such as financial statement, professional qualification, contract agreement and final acceptance.	Submission of back-up data is under consideration.
2	Dissemination of systems	Seminars and workshops to stakeholders shall be held prior to implementation.	Similar to recommendation.
3	Application of systems	All public works are to be applied.	Similar to recommendation
4	Management organization	1) CAMD of MOC 2) DOC of PPC 3) Others In case of 2) or 3), overall responsibility shall still remain to CAMD and training to them shall be arranged in advance.	CAMD together with DOC of PPC shall manage the system.
5	Data in website	Only limited information shall be in website. Project owners only can access to all data, which is practice in Japan and Singapore.	All information shall be in website.
6	Fee for application	Fee for registration and construction package database system shall be paid by applicants for maintaining whole systems.	Fee collection is under consideration.

(2) Roadmaps

In accordance with the new Decree 15, there is an article for construction company registration (CRG) system and no stipulation for construction package database (CPDB) system. MOC is currently revising the construction law and CPDB is maybe specified in the new law. Assuming CPDB is incorporated in the law, future roadmap is drawn for both systems and shown in **Table 7.5.2** below.

The map indicates that construction company registration system will be implemented at the end of year 2013 and construction package database system will be in year 2015.

Table 7.5.2 Roadmap for Registration System and Construction Package Database System



7.6 DEVELOPMENT OF CONTRACTOR WORK PERFORMANCE EVALUATION SYSTEM

The contractor performance evaluation system for Vietnam was developed by studying overseas practice and the proposed framework. The following sections describe overseas practices and developed idea for the evaluation system to be applied in Vietnam.

7.6.1 Overseas Practice

In Vietnam, contactor performance has never been evaluated and evaluation result has never been reflected to PQ examination. Therefore, at first, oversea practices such as Japan, Hong Kong, Malaysia, and Singapore were introduced in order to show MOC what contractor work performance evaluation is, which helps MOC understand the contractor performance evaluation system.

(1) Example of Japan

1) Purpose

The one main purpose of contractor performance evaluation in Japan is to select proper contractors matching scale and types of construction packages at PQ examination. In order to select proper contractors, project owners evaluate contractors in terms of work performance in addition to managerial factors. Also, there is the other purpose that contractors' awareness towards quality enhancement is raised by reflecting work performance evaluation to PQ examination for next bidding. To appropriately execute that, the government (MLIT) enforced the law and guideline related with work performance evaluation system.

2) Evaluation Procedure

Work performance evaluation in Japan is conducted in line with the following procedures.

- Project owners designate three evaluators.
- Project owners hold the evaluation meeting with the evaluators and contractor at the end of construction work.
- The evaluators conduct evaluation in line with "Guideline for Performance Evaluation of Construction Work".
- Contractor's work performance is preserved in the construction package database system with relevant information regarding the package.
- Contractor's work performance can be referred in the procedure of next bidding to select contractors, coupled with other factors such as financial data (capital, annual turnover and profit) and managerial data (the number of engineer, contractor experience, and experience of site manager).

3) Evaluation Indexes

The work performance is mainly evaluated in terms of the eight categories with detailed criteria, by checking documents and completed work sites (see **Table 7.6.1**). The main categories to be evaluated consist of organization with manpower, management with schedule and safety, and quality with parameter, material, and appearance. The auxiliary categories consist of technical capability, originality, social responsibility, failure to conforming laws and regulation, and incentive points for value engineering. Thanks to detailed criteria, the checking points have become clear and this fact has facilitated any evaluator to evaluate the construction works appropriately and uniformly. Also, since project owners have unique criteria and weighted points, they can arrange the original score distribution of detailed criteria to match project owner's point of view and the character of construction sites.

Appendix_7-2-1 to **7-2-4** provides the Japanese evaluation sheet, which shows further detail of evaluation indexes.

4) Rating of Contractor's Work Performance

Principally, five-grade rating with scoring method is used, where the ration of how many detailed criteria the construction works meet decide the score. For example, if the construction works meet over 80% or more of the detailed categories in one subcategory; this subcategory is evaluated as grade 'a' which means maximum points are awarded. These detail criteria are evaluated by evaluators' check about the contract document, specification, design drawings and the completed construction site.

By using the scoring method, one can quantitatively measure the contractor work performance evaluation and can match easily grades or types of construction works with contractor's capability.

Table 7.6.1 Example of Evaluation Index and Score in Japan

No	Category	Assistant Manager	Chief Manager	Inspection Manager
1	Organization	+4.5	-	-
2	Management	+6.5	+25	+5
3	Quality	+4	-	+30
4	Technical Capability	+13	-	-
5	Originality	+7	-	-
6	Social Responsibility	-	+10	-
7	Failure to conform to laws and regulations	-	0 ～ (-20)	-
8	Incentive points for value engineering	-	-	-
	Basic score	+65	+65	+65
	Maximum score	100	100	100

5) Evaluators

The project owner shall select three evaluators from project owner's side and independent department. One engineer, inspection manager, shall be selected from the independent department to ensure fairness and transparency of evaluation. 2 engineers, chief supervisor and assistant supervisor who directly get involved in the construction works shall be selected from the construction office to evaluate daily work status. Also evaluators don't need to get specific qualifications and are selected in terms of knowledge and experiences.

Table 7.6.2 shows the outline of evaluators in Japan.

Table 7.6.2 Outline of Evaluators in Japan

No	Evaluator	Dep.	Org	Role	Qualification
1	Chief supervisor	Construction Office in charge of construction site	Project Owner	Evaluate the work from daily supervision	In-house engineer No qualification
2	Assistant supervisor				
3	Inspection Manager	Quality Control Team Independent from construction site		Evaluate the work from the third party's standpoint Ensure fairness and transparency	

6) Packages to be Evaluated

"The Guideline for Performance Evaluation of Contracted Work" was issued by MLIT on March 30th, 2001 has explained that Project owners shall principally evaluate construction packages of more than 5 million yen (approximately US$ 50 thousand) and give the calculated evaluation score to the contractor.

Appendix_7-2-5 provides this Guideline for Performance Evaluation of Contracted Work.

7) Management of Evaluation Data

The left side of the following flow (see **Figure 7.6.1**) shows the process from bidding notice to final inspection and the right side show the flow of the database systems related to bidding procedure. Work performance is evaluated at the final inspection and this evaluation result is preserved by the project owner for PQ examination of bidding. At the same time, the contractor registers the evaluation result with other project information on "Construction Package Database System" which has been managed by the third party organization called "Japan Construction Information Center" (JACIC).

As for construction company information, construction companies submit the company information to project owners. Project owners shall preserve the company information by themselves.

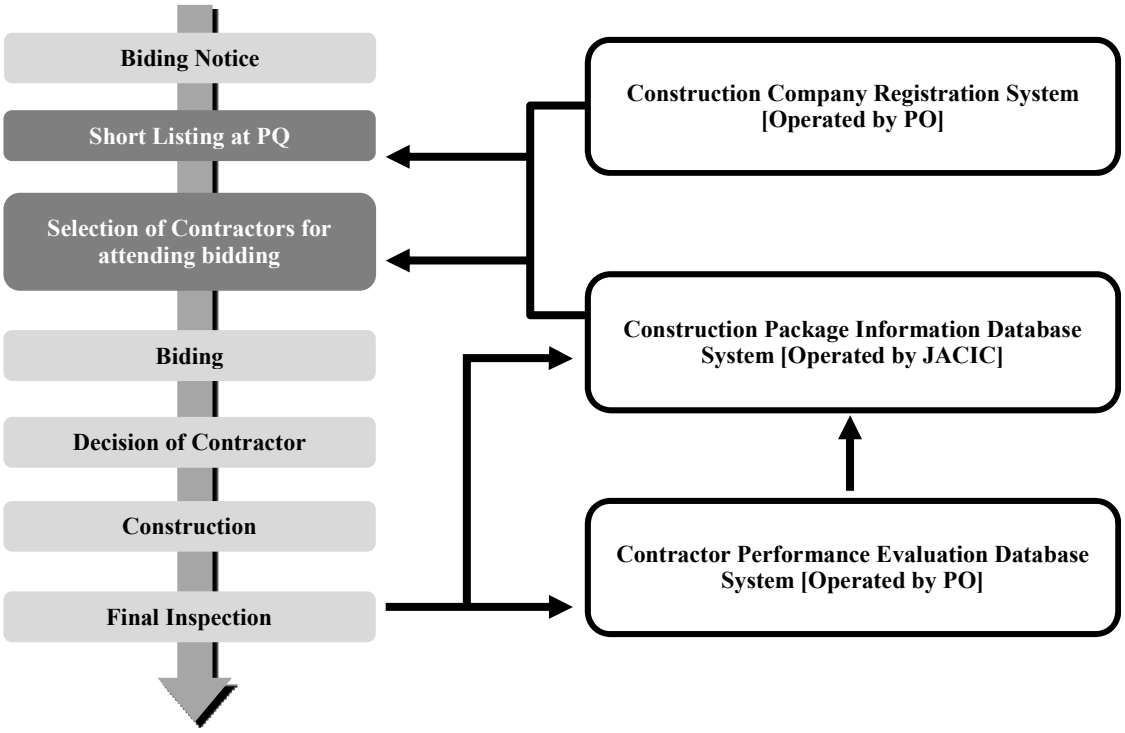


Figure 7.6.1 Interrelation between Bidding Process and Systems

8) Data Utilization

The data on construction package information with evaluation data are used as well as construction company information by each project owner, in order to grasp the contractor's capability and make the shortlist of applicants for PQ examination.

9) Relative Law

MLIT have organized the law and guideline concerned with the contractor performance evaluation system and applied it to the construction packages nationwide.

Appendix_7-2-6 to **7-2-8** provides the construction act, the action plan, and the guideline issued by MLIT.

a. Japanese Construction Business Act (issued on May, 2, 2008) specifies;

- Contractors must be examined on managerial criteria when they directly intend to make a contract with public corporation.
- Contractors must apply for examination of managerial factors to the relevant ministry-designated authorities.
- Managerial factors must be examined by the relevant ministry- designated authorities.
- The relevant ministry- designated authorities must inform companies of the examination results.
- The results are available to apply for public works bid.

b. The Action Plan on Reform of Bidding and Contracting Procedures for Public Works (approved by the Cabinet on January 18, 1994) specifies;

- Selecting trustworthy companies are essential through objective procedures to secure high quality and efficient public works and increase the benefit for tax payers.
- Project owners shall use the results of managerial factor evaluation conducted in line with the Construction Business Act, which ensures that all tenderers for public works are evaluated objectively in terms of their business conditions.
- Technical conditions including past performance of similar works and experienced and fully qualified engineers are set up at each organization to determine if companies have an ability to implement contract of works,

c. Guideline for Performance Evaluation of Contracted Work (issued on March, 30, 2001) specifies;

- Evaluation shall be conducted for packages with the contract price of 5 million yen or over.

- Evaluation shall be conducted in terms of performance (status of construction, quality of finished work) and technical level (technical difficulties such as requirements for particular types of structures, technical characteristics)
- Each evaluator shall independently evaluate the supervisor, the inspection and other relevant factors for each construction works accurately and fairly.
- Evaluator shall conduct evaluation upon the completion of construction.

(2) Example of Hong Kong

1) Purpose

The purpose of work performance evaluation system in Hong Kong is to provide a ready indication of contractors' performance standard for reference by the project office and tender evaluation. To do that, the governmental organization, "Environment, Transport and Works Bureau" issued the circular on work performance evaluation system.

Appendix_7-2-9 provides the circular on work performance evaluation sheet in Hong Kong.

2) Evaluation Indexes

After construction work has been completed, the performance is evaluated in terms of the following eleven categories (**Table 7.6.3**). The heaviest score of 25 is put on site safety, but the score appears to be evenly distributed. It means that there is no classification between the main and auxiliary categories.

3) Rating of Contractor's Work Performance

Five-grade rating with scoring method is used, where evaluators judge the grades in each category. For example, if evaluators consider workmanship should fall on "good", the maximum sore of 15 multiplied by 0.75, which is 11.25, is awarded to the workmanship indexes (**Table 7.6.3**)

Also, [the sum of Contactor's Score/Sum of Maximum Score] *100 is recognized as the performance score of the evaluated package, and weighed average of the performance scores of all the reports during three years is recognized as contractor's performance rating.

Table 7.6.3 Evaluation Indexes in Hong Kong

No.	Asset of Performance	Maximum Score
1	Workmanship	15
2	Progress	15
3	Site Safety	25
4	Environmental Pollution Control	15

No.	Asset of Performance	Maximum Score
5	Organization	10
6	General Obligations	5
7	Industry Awareness	5
8	Resources	10
9	Design	10
10	Attendance to Emergency	10
11	Attitude to Claims	5
	Total	**125**

Table 7.6.4 Grade and Score

5-Grade of the respective item	Contractor's score
Very good	1.0 x maximum score
Good	0.75 x maximum score
Satisfactory	0.5 x maximum score
Poor	0.25 x maximum score
Very Poor	0

4) Relative Law

Environment, Transport and Works Bureau in the Government of the Hong Kong Special Administrative region issues "Technical Circular (Works) No.3/2007 (issued on 12 March 2007)" mainly specifies;

- Performance System is compulsory.
- The performance score of a contractor's performance report is determined by the percentage of the score attained by the contractors.
- Departments of Environment, Transport and Works Bureau shall be responsible for uploading all contractors' reports to the Contractor Management System (CMIS)

(3) Example of Malaysia

1) Purpose

The purpose of work performance evaluation in PLUS (Expressway Operation Company in Malaysia) is to select proper contractors at next tendering.

Appendix_7-2-10 provides the work performance evaluation indexes in PLUS.

2) Evaluation Procedure

Work performance evaluation is conducted according to the following procedure by PLUS.

- Project owners designate one evaluator.
- The evaluators conduct evaluation at the end of construction work.
- Contractor's work performance is scored based on the evaluation sheet.

3) Evaluation Indexes

The work performance is evaluated in terms of the following 7 categories, which are manpower with professional and general labor, machinery, work program, quality of work, management, response time and overall. However, the Project was not able to get the detailed information on how they evaluate performance and mark the scores.

4) Rating of Contractor's Work Performance

Five-grade rating with scoring method is used, where evaluators judge performance and decide the score. For example, if the management is extremely bad, 1 point will be awarded. If the performance far exceeds expectations, 5 points will be awarded.

5) Evaluators

One evaluator will be selected from the headquarters of the project owner side in charge of the construction works.

(4) Example of Singapore

1) Purpose

The purpose of work performance evaluation system in Singapore is to measure the quality level achieved in a completed package. To do that, the governmental organization, CONQUAS (The Construction Quality Assessment System) was designed by the Building and Construction Authority (BCA) in conjunction with major public sector and various leading industry professional bodies. CONQUAS has the following three objectives.

- To have a standard quality assessment system for construction packages.
- To make quality assessment objective by measuring constructed works against workmanship standards and specification and using a sampling approach to suitably represent the whole package.

- To enable quality assessment to be carried out systematically within reasonable cost and time.

Appendix_7-2-11 provides the work performance evaluation system, called "Quality Assessment System" which shows the further detail of evaluation indexes.

2) Evaluation Procedure

- The evaluator should select the actual locations to be evaluated prior to each evaluation. Selection of samples shall be based on drawings and location plans. The samples shall be distributed as uniformly as possible.
- The scoring will be done on the works that are inspected for the first time. Rectification and correction carried out after the evaluation will not be re-scored. The objective of this practice is to encourage contractors "doing things right the first time."
- When the evaluation items do not comply with the corresponding CONQUAS Standards, it is considered failed.

3) Evaluation Indexes

Evaluation components cover most general aspects of general building works. These consist of the following three parts.

- Structural works
- Architectural works
- Mechanical & Electrical (M&E) works

Each component is further divided into different items, and the evaluation indexes exclude works such as piling, heavy foundation and sub-structure works which are heavily equipment-based, buried, or covered and usually called under separate contracts or sub-contracts.

The building is assessed primarily on workmanship standards through inspection. The evaluation is done throughout the construction process for structural and M&E works and on the completed building for architectural works. Apart from site inspection, the evaluation also includes tests on the materials and the functional performance of selected services and installations.

4) Rating of Contractor's Work Performance

The weights are allocated for Structural, Architectural, and M&E works. The weight system, which is aimed at making CONQUAS score objective in representing the quality of a building, is a compromise between the cost proportions of the three components in the various

buildings and their aesthetic consideration. The scoring method with the sum of points awarded to each component of buildings is applied.

As it is impractical to assess all elements in a building, CONQUAS uses a sampling system for evaluation. The sampling system, which is based on the gross floor area of the building, will ensure that the evaluation adequately represents the entire building.

5) Evaluator

Evaluators from BCA undergo a rigorous training program. They are required to attend BCA's in-house CONQUAS training and calibration program to ensure competency and consistency in evaluation.

(5) Comparison between Each Country

Table 7.6.5 shows the comparison evaluation indexes only between Japan and Hong Kong, because the example of Singapore specializes in building works and also the Project did not get detailed information on the example of Malaysia. Among 14 categories used in Japan and Hong Kong, it was found that nine categories are used in both countries.

Table 7.6.5 Comparison List of Evaluation Indexes

No	Criteria	Japan	Hong Kong	Singapore
1	Quality	X	X	X
2	Progress	X	X	---
3	Site Safety	X	X	---
4	Environmental Pollution Control	X	X	---
5	Organization	X	X	---
6	General Obligations	X	X	---
7	Industry Awareness	---	X	---
8	Resources	X	X	---
9	Design	---	X	---
10	Attendance to Emergency	X	X	---
11	Attitude to Claims	X	X	---
12	Level of Technical Capability	X	---	---
13	Originality	X	---	---
14	Value Engineering	X	---	---

Table 7.6.6 shows the comparison among three countries, Japan, Hong Kong, and Singapore on essential items of the evaluation system. The most characteristic points are that the system

in Singapore is applied only for Building packages and not used for tender evaluation. This is because Japan and Hong Kong uses a variety of evaluation indexes compared to Singapore where they evaluate only quality. Since the system in Japan and Hong Kong have the purpose of selection of the contractor, these evaluation methods are more suitable for Vietnam where they have the same purpose.

Table 7.6.6 Comparison among Three Countries, Japan, Hong Kong, and Singapore

No	System Items	Japan	Hong Kong	Singapore
1	Organizer	PO	PO	PO
2	Entities to be evaluated	Contractor	Contractor	Contractor
3	Applied Project	Investment with Over 5 million yen ($60 thousand)	Construction	Building
4	Purpose	Selection of Contractor	Selection of Contractor	Benchmark of workmanship
5	Evaluators	PMU (Representative, Quality Control Dep.)	No information	BCA assessor
6	Timing of implementation	After completion of construction works	After completion of construction works	After completion of construction works
7	Evaluation index	Resource Management Quality	Resource Management Quality	Workmanship
8	Evaluation Technique	Scoring Method with 5 grades	Scoring Method with 5 grades	Scoring Method on each standard-based
9	Data Management	PO	ETWB (Gov. Bureau)	BCA (Gov. Authority)

7.6.2 System Development for Contractor Work Performance Evaluation in Vietnam

(1) MOC's Role

MOC shall officially establish contractor performance evaluation system to select the proper contractor. At the same time MOC shall officially arrange the appropriate bidding environment where appropriate information on construction companies and construction packages with evaluation results are provided to project owners. The effective systems shall be considered and established by MOC.

(2) Information Database System for PQ

Since there have been many construction companies and many construction packages, these information needs to be managed systematically and efficiently provided to the project owners. Therefore, MOC who has responsibility for construction works nationwide needs to establish the efficient information provision system. The Project agreed that the following

three information database systems shall be introduced nationwide, and managed by MOC. The outlines of these systems are as follows.

1) Construction Company Registration System (refer to Section 0 and 7.3)

Builds up database for information (financial and technical data) on construction companies

2) Construction Package Database System (refer to Section 7.4)

Builds up database for information (contract amount / term / package type) on completed construction packages

3) Contractor Performance Evaluation System

Build up database for information on work performance of construction package evaluated in terms of construction resource / management / quality

Here in this Activity 3.2, the Project is focusing on the Contractor Performance Evaluation System. Therefore, the following sections specialize on Contractor Performance Evaluation System.

(3) Contractor Performance Evaluation System

This system will build up the database for information on work performance of construction package which is evaluated in terms of contractor's abilities. Only if their works are accepted, the discrepancy among contractor's capability will not be measured and project owners cannot select the proper contractors and rank the contractors in the future. It is meaningful that project owners evaluate contractor's completed works.

(4) Purpose

If project owners apply work performance evaluation system, they are able to accomplish the following two primary purposes.

1) Select Capable Contractors at PQ examination

Selection of proper and capable contractors matching construction work scale and type enables contractors to work efficiently and construct the structure with better quality.

Although in current PQ examination of Vietnam, financial factors such as capital, turnover and profit and managerial factors such as the number of qualified engineers and the past experiences are evaluated to select contractors, these factors do not express contractors' practical construction capability. If project owners incorporate the data of contractor work performance evaluation into these previous data, more capable contractors will be selected at PQ examination.

2) Raise Contractors' Awareness to Quality Enhancement

Work performance evaluation encourages contractors to raise contractors' awareness towards quality enhancement, by improving their working activities in order to take advantage of PQ for next bidding. This fact makes contractors always conscious about evaluation indexes during daily construction procedure. As a result, they are expected to assign capable site managers and labor forces, reduce accidents, and keep structure in high quality.

(5) Advantage

For supervising authority (SA) and project owners, the following advantages are expected to be produced by contractor performance evaluation system.

- Evaluation system facilitates project owners to select contractors at PQ examination, leading saving.
- Selecting the capable contractors causes higher structure quality and maintenance cost is reduced.
- Accumulation of evaluation data is utilized for the ranking of construction companies in the future.

Also, for the contractors, the following advantages will be expected to be produced.

- Since contractors are fairly evaluated at PQ, they will acquire the construction works matching their capabilities.
- Contractors will increase their capabilities by using evaluation standard and then understanding the important points during construction works.

(6) Verification

In Japanese case, MLIT conducted the study on verification of evaluation tendering method. In FY 2005, the Quality Assurance Act was enforced and full implementation of the evaluation method started. Along with the introduction and spread of evaluation, work performance evaluation scores are becoming higher from year to year, which indicates the possibility of this evaluation method being related to an improvement of quality because of excluding incompetent contractors and improving contractors' awareness. It was reported that 73.2 points of average score for FY 2005 on all types of construction works managed by MLIT has increased by 2.3 pints to 75.5 points for FY 2010.

(7) Evaluation Procedure

As a result of discussion with C/P, the Project agreed that the evaluation procedure in Vietnam was as follows. The major procedure is as follows.

- Project owners designate three evaluators immediately after acceptance by project owners and inspection by supervising authorities.
- Project owners hold the evaluation meeting. The designated evaluators and the contractor compulsorily participate in the evaluation meeting.
- Contractor's work performance is scored by evaluators.
- Project owners input and preserve the evaluation data on "Contractor Performance Evaluation System".
- Project owners register the evaluation data on "Construction Package Database System" with relevant information regarding the package
- The evaluation data can be referred in the PQ examination to select contractors coupled with other factors such as financial data (capital, annual turnover and profit) and managerial data (the number of engineer, experience of contractors, and experience of site manager).

Figure 7.6.2 shows the process of evaluation data which is made at final inspection, registered on construction package database system and used for selecting contractors at the PQ examination.

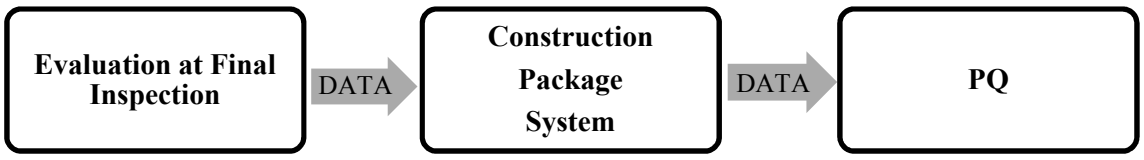


Figure 7.6.2 Flow of Evaluation

(8) Evaluation Indexes

1) Category and Subcategory

Since any construction work requires the components such as sufficient finance, capable staff, machinery to meet the required specification, and management skill to bring success in completion of projects, these components need to be examined when the Project want to know how the contractor implemented the project. As a matter of fact, quality of completed structure should be evaluated as one of key factors to know the contractor's ability. Here the Project clarified these components into three categories, construction resources such finance, manpower, and machinery, and construction management (schedule, safety) and quality. Then, each category was broken into detail.

The following comments show the result of discussion with C/P about the necessity of each subcategory for the work performance evaluation.

a. Resources

- Financial status

  Finance status, which contains capital, turnover and profit, is evaluated in the tendering documents at PQ examination. Therefore, it is concluded that finance is not necessary as a component of work performance evaluation.

- Manpower ability

  The practical ability of manpower, which contains site manager, technical manager and workers, cannot be evaluated in the tendering documents of PQ examination. Since their abilities seriously affect the result of work performance, it is concluded to evaluate them after completion of the construction works.

- Machinery performance

  The number, performance, and allocation of machinery are evaluated in "Request for Proposal" in the tendering document. Since MOC points out that large discrepancy of the number and performance of machinery between "Request for Proposal" and the actual construction site often can be seen, it is concluded that machinery is one of necessary components for work performance evaluation. However, project owners have to pay attention to that the machinery plan written in "Request for Proposal" is not compulsory for the contractor to implement the construction works. If the contractor can implement the construction works based on the proper machinery plan, the point will not be deducted.

b. Management ability

The practical ability of construction management, which contains processes of general procedure, schedule and safety, is not evaluated in the tendering documents of PQ examination. Since the management ability seriously affects the result of work performance, it is concluded to evaluate them after completion of the construction works.

c. Quality control ability

The practical ability to control quality, which contains parameter, quality of material, and appearance of structure and schedule and safety is not evaluated in the tendering documents of PQ examination. Since the quality control ability seriously affects the result of work performance, it is concluded to evaluate them after completion of the construction works.

In addition to such primary categories, projects can be seen from other viewpoints. The following components are raised as additional based on overseas practice.

- Advanced technical skill (supporting organization for more complex structure, construction under severer conditions of nature)

- Originality (improvement on housing environment for workers)
- Social responsibility (cleaning activity at neighboring areas, construction site tour for neighboring residents)

Japan has adopted additional categories because most contractors who can join the state-funded projects have already the capability to complete construction works at the level to meet the standard in the basic evaluation indexes (manpower, management, quality). If they want to see the visible difference between contractors, such additional categories should be evaluated. On the other hand, these additional ones have not been evaluated in Malaysia that is still a developing country. The Project agreed that in Vietnam, additional categories are not to be evaluated as the first step. In the near future, when contractors' capability improves and most of contractors can complete the construction at the level to meet the standard in the evaluation indexes, these categories should be applied.

2) Standards

The key point is to make appropriate standards to prevent one-sided evaluation and guide evaluators to fairly evaluate work performance. As a result of the discussion with C/P, the Project agreed that the following supporting items and standards were built up in each category (see **Table 7.6.7**). These standards were selected in terms of evaluating necessary abilities for general construction works under the Vietnam current construction system. Although checking points of resources and management abilities are common in any type of construction packages, quality control abilities are different between each type of construction works. At this moment, the Project agreed that the standards are made for only category of quality corresponding with road, bridge, hydropower, and building that are supposed to be selected as trial packages, because it is impossible to make the quality standards for all types of construction works during the JICA Project.

From this time forward, it is important that MOC shall collaborate with other supervising ministries to compile the evaluation indexes for all type of construction works.

Table 7.6.7 List of Supporting Items and Standards

Category	Subcategory	Supporting Items/ Standard
Construction resources	Site manager	• Understanding, Management, Communication
	Technical staff	• Understanding, Management
	Skilled Worker	• Quantity, Quality
	Machinery	• Performance • Comparison with Request for Proposal, Method Statement, Actual site
Management	General	• Procedure • Task allocation • Dossiers • Approval on method statement • Environment • Cleaning on the site

Category	Subcategory	Supporting Items/ Standard
		• Contribution to local community
	Schedule	• Procedure • Method statement • Control • Delay, Period • Complaint • Staff holiday • Challenging situation
	Safety	• Procedure • Method statement • Temporary structure • Control • Preventive measure • Dangerous behavior • Patrol • Safety Patrol • Improvement on dangerous spot • Inspection • Temporary structure • Training • Accident • Injured worker, dead worker
Quality	Parameter	• Inspection • Size, Position • Record • Hidden Part • Direction • Repair in writing
	Quality	• Inspection • Quality (Set-up for each type of structure) • Direction • Repair in writing
	Workmanship	• Appearance (Set-up for each type of structure)

3) Scoring Method

As a result of discussion with C/P, the Project agreed that three-grade rating with scoring method was used, where evaluators were able to judge each standard and mark the score of it. Although five-grade rating with scoring method is used in Japan, Hong Kong, and Malaysia, it is concluded that three-grade rating is more suitable than five-grade, because the standard was broken down into detail and had each score so that the points to be revised was made clear.

Three evaluators mark the sore in accordance with the evaluation sheet. Then, the sum of three scores is calculated again on the scale of 100 marks. It is regarded as the final score of the contractor's construction package awarded by the project owner.

4) Weighing Factor

Based on the discussion with C/P, it is concluded that every category should be improved but at this moment, quality control abilities should be directly paid attention to than other

categories. Resources and management cannot be improved promptly since it takes long time to train the capable managers and change settled management system. On the other hand, quality control abilities can be improved by conducting inspection and maintenance appropriately, and the contractor can use these improved abilities as soon as possible one next construction package.

Therefore, 50% ratio was allocated to the category of quality, and the remaining 50% was allocated to resources (25%) and management (25%). As a reference to weighing factors, the Project shows other countries' weighing factors at **Table 7.6.8**. It turned out that each country has an original weighing factor and it is considered that each country is under the situation where the points to be improved on contractors are different.

Table 7.6.8 Comparison List of Weighing Factor

Country	Resources	Management	Quality	Others
Japan	5	40	35	20
Hong Kong	20	60	10	10
Malaysia	25	40	10	25
Vietnam	15	35	50	0

5) Evaluator

According to Article 24 of Decree 15, project owners shall select eligible contractors, check the actual capacities of contractors, conditions for the commencement of construction facilities, the construction process, methods, materials, and equipment.

Therefore, project owners are the most suitable personnel to evaluate contractors' capability because project owners supervise whole construction works and they are the entities that shall use the results of work performance evaluation to select eligible contractors.

At the same time, the Project needs to consider how transparency and fairness are secured, because the evaluation shall be reflected to the tendering for state-funded construction packages. One way to secure them is that the personnel shall be selected from independent organization which does not directly contact with the contractor during construction works.

The Project agreed that suitable evaluators were selected from the two sides, the project owner and independent sides.

a. Project Owner

The Project agreed that one representative from project manager or project management unit (PMC) or project management consultant (PMC) in charge of construction works and one representative of supervising consultants (SC) in charge of the construction site are selected as evaluators of the project owner side based on the following reasons.

- Project owners are supposed to employ PMC or PMU who manages whole tasks from schedule, quality to safety management in construction works, in case project owners don't have capability to directly manage construction works according to Decree12. Thus PMU or PMC personnel become the appropriate evaluator in term of their obligation at the construction site.

- Project owners are supposed to employ SC to conduct quality inspection and safety management day by day according to Article 24 of Decree 15, which tells that SC shall prepare the organizational structure, work plan with responsibilities and tasks, quality control plan. Thus, SC personnel becomes the appropriate evaluator in terms of familiarity with the events on the construction sites regarding both management and engineering,

b. Independent Organization

The Project agreed that the official from State Authority (SA) is selected by the project owner as one evaluator of the independent side bases on the following reasons.

- The official of SA does not directly contact with the contactor to secure fairness and transparency of evaluation

In addition to this reason, it is more preferable for the evaluator to know the knowledge of the construction packages.

- The official of SA who takes a responsibility for design appraisal and inspection according to Article 21 and 32 of Decree 15 is under the advantageous environment where they get information under their jurisdiction. Thus they have the knowledge of construction projects enough to evaluate them.

According to Article 41 of Decree 15, supervising authorities related to 4 ministries such as MOC, MOT, MOARD, and MOIT have their quality control divisions and they have been deployed to take responsibilities for construction packages in their administrative area.

Thus as for these 4 Ministries, the Project proposes that the officials from quality control divisions who take a responsibility for design appraisal and inspection are selected as evaluators.

As for other ministries, they don't have the professional quality control divisions and then at this moment MOC and DOC take responsibilities for design appraisal and inspection of their construction projects according to Article 21 and 32 in Decree 15. Considering this situation, the evaluator as SA shall be assigned from MOC and DOC who is in charge of design appraisal and inspection. The following table (**Table 7.6.9**) shows the proposed deployment of evaluators.

Table 7.6.9 Deployment of Evaluator

No	Grade	SA	Evaluator		
			PO/PMU	SC	SA
1	S, I	MOC/ MOT/ MOARD /MOIT	PO representative in charge of construction works or PMU representative	Chief SC	• Quality Control Division in MOC/MOT/MOARD/MOIT • In charge of design appraisal and inspection
2	II	DOC/DOT/ DOARD/DOIT			• Quality Control Division • In DOC/DOT/DOARD/DOIT in charge of design appraisal and inspection
3	S, I	Other Ministries			• SACQI (*1) in MOC • In charge of design appraisal and inspection
4	II	Department under Other Ministries			• Quality Control Division in DOC (*1) • In charge of design appraisal and inspection

*(*1) in the case of No. 3&4, the official of quality control divisions under MOC and DOC is supposed to be assigned as one evaluator for the projects under other Ministries. The Project proposes that the process for other Ministries to assign the official of MOC should be permitted by both Ministries and the coordination system should be organized under new Circular.*

(9) Guideline for Contractor Performance Evaluation System

Guideline for contractor performance evaluation system is provided hereinafter.

1) Purpose

This guideline specifies the provisions regarding contractor performance evaluation (hereinafter referred to as Evaluation) for construction packages owned by project owners. It aims to ensure fair and transparent evaluation, and to facilitate an appropriate appointment of contractors at prequalification examination of tendering and raising contractors' awareness towards quality enhancement.

Besides, project owners with private construction packages evaluation shall be encouraged to be conducted for the principal contractors at the end of construction works who made the contract of private construction packages.

2) Applied Projects

Evaluation shall be conducted for the principal contractors at the end of construction works who made the contract of state-funded construction projects with grade Special, I and II specified in Circular 33. It is not required to evaluate the contractors who transferred all jobs to sub-contractors or delegated all jobs to other contractors before completion of construction works.

3) Contents of Evaluation

Evaluation shall be conducted in terms of contractor's abilities regarding the following three contents throughout the construction process and on the completed construction works.

(1) Construction Resources indicating manpower and machinery

(2) Construction Management indicating schedule and safety

(3) Quality Control indicating parameter, quality and workmanship

The project owner shall utilize "Work Performance Evaluation Sheet" corresponding with the project type attached behind this guideline.

4) Evaluator and Evaluation Standpoint

Evaluation stated in Article 3 shall be conducted by the following persons (hereinafter referred to as Evaluator). Two persons shall be assigned from project owner's standpoint and one person shall be assigned as follows:

(1) Project Owner Side

One project owner's representative in appropriate position who takes a responsibility for the construction package shall be assigned. Project owner's representative, Director of PMU or PMC is expected to be the most suitable evaluator.

One supervising consultant's representative who takes a responsibility for construction works shall be assigned. For example, chief supervising consultant is expected to be the most suitable evaluator.

(2) Independent Organization Side

One official of supervising authority who takes a responsibility for design appraisal and inspection over acceptance of POs specified in Article 20 and 32 of new Decree 15 and have at least seven year experiences in quality control department of construction works shall be assigned.

Ministries other than four Ministries such as MOC, MOT, MARD, and MOIT have not established their own construction quality department yet. Therefore, they shall assign the official of MOC or DOC, who takes a responsibility for design appraisal and inspection, as the evaluator of supervising authority.

However, this may not be the case that project owners accept another person as a suitable evaluator since the person's ability is comparable with the person as describe in preceding (1) and (2).

5) Evaluation Method

(1) Each evaluator shall independently evaluate the relevant categories for each construction work accurately and fairly.

(2) Project owners shall set up the evaluation meeting, call for the organizations concerned of evaluators and the site manager of the contractor, and inform schedule and the meeting place of them immediately after project owners accepted work completion.

(3) During the evaluation meeting, evaluators shall select samples of construction works to be evaluated in order to enable evaluation to be carried out within reasonable cost and time, and check the dossiers and the completed construction site of selected samples. The samples shall be selected as uniformly as possible throughout the whole construction works. When evaluators are not able to determine the score of standards only from the dossiers provided and the construction site, evaluators are able to ask any question to other evaluators and the contractor.

(4) Evaluators shall utilize the work performance evaluation sheet as prescribed in this guideline and evaluate their allocated standards prescribed in this evaluation sheet. At the same time, evaluators shall pick up the standards out of the category of "quality" related to the construction works implemented based on the contract.

(5) Project owners may design the weight ratio of each construction work among the category of "quality" based on the ratio among the final contract amount of each construction work.

(6) If it is required to revise the work evaluation sheet prescribed in this guideline due to special features of construction works, project owners may add or eliminate standards to this original evaluation sheet in the guideline and also arrange the score distribution. In cases where any revision was made as described in the preceding sentence, project owners shall promptly inform the contractor of this revision.

(7) The scoring with 3-grades for every standard of the evaluation sheet shall be done on the works that are evaluated for the first time. Rectification and correction carried out after the evaluation should not be re-scored.

(8) Project owners shall average the scores given by two sides, the project owner and the independent organization side. This average score on the scale of 100 full marks shall be recognized as the final score decided by project owners.

6) Timing of Evaluation

Project owners shall conduct the evaluation at the same time as the inspection specified in Article 32 of Decree 15.

7) Management of Evaluation Data

(1) The evaluation data shall be registered on “Contractor Performance Evaluation System" and preserved by project owners.

(2) The evaluation data with other related package information will be linked with “Construction Package Database System”.

8) Notice of Evaluation Results

Project owners shall promptly notify the evaluation results to the contractors who undertook the evaluated work upon the receipt of evaluation results from evaluators.

9) Request for Explanation

(1) Contractors who have been notified of the evaluation results may request its explanation in writing from the project owner within 14 days (holidays included) from the receipt of the notification.

(2) If explanation was requested as prescribed in (1) above, the project owners shall provide the explanation to the contractor in writing as prescribed in the previous paragraph.

10) Payment

Project owners shall pay transportation expense and allowance of evaluators, amount of which can be decided by project owners.

The detail of Main Evaluation sheet is shown in **Table 7.6.10** and appendixes from 1 to 4 are shown in **Table 7.6.11**, **Table 7.6.12**, **Table 7.6.13** and **Table 7.6.14** in turn. Depending on the work type to be evaluated, suitable appendix shall be used.

Table 7.6.10 Work Performance Evaluation Sheet

PACKAGE INFORMATION

PACKAGE NAME:
LOCATION:
PROJECT OWNER:
CONTRATOR NAME:
SUPERVISING AUTHORITY DEPARTMENT:
CONTRACT TERM:
BID AMOUNT:
FINAL AMOUNT:
SOURCE of FUNDING:
SITE MANAGER:
CONSTRUCTION TYPE:
COSNTRUCTION GRADE:

EVALUATION INFORMATION

EVALUATION DATE &TIME:
PLACE for EVALUATION MEETING:
CONTRATOR NAME:
REPRESENTATIVE OF PROJECT OWNER:
EVALUATOR [name]:
EVALUATOR [company]:
REPRESENTATIVE OF SUPERVISING CONSULTANT:
EVALUATOR [name]:
EVALUATOR [company]:
REPRESENTATIVE OF SUPERVISING AUTHORITY DEPARMENT:
EVALUATOR [name]:
EVALUATOR [company]:

EVALUATOR INFORMATION

NAME
JOB TITLE:
TELEPHONE:
EMAIL:
COMPANY NAME:
ADDRESS:
SIGNATURE:

DATE & TIME:

Category			Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remarks	Evaluators		
Category	Full	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score					PMC /PMU	SC	SA
Construction Resources	15		Site Manager	6		Understanding	2		1	The site manager accurately understood the contract, technical specification, shop drawing, legal regulation.	2		2	1	0		○		○
						Management	2		2	The site manager assigned a section manager and technical staff in each subcontractor's site to oversee the site.	2		2	1	0		○		○
						Communication	2		3	The site manager communicated with a project owner according to contract term; request, record of the meeting, construction diary, acceptance form, technical advice.	2		2	1	0		○		○
			Technical Staff	3		Understanding	2		4	The technical staff understood, technical issues, the technical specification, shop drawing and method statement, which has been reflected in the project implementation.	2		2	1	0		○		○
						Management	1		5	The technical staff provided proper technical instructions to keep close control of the subcontractor.	1		1	0.5	0		○		○
			Skilled Worker	3		Quantity	2		6	The number of skilled worker on the site met the request for proposal.	2		2	1	0		○		○
						Quality	1		7	The skilled workers dealt with the materials and equipments on the site appropriately.	1		1	0.5	0		○		○
			Machinery	3		Performance	3		8	There was no trouble with the machinery because machinery with sufficient performance, quality, quantity according to the request for proposal was brought to accurately carry out the construction work.	2		2	1	0		○		○
									9	There was no trouble with the machinery caused by the method statement on the machinery.	1		1	0.5	0		○		○

Contractor Performance Evaluation Sheet

Category			Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remarks	Evaluators		
Category	Full	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score					PMC /PMU	SC	SA
Management (1/2)	35		General	5		Procedure	3		10	The scope of task allocation and responsibility of staffs became clear in the method statement. The organization chart of skilled workers was reported to the project owner.	1		1	0.5	0		○		○
									11	Dossiers were appropriately recorded and submitted to the project owner based on the contract.	1		1	0.5	0		○		○
									12	The work plan was approved by the consultant before construction work.	1		1	0.5	0		○		○
						Environment	2		13	The construction site was kept tidy and neat every day.	1		1	0.5	0			○	○
									14	The contractor participated actively in local volunteer activities (e.g.. picking up trash, cleaning, road surface) to contribute to relationship local communities.	1		1	0.5	0			○	○
			Schedule	20		Procedure	6		15	The method statement on schedule was submitted to the project owner.	3		3	1.5	0		○		○
									16	Weekly and monthly schedule were submitted to the project owner.	3		3	1.5	0		○		○
						Control	14		17	The project was completed on time within the contract term without any delay by the contractor's responsibility.	5		5	-7.5	-20		○		○
									18	The construction period has been shortened by making the new proposal.	3		3	1.5	0		○		○
									19	The contractor communicated closely with local communities and dealt with any complaint for a smooth implementation of the project.	2		2	1	0		○		○
									20	The contractor secured appropriatel staff holidays and recirded in writing.	2		2	1	0		○		○
									21	Although contractors experienced challenging situations like natural disasters which seemed to affect the whole schedule, the contractor was able to complete works ahead of time.	2		2	1	0		○		○

Contractor Performance Evaluation Sheet

Category			Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remarks	Evaluators		
Category	Full	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score					PMC /PMU	SC	SA
Management (2/2)			Safety	10		Procedure	3		22	The statement method on the location of guard was archived.	2		2	1	0		○		○
									23	the shop drawing of the temporary structure (scaffolding and support structures) were accepted by the project owner.	1		1	0.5	0		○		○
						Control	1		24	The appropriate preventive measures were taken against potential risks.	1		2	1	0		○		○
							1		25	There was no dangerous behavior against the labor safety law on the site (no protector of helmet, safety clothes, unsafely driving).	1		2	1	0		○		○
						Patrol	3		26	Safety patrol was regularly implemented.	1		1	0.5	0			○	○
									27	The results of safety patrol was always recorded and stored in the site.	1		1	0.5	0			○	○
									28	The dangerous spot pointed out by the safety patrol was immediately improved	1		1	0.5	0			○	○
						Inspection	1		29	The temporary structure (scaffolding and support structures) was inspected after they were assembled.	1		1	0.5	0			○	○
						Training	1		30	Safety training program was implemented for all workers in a timely manner.	1		1	0.5	0			○	○
						Accident	0		31	There happened at least one injured worker during contract term.	0		0	-2.5	-5			○	○
							0		32	There happened at least one dead worker during contract term.	0		0	-5	-10			○	○

Contractor Performance Evaluation Sheet

Category			Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remarks	Evaluators		
Category	Full	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score					PMC /PMU	SC	SA
Quality	50		Parameter	10		Inspection	2		33	The size of completed parts ranged within tolerance specified in the specification.	2		2	1	0			○	○
							2		34	The position of completed works was set up within torelance specified in the specification.	2		2	1	0			○	○
							2		35	Results of the measurements of completed part of work were appropriately archived.	2		2	1	0			○	○
							2		36	the measurement of hidden parts of work were properly archived with photos.	2		2	1	0			○	○
						Direction	2		37	No directions for the contractor to repair defect was issued in writing.	2		2	1	0			○	○
			Quality	40		Inspection/ Direction	40		38	Refer to appendix in each type of works	40		Input final score of the appendix					○	○
Total	**100**			**100**			**100**		**38**		**100**								

NOTES:

* The evaluator shall independently evaluate the standard above.

* The evaluator shall choose the appropriate score for the evaluated works following the standard between 3 values.

* The total score is automatically calculated when the evaluator completes marking the score of each standard.

Table 7.6.11 Appendix 1 of Work Performance Evaluation Sheet for Quality Section of Road Project

PACKAGE INFORMATION

PACKAGE NAME	
LOCATION	
PROJECT OWNER	
CONTRATOR NAME	
SUPERVISING AUTHORITY DEPARTMENT	
CONTRACT TERM	
BID AMOUNT	
FINAL AMOUNT	
SOURCE of FUNDING	
SITE MANAGER	
CONSTRUCTION TYPE	
COSNTRUCTION GRADE	

EVALUATION INFORMATION

EVALUATION DATE &TIME:	
PLACE for EVALUATION MEETING:	
CONTRATOR NAME:	
REPRESENTATIVE OF PROJECT OWNER:	
EVALUATOR [name]:	
EVALUATOR [company]:	
REPRESENTATIVE OF SUPERVISING CONSULTANT:	
EVALUATOR [name]:	
EVALUATOR [company]:	
REPRESENTATIVE OF SUPERVISING AUTHORITY DEPARMENT:	
EVALUATOR [name]:	
EVALUATOR [company]:	

EVALUATOR INFORMATION

NAME	
JOB TITLE:	
TELEPHONE:	
EMAIL:	
COMPANY NAME:	
ADDRESS:	
SIGNATURE:	
DATE & TIME:	

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Piling]	20	1		Quality	20		Inspection	16		1	Concrete or steel used for materials was confirmed appropriate according to the specification.	4		4	2	0	
										2	Depth of excavation, volume of removed soil, change in water level was kept within the appropriate range written in the specification.	4		4	2	0	
										3	Welding work was complied with the specifications.	4		4	2	0	
										4	Drain work was complied with the specification.	4		4	2	0	
							Direction	4		5	No directions for the contractor to repair defect was issued in writing.	4		4	2	0	

APPENDIX 1: Evaluation Sheet for Quality Section of Road project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*
The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Earthwork]	10	1		Quality	6		Inspection	5		1	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
										2	Appropriate surface protection was implemented according to the specification	1		1	0.5	0	
										3	The soil was excavated or heaped up were complied with the specification.	1		1	0.5	0	
										4	Appropriate compaction and shaping on slope were done in a appropriate timing.	1		1	0.5	0	
										5	Gradient of cut slope and embankment were complied with the specification.	1		1	0.5	0	
							Direction	1		6	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
				Workmanship	4		Appearance	4		7	Surface had a smooth and fine finish.	1		1	0.5	0	
										8	Slop surface looks smooth with a surface protection such as a consistant vegetation and concrete sprayed surface.	1		1	0.5	0	
										9	Joints and edges of structures had a smooth and fine finish.	1		1	0.5	0	
										10	It had an excellent overall appearance.	1		1	0.5	0	

APPENDIX 1: Evaluation Sheet for Quality Section of Road project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*
The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Reinforced concrete]	15	1		Quality	10		Inspection	9		1	Testing of concrete mix formula was carried out, followed by trial mixing, as specified by the shop drawings and specifications.	1		1	0.5	0	
										2	The strength, slump, and amount of air in concrete were checked and the results were confirmed appropriate.	1		1	0.5	0	
										3	Transportation time, concrete casting speed, drop height of concrete mix, type of vibrating compactor, and curing method were verified to meet the construction requirements and weather conditions.	1		1	0.5	0	
										4	When removing formworks, it was ensured that the concrete had already set and gained sufficient strength	1		1	0.5	0	
										5	Mill sheet of rebars were confirmed upon inspection.	1		1	0.5	0	
										6	Tensile strength and bending strength of rebar were tested.	1		1	0.5	0	
										7	Welding work of rebar was carried out according to the specification.	1		1	0.5	0	
										8	Spacer bars were arranged into proper locations with sufficient thickness of concrete covering.	1		1	0.5	0	
										9	Appropriate process was made for concrete joints.	1		1	0.5	0	
							Direction	1	0	10	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
				Workmanship	5		Appearance	5		11	Concrete surface had a smooth and fine finish.	1		1	0.5	0	
										12	Joints and edges of concrete had a smooth and fine finish.	1		1	0.5	0	
										13	structures of concrete were aligned neatly in a straight line.	1		1	0.5	0	
										14	There was no crack or water leakage in concrete structures	1		1	0.5	0	
										15	It had an excellent overall appearance.	1		1	0.5	0	

APPENDIX 1: Evaluation Sheet for Quality Section of Road project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*
The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Prestressed Concrete]	15	1		Quality	10		Inspection	9		1	Testing of concrete mix formula was carried out, followed by trial mixing, as specified by the drawings and specifications.	1		1	0.5	0	
										2	The strength, slump, and amount of air in concrete were checked and the results were confirmed appropriate.	1		1	0.5	0	
										3	Transportation time, concrete casting speed, drop height of concrete ix, type of vibrating compactor, and curing method were verified to meet the construction requirements and weather conditions.	1		1	0.5	0	
										4	When removing formworks, it was ensured that the concrete had already set and gained sufficient strength	1		1	0.5	0	
										5	Mill sheet of rebars were confirmed upon inspection.	1		1	0.5	0	
										6	Tensile strength and bending strength of rebar were tested.	1		1	0.5	0	
										7	Welding work of rebar was carried out according to the specification.	1		1	0.5	0	
										8	Tensioning and grouting was properly implemented according to the specification.	1		1	0.5	0	
										9	Sheaths and grout hoses and anchorages were positioned appropriately.	1		1	0.5	0	
							Direction	1	0	10	No directions for the contractor to repair defect were issued in writing.	1		1	0.5	0	
				Workmanship	5		Appearance	5		11	Concrete surface had a smooth and fine finish.	1		1	0.5	0	
										12	Joints and edges of concrete had a smooth and fine finish.	1		1	0.5	0	
										13	Structures of concrete were aligned neatly in a straight line.	1		1	0.5	0	
										14	Surface of concrete slab was flat.	1		1	0.5	0	
										15	It had an excellent overall appearance.	1		1	0.5	0	

APPENDIX 1: Evaluation Sheet for Quality Section of Road project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*
The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Steel]	15	1		Quality	10		Inspection	9		1	Correct type of steel materials was used according to the specification.	1		1	0.5	0	
										2	Mill sheet of steel was confirmed before steel was used.	1		1	0.5	0	
										3	The measure for prevention of corrosion was implemented.	1		1	0.5	0	
										4	Welding work was carried out according to the specification.	1		1	0.5	0	
										5	Tightness of bolts was checked and its record has been properly kept.	1		1	0.5	0	
										6	Bolt tension and measuring devices were correctly calibrated.	1		1	0.5	0	
										7	The type, size and number of bolts and washers met the specification and shop drawing.	1		1	0.5	0	
										8	Material of the painting or proactive layer was used according to the specification.	1		1	0.5	0	
										9	Painting was done in a good work environment according to the material specification.	1		1	0.5	0	
							Direction	1		10	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
				Workmanship	5		Appearance	5		11	Electrical generator had sufficient electrical power output according to the specification.	1		1	0.5	0	
										12	Steel surface was flat.	1		1	0.5	0	
										13	Paint work was smooth and consistent.	1		1	0.5	0	
										14	Welding work was smooth and consistent.	1		1	0.5	0	
										15	It had an excellent overall appearance.	1		1	0.5	0	

APPENDIX 1: Evaluation Sheet for Quality Section of Road project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*
The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Asphalt pavement]	15	1		Quality	10		Inspection	9		1	CBR value of roadbed was reviewed or measured.	1		1	0.5	0	
										2	Compound of materials such as ratio of water and cement content, and volume of cement was archived.	1		1	0.5	0	
										3	Compaction of roadbed was done according to the specification.	1		1	0.5	0	
										4	Process on pavement joints was made according to the specifications	1		1	0.5	0	
										5	Proof rolling of roadbed was done to detect and rectify defects	1		1	0.5	0	
										6	[illegible] design specifications	1		1	0.5	0	
										7	Temperature of mixture was strictly controlled (checked upon the dispatch from the plant, arrival at the site, start of paving work)	1		1	0.5	0	
										8	Appropriate methods of paving and delivering mixture have been selected considering weather conditions of the site	1		1	0.5	0	
										9	Bitumen was added as prescribed in the specification.	1		1	0.5	0	
							Direction	1		10	No directions for the contractor to repair defect were issued in writing.	1		1	0.5	0	
				Workmanship	5		Appearance	5		11	Pavement surface was consistently flat.	1		1	0.5	0	
										12	Transition from pavement to structures was smooth.	1		1	0.5	0	
										13	Thorough work was done on the end treatment of pavement.	1		1	0.5	0	
										14	Water was smoothly drained to the gutter and basin.	1		1	0.5	0	
										15	It has an excellent overall appearance	1		1	0.5	0	

APPENDIX 1: Evaluation Sheet for Quality Section of Road project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*
The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Concrete pavement]	15	1		Quality	10		Inspection	9		1	CBR value of roadbed was reviewed or measured.	1		1	0.5	0	
										2	Compound of materials such as ratio of water and cement content, and volume of cement was archived.	1		1	0.5	0	
										3	Compaction of roadbed was done according to the specification.	1		1	0.5	0	
										4	Testing of concrete mix formula was carried out, followed by trial mixing, as specified by the drawings and specifications.	1		1	0.5	0	
										5	The strength, slump, and amount of air in concrete were checked and the results were confirmed appropriate.	1		1	0.5	0	
										6	Transportation time, concrete casting speed, drop height of concrete ix, type of vibrating compactor, and curing method were verified to meet the construction requirements and weather conditions.	1		1	0.5	0	
										7	Mill sheet of rebars were confirmed upon inspection.	1		1	0.5	0	
										8	Tensile strength and bending strength of rebar were tested.	1		1	0.5	0	
										9	Appropriate process was made for concrete joints.	1		1	0.5	0	
							Direction	1		10	No directions for the contractor to repair defect were issued in writing.	1		1	0.5	0	
				Workmanship	5		Appearance	5		11	Pavement surface was consistently flat.	1		1	0.5	0	
										12	Transition from pavement to structures was smooth.	1		1	0.5	0	
										13	Thorough work was done on the end treatment of pavement.	1		1	0.5	0	
										14	Water was smoothly drained to the gutter and basin.	1		1	0.5	0	
										15	It has an excellent overall appearance	1		1	0.5	0	

Table 7.6.12 Appendix 2 of Work Performance Evaluation Sheet for Quality Section of Bridge Project

PACKAGE INFORMATION

PACKAGE NAME	
LOCATION	
PROJECT OWNER	
CONTRATOR NAME	
SUPERVISING AUTHORITY DEPARTMENT	
CONTRACT TERM	
BID AMOUNT	
FINAL AMOUNT	
SOURCE of FUNDING	
SITE MANAGER	
CONSTRUCTION TYPE	
COSNTRUCTION GRADE	

EVALUATION INFORMATION

EVALUATION DATE &TIME:	
PLACE for EVALUATION MEETING:	
CONTRATOR NAME:	
REPRESENTATIVE OF PROJECT OWNER:	
EVALUATOR [name]:	
EVALUATOR [company]:	
REPRESENTATIVE OF SUPERVISING CONSULTANT:	
EVALUATOR [name]:	
EVALUATOR [company]:	
REPRESENTATIVE OF SUPERVISING AUTHORITY DEPARMENT:	
EVALUATOR [name]:	
EVALUATOR [company]:	

EVALUATOR INFORMATION

NAM E:
JOB TITLE:
TELEPHONE:
EMAIL:
COMPANY NAME:
ADDRESS:
SIGNATURE:
DATE & TIME:

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Piling]	5	1		Quality	5	0	Inspection	4		1	Concrete or steel used for materials was confirmed appropriate according to the specification.	1		1	0.5	0	
										2	Depth of excavation, volume of removed soil, change in water level was kept within the appropriate range written in the specification.	1		1	0.5	0	
										3	Welding work was complied with the specifications.	1		1	0.5	0	
										4	Drain work was complied with the specification.	1		1	0.5	0	
							Direction	1		5	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	

APPENDIX 2: Evaluation Sheet for Quality Section of Bridge project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Earthwork]	5	1		Quality	5	0	Inspection	4		1	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
										2	The soil was excavated or heaped up met the requirements of specification.	1		1	0.5	0	
										3	Appropriate compaction and shaping on slope were done in a appropriate timing.	1		1	0.5	0	
										4	Appropriate surface protection was implemented according to the specification	1		1	0.5	0	
							Direction	1		5	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	

APPENDIX 2: Evaluation Sheet for Quality Section of Bridge project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Reinforced concrete]	15	1		Quality	10	0	Inspection	9		1	Testing of concrete mix formula was carried out, followed by trial mixing, as specified by the shop drawings and specifications.	1		1	0.5	0	
										2	The strength, slump, and amount of air in concrete were checked and the results were confirmed appropriate.	1		1	0.5	0	
										3	Transportation time, concrete casting speed, drop height of concrete mix, type of vibrating compactor, and curing method were verified to meet the construction requirements and weather conditions.	1		1	0.5	0	
										4	When removing formworks, it was ensured that the concrete had already set and gained sufficient strength	1		1	0.5	0	
										5	Mill sheet of rebars were confirmed upon inspection.	1		1	0.5	0	
										6	Tensile strength and bending strength of rebar were tested.	1		1	0.5	0	
										7	Welding work of rebar was carried out according to the specification.	1		1	0.5	0	
										8	Spacer bars were arranged into proper locations with sufficient thickness of concrete covering.	1		1	0.5	0	
										9	Appropriate process was made for concrete joints.	1		1	0.5	0	
							Direction	1	0	10	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
				Workmanship	5	0	Appearance	5		11	Concrete surface had a smooth and fine finish.	1		1	0.5	0	
										12	Joints and edges of concrete had a smooth and fine finish.	1		1	0.5	0	
										13	structures of concrete were aligned neatly in a straight line.	1		1	0.5	0	
										14	There was no crack or water leakage in concrete structures	1		1	0.5	0	
										15	It had an excellent overall appearance.	1		1	0.5	0	

APPENDIX 2: Evaluation Sheet for Quality Section of Bridge project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Prestressed Concrete]	15	1		Quality	10	0	Inspection	9		1	Testing of concrete mix formula was carried out, followed by trial mixing, as specified by the drawings and specifications.	1		1	0.5	0	
										2	The strength, slump, and amount of air in concrete were checked and the results were confirmed appropriate.	1		1	0.5	0	
										3	Transportation time, concrete casting speed, drop height of concrete ix, type of vibrating compactor, and curing method were verified to meet the construction requirements and weather conditions.	1		1	0.5	0	
										4	When removing formworks, it was ensured that the concrete had already set and gained sufficient strength	1		1	0.5	0	
										5	Mill sheet of rebars were confirmed upon inspection.	1		1	0.5	0	
										6	Tensile strength and bending strength of rebar were tested.	1		1	0.5	0	
										7	Welding work of rebar was carried out according to the specification.	1		1	0.5	0	
										8	Tensioning and grouting was properly implemented according to the specification.	1		1	0.5	0	
										9	Sheaths and grout hoses and anchorages were positioned appropriately.	1		1	0.5	0	
							Direction	1	0	10	No directions for the contractor to repair defect were issued in writing.	1		1	0.5	0	
				Workmanship	5	0	Appearance	5		11	Concrete surface had a smooth and fine finish.	1		1	0.5	0	
										12	Joints and edges of concrete had a smooth and fine finish.	1		1	0.5	0	
										13	structures of concrete were aligned neatly in a straight line.	1		1	0.5	0	
										14	Surface of concrete slab was flat.	1		1	0.5	0	
										15	It had an excellent overall appearance.	1		1	0.5	0	

APPENDIX 2: Evaluation Sheet for Quality Section of Bridge project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Steel]	15	1		Quality	10	0	Inspection			1	Correct type of steel materials was used according to the specification.	1		1	0.5	0	
										2	Mill sheet of steel was confirmed before steel was used.	1		1	0.5	0	
										3	The measure for Prevention of corrosion was implemented.	1		1	0.5	0	
										4	Welding work was carried out according to the specification.	1		1	0.5	0	
										5	Tightness of bolts was checked and its record has been properly kept.	1		1	0.5	0	
										6	Bolt tension and measuring devices were correctly calibrated.	1		1	0.5	0	
										7	The type, size and number of bolts and washers met the specification and shop drawing.	1		1	0.5	0	
										8	Material of the painting or proactive layer was used according to the specification.	1		1	0.5	0	
										9	Painting was done in a good work environment according to the material specification.	1		1	0.5	0	
							Direction	1		10	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
				Workmanship	5	0	Appearance	5		11	There was no damage or rust on the surface of steel.	1		1	0.5	0	
										12	Steel surface was flat.	1		1	0.5	0	
										13	Paint work was smooth and consistent.	1		1	0.5	0	
										14	Welding work was smooth and consistent.	1		1	0.5	0	
										15	It had an excellent overall appearance.	1		1	0.5	0	

APPENDIX 2: Evaluation Sheet for Quality Section of Bridge project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Asphalt pavement]	15	1		Quality	10	0	Inspection	9		1	Electrical generator had sufficient electrical power output according to the specification.	1		1	0.5	0	
										2	Compound of materials such as ratio of water and cement content, and volume of cement was archived.	1		1	0.5	0	
										3	Compaction of roadbed was done according to the specification.	1		1	0.5	0	
										4	Process on pavement joints was made according to the specifications	1		1	0.5	0	
										5	Proof rolling of roadbed was done to detect and rectify defects	1		1	0.5	0	
										6	Trial mixing was conducted to verify that the asphalt mixture complied with the design specifications	1		1	0.5	0	
										7	Temperature of mixture was strictly controlled (checked upon the dispatch from the plant, arrival at the site, start of paving work)	1		1	0.5	0	
										8	Appropriate methods of paving and delivering mixture have been selected considering weather conditions of the site	1		1	0.5	0	
										9	Bitumen was added as prescribed in the specification.	1		1	0.5	0	
							Direction	1		10	No directions for the contractor to repair defect were issued in writing.	1		1	0.5	0	
				Workmanship	5	0	Appearance	5		11	Pavement surface was consistently flat.	1		1	0.5	0	
										12	Transition from pavement to structures was smooth.	1		1	0.5	0	
										13	Thorough work was done on the end treatment of pavement.	1		1	0.5	0	
										14	Water was smoothly drained to the gutter and basin.	1		1	0.5	0	
										15	It has an excellent overall appearance	1		1	0.5	0	

APPENDIX 2: Evaluation Sheet for Quality Section of Bridge project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Concrete pavement]	15	1		Quality	10	0	Inspection	9		1	CBR value of roadbed was reviewed or measured.	1		1	0.5	0	
										2	Compound of materials such as ratio of water and cement content, and volume of cement was archived.	1		1	0.5	0	
										3	Compaction of roadbed was done according to the specification.	1		1	0.5	0	
										4	Testing of concrete mix formula was carried out, followed by trial mixing, as specified by the drawings and specifications.	1		1	0.5	0	
										5	The strength, slump, and amount of air in concrete were checked and the results were confirmed appropriate.	1		1	0.5	0	
										6	Transportation time, concrete casting speed, drop height of concrete, type of vibrating compactor, and curing method were verified to meet the construction requirements and weather conditions.	1		1	0.5	0	
										7	Mill sheet of rebars were confirmed upon inspection.	1		1	0.5	0	
										8	Tensile strength and bending strength of rebar were tested.	1		1	0.5	0	
										9	Appropriate process was made for concrete joints.	1		1	0.5	0	
							Direction	1		10	No directions for the contractor to repair defect were issued in writing.	1		1	0.5	0	
				Workmanship	5	0	Appearance	5		11	Pavement surface was consistently flat.	1		1	0.5	0	
										12	Transition from pavement to structures was smooth.	1		1	0.5	0	
										13	Thorough work was done on the end treatment of pavement.	1		1	0.5	0	
										14	Water was smoothly drained to the gutter and basin.	1		1	0.5	0	
										15	It has an excellent overall appearance	1		1	0.5	0	

Table 7.6.13 Appendix 3 of Work Performance Evaluation Sheet for Quality Section of Hydropower Project

PACKAGE INFORMATION

PACKAGE NAME	
LOCATION	
PROJECT OWNER	
CONTRATOR NAME	
SUPERVISING AUTHORITY DEPARTMENT	
CONTRACT TERM	
BID AMOUNT	
FINAL AMOUNT	
SOURCE of FUNDING	
SITE MANAGER	
CONSTRUCTION TYPE	
COSNTRUCTION GRADE	

EVALUATION INFORMATION

EVALUATION DATE &TIME:	
PLACE for EVALUATION MEETING:	
CONTRATOR NAME:	
REPRESENTATIVE OF PROJECT OWNER:	
EVALUATOR [name]:	
EVALUATOR [company]:	
REPRESENTATIVE OF SUPERVISING CONSULTANT:	
EVALUATOR [name]:	
EVALUATOR [company]:	
REPRESENTATIVE OF SUPERVISING AUTHORITY DEPARMENT:	
EVALUATOR [name]:	
EVALUATOR [company]:	

EVALUATOR INFORMATION

NAME	
JOB TITLE:	
TELEPHONE:	
EMAIL:	
COMPANY NAME:	
ADDRESS:	
SIGNATURE:	
DATE & TIME:	

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Earthwork]	10	1		Quality	6	0	Inspection	5		1	Appropriate measures were implemented to drain rainwater and ground water.	1		1	0.5	0	
										2	The soil was excavated or heaped up met the requirement of specification.	1		1	0.5	0	
										3	Appropriate compaction and shaping on slope were done in a appropriate timing.	1		1	0.5	0	
										4	Gradient of cut slope and embankment were complied with the specification.	1		1	0.5	0	
										5	Appropriate surface protection was implemented according to the specification	1		1	0.5	0	
							Direction	1		6	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
				Workmanship	4		Appearance	4		7	Surface had a smooth and fine finish.	1		1	0.5	0	
										8	Joints and edges of structures had a smooth and fine finish.	1		1	0.5	0	
										9	Slop surface looks smooth with a surface protection such as a consistant vegetation and concrete sprayed surface.	1		1	0.5	0	
										10	It had an excellent overall appearance.	1		1	0.5	0	

APPENDIX 3: Evaluation Sheet for Quality Section of Hydro power project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Reinforced concrete]	15	1		Quality	10	0	Inspection	9		1	Testing of concrete mix formula was carried out, followed by trial mixing, as specified by the shop drawings and specifications.	1		1	0.5	0	
										2	The strength, slump, and amount of air in concrete were checked and the results were confirmed appropriate.	1		1	0.5	0	
										3	Transportation time, concrete casting speed, drop height of concrete mix, type of vibrating compactor, and curing method were verified to meet the construction requirements and weather conditions.	1		1	0.5	0	
										4	When removing formworks, it was ensured that the concrete had already set and gained sufficient strength	1		1	0.5	0	
										5	Mill sheet of rebars were confirmed upon inspection.	1		1	0.5	0	
										6	Tensile strength and bending strength of rebar were tested.	1		1	0.5	0	
										7	Welding work of rebar was carried out according to the specification.	1		1	0.5	0	
										8	Spacer bars were arranged into proper locations with sufficient thickness of concrete covering.	1		1	0.5	0	
										9	Appropriate process was made for concrete joints.	1		1	0.5	0	
							Direction	1	0	10	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
				Workmanship	5	0	Appearance	5		11	Concrete surface had a smooth and fine finish.	1		1	0.5	0	
										12	Joints and edges of concrete had a smooth and fine finish.	1		1	0.5	0	
										13	structures of concrete were aligned neatly in a straight line.	1		1	0.5	0	
										14	There was no crack or water leakage in concrete structures	1		1	0.5	0	
										15	It had an excellent overall appearance.	1		1	0.5	0	

APPENDIX 3: Evaluation Sheet for Quality Section of Hydro power project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Prestressed Concrete]	15	1		Quality	10	0	Inspection	9		1	Testing of concrete mix formula was carried out, followed by trial mixing, as specified by the drawings and specifications.	1		1	0.5	0	
										2	The strength, slump, and amount of air in concrete were checked and the results were confirmed appropriate.	1		1	0.5	0	
										3	Transportation time, concrete casting speed, drop height of concrete ix, type of vibrating compactor, and curing method were verified to meet the construction requirements and weather conditions.	1		1	0.5	0	
										4	When removing formworks, it was ensured that the concrete had already set and gained sufficient strength	1		1	0.5	0	
										5	Mill sheet of rebars were confirmed upon inspection.	1		1	0.5	0	
										6	Tensile strength and bending strength of rebar were tested.	1		1	0.5	0	
										7	Welding work of rebar was carried out according to the specification.	1		1	0.5	0	
										8	Tensioning and grouting was properly implemented according to the specification.	1		1	0.5	0	
										9	Sheaths and grout hoses and anchorages were positioned appropriately.	1		1	0.5	0	
							Direction	1	0	10	No directions for the contractor to repair defect were issued in writing.	1		1	0.5	0	
				Workmanship	5	0	Appearance	5		11	Concrete surface had a smooth and fine finish.	1		1	0.5	0	
										12	Joints and edges of concrete had a smooth and fine finish.	1		1	0.5	0	
										13	structures of concrete were aligned neatly in a straight line.	1		1	0.5	0	
										14	Surface of concrete slab was flat.	1		1	0.5	0	
										15	It had an excellent overall appearance.	1		1	0.5	0	

APPENDIX 3: Evaluation Sheet for Quality Section of Hydro power project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Steel]	15	1		Quality	10		Inspection	9		1	Correct type of steel materials was used according to the specification.	1		1	0.5	0	
										2	Mill sheet of steel was confirmed before steel was used.	1		1	0.5	0	
										3	The measure for Prevention of corrosion was implemented.	1		1	0.5	0	
										4	Welding work was carried out according to the specification.	1		1	0.5	0	
										5	Tightness of bolts was checked and its record has been properly kept.	1		1	0.5	0	
										6	Bolt tension and measuring devices were correctly calibrated.	1		1	0.5	0	
										7	The type, size and number of bolts and washers met the specification and shop drawing.	1		1	0.5	0	
										8	Material of the painting or proactive layer was used according to the specification.	1		1	0.5	0	
										9	Painting was done in a good work environment according to the material specification.	1		1	0.5	0	
							Direction	1		10	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
				Workmanship	5	0	Appearance	5		11	There was no damage or rust on the surface of steel.	1		1	0.5	0	
										12	Steel surface was flat.	1		1	0.5	0	
										13	Paint work was smooth and consistent.	1		1	0.5	0	
										14	Welding work was smooth and consistent.	1		1	0.5	0	
										15	It had an excellent overall appearance.	1		1	0.5	0	

APPENDIX 3: Evaluation Sheet for Quality Section of Hydro power project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Equipment of Hydro]	10	1		Quality	6		Inspection	5		1	Electrical generator had sufficient electrical power output according to the specification.	1		1	0.5	0	
										2	Transformer had sufficient capacity according to the specification.	1		1	0.5	0	
										3	Turbine had sufficient capacity according to the specification.	1		1	0.5	0	
										4	Power transmission wire had sufficient capacity according to the specification.	1		1	0.5	0	
										5	The preliminary test was conducted at plant or construction site and the performance of the entire system was confirmed appropriate.	1		1	0.5	0	
							Direction	1		6	No directions for the contractor to repair defect were issued in writing.	1		1	0.5	0	
				Quality	4		Appearance	4		1	There was no damage or rust on the equipment.	1		1	0.5	0	
										2	Maintenance and inspection were taken into account when equipment was installed.	1		1	0.5	0	
										3	Equipment and their wiring were located systematically.	1		1	0.5	0	
										4	It had an excellent overall appearance.	1		1	0.5	0	

Table 7.6.14 Appendix 4 of Work Performance Evaluation Sheet for Quality Section of Building Project

PACKAGE INFORMATION

PACKAGE NAME	
LOCATION	
PROJECT OWNER	
CONTRATOR NAME	
SUPERVISING AUTHORITY DEPARTMENT	
CONTRACT TERM	
BID AMOUNT	
FINAL AMOUNT	
SOURCE of FUNDING	
SITE MANAGER	
CONSTRUCTION TYPE	
COSNTRUCTION GRADE	

EVALUATION INFORMATION

EVALUATION DATE &TIME:	
PLACE for EVALUATION MEETING:	
CONTRATOR NAME:	
REPRESENTATIVE OF PROJECT OWNER:	
EVALUATOR [name]:	
EVALUATOR [company]:	
REPRESENTATIVE OF SUPERVISING CONSULTANT:	
EVALUATOR [name]:	
EVALUATOR [company]:	
REPRESENTATIVE OF SUPERVISING AUTHORITY DEPARMENT:	
EVALUATOR [name]:	
EVALUATOR [company]:	

EVALUATOR INFORMATION

NAM	
JOB TITLE:	
TELEPHONE:	
EMAIL:	
COMPANY NAME:	
ADDRESS:	
SIGNATURE:	
DATE & TIME:	

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*

The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Piling]	5	1		Quality	5	0	Inspection	4		1	Concrete or steel used for materials was confirmed appropriate according to the specification.	1		1	0.5	0	
										2	Depth of excavation, volume of removed soil, change in water level was kept within the appropriate range written in the specification.	1		1	0.5	0	
										3	Welding work was complied with the specifications.	1		1	0.5	0	
										4	Drain work was complied with the specification.	1		1	0.5	0	
							Direction	1		5	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
Quality [Earthwork]	5	1		Quality	5	0	Inspection	4		1	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	
										2	The soil was excavated or heaped up met the requirements of specification.	1		1	0.5	0	
										3	Appropriate compaction and shaping on slope were done in a appropriate timing.	1		1	0.5	0	
										4	Appropriate surface protection was implemented according to the specification	1		1	0.5	0	
							Direction	1		5	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	

APPENDIX 4: Evaluation Sheet for Quality Section of Building project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*
The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Reinforced concrete]	10	1		Quality	10	0	Inspection	9		1	Testing of concrete mix formula was carried out, followed by trial mixing, as specified by the shop drawings and specifications.	1		1	0.5	0	
										2	The strength, slump, and amount of air in concrete were checked and the results were confirmed appropriate.	1		1	0.5	0	
										3	Transportation time, concrete casting speed, drop height of concrete mix, type of vibrating compactor, and curing method were verified to meet the construction requirements and weather conditions.	1		1	0.5	0	
										4	When removing formworks, it was ensured that the concrete had already set and gained sufficient strength	1		1	0.5	0	
										5	Mill sheet of rebars were confirmed upon inspection.	1		1	0.5	0	
										6	Tensile strength and bending strength of rebar were tested.	1		1	0.5	0	
										7	Welding work of rebar was carried out according to the specification.	1		1	0.5	0	
										8	Spacer bars were arranged into proper locations with sufficient thickness of concrete covering.	1		1	0.5	0	
										9	Appropriate process was made for concrete joints.	1		1	0.5	0	
							Direction	1	0	10	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	

APPENDIX 4: Evaluation Sheet for Quality Section of Building project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*
The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Prestressed Concrete]	10	1		Quality	10	0	Inspection	9		1	Testing of concrete mix formula was carried out, followed by trial mixing, as specified by the drawings and specifications.	1		1	0.5	0	
										2	The strength, slump, and amount of air in concrete were checked and the results were confirmed appropriate.	1		1	0.5	0	
										3	Transportation time, concrete casting speed, drop height of concrete ix, type of vibrating compactor, and curing method were verified to meet the construction requirements and weather conditions.	1		1	0.5	0	
										4	When removing formworks, it was ensured that the concrete had already set and gained sufficient strength	1		1	0.5	0	
										5	Mill sheet of rebars were confirmed upon inspection.	1		1	0.5	0	
										6	Tensile strength and bending strength of rebar were tested.	1		1	0.5	0	
										7	Welding work of rebar was carried out according to the specification.	1		1	0.5	0	
										8	Tensioning and grouting was properly implemented according to the specification.	1		1	0.5	0	
										9	Sheaths and grout hoses and anchorages were positioned appropriately.	1		1	0.5	0	
							Direction	1	0	10	No directions for the contractor to repair defect were issued in writing.	1		1	0.5	0	

APPENDIX 4: Evaluation Sheet for Quality Section of Building project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*
The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Steel]	10	1		Quality	10		Inspection	9		1	Correct type of steel materials was used according to the specification.	1		1	0.5	0	
										2	Mill sheet of steel was confirmed before steel was used.	1		1	0.5	0	
										3	The measure for Prevention of corrosion was implemented.	1		1	0.5	0	
										4	Welding work was carried out according to the specification.	1		1	0.5	0	
										5	Tightness of bolts was checked and its record has been properly kept.	1		1	0.5	0	
										6	Bolt tension and measuring devices were correctly calibrated.	1		1	0.5	0	
										7	The type, size and number of bolts and washers met the specification and shop drawing.	1		1	0.5	0	
										8	Material of the painting or proactive layer was used according to the specification.	1		1	0.5	0	
										9	Painting was done in a good work environment according to the material specification.	1		1	0.5	0	
							Direction	1		10	No directions for the contractor to repair defect was issued in writing.	1		1	0.5	0	

APPENDIX 4: Evaluation Sheet for Quality Section of Building project (Attached with Contractor Performance Evaluation Sheet)

*NOTE: * Weight = 40 / the total score evaluated roundoff to one dicimal place*
The final score of quality is the total input score multiplied by the weight.

Category				Subcategory			Supporting Items			No	Standard			Score <3 steps>			Remark of Evaluators
Category	Full	Weight (*)	Score	Subcategory	Full	Score	Supporting Items	Full	Score		Standard	Full	Input Score				
Quality [Architecture]	20	1		Quality	10		Inspection	9		1	Internal/external wall met the specification in terms of matrerial and strength, etc.	1		1	0.5	0	
										2	Ceiling met the specification in terms of material and strengh, etc.	1		1	0.5	0	
										3	Door met the specification in terms of material and strength, etc.	1		1	0.5	0	
										4	Coating of interier/exterier wall met the specification in terms material and envoronmental condition.	1		1	0.5	0	
										5	Accessories such as fixture met the specification in terms of material and strength, etc.	1		1	0.5	0	
										6	Connect type of electrical wiring was installed according to the specification in terms of material and performance, etc.	1		1	0.5	0	
										7	Distribution board was installed according to the specification in terms of performance.	1		1	0.5	0	
										8	Applies equipment met the specification in terms of performance.	1		1	0.5	0	
										9	The preliminary test was conducted at plant or construction site and the performance of the entire system was confirmed appropriate.	1		1	0.5	0	
							Direction	1		10	No directions for the contractor to repair defect were issued in writing.	1		1	0.5	0	
				Workmanship	10		Appearance	10		1	The floor had no stain marks, visible damages, water leaking, and finishing was flat.	1		1	0.5	0	
										2	The internal/external wall had no stain marks, viisble damages, water leaking, and finishing was flat.	1		1	0.5	0	
										3	The ceiling had no stain marks, viisble damages, and water leaking, and finishing was flat.	1		1	0.5	0	
										4	There was no visible gap between the door frame and wall and the window frame and wall .	1		1	0.5	0	
										5	It was easy in opening, closing, and locking the door and window, and there was no squeaky sound during swinging the door or widow.	1		1	0.5	0	
										6	The lighting was alligned neatly and illuminated clearly.	1		1	0.5	0	
										7	There was no damage or rust on the equipment.	1		1	0.5	0	
										8	Maintenance and inspection were taken into account when equipment was installed.	1		1	0.5	0	
										9	Equipment and their wiring were located systematically.	1		1	0.5	0	
										10	It had an excellent overall appearance.	1		1	0.5	0	

(10) Timing of Evaluation

Evaluation shall be conducted after completion of construction and before putting facilities into use. If project owners conduct evaluation when construction work is completed, evaluation will be worked smoothly.

Decree 15 tentatively tells that acceptance of project owners specified on Article 32 is applied for all projects. Then supervising authorities shall inspect the dossiers submitted by project owners within the fixed days.

A part of contents of evaluation have a similarity of contents of inspection and thus if the same SA staff conducts evaluation and inspection at the same time, evaluation will be more smoothly conducted than being conducted by a different staff.

Thus, the Project recommends that evaluation shall be conducted at the same time as inspection.

(11) System Development

The following three database systems will be developed in line with this Actvity3.

(a) Contractor Performance Evaluation

(b) Construction Company Registration

(c) Construction Package Database

(12) System Management

Since all the data are supposed to be used for PQ examination, tender selection and work implementation, three information database systems with all data shall be managed by the one organization. When three database systems are managed in one organization, the data provision to the project owner will work more effectively and promptly than when they are managed by several organizations. The Project agreed that the management department in MOC shall finally manage three systems and collect all the data nationwide.

As far as Construction Package Database System and Construction Contractor/Consultant Registration System are concerned, CAMD is a suitable organization for managing them because CAMD has already managed the construction company registration system and also in charge of construction management and supervision of the implementation of regulations in construction activities nationwide as specified in Decision No: 463 /QD-BXD.

As far as Contractor Performance Evaluation System is concerned, SACQI is a suitable organization for managing it, because the work performance evaluation is supposed to be conducted in line with the Decree 15 and SACQI in charge of studying and proposing policies, programs, projects, regulations and guidelines on construction quality management and inspection specified in Decision No. 988/QD-BXD.

Besides, it is desirable that the data of packages owned by MOT and other ministries are incorporated into the MOC database systems.

(13) Data Preservation

The Project agreed that final score of the evaluation as well as other package information data shall be input on the newly established "Construction Package Database System". At the same time, the evaluation sheets made by evaluators shall be attached the newly established "Construction Package Database System".

(14) Contract Types and Contractors

1) Contract Type

In Vietnam, JV, separate, and partnership contracts are applied as the general contract methods. Since many companies are involved in one package, it is important to clarify what contractor is evaluated. The following **Figure 7.6.3** shows the examples of contracts types.

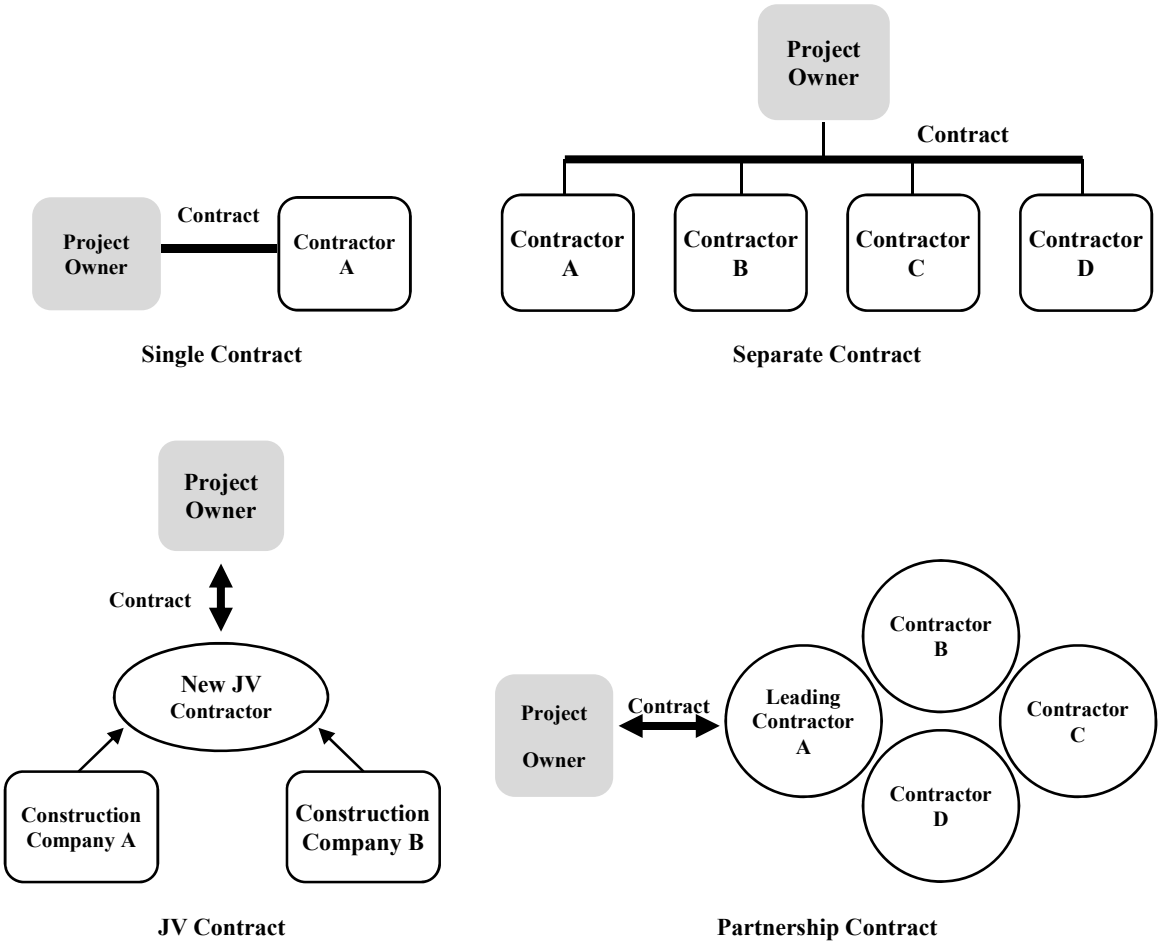


Figure 7.6.3 Contractors to be Evaluated

The Project agreed that in any contract such as single, JV, separate and partnership contract, the contractor who made the direct contract with the project owner should be evaluated. Thus, the evaluation result is supposed to be applied to the contractor who manages whole construction works.

The contractor to be evaluated in each contract is described as follows.

- In single contract, one contractor (A) is evaluated.
- In JV contract, newly established JV is established. Evaluation result is taken over to the construction companies (A, B) who are investors after JV is dismisses.
- In separate contract, each contractor (A, B, C, D) is independently evaluated.
- In partnership contract, the leading contractor and the contractors who directly contract with the project owner are evaluated among contractors (A, B, C, D) who make agreement with leading contractor (A). Evaluation result is taken over after agreement is terminated.

2) Subcontractor

There was the opinion that it was unfair to evaluate only the main contractor who made the contract with the project owner in case subcontractors practically conducted the whole construction works.

However, the article 46 (c) in Decree 48 stipulates that the general contractor may not transfer all jobs under the contract. It means that the main contractor is obliged to manage the subcontractor's works. Due to these reasons, the Project agreed that the main contractor who directly made the contract with the project owner shall be evaluated and the subcontractor shall not be evaluated.

When the main contractor takes who delegates all responsibilities to the subcontractor, the contractor shall not be evaluated due to illegal action against Decree 48. As a result, such a contractor has a disadvantage on PQ examination due to lack of evaluation data.

(15) Selection of Packages to be Evaluated

One concern is that the clarification of the contractor to be evaluated shall be considered because there are uncountable construction works from miner to large projects. The Project proposes that the clarification of evaluated companies is made according to grade specified in Circular 33.

As for the implementation method, construction packages with Grade S, I and II will be applied first until the clarification is decided.

The final clarification of the contractor to be evaluated is under discussion and should be determined after "Construction Package Database System" is completed and the number of

construction works in each type and grade is captured by MOC. For example, setting up the minimum investment of construction packages is one method to decide the final clarification.

(16) Publication

It is important that all information on the contractors' work performance is open to the parties concerned with the bidding system in order to keep the evaluation system transparent. The evaluation data is input to "Construction Package Database System" and will be disclosed with other package information to the parties concerned. This action will also encourage contractors to get higher score and take an advantage of PQ examination by improving their work quality.

The information's publication is still under discussion.

(17) Decree 15

The contractor work performance evaluation system is strongly connected to basic concept of Decree 15, which describes checking and acceptance of completed construction items before they are put to use. This contractor work performance evaluation system was supposed to be specified in Decree 15, however it has not been incorporated this time.

Thus, when the contractor work performance evaluation system is added to Decree 15 in future, MOC shall prepare for the circular which contains the evaluation guideline describing what project owners should specifically conduct. Also, another circular shall be enforced to input the evaluation data into "Construction Package Database System" managed by MOC.

One concern is the relationship between the Law on Tendering issued by MPI and the work performance evaluation. Section 2(a) in Article 32, "Preparation for tendering" in the "Law on tendering 61" specifies the prequalification invitation documents, which indicate technical requirements in case of construction tendering. The collaboration between MOC and MPI will be necessary to lead successful results.

The contents of circular and the relationship with MPI shall be discussed in due course.

(18) Output

The output in contractor work performance evaluation system includes four products:

(1) Final Report

(2) Operation Guideline

(3) Appendix - Overseas Practice

(4) Computer Software

(19) Evaluation Trial Plan

1) Selected Package

In order to confirm verification of evaluation indexes and find the points to be revised based on feedback from project owners, the Project conducted the trial for the evaluation system.

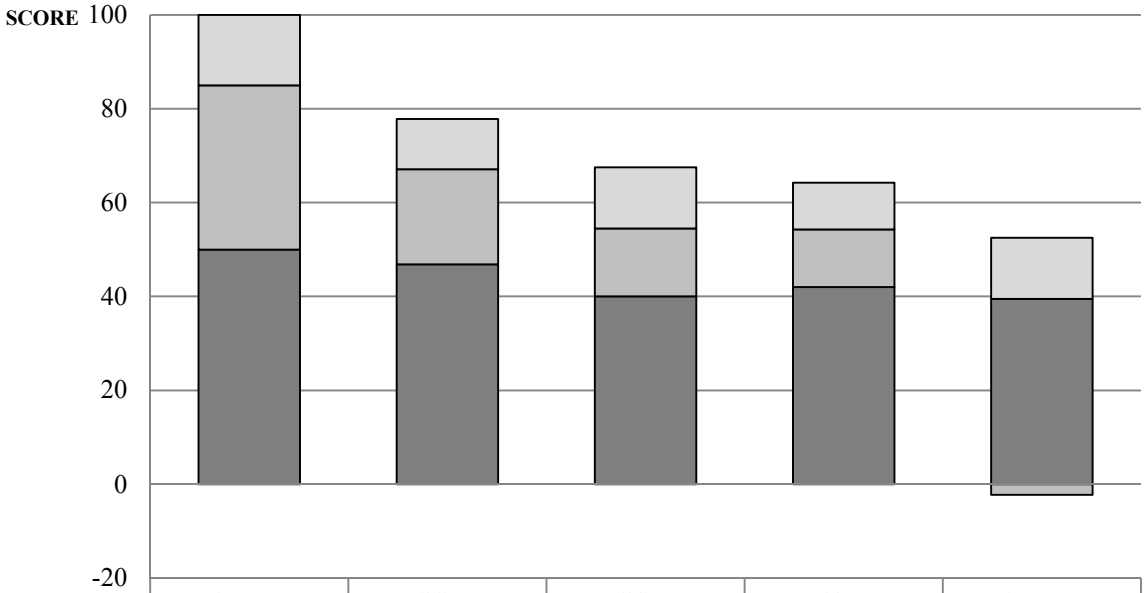
The four construction packages were selected from Transportation (Bridge), Industry (Hydropower) and Building (Architecture) type, and were held at the construction site. The following table shows the detail of construction packages selected for the trials.

Table 7.6.15 Projects and Packages Selected for Trials

		Project				Package				
No	Date	Type	Name	Grade	Contract amount (VND)	Package Name (VND)	Contract amount (VND)	Project Owner	Principal Contractor Name	Supervision Consultant
1	12/15 2011	Building A	Dolphin Plaza	S	747 billion	Foundation and Transfer Beam	180 billion	TID PVFC PVC	HICC1	IBST
2	12/20 2011	Building B	New Skyline	S	1,200 billion	Foundation & 2 Basement	287 billion	HUD-Housing and Urban Development Holdings Corporation	HUD3 and COFICO	CCU
3	1/9 2012	Bridge C	Pha Lai Railway	I	2,000 billion	Package No.9	318 billion	Vietnam Railway Bureau	CIENCO 1	Thang Long Consultant
4	1/10 2012	Hydropower D	Ban Ve	I	7,200 billion	General Construction Package	950 billion	EVN	SD2	PECC1

2) Evaluation Result

The following **Figure** 7.6.4 describes the comparison of each category and final score package between construction packages.



	Maximum score (Total score: 100)	Building: A (Total score: 78)	Building: B (Total score: 68)	Bridge: C (Total score: 64)	Hydropower: D (Total score: 50)
Construction Resources	15	10.75	13	10	13
Management	35	20.25	14.5	12.25	-2.25
Quality	50	46.83	40	42	39.5

Figure 7.6.4 Comparison of Trial Evaluation Results

All evaluators were able to conduct evaluation smoothly according to the evaluation sheet and the Project can say that the proposed standards were feasible for evaluators.

In terms of difference of each score, the contractor of Hydropower D got '-2.25' on Management Category, because they had the serious accident (several workers died) and the score of safety standards was lower than others. On the other hand, Building A got '20.25' on Management Category because they had no accidents and followed the appropriate process on safety and schedule.

The Project finds the difference between the contractors when this evaluation scoring method is used.

3) Feedback

Since the Project received some questions from participants of evaluation meetings during trials, the Project have to reflect appropriate feedback to the tentative evaluation system. The followings are questions and the answers to them.

Q1. There are some cases that SC has many experiences and more knowledge than PMU or PMC. Is it appropriate that PMU or PMC evaluates the standards?

A1. This evaluation data is supposed to be used for the project owner to select contractors at the bidding of state-funded projects. It is important that project owner side (PMU or PMC) get involved in evaluation in any case.

Q2. Do we need to set up any qualification for evaluators?

A2. As for PMU or PMC, the Project should emphasize how they get involved in the construction management more than the experiences and qualification. This is why the persons in important position who directly communicate with SC and contractors shall be assigned.

As for SC, the Project should emphasize how they manage the construction sites. This is why the persons engaged in chief SC shall be assigned.

As for SA, the Project should emphasize their experiences in quality control. This is why they are not directly involved in the project and have to evaluate performance based on their knowledge and experiences. The persons with sufficient experiences in quality control department shall be assigned.

Q3. In hydropower plant, most construction works was occupied by concrete parts. In this case, do we need to arrange the weight among the category "quality"?

A3. Yes, the Project proposes that project owners can arrange the weight according to the contract amount of each construction works in category "quality".

(20) Roadmap

- To successfully complete technology transfer, roadmap planning should be made so that MOC can surely implement this succeeding procedure and certainly spread the contractor performance evaluation system nationwide. The following roadmap is proposed by the Project.
- From 2012 to 2014, evaluation system will start from pilot projects with Grade S, I, and II. At the same time, other two systems such as "Construction Contractor/Consultant Registration System" and "Construction Package Database System" shall be worked because these three database systems are used for PQ examination. If any revised points on evaluation system are found, they will be improved through the committee and public hearing.

- During 2015, construction packages applied for evaluation system will be extended to 50% of packages types with Grade S, I, and II nationwide. From 2016, construction packages applied will be extended to the other 50% of packages types with Grade S, I, and II nationwide.
- At the same time, the new ranking system will be reviewed along with implementation of evaluation system in 2016.
- The following description shows the detailed schedule and scheme of work performance evaluation system from pilot projects to implementation.

1) Dissemination of Evaluation System

a. Pilot Projects (2013-2014)

(1) Organizer

- SACQI

(2) Conductor

- Construction department of supervising authorities managing pilot projects in all provinces

(3) Time

- From January 2013 to December 2014

(4) Pilot Projects

- 10% of all projects or at least 1 project with Grade S, I, II within each province, which were completed or almost completed during year 2013, are selected by conductors. Although the guideline specifies that the evaluation shall be conducted after construction completion, the number of such projects is limited. Therefore, each conductor can select the construction packages which were almost completed as pilot projects
- Selected packages are registered as pilot projects of MOC.

(5) Method

- The evaluation shall be conducted according to the operation guideline.

(6) Committee (If any)

- If any serious problems happen on conduct of pilot projects, the committee can be held to improve the evaluation system. The members are selected from CAMD, SACQI in MOC, and other construction departments of supervising authorities.

(7) Public Hearing (If any)

- If any serious problems happen on conduct of pilot projects, the public hearing can be held to guide the evaluation system. The members are officials of CAMD, SACQI other construction departments of supervising authorities, contractors, and consultants.

(8) Circular (If any)

- If any serious problems happen to the issued Circular, the circular can be amended.

b. All Projects (2015-2016)

(1) Organizer

- SACQI

(2) Conductor

- Construction department of supervising authorities managing construction projects with Grade S, I, II in all provinces

(3) Time

- From January 2015 to December 2016

(4) Projects

- 50% projects with Grade S, I, and II managed by each conductor are evaluated.
- 100% projects with Grade S, I, and II nationwide are evaluated.

(5) Method

- The evaluation shall be conducted according to the operation guideline.
- **Figure 7.6.5** shows the roadmap for spreading work performance evaluation system which is recommended by the Project.

Plans		Road Map (Year)				
		2013	2014	2015	2016	2017～
		1	2	3	4	5
☆Contractor Evaluation System						
- Implement Pilot Projects						
1	Decree 15					
2	Pilot Projects Selected					
3	Pilot Projects Conducted					
4	Committee Held (if any)					
5	Public Hearing Held (if any)					
6	Circular Amended (if any)					
- Implement All projects						
1	50% Projects Conducted					
2	100% Projects Conducted					
☆Ranking System						
	Review Ranking System					

Figure 7.6.5 Roadmap

2) Dissemination of Ranking System

After the period of dissemination of the contractor evaluation system, the ranking system will be expected to be reviewed. In the proposed schedule, the period from 2016 to 2020 will be focused on trial and implementation of the ranking system. It is proposed that taking a sufficient time is important because this ranking seriously affects the contractors' achievement, that is to say, the contract amount that the contractors can acquire.

(21) Issues to be discussed

Though the contractor evaluation system has not been specified in Decree 15, several issues should be discussed hereafter in line with conduct of pilot projects.

1) Set up Minimum Investment Amount for the Evaluation System to be applied

As each project has a variety of construction packages, evaluating all projects are not impractical. Also, evaluating small contract amount of packages does not have a serious impact on improvement of construction quality. Moreover, such a small contract amount of construction packages are simple and contractors are considered to implement them in a similar level. One method is to set up the minimum investment amount and select key construction packages.

2) Make the Category of "Quality" Corresponding to All Types of Construction Projects

Before evaluating pilot projects, the category of "quality" concerned with pilot project types should be organized. MOC should ask other Ministries to make the standards of "quality". Then, all the standards should be specified under the Circular.

3) Review "Quality Work" Evaluation for the Projects

MOC currently focuses on evaluation of work quality of the projects as well as the contractors. Although the Project specifies only how to evaluate the contractors, the contents include the evaluation of work quality for construction packages. Thus the study can be used for evaluation of work quality of the projects by picking up the standards of category of "Quality". This study will be continued by the Vietnamese C/P.

7.7 SOFTWARE SYSTEM DEVELOPMENT

7.7.1 Construction Company and Consultant Company Registration System and Contractor Work Performance Evaluation System

(1) Objective

The Project developed the following internet web based software systems;

- Construction Contractor Registration System (CRG-1)
- Construction Consultant Registration System (CRG-2)
- Construction Package Information Database System (CPDB)
- Contractor Work Performance Evaluation System

Of the above systems, the Project intended to develop the Construction Package Information Database System and the Contractor Work Performance Evaluation System in high priority and developed in 2011. Remaining the Construction/ Consultant Company Registration Systems were developed in 2012.

(2) Interrelation between Systems

Systems of Registration for Contractor / Consultant, Construction Package Database and Evaluation System for Contractors work in coordinated manner and support for bidding process. The evaluation results of contractor work performance, which are brought out from the Contractor Work Performance Evaluation System, are registered in the Construction package information Database System together with construction package information.

Construction companies who wish to participate in state-budget construction works are requested by relevant regulations in advance to the tendering process. The information registered in the Construction Company Registration System will be integrated together with the construction package information and offered to project owners to evaluate preliminary Qualifications (PQs), forming a PDCA cycle in contractor selection (Company Registration – Contractor Selection – Work Performance Evaluation – Data Registration).

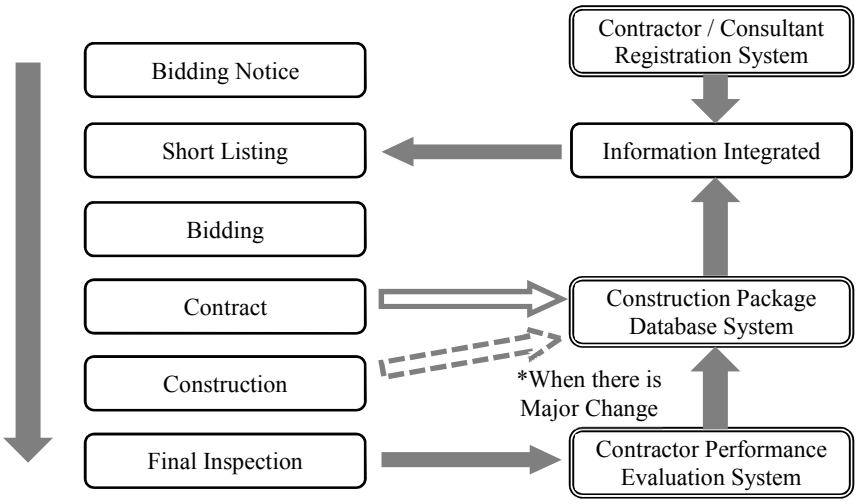


Figure 7.7.1 System Relationship

(3) Schedule of System Development

The Construction Package Database and the Evaluation System for Contractors were developed by March 2012 and the Registration System for Contractor and Consultant were developed by November 2012. Systems are developed by local software companies in accordance with design and instruction of JICA Project Team.

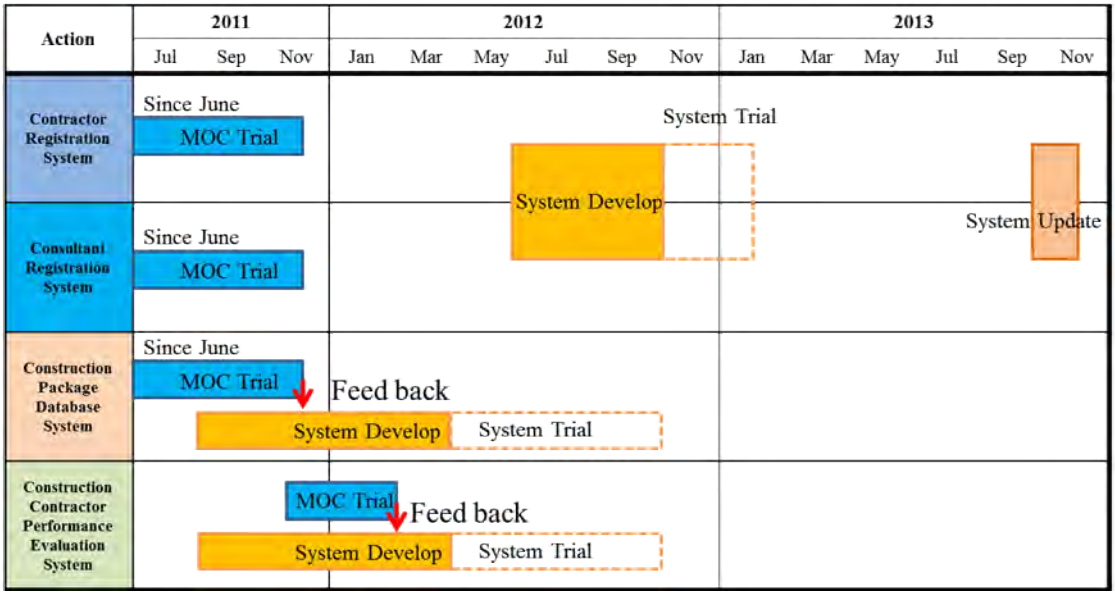


Figure 7.7.2 Schedule of System Development

(4) System Outlines

Table 7.7.1 summarizes the proposed outlines of these systems. Further details are shown in corresponding sections such as **7.2, 7.3, 7.4,** and **7.6**. Required data are input by Project Owners firstly through website and are checked and approved by CAMD. MOC Information Center plays roles of servers and web structure maintenance. MOC shall consider an OM institution for system operation and maintenance.

Table 7.7.1 System Outlines

	Contractor Registration System	Consultant Registration System	Construction Package Database System		Contractor Performance Evaluation System	
Target	Contractors	Consultants	State Budget Project of special, grade I and II		State Budget Project of special, grade I and II	
Data Provider	Construction Company who intend to apply to construction works	Consultant Company who intend to apply to Construction survey/ design/ supervision	Prime Contractor/ Consultant		Evaluators -PMC / PMU -Supervision Consultant -Authority	
Data Input			Project Owner - PMUs - PPCs	CAMD in case data are submitted by document	Project Owner - PMUs - PPCs	CAMD in case data are submitted by document
Receiver / Acceptant	DOCs		DOCs		DOCs	
Data Management - Register - Update / Delete	CAMD		Project Owner and CAMD		CAMD: In case, any modification is required	
Viewer / User	Public		Public		Evaluated score is to be registered in Contraction Package Database at final stage	

Table 7.7.2 Responsibility Assignments for System Development

	Contractor Registration System	Consultant Registration System	Construction Package Database System	Contractor Performance Evaluation System
System Design	JICA Project Team in consultation with PMU/ Working Gourp			
System Developer	Local Software Company		Local Software Company	
System server and Data base Server	Information Center			
System Operation and Maintenance	CAMD			
System Development Period	From June to November 2012 (Updated from September to November 2013)		From October 2011 to March 2012 (Temporary Disabled)	
Document (Back data) Management	DOCs		DOCs	

(5) User Classes and Roles

The system has six (6) user classes and defines their roles as follows.

- Project Owner: Registrant of Construction Package data and Evaluation data..
- Contractor: Registrant of Contractor information. Who manages own data through the system.
- Consultant: Registrant of Consultant information. Who manage own data through the system.
- DOCs: First recipient of any registered information. Verify registered information with back up data and decide to accept or to decline the registration.
- CAMD Leader: Final acknowledger of any registered information. After verifying registered information by DOCs, makes final acceptance of the registration.
- Administrator: System administrator

Three (3) users, Project Owner, Contractor and Consultant, are registrants of the system. And another three (3) users, DOCs, CAMD Leader and Administrator, are data / system administrators.

Table 7.7.3 User Classes and Roles

User Class	Roles at Data Entry	Availability of Data Search and View
Contractor **Consultant**	• Register company information to the system for applying to construction package contract of grade special, I and II. • Revision of the data is required for a certain period.	• Not Available
DOCs	• Check registered data and decide accept or decline.	• Available
CAMD Leader	• Acknowledge CAMD Staff accepted data finally.	• Available
Project owner	• Register the Package data information. • Evaluate work performance of contractor. • User of the System for Preliminary Qualifications of tendering.	• Available
Administrator	• Not Available	• Available

There are some issues to be determined for actual operating the system. One of the issues is that registered data would be opened to public or not. The project team recommended the system to be closed to encourage registrants to disclose sensitive information, such as financial information. This system was firstly designed that all users are required for registration on the basis of closed system. Hence, membership account was proposed and introduced in order to restrict users to the qualified members only. The membership account might be charged and the income might be used for operating cost of the system. The member can view approved data in the system but it has no function to register any data into the system. However, the circular defined to open the information to public, thus the membership account was abolished in the process of updating.

(6) Data Approval Process

First, registrants register their user account for the system. Then, registrants input their project/ company data into the systems. Those data come to waiting list for approval by DOCs. The registrant is required to submit their dossiers to DOC which the registrant entity registered by mail. DOC checks registered data with dossiers sent by mail. In case, data is wrong or dossiers are insufficient, DOC declines the registered data through the system and notice comes to the registrant on the web system. When the registered data passes the check of DOC, CAMD Leader is required final acceptance of the data. With final acceptance, the data is stored in the database, and viewers can access to the accepted data on the system.

To make certain the accuracy of the information, CAMD is to conduct inspections periodically on registered information at random in cooperation with DOCs.

7.7.2 Construction Company and Consultant Company Registration System Update

(1) Measure Items to be Updated

The company registration systems are being enforced earlier than package database system and evaluation system. Hence, those upcoming systems have been disabled until legislated.

Systems	Updates
Construction Company Registration System (CRG-1)	**Updated**
Consultant Company Registration System (CRG-2)	**Updated**
Construction Package Information Database System (CPDB)	*Disabled*
Contractor Work Performance Evaluation System	*Disabled*

Followings are measure items to be updated:

- Modify input data items in order to comply the new circular;
- Add a function to create application forms in accordance with the appendices of the new circular;
- Spread CAMD Staff role to DOCs. The first approval of the application form was given to CAMD in the present registration systems, however, the new circular defines that it is to be done by DOCs, thus the CAMD staff role should be changed to DOCs and the charter of first approval should be given to each DOC by each jurisdiction of the province. Whereas, the final approval is not changed, that is done by CAMD Leader;
- Add a function to announce the status of expiring and expired company data in order to remind entities to update their company registration forms within legitimate duration stipulated by the new circular. That duration is set by the system administrator of the system; and
- Everybody can search and view the registered entities' information, thus guest account was disabled.

Table 7.7.4 Comparison between the System Outlines of Former Registration Systems and Updated Systems

	Present Contractor/ Consultant Registration Systems	Updated Contractor/ Consultant Registration Systems
Data Input	Companies	
Receiver / Acceptant	CAMD	DOCs
Data Management - Register - Update / Delete	CAMD	
Viewer / User	- MOC - Project Owner - Member	Everybody
User Class	-Project Owner -Contractor -Consultant -CAMD Staff -CAMD Leader -Administrator -Member	-Project Owner -Contractor -Consultant -DOCs (64 accounts) -CAMD Leader -Administrator

(2) User Interface

Sample screen shot of the user interface of the system is as shown below.

Print screen shot of updated system to be pasted.

Figure 7.7.3 Sample Screen Shot of the Updated System User Interface

7.8 RANKING SYSTEM

The following statements are written for reference, when MOC decides to commence ranking system.

When construction companies are ranked, the managerial factors are as important as the technical factor (evaluation score). Therefore, MOC needs to decide what factors are adopted for grading and arrange the ratio between the score of managerial factor, technical factor, and disqualification factor by collecting all the data from "Construction Contractor and Consultant Registration System (CRG- 1/2)" and "Construction Package Database System (CPDB)".

Table 7.8.1 shows one simplified example of contractor grading method referring to Japanese practice (the table is prepared by referring the ranking system in the Central Nippon Expressway Company Limited). When the construction company intends to join the state-funded construction packages in Japan, the company shall apply to the third party organization according to "Construction Business Act" issued by MLIT for appraisal of the company's capability. This organization analyzes the company's managerial factors, calculates the score, and finally notifies the official score to the company.

Table 7.8.1 Example of Contractor Grading Method in Japan

Factors	Items	Classification	Maximum Score	Awarded Score
Managerial Factor	Sales	Average sales among annual construction contracts	100	70
	Capital	Owned Capital, etc.	100	70
	Profitability	Operating Profit on sales, etc.	100	70
	Employees	The number of employees engaged in construction business	100	70
	Engineers	The number of qualified engineers with designated qualification	100	70
Technical Factor	Work Performance	Evaluation scores during the past 4 years	100	80
Disqualification Factor	Accidents involving workers Property damage or injury to the third party	-10 points per month with Disqualification Period	0	-10
Total			**700**	**420**

For example, if the minimum score of the evaluation data to participate in PQ is determined, project owners can easily exclude low capability contractors.

If MOC decides how to organize these data, the construction company ranking system will be made**. Table 7.8.2** shows the example of the construction company grading method. For example, when one contractor awards 420 points (**Table 7.8.1**), they are ranked as "B" based on the example of grading system. The contractor ranked as B can participate in project scale with $400 million to $500 million. This kind of ranking system shall be made in each type of construction works by each project owner.

Table 7.8.2 Example of Construction Company Grading Method

Rank	Awarded Score	Contract Amount ($)
A	600-500	More than 500mil
B	500-400	500mil - 400mil
C	400-300	400mil - 300mil
D	Under 300	Under 300mil

CHAPTER 8 IMPROVEMENT OF ENGINEER QUALIFICATION SYSTEM (ACTIVITY-4)

8.1 FRAMEWORK OF IMPROVEMENT OF ENGINEER QUALIFICATIONS IN VIETNAM

8.1.1 Development of Comprehensive Improvement Plans for Engineer Qualifications in Vietnam

(1) Concept of Improvement

With the current growth in infrastructure development in Vietnam, demand for more qualified engineers is on the rise sharply. MOC has already enforced three categories of engineer qualification with 20 individual qualifications in the categories. However, to cope with rapid growth in planning, construction, supervision and maintenance technologies, MOC has tackling the enhancement of engineer qualifications.

To begin with the study on improving engineer qualifications, the Project will introduce Japanese practices as a sample case study of engineer qualifications. Also, the Project will clarify the differences in engineer qualifications by making comparison between Japanese and Vietnamese practices.

Focuses of the study to find out potential of improving engineer qualifications in Vietnam are as follows;

- Engineer without job employment restrictions
- Vocational engineer qualifications
- Grading of qualifications
- Evaluation of eligibilities, examinations or training courses

(2) Methodology

- Introduce practices in Japan in engineer qualifications
- Analyze current engineer qualifications in Vietnam
- Summarize recommendations on the comprehensive plans for improving engineer qualifications

(3) Outputs

- Recommendations on the comprehensive improvement plans for engineer qualifications in Vietnam

8.1.2 Improvement of Construction Supervisor Qualifications

(1) Concept for Improvement

There are three engineer qualifications officially approved in Vietnam. Of these qualifications, the Project focuses on construction supervisor qualification and formulates an improvement plan. The qualification holders of the construction supervisor are expected to play a leading role for managing construction projects and construction quality in the fields. The plan is intended to enhance their managerial capacity by improving examinations and training systems and to let them equip with knowledge and technology suitable for the construction project management.

Based on the study and analysis on the current engineer qualifications, the Project studies the improvement plans in line with the following methodologies:

(2) Methodology

1) Improve Examination System

Objective of this plan is to improve the current exam system deemed unfair and unreliable. The Project will develop recommendations, focusing on the following viewpoints. Due to these improvement plans, it is expected that existing dishonest acts will be drastically decreased.

- Centralization of examination management
- Evaluation by scoring method
- Selection of successful examinees
- Further study on examination questions

2) Improve Training Courses

The objectives of the system are to abolish the current compulsory training course in order to reduce inordinate burden given to the applicants and to encourage training centers to provide high quality training courses and a variety training courses to applicants. The Project will develop recommendations, focusing on the following viewpoints.

- Decrease in inordinate burden on applicants
- Provision of high quality training courses
- Provision of various training courses
- Further study on the implementation of examinations

3) Continuous Professional Development (CPD)

Continuous professional development (CPD) is intended to provide obligatory training courses to the existing qualification holders to keep maintaining their competence. With this objective, CPD provides qualification holders with opportunities to learn update information on their professional domains and to provide compulsory 1 or 2-day training courses to the qualification holders when renewing qualification. The Project will develop recommendations on the following two viewpoints.

- Provision of update information to the qualification holders
- Further study on the update information

4) Develop Grading of Engineer Qualifications

The objective of this plan is to provide higher level qualifications by applying grading of qualifications. The Project will develop recommendations, focusing on the following viewpoints.

- Prepare an intermediate-level supervisor qualification for a chief supervisor
- Prepare an advanced-level supervisor qualification for a leader supervisor
- Further study on the intermediate-level and the advanced-level qualifications

(3) Outputs

- Recommendations on the comprehensive plans for improving engineer qualifications in Vietnam
- Recommendations on the improvement of construction supervisor qualifications
- Recommendations on the improvement of site manager qualifications

8.1.3 Improvement of Site Manager Qualifications

(1) Concept for Improvement

There is a practice engineer certificate system in Vietnam, currently falling into four classifications; (1) architecture certificate, (2) construction engineering certificate (3) construction supervisor certificate and (4) cost estimate certificate. The system has never been applied to the contactor staffs, but to the consultant staffs. There is no regulation which obliges contractor staff to have qualifications. Anybody, who can satisfy academic and job career requirements, is eligible to be a site manager of a construction project. However, current construction projects tend to require high knowledge and professional expertise in construction management and in construction quality assurance. In fact, the current survey has

reported that insufficient construction quality is partly because of the poor management capacity of site managers. The activity is intended to find the potential of applying a qualification system for site managers.

(2) Methodology

- The Project will enhance capacity of site managers by applying engineering qualifications to them.
- Study potential of applying an engineer qualification system to site managers
- Study on applying examination systems
- Study on training system
- Study on the renewal of qualifications
- Study on the operation and management system for the site manager qualifications

(3) Outputs

- Recommendations on the site manager qualification system
- Revision of related regulations

8.2 DEVELOPMENT OF COMPREHENSIVE IMPROVEMENT PLAN FOR ENGINEER QUALIFICATIONS IN VIETNAM

8.2.1 Background

In order to enhance infrastructure construction quality, attention needs to be directed to engineers' capacity involved in construction sectors in addition to the enhancement of institutions and quality management technologies.

8.2.2 Objective

Objective of this analysis is to study engineer qualifications in Vietnam and to analyze the potential of improvement for the engineer qualifications in Vietnam. The analysis employed herein uses the comparison of engineer qualifications between in Vietnam and in Japan. Recommendation will be made upon completion of the analysis.

8.2.3 Current Status of Engineer Qualifications in Vietnam

In Vietnam, engineer qualifications have been developed as certificates which verify engineer's capacity of performing construction practices.

(1) Regulations

The regulations stipulating the certificates are shown as follows with their summaries of provisions;

1) Construction Law

It stipulates that individuals must possess relevant practice certificates and take personal responsibility for their jobs when they provide consultancy on construction planning, design, and construction supervision and construction survey.

2) Decree No.12/2009/NĐ-CP

It stipulates that holders of the title of manager of construction-planning; design manager; construction survey manager; or construction supervisor, and independent practitioners that perform construction planning, construction design or construction supervision must possess practice certificates as required.

3) Decree No.112/2009/NĐ-CP

It stipulates that Cost estimation certificates show the capacity of consultants in cost management.

4) Circular No.12/2009/TT-BXD and Circular No.112/2010/TT-BXD

Circular 12 stipulates details of construction practice certificate. The practice certificate falls into 4 major categories with further breakdown of 20 individual certificates as shown below;

Engineers who desire to be construction design managers or chief-designers should hold a "Construction Engineering" certificate or an "Architecture" certificate. This is not applied to young engineers, but to design managers or chief-designers only. Young engineers except for design managers and chief-designers do not necessarily take "Construction Engineering" certificate (Article 36, Article 47, Article 48, and Decree No.12).

- Architecture (3 qualifications)
  - Design of Construction Plan
  - Design of Architectural Works
  - Design of Interior-exterior works
- Construction Engineering (12 qualifications)
  - Design of Structure Works
  - Design of Electrical Works

- Design of Electro-mechanical Works
- Design of Water Supply and Drainage
- Design of Heat Supply
- Design of Ventilation and Air Conditioning
- Design of Communication Network in Construction Works
- Design of Fire Prevention and Protection
- Design in other Field
- Topographic Survey
- Geological Survey
- Hydrological Geology Survey

- Construction Supervisor (4 qualifications)

  Anyone wishing to get construction supervision jobs should hold a "Construction Supervision" certificate, regardless of their job status unlike the "Construction Engineering" certificate and "Architecture" certificate stated above.

  - Supervision of Construction Survey
  - Supervision of Construction and Finishing Work
  - Supervision of Equipment Installation Works
  - Supervision of Technological Equipment Installation

- Cost Estimate (1 qualification)

5) Decision 820/QD-BXD dated on August 6th 2009 promulgating Assessment Statement for ASEAN Chartered Professional Engineers (ACPE)

It stipulates that under the ASEAN Mutual Recognition Agreement, a professional engineer or practitioner who holds the nationality of an ASEAN Member Country and who possesses qualifications and experience that complies with the requirements specified in this Assessment Statement may apply to be placed on the ASEAN Chartered Professional Engineers Register (ACPER) and accorded the title of ASEAN Chartered Professional Engineer (ACPE).

(2) Characteristics of the Certificate

Characteristics of the certificates in Vietnam are briefly summarized as follows;

- The certificates are the sorts of vocational qualifications with employment restriction, so that engineers without certificates are not allowed to get jobs linked to the certificates.
- The certificates fall into "Architecture", "Construction Engineering", "Construction Supervisor" and "Cost Estimator", so that the "Designer" and the "Construction supervisor" are working separately.
- The qualification for the "Construction Engineering" comprises 12 certificates, but that for the "Construction Supervisor" falls into 4 certificates, fewer than those for "Construction Engineers". This may prove that much attention is more likely paid on the "Construction Engineering" rather than on the "Construction Supervision".
- Qualifications for managing-level or supervisor-level engineers are not institutionalized for "Construction Supervision" now, except for those in "Construction Engineering" and "Architect".

8.2.4 Overseas Practice – Practice in Japan

Engineer qualifications relevant to "Construction Sector" in Japan fall into "National Qualifications" and Private-Sector Qualifications".

National qualifications are to allow individuals to use the names of qualifications when they pass the examinations specified by the regulations. Examinations are implemented by the organizations including the government, governmental organizations or those entrusted by the Government. As shown in **Table 8.2.1**, total numbers of 313 national qualifications are available for all sectors in Japan as of July 2010. Of these, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) institutionalize 77 qualifications.

Table 8.2.1 National Qualifications by Enforcing Ministry Level

Ministries	No. of Qualifications
Cabinet Office	12
Ministry of Internal Affairs and Communications	12
Ministry of Justice	6
Ministry of Finance	2
Ministry of Education, Culture, Sports, Science and Technology	8
Ministry of Health Labor and Welfare	137
Ministry of Agriculture, Forestry and Fisheries	15
Ministry of Economy, Trade and Industry	35
Ministry of Land, Infrastructure, Transport and Tourism	77
Ministry of Environment	12
Sum	313

Private-sector qualifications are not those based on regulations, but are voluntary qualifications. Qualification criteria and examinations are in principle prepared by private sectors.

There used to be so-called public qualifications operated by non-profit organizations, but these are recently categorized as private-sector qualifications since 2005. **Table 8.2.2** shows the national qualifications.

(1) National Qualifications in the Construction Sector

There are six (6) Ministries currently enforcing national qualifications in the construction sector. They are listed in **Table 8.2.2**.

- MOIC: Ministry of Internal Affairs and Communications
- MOEC: Ministry of Education, Culture, Sports, Science and Technology
- MOHL: Ministry of Health. Labor and Welfare
- MOET: Ministry of Economy, Trade and Industry
- MLIT: Ministry of Land, Infrastructure, Transport and Tourism
- MOE: Ministry of Environment

Table 8.2.2 National Qualifications in Japan

Category	Ministry	Regulation	Provision	Engineer Qualification
National Qualifications	MOEC	Act on Professional Engineer	Professional engineers are those whose knowledge of advanced technologies and its application are approved by the Government. Professional engineers should make an effort to continuously enhance his quality with high engineering ethics.	Mechanical Engineering
				Marine and Ocean Engineering
				Aerospace Engineering
				Electrical & Electronics Engineering
				Chemistry Engineering
				Textiles Engineering
				Metals Engineering
				Mining Engineering
				Civil Engineering
				Water Supply & Sewerage Engineering
				Sanitary Engineering
				Agriculture Engineering
				Forest Engineering
				Fisheries Engineering
				Industrial Engineering
				Information Engineering
				Applied Science Engineering
				Biotechnology & Bioengineering
				Environment Engineering
				Nuclear & Radiation Engineering

Category	Ministry	Regulation	Provision	Engineer Qualification
				Comprehensive Technical Management
	MLIT	Act on Architects	Building works should be designed by Architects and constructed by the supervision of Architects	Architects (1st/2nd Grade)
				Structure 1st Grade Architect
				Facility 1st Grade Architect
				Building Work Facility Engineer
		Act on Surveyor	Survey tasks should be performed by Registered Surveyor.	Registered Surveyor
		Act on Construction Business	Contractor should assign an eligible Site Manager, Managing Engineer or Chief Engineer to its construction projects. Managing Engineer should qualify for at least one qualification.	Construction Machinery Operation Engineer
				Civil Works Management Engineer
				Building Work Management Engineer
				Electronic Work Management Engineer
				Plumbing Work Management Engineer
				Landscape Management Engineer
	MOHL	Act on Industrial Safety and Health	Contractor should assign an eligible Safety Manager and Safety and Health Supervisor to its construction projects.	Safety Manager
				Safety and Health Supervisor
		Act on Water Supply	Design and construction of water supply facilities should be supervised by eligible Supervisors for Water Supply Facilities.	Supervisor for Water Supply Facilities
	MOE	Act on Waste Management and Public Cleaning	Contractor should assign an eligible Environmental Hygiene Management Engineer to its project.	Environmental Hygiene Management Engineer for Building Facilities
	MOIC	Act on Fire and Disaster Management	Design and construction of fire and disaster facilities should be supervised by eligible Fire and Disaster Management Engineers.	Fire and Disaster Management Engineer
	MOET	Act on Electricity Business	Design and construction of electric facilities should be supervised by eligible Registered Electricians.	Registered Electrician

The following is the outline of major national qualifications in the construction sector.

1) MOEC Professional Engineer Qualification (PE)

Of these ministries, MOEC institutionalized one but an important qualification, that is a Professional Engineer qualification (PE), which plays the highest-level qualification of all with twenty one (21) engineering fields, so that PE is the one not limited to the construction sector, but cover all engineering sectors. PE has come to compatible with APEC engineer in eleven (11) engineering fields since 2006.

2) MLIT Managing Engineer/Chief Engineer and Architects Qualifications

MLIT enforces the Act on Construction Business, one of the most important Acts in the construction sector, which obliges a contractor to assign an eligible Site Manager, a Managing Engineer and a Chief Engineer in the construction project undertaken by the contractor. The Site Manager, the Managing Engineer and the Chief Engineer are those playing a management role including project management and construction quality management in the construction project. Also, MLIT institutionalized Architect qualifications as independent qualifications to others aiming to manage design and construction supervision of building works.

This is because of the fact that building work projects, which are mostly the private sector projects, may give serious impacts and damages to the public when accidents or incidents occur to their facilities, so that the Act on Building Standards was enforced independently to others and engineer qualifications specialized for the design and construction supervision of building works are also enforced independently.

3) MOET, MOIC and MOH Qualifications for Design and Construction Supervision of Electricity, Fire and Plumbing Facilities

As is the case of Architect qualification, same concept has been applied to the design and construction supervision of electricity, fire/disaster prevention and plumbing facilities. These are the facilities which closely relate human life and thus may cause serious impacts and damages to the public when accidents or incidents occur, so that design and construction supervision should be managed by qualified engineers as stipulated in the concerned regulations shown in the table.

(2) National Qualifications for State Agencies (Building Standard Expert)

These national qualifications are for the state agencies being involve in approving the building facility construction certificates, which is similar to the Construction Permit in Vietnam. **Table 8.2.3** shows the outline of this qualification. The proposals for construction certificates are in principle addressed by relevant public authorities and private companies to the certificate agencies stationed in local governments (Prefectures). However, high knowledge and expertise are in general required in the examination on the proposals before issuing certificates. This is because the national qualifications are required for the staffs in the local governments responsible for issuing building facility construction certificates.

Table 8.2.3 National Qualifications for State Agencies (Building Standard Expert)

Category	Ministry	Regulation	Provision	Engineer Qualification
National Qualifications	MLIT	Act on Building Standards	The qualification holders examine building works whether final products comply with Building Standards.	Expert for examining Conformity of Building Standards Act Expert should hold the 1st-Grade Architect Qualification.

(3) National Qualifications for Inspecting Building Facilities

Building Standards Act in Japan has obliged facility owners, who are either public or private organizations and who own specified building facilities, should undertake regular inspection on their facilities and report to the local governments. With these purposes, national qualifications shown in **Table 8.2.4** are requested for these inspectors. Outline of the specified facilities are briefly stated as follows

- Building facilities in frequent use of the public such as schools, hospitals, medical centers, movie theaters, office buildings and so forth.
- Lift and play facilities
- Fire and disaster protection facilities such as ventilation, smoke-extraction, emergency lighting, water supply and drainage systems, and so forth.

Table 8.2.4 National Qualifications for Inspecting Building Facilities

Category	Ministry	Regulation	Provision	Engineer Qualification
National Qualifications	MLIT	Act on Building Standards	The inspector inspects structures, walls and facilities for the special building facilities (Schools, Hospitals, Medical Centers, Movie Theaters, and Office Buildings.)	Special Building Facility Inspector Training course only, no examination
			The inspector inspects lift and play facilities.	Lift and Play Facility Inspector Training course only, no examination
			The inspector inspects building facilities such as ventilation, smoke-extraction, emergency lighting, water supply and drainage systems periodically and report the results to the local government.	Building Facility Inspector Training course only, no examination

(4) Qualification Grade Classification and Capacity Evaluation

Table 8.2.5 shows grade classifications of qualifications and ways of capacity evaluation for applicants. As seen in the table, some of the qualifications including national and private-sector qualifications has a grading system such as 1st-Grade & 2nd-Grade, 1st-Class & 2nd Class etc. In addition, many of the qualifications employ examination systems in order to evaluate the capacity of applicants.

Table 8.2.5 Qualification Grade Classification and Capacity Evaluation

	Qualification	Grade of Qualification	Capacity Evaluation
1	Professional Engineer	Professional Engineer Associate PE	Examination
	Professional Engineer		
2	Survey	Registered Surveyor Associate RS	Examination
	Registered Surveyor		
3.	Design & Construction Supervision for Building Works	1st Grade Architect 2nd Grade Architect Wooden Structure Architect	Examination
	Architect		
		Structure 1st Grade Architect Facility 1st Grade Architect	Training + 5-year Experience
	Building Work Facility Engineer	Building Work Facility Engineer	Examination
4.	Design & Construction Supervision for Water Supply Facilities	Supervisor for Water Supply Facilities	Examination
	Supervisor for Water Supply Facilities		
5.	Design& Construction Supervision for Fire & Disaster prevention Facilities	Class Special Engineer 1st Class～7th Class Engineer	Examination
	Fire & Disaster Management Engineer		
6.	Design & Construction Supervision for Electric Facilities	1st Class Chief Electrician 2nd Class CE 3rd Class CE	Examination
	Registered Chief Electrician		
	Registered Electrician	1st Class Registered Electrician 2nd Class RE	Examination
7	Construction Management & Supervision	Each qualification falls into two grades examined separately. 1st Grade Management Engineer 2nd Grade Management Engineer	Examination
	Construction Machinery Management Engineer		
	Civil Work Management Engineer		
	Building Work Management Engineer		
	Electronic Work Management Engineer		
	Plumbing Work Management Engineer		
	Landscape management Engineer		
8.	Safety and Health Supervision	Safety Manager	Training Course
	Safety Manager		
	Safety and Health Supervisor	Special Safety Manager 1st Class Manager 2nd Class Manager	Examination
9	Waste Material Treatment	Environmental Hygiene Management Engineer for Building Facilities	Training Course
	Environmental Hygiene Management Engineer for Building Facilities		

8.2.5 Comparison of Engineer Qualifications between Vietnam and Japan

Table 8.2.6 summarizes the comparison of qualifications between Vietnam and Japan and **Figure 8.2.1** shows a schematic view of the comparison. The differences between two countries are briefly summarized below;

- National discipline-based engineer qualification, like an independent Professional Engineers system, is not available in Vietnam. However, MOC has ratified the ASEAN

Chartered Professional Engineers. Anyone who holds construction practice certificates stipulated in Circular 12/2009/TT-BXD can register the ASEAN professional engineers.

- The current construction practice certificates in Vietnam can be regarded as a category of vocational engineer qualification. Currently, 20 construction practice certificates are available in Vietnam. Meanwhile, there are over 14 qualifications available in Japan. Comparison has clarified that there are many similarities in qualifications between two countries. Particular note here includes the following;

(1) Vocational Qualifications

Vocational qualifications in Japan are managed by several ministries, MLIT, MOHL, MOET, and MOE, following specialty for each ministry.

On the other hand, MOC is a dominant organization handling construction practice certificates in Vietnam.

(Reference)

MLIT;	Ministry of Land, Infrastructure, Transport and Tourism
MOHL;	Ministry of Health. Labor and Welfare
MOET;	Ministry of Economy, Trade and Industry
MOE;	Ministry of Environment

(2) Examination of Applicants

Qualifications in Japan are awarded to the applicants by means of examinations in principle, so that anyone who passed the examination can equally use this qualification in his businesses. Use of examination systems facilitates the grading of qualifications.

Meanwhile in Vietnam, certificates for architecture, construction engineering and cost estimate arc issued based on the document evaluation, and likewise those for construction supervision are issued, obliging candidates to take training courses and brief end-term examinations.

(3) Grading of Qualifications

Qualifications in Japan are focused more on raising supervisor-class or manager-class engineers and on ensuring their eligibility. Anyone who passed the examination for a higher grade qualification can get a position of supervisor or manager. This is because of the fact that in the design and construction works contracted out to consultants or contractors, the companies should take whole responsibilities for the quality of the products, thereby eligible supervisors or managers plays important roles to ensure quality.

On the other hand in Vietnam, the eligibility of supervisor-class or manager-class engineers is examined based on their academic records and past experiences, following DecreeNo.12/2009.

Table 8.2.6 Comparison of Engineer Qualifications

Classification	Vietnam	Japan
Discipline-based qualification system	National qualification is not available Mutual authentication with ASEAN Chartered Professional Engineers	Professional Engineers consisting of 21 disciplines Mutual authentication with APEC Engineers
National Qualifications	• **Four(4) categories and 20 construction practice certificates** a. Architecture with 3 work types b. Construction Engineering with 12 work types c. Construction Supervisor with 4 work types d. Cost Estimate • **Vocational certificates** **a. By Circular03/2010/TT-BXD** Mason – Finishing, Formwork – Scaffolding, Reinforce bar – Welding, Concrete, Clay, Ceramic tile manufacturing, Sanitary faience manufacturing, Glass manufacturing, Urban greenery managing stone sculpture. **b. By Circular 04/2011/TT-BXD** Water supply, Electricity fitting, Water pipes fitting, Technology pipes fitting, Metal structure erection, Construction machinery repairing, Construction carpenter and interior decoration, Township management, Drainage, Cement manufacturing equipment. **c. By Circular 10/2011/TT-BXD** Welding.	• **About 8 categories and over 17 qualifications** a. Surveyor b. Architect with 4 qualifications c. Supervisor for water supply facilities d. Supervisor for fire/disaster prevention facilities e. Supervisor for electric facilities f. Supervisor for construction management with 6 qualifications g. Supervisor for Safety and health with 2 qualifications h. Waste material management engineer

Oualifications in Vietnam

- **APEC Engineers**

Civil Engineer	Structural Engineer
Geotechnical Engineer	Environmental Engineer
Mechanical Engineer	Electrical Engineer
Industrial Engineer	Mining Engineer
Chemical Engineer	Information Engineer
Bio Engineer	

Australia, Brunei, Canada, Chile, People's Republic of China, Hong Kong China, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, The Philippines, Russia, Singapore, Chinese Taipei, Thailand, USA, Viet Nam (21 countries)

- **ASEAN Chartered Professional Engineers (ACPE)**
  Decision No.820/ QD-BXD, 6 Aug 2009 (MOC)

Circular No.12/2009_TT-BXD: Construction Practice Certificates

1. Architecture
1.1. Design of Construction Plan
1.2. Design of Architectural Works
1.3. Design of Interior-exterior works

2. Construction Engineering
2.1. Design of Structure Works
2.2. Design of Electrical Works
2.3. Design of Electro-Mechanical Works
2.4. Design of Water Supply and Drainage
2.5. Design of Heat Supply
2.6. Design of Ventilation and Air Conditioning
2.7. Design of Communication Network in Construction Works
2.8. Design of Fire Prevention and Protection
2.9. Design in other Field
2.10. Topographic Survey
2.11. Geological Survey
2.12. Hydrological Geology Survey

3. Construction Supervisor
3.1. Supervision of Construction Survey
3.2. Supervision of Construction and Finishing Work
3.3. Supervision of Equipment Installation Works
3.4. Supervision of Technological Equipment Installation

4. Cost Estimate

(Note) Practices in Japan
MOIC; Ministry of Internal Affairs and Communications
MOEC: Ministry of Education, Culture, Sports, Science and Technology
MOHL; Ministry of Health. Labor and Welfare
MOET; Ministry of Economy, Trade and Industry
MLIT: Ministry of Land, Infrastructure, Transport and Tourism
MOE; Ministry of Environment

Qualifications in Japan

National Professional Engineer

1. Professional Engineer in Japan (MOEC)
1.1. Mechanical Engineering
1.2. Marine and Ocean Engineering
1.3. Aerospace Engineering
1.4. Electrical & Electronics Engineering
1.5. Chemistry Engineering
1.6. Textiles Engineering
1.7. Metals Engineering
1.8. Mining Engineering
1.9. Civil Engineering
1.10. Water Supply & Sewerage Engineering
1.11. Sanitary Engineering
1.12. Agriculture Engineering
1.13. Forest Engineering
1.14. Fisheries Engineering
1.15. Industrial Engineering
1.16. Information Engineering
1.17. Applied Science Engineering
1.18. Biotechnology & Bioengineering
1.19. Environment Engineering
1.20. Nuclear & Radiation Engineering
1.21. Comprehensive Technical Management

National Vocational Qualifications

1. Survey (MLIT)
1.1 Registered Surveyor

2. Design & Construction Supervision for Building Works (MLIT)
2.1 Architects (1st Architect /2nd Architect /Wooden Structure Architect)
2.2 Structure 1st Grade Architect
2.3 Facility 1st Grade Architect
2.4 Building Work Facility Engineer

3. Design & Construction Supervision for Water Supply Facilities (MOHL)
3.1 Supervisor for Water Supply Facilities

4. Design & Construction Supervision for Fire and Disaster Prevention Facilities (MOIC)
4.1 Fire and Disaster Management Engineer

5. Design & Construction Supervision for Electric facilities (MOET)
5.1 Registered Electrician

6. Construction Management Supervision – Managing Engineer/Chief Engineer (MLIT)
6.1 Construction Machinery Operation Engineer
6.2 Civil Work Management Engineer
6.3 Building Work Management Engineer
6.4 Electronic Work Management Engineer
6.5 Plumbing Work Management Engineer
6.6 Landscape Management Engineer

7. Safety and health (MOHL)
7.1 Safety Manager
7.2 Safety and Health Supervisor

8. Waste Material Management (MOE)
8.1 Environmental Hygiene Management Engineer for Building Facilities

Figure 8.2.1 Comparison of Engineer Qualifications between Vietnam and Japan

8.2.6 Recommendations for Developing Engineering Qualification Systems in Vietnam

Engineer qualification is a sort of certificate which ensures engineer's professionalism in the specified discipline or in the specified business domain. There are in general two types of engineer qualifications as follows. Recommendations regarding these qualifications are briefly summarized below.

- Engineer qualifications without employment restriction
- Engineer qualifications with employment restriction

(1) Engineer Qualifications without Employment Restriction

Professional Engineer (PE) qualifications in USA, Canada, Japan and many countries worldwide are the engineer qualifications without employment restriction, but to simply certify their abilities, so that the PE qualifications are not those mandated by regulations unlike vocational qualifications.

PE in Japan is defined in the PE Law as a leading expert on science and technology, who is publicly recognized as being able to render guidance and counsel on research, development, design and evaluation relating to technology, improving the quality and the manufacturing process of products, formulating and managing project plans, investigating the causes of accidents and assessing the damages.

PE will be hopefully a national leading qualification in Vietnam, keeping its status of covering not only various construction sectors, but also various technological disciplines regardless of employment restriction. Moreover, as internationally approved qualifications, PE will play an important role, being mutually certified with APEC Engineer.

With these reasons, it is recommended that MOC and relevant ministries in Vietnam should study the potential of developing the Professional Engineering system in Vietnam as the most representative national qualification.

(2) Engineer Qualifications with Employment Restrictions

The latter qualifications are to ensure engineer's ability which can meet specific business requirements, so that those without the qualification are not allowed to get jobs associated with the qualification.

Current engineer qualification systems in Vietnam look very similar to engineer qualifications with employment restriction in Japan as shown in the above Chapter.

For the further expansion of the current system, MOC is recommended to carry out demand analysis on the needs of specialists in the construction sector and draw a concept plan for the development of engineer qualifications.

(3) Grading of Engineer Qualifications

It is recommended to develop grading systems of engineer qualifications, such as 1st Grade and 2nd Grade, in particular for "Architecture" and "Construction Supervisor" as a high priority issue. It is needed to develop grading systems in order to meet the demand for manager-class or supervisor-class engineers. Current system in Vietnam has explained that any engineers wishing to be managers or supervisors satisfy the conditions stipulated in Decree No.12 in addition to relevant construction practice certificates. They are requested to propose the document showing the discipline of university graduate, duration of job experience and the number of experienced projects. However, it is more preferable to apply examinations in accordance with the grading of qualifications rather than the document examinations, because of the transparency of judgment.

In addition, in the society where many works including designs, supervisions and construction works are outsourced to private companies, manager-level qualification holders play an important role in their companies in supervising the tasks undertaken by the companies, thereby ensuring the quality of the works. MOC is recommended to incorporate the grading of qualifications into the current qualification system.

(4) Evaluation of Eligibilities -Examination and Training Courses

In conjunction with the above issue (3), use of examinations will be beneficial in evaluating candidate's eligibility. However, a particular note here is that this does not mean that examinations be applied to all the qualifications for evaluation, but another possible way of providing knowledge is to oblige candidates to take training courses. Proper selection of applying examinations or training courses should be studied in accordance with the types of qualifications.

(5) Integration of Design Capacity and Construction Supervision Capacity

In the construction sector, design and construction supervision are the two sides of the same coin. Knowledge and experience of design are needed for enhancing construction supervision, and on the contrary, knowledge and experience of construction supervision are needed for improving design, so that MOC is recommended to integrate the current qualification system separately handling design and supervision.

(6) Engineer Qualifications Common to Consultants and Contractors.

Qualifications are in principle given to individual engineers based on the evaluation of their personal eligibility, so that separate handling of qualifications between consultants and contractors is not beneficial. Rather, it is important to set qualifications independent from job categories, thereby reducing the number of qualifications.

(7) Safety Supervisor

Circular 22/2010/TT-BXD stipulates that contractors should take a responsibility for establishing a network and division for managing labor safety at their construction sites (Article 6). Circular 22 also prescribes the responsibility of the staff dedicated to labor safety in their projects. As regards the safety engineer, MOC is recommended to mandate them to take official training courses on the labor safety during construction which must be offered by authorized organizations.

8.3 IMPROVEMENT OF SUPERVISION QUALIFICATION SYSTEM

8.3.1 Improve Examination and Training System

(1) Implement Unified Examination (Plan-1)

1) Objective

Objective of this plan is to improve the current exam system that is said to be unfair and unreliable. As the result of this improvement, new applicants of GS1 and GS2 will be encouraged to study hard to pass the new exam.

It is expected that existing dishonest acts will be drastically decreased if this new plan gets on right track.

2) Centralization on Examination Management

Current practices explain that authorized training centers develop exam questions on their own, so that the quality of examinations varies depending upon training centers. In order to avoid this unfairness, it is recommended to limit the number of authority preparing exam questions into one organization.

MOC and some DOCs are deemed the most reliable organizations to manage the examinations. The Project therefore strongly recommends that MOC implements the new examinations itself.

In conjunction with this, it is recommended to establish a "Qualification Examination Center" (QE Center) inside of MOC for the purpose of managing the examination (**Table 8.3.1** Plan A). This QE Center is expected to make a question database to prepare for the exam questions effectively. This center is also recommended to supervise, to score the new exams and to issue exam certificates to applicants. The applicants then submit them to DOC to obtain qualifications.

In implementing the unified examination there are many staffs needed to manage the examination, so that supports from staff of university and academies belonging MOC may be necessary. Some universities and academies located main cities are recommended to be used as examination location. The examination therefore should be implemented on Sunday or holiday of the universities.

Proposed revision will not burden on DOCs, but works of MOC will be expanded. Although independent and nonprofit institutions are currently involved in the qualification system in the foreign countries to alleviate workloads of the ministry following their decentralization policies, but high reliability cannot be expected in Vietnam at the present stage. Therefore QE Center is recommended establishing into MOC for the mean while.

Table 8.3.1 Comparison of Authorities Implementing Examination

Plan No. Authorities		Plan A Qualification Examination Center in MOC	Plan C DOCs	Plan D Institution	Plan E Training Center (TC)
Number of Authorities		1	63	1	33 (Hanoi27)
Question Maker		QE Center	MOC	Institution	MOC
Supervisor of Exam		QE Center	DOCs	Institution	TC
Staff of Exam (Examiners)		Staff of schools & academies belonging to MOC	DOCs	Institution & TC	TC
Scorer of Exam		QE Center	DOCs	Institution	TC
Location of Exam		Schools	Schools	Schools	TC
Countries installing a Similar System		Singapore, China		Japan, Indonesia	
○:Advantage △:Small Disadvantage ●:Disadvantage	1.Prevent Wrongdoings	○ Very Good	● Doubtful (Some DOCs)	● Doubtful	● Poor
	2.Workload of MOC	△ Needs to establish QE Center in MOC	● Needs to make 63 DOCs provide exam without wrongdoing	● Needs to establish a new institution and administrate it	● Needs to make 33 training centers provide a reliable exam
	3.Workload of DOC	○ Nothing	● Needs to establish a division in each DOC	○ Nothing	○Nothing
	4.Future expandability for high-level exam for high-level qualifications	○ Acceptable	● Difficult to provide the same quality exam	○ Acceptable	●Difficult to provide the same quality exam
	5.Accessibility of Applicants	△ Implementing at main cities	○ Implementing at every province	△Implementing at main cities	△Implementing at main cities
	6.Facilities & Staffs	△ Needs to rent facilities &staff	△ Needs to rent facilities &staff	△ Needs to rent facilities &staff	○Owning classrooms
Evaluation of This Project		Recommended		Future Plan	

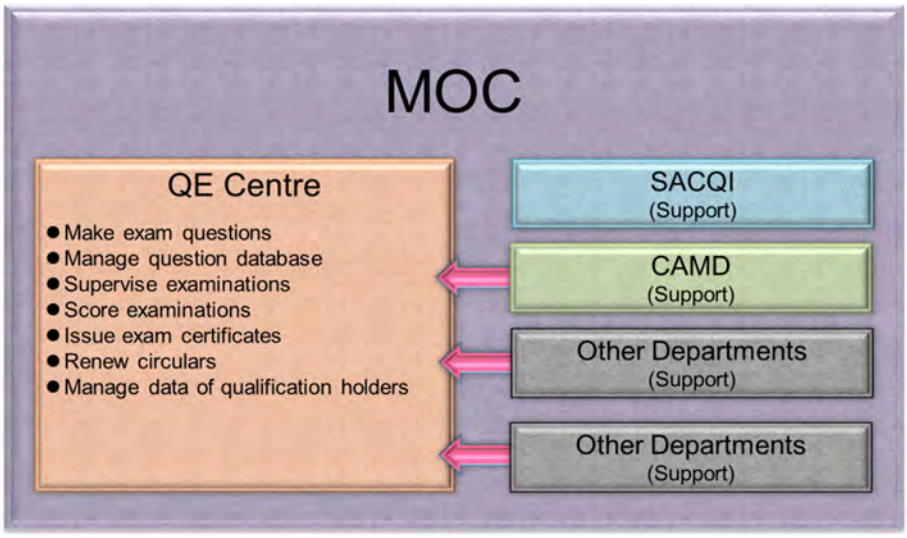


Figure 8.3.1 QE Center in CAMD

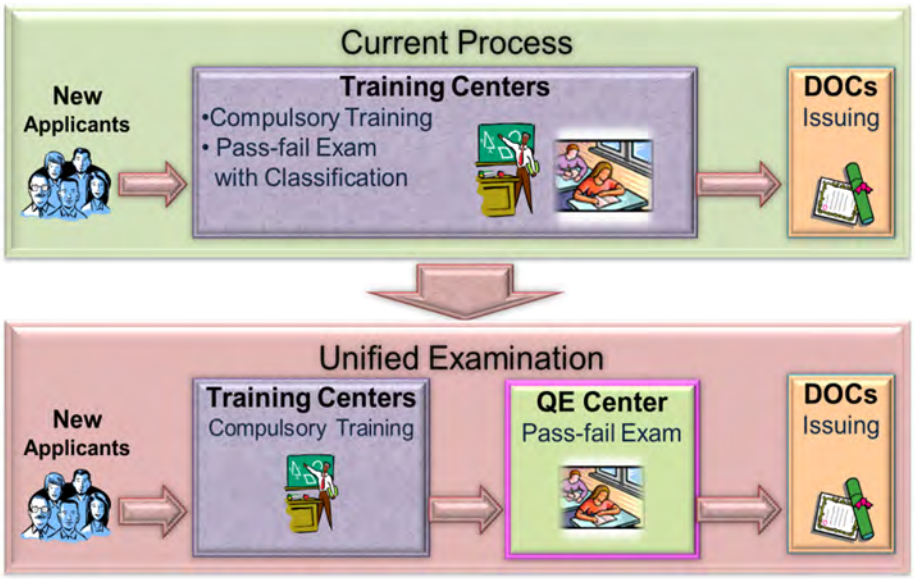


Figure 8.3.2 Current Process ⇒ Unified Examination

3) Studies to Implement the Unified Examination

Table 8.3.2 shows a comparison of examinations. Japanese four qualifications shown in the table are 1st and 2nd-class Civil Engineering CME and 1st and 2nd-class Architectural CME. Vietnamese current qualification for supervisor is shown next. It is necessary to decide some details such as examination locations, frequency date, fee, question style, ration of technical questions and regulations + ethics, time, and selection of successful examinees. For each topic, this project recommends some suggestions as below.

a. Locations

There are 10~19 locations provided qualification examination in Japan. The land size and shape of Vietnam and Japan are similar, so it is recommended that unified examination should be implemented at least 10 locations in Vietnam.

b. Frequency

Frequency of Japanese examinations is once a year. Vietnamese people do not get used to take unified examination only once a year, but it is recommended that frequency of the unified examination be once (or twice) a year. There are three reasons to support this recommendation.

- If examination is implemented only once or twice a year, most candidates want to avid to fail the examination, because they have to wait long time to challenge the next unified examination. Therefore, most of them study enough to pass the unified examination. This way encouraged candidates study hard before challenging the unified examination.
- Candidates who fail examinations are recommended to study more than half year before challenge the next unified examination.
- It is very difficult what only one authority frequently implements unified examination in a year. Workloads of QE center should be limited to minimum essentials.

Table 8.3.2 Comparative Table to Decide the Details of Vietnamese New Examination

Name of Qualifications		Japanese 1st-class, Civil Engineering CME	Japanese 2nd-class, Civil Engineering CME	Japanese 1st-class, Architectural CME	Japanese 2nd-class Architectural CME	Vietnamese Current Exam	Vietnamese New Exam
Implementing Organization		Independent Organization	Independent Organization	Independent Organization	Independent Organization	Authorized Training Center	**QE Center (MOC)**
Locations		13 nationwide	19 nationwide	10 nationwide	13 nationwide	33	**More than10**
Name of Cities (Vietnam: Provinces)		Sapporo, Kushiro, Aomori, Sendai, Tokyo, Niigata, Nagoya, Osaka, Okayama, Hiroshima, Takamatsu, Fukuoka, Naha	Sapporo, Kushiro, Aomori, Sendai, Akita, Tokyo, Negate, Toyama, Shizuoka, Nagoya, Osaka, Matsue, Okayama, Hiroshima, Takamatsu, Kochi, Fukuoka, Kagoshima, Naha	Sapporo, Sendai, Tokyo, Niigata, Nagoya, Osaka, Hiroshima, Takamatsu, Fukuoka, Naha	Sapporo, Aomori, Sendai, Tokyo, Niigata, Kanazawa, Nagoya, Osaka, Hiroshima, Takamatsu, Fukuoka, Kagoshima, Naha	North: Ha Noi: 27 Middle: Da Nang: 1 South: ・Binh Duong: 1 ・DoungNai: 1 ・Ho Chi MInh: 3	**・North: 4 ・Middle: 2 ・South:4**
Frequency of Exam		Once a Year	Once a Year	Once a Year	Once a Year	Every month	**1 (or 2) a Year**
Application Month		April	April	February	July		**a few month before the examination**
Exam Date	Academic	July	October	June	November		**Spring or Autumn**

Name of Qualifications		Japanese 1st-class, Civil Engineering CME	Japanese 2nd-class, Civil Engineering CME	Japanese 1st-class, Architectural CME	Japanese 2nd-class Architectural CME	Vietnamese Current Exam	Vietnamese New Exam
	Practical	October		October			
Exam Fee	Academic	1,822,000 dong	911,000 dong	2,090,000 dong	1,045,000 dong	(CQM)1,700,000VND for 1Compulsory + 1Technical Subject including training fee	**Depend on expense of QE Center**
	Practical	1,822,000 dong	911,000 dong	2,090,000 dong	1,045,000		
Exam Type	Academic	Multiple Choice (1/4)	Multiple Choice (1/4)	Multiple Choice (1/4)	Multiple Choice (1/4)	Multiple Choice (1/2-5)	**Multiple Choice (1/4)**
	Practical	Writing	Writing	Writing	Writing		
Exam Time	Academic	1st-Day AM: 2h 30min PM: 2h	AM: 2h 10min	1st-Day AM: 2h 20min PM: 2h 10min	AM: 2h 30min	Regulation: 30m Three Technical Fields: 30m each	**Regulation+ Ethics: AM 1h Technical Fields: PM 3h**
	Practical	2nd Day: 2h 45min	PM: 2h	2nd Day: 3h	PM: 2h		
No. of Examinee		34,900	31,467	25,195	23,081	9,611	**About 10,000**
Pass Rate (2009)	Academic	50.9%	59.0%	34.9%	34.9%	Almost 100%	**Depend on demand of the construction industry**
	Practical	19.1%	21,5%	41.1%	31.1%		
Exam Components (2009)		**1st-Day AM:** Academic Civil Eng (General) 12Q/15Q Choice ・Civil Eng (Specific) 10Q/34Q Choice ・Regulation 8Q / 12Q Choice **1st-Day PM**: Academic ・Engineering (General) 5Q Compulsory ・Supervising Construction 30QCompulsory **2nd-Day:** Practical Fields ・Supervising Construction 1Q Compulsory 3Q / 5Q Choice	**AM:** Academic ・Civil Eng (General) 9Q/11QChoice ・Civil Eng. (Specific) 6Q/20QChoice ・Regulation 6Q / 11Q Choice ・Engineering (General) 4Q Compulsory ・Supervising Construction 15Q Compulsory **PM:** Practical Fields ・Supervising Construction 3Q Compulsory 1Q / 2Q Choice	**1st-Day AM:** Academic ・Architect 12Q /15QChoice 5Q Compulsory 5Q/13Q Choice 5Q/12Q Choice **1st-Day PM:** Academic ・Supervising Construction 25Q Compulsory ・Regulation 8QCompulsory **2nd-Day:** Practical Fields ・Supervising Construction 6Q Compulsory	**AM**: Academic ・Architect 9Q/14QChoice 3QCompulsory ・Regulation 6Q / 8QChoice ・Supervising Construction 10Q Compulsory ・Architect 6Q/15Q Choice 6Q /15Q Choice **PM:** Practical Fields ・Supervising Construction 5Q Compulsory	Compulsory Subject Legal regulations and general issues on construction supervision Optional Subjects Construction supervision of civil, industrial and infrastructural works Construction supervision of transportation works Construction supervision of irrigational and hydropower works	**Regulations+ Ethic (compulsory): 1hour** **Technical fields (Optional): 3hours**

c. Examination Date

According to **Table 8.3.2**, Japanese unified examination is implemented June, July, October or November. There are no specific reasons to decide these days. It is recommended that summer season should be avoided in Vietnam, because many air conditioners are used in hot days and this situation usually causes blackout. Winter is quite cold in Hanoi, so spring or autumn season is recommended to implement the unified examination.

d. Examination Fee

It is recommended that all expense of QE center be covered by income of examination fee. Namely, it is necessary to calculate the expense of QE center to decide the examination fee. Price level of Vietnam and Japan is absolutely different, so it is not a good way to compare between the Japanese examination fee and Vietnamese examination fee.

e. Examination Question Style

The Project recommends using a multiple-choice scoring method to decrease the workloads of QE center. Current examination questions are too simple, so it is recommended to make

f. Ratio of Technical Questions and Regulation + Ethic Questions

In the case of Japanese qualifications that are Civil Engineering CME and Architectural CME, ratio of examination questions for regulations + ethic is from 12% to 15% (**Table 8.3.3**). In the case of Vietnam, regulations are frequently revised, so it is a very important topic for supervisors. Ethic is also very important for Vietnamese people. Therefore the ratio of examination questions relating regulations and ethics should be greater than the ration of Japanese examination questions. It is therefore recommended that 25% questions should be from the regulations and ethics field.

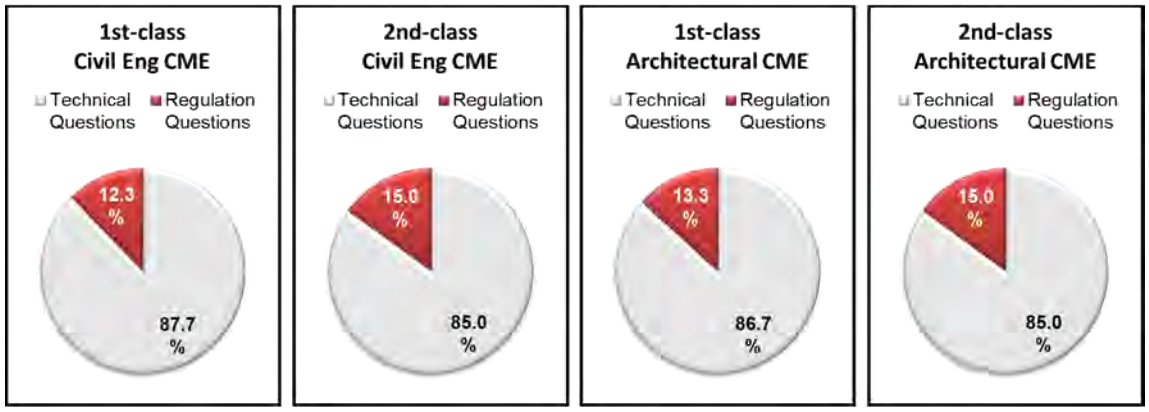


Figure 8.3.3 Ratio of Technical Questions and Regulation + Ethic Questions in Japan

g. Examination Time

In the case of Japanese 2nd-class Civil Eng. CME and 2nd-class Architectural CME, examination time is 4 hours and 30 minutes. Regarding the Japanese information, this project recommends the examination time as shown below:

- Regulation/Ethic (Compulsory Questions) : 1 hour (25%)
- Technical Fields (Compulsory and Optional Questions) : 3 hours (75%)

h. Selection of Successful Examinees

There are three ways to select successful examinees as shown in **Table 8.3.3**. Fixed "pass rate" method is recommended, but requirement for the number of qualification holders depends on the demand of Vietnamese construction industry. Therefore, number of exam passer for the current qualification should be fixed. It is recommended to fix the ratio of successful applicants for the intermediate and advanced qualification in case that these level qualifications are provided. Capability of these higher level qualification holders should be stable. Details of the Intermediate and Advanced qualification are explained hereinafter.

Table 8.3.3 Three Methods to Select Successful Examinees

	Example	Advantages	Disadvantages
Fixing Number of Passer	University Entrance Exam	Number of exam passer can be fixed for demands	Ability of exam passer depends on number of applicants
Fixing Pass Score	Term-end Exam Driver license exam	Applicants can know how many score do they need to take	Ability & Number of exam passer depend on difficulty of exam
Fixing Pass Rate	Qualification Exam in Japan	Ability of exam passer is stable	Number of exam passer depends on number of applicants

(2) Implement Optional Training Courses (Plan-2)

1) Objective

The plan is intended to provide applicants equipped with sufficient capability with opportunities to challenge examinations directly without taking training courses. On the other hand, the plan encourages training centers to develop high quality and a variety of training programs.

2) Alleviate Excess Burden on the Applicants

Applicants who are capable enough do not need to take training courses. They should be allowed to challenge the new examination directly. Therefore, the project recommends that regulations should not oblige candidates to take the training courses before taking examinations.

3) Encourage Training Centers to Develop High Quality Training Programs

Other Applicants are encouraged to take training courses before challenging examination. Most training centers are recommended to provide high quality training courses facilitating trainees to challenge the new examinations. The centers should make an effort in attracting more trainees. Good reputation would be important for training centers.

4) Diversify Training Courses

In the current system, the curricula and the time schedules for the existing training courses have been decided by MOC, following Circular No.25/2009/TT-BXD, 29 July 2009. By changing the training courses to be optional, every training center can develop a variety of training courses to attract applicants, such as short-term courses, night courses and so forth.

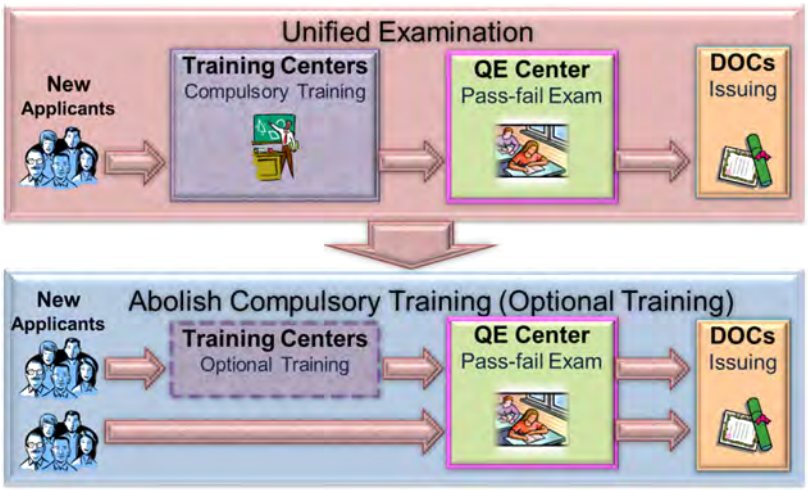


Figure 8.3.4 Unified Examination ⇒ Optional Training

5) Time to Change

It is recommended that the current compulsory training courses should not be changed to the optional training courses until unified examination gets on right track.

8.3.2 Continuous Professional Development (CPD)

(1) Provide Short Term Training Courses in the Qualification Renewal (Plan-3)

1) Objective

This plan is intended to obligate existing qualification holders to keep maintaining their competence. It provides qualification holders with opportunities to learn update information

on their professional domains, obligating them to take compulsory 1 or 2-day training courses every 5 years when renewing qualifications.

2) Japanese 1-day Training Course for Site Manager

Under the current regulations, if construction cost of a project is more than 30 million yen (6.7 billion VND), site manager is obliged to have a certificate of "1-day Training Course Attendance" and certificate of "Site Manager" in Japan. The certificate of Site Manager requires a qualification (1st-class Civil Engineering CME). Civil Engineering CME does not need to be renewed, but both certificates need to be renewed every 5 year. Japanese system seems to be a good model for the Vietnamese new system. Basic information of the Japanese 1-day Training Course is as below:

- Provider : Authorized Independent Unprofitable Institution
- Location : Nationwide
- Facilities : School, Conference Room, etc.
- Fee : 10,000 yen (about 2.2million VND) / 1 day
- Frequency: : About once a month (Depends on the number of applicants)
- Time : 9:00 ~ 16:40

Main contents of the training course:

- Tasks as a construction engineer in the construction industry (Ethic)
- Regulations
- Construction planning and management
- Construction safety management
- Environmental Mitigation

3) Provision of Update Information to the Qualification Holders

Regulations are frequently revised in Vietnam, but qualification holders are said to have difficulty in following these changes. Short training course can be an effective way to provide information on renewed regulations. Information on accidents at construction sites would also be important information to raise their awareness towards accident. Qualification holders need to renew their qualification every 5 year, so it will be a good opportunity to provide a lecture when they renew their qualification.

Three plans (Plan A, B, C) for the short training course have been discussed with MOC and Hanoi City DOC. These methodologies are shown in **Table 8.3.4** and **Figure 8.3.5, Figure 8.3.6**, and **Figure 8.3.7.**

Table 8.3.4 Short Training Course Comparative Table of Plan A, B, C

	Plan A	Plan B	Plan C
Provider	Training Centers	DOCs	Training Centers
Location	Training Centers	DOCs	Schools (Every Province)
Numbers	▵ 33	○ 63	○ 63
Accessibility	▲Only Big Cities	○ Nationwide	○ Nationwide
Efficiency	▲ Not Good	○ Very Good	▵ Good
Facilities	○ Classroom	▵ Conference Room	▲Need to use schools
Lecturers	○ Lecturers	▲ Need to hire lecturers	▵ Need to send lecturers to
Reliability	▲ Poor	▵ Fair	▲ Poor
Evaluation			

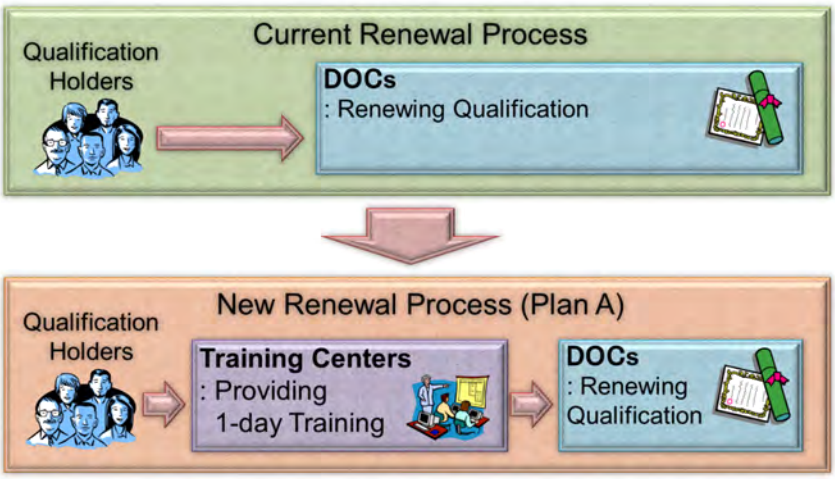


Figure 8.3.5 Plan A

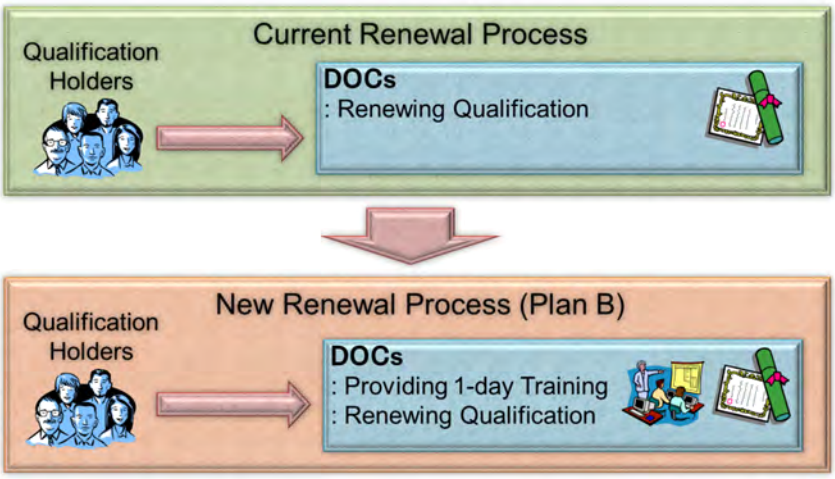


Figure 8.3.6 Plan B

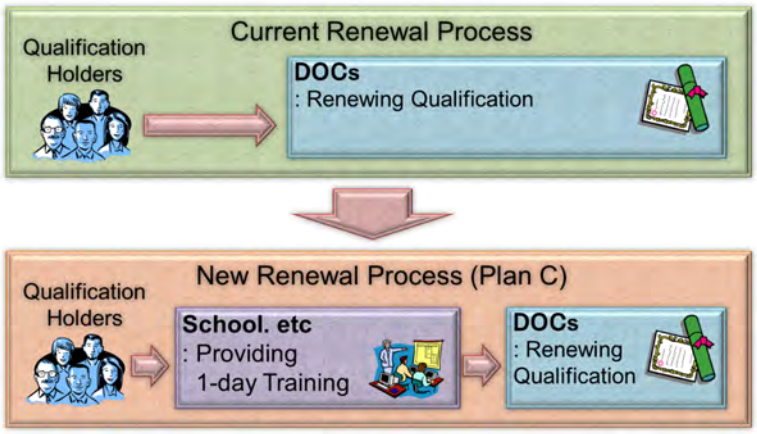


Figure 8.3.7 Plan C

Candidate curriculums of this training course are as shown below:

- Tasks as construction engineer in the construction industry (Ethic)
- Revised regulations (at least recent 5 years)
- Construction safety management and case study of construction accidents
- Environmental mitigation

(2) Establish Intermediate Level & Advanced Level Qualification (Plan-4)

1) Objective

The objective of this plan is to provide higher level qualification and encourage qualification holders to challenge these qualifications. The Project recommends that the current supervisor qualification be changed to basic-level qualification and develop intermediate-level and advantaged-level qualification on the basic-level qualification.

Most Japanese qualifications are classified into a few levels. High level qualifications require applicants to take exams such as writing exam, short essay exam and official interview. Even if applicants did not graduate a university, he/she can challenge the high class qualifications (but required working experience is longer than applicants who graduated university).

2) To Raise Chief Class Supervisors

Establishing an intermediate-level qualification will be an efficient way to encourage the current qualification holders to enhance their capacity and to get higher status of job opportunities. The Intermediate-level qualification is to request higher knowledge, expertise and technologies to comply with current advances in construction supervision technologies. The Project recommends that Intermediate-level qualification be applied for chief class supervisors or equivalent who will be involved in big projects.

3) To Raise Leader-Class Supervisors

Establishing an advanced-level qualification is a good way to raise leader class supervisors who can manage overall supervision and transfer technologies to younger supervisors. Every supervision consultant is advised to keep at least one advance-level qualification holder in the company in the future.

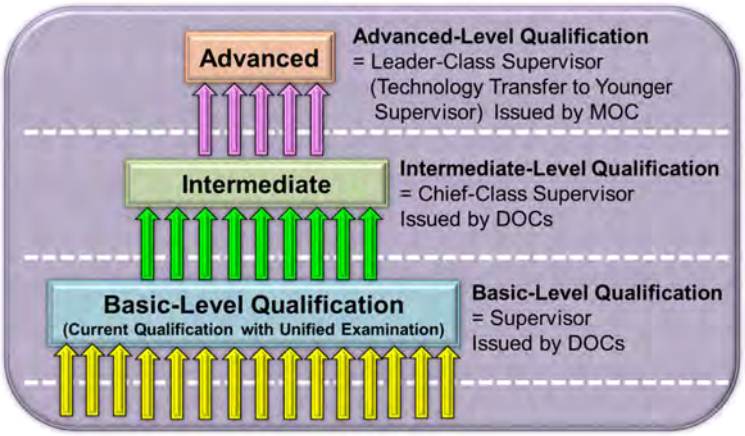


Figure 8.3.8 Three Levels of the Supervisor Qualifications

Table 8.3.5 Requirements of Supervisor Qualification

Qualification	Functional Requirement	Requirement		
		Working Career	Knowledge	
			Technology Regulation Ethic	Overall Supervision Management
Advanced-Level Qualification	Leader-Class Supervisor	At least 7~10 year	○	○
Intermediate-Level Qualification	Chief-Class Supervisor	At least 5~7 year	○	–
Basic-Level Qualification	Supervisor	At least 3 year	○	–

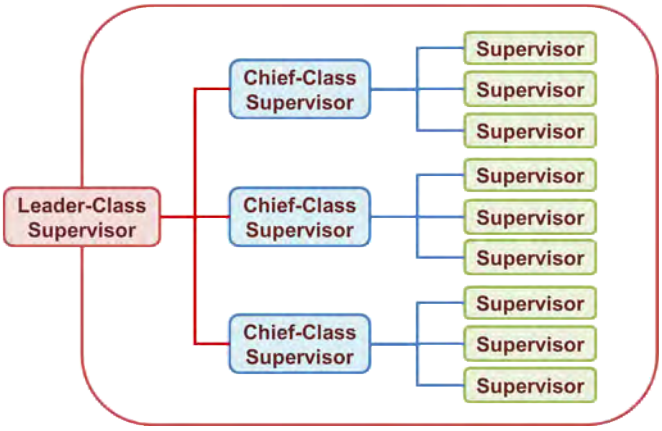


Figure 8.3.9 Project Implementation Structure (Example)

Table 8.3.6 Examination (Example)

Qualification Level	Pass Rate (%)	Examination Type*			
		Multiple-Choice	Writing	Short Essay	Official Interview
Advanced	5-10	–	○	○	○
Intermediate	30-50	○	○	–	–
Basic	–	○	–	–	–

(Note) Examination Type:

- Multiple-Choice: Read questions and chose one answer
- Writing: Read questions and write answers
- Short Essay: Read topics and write essays about them
- Official Interview: Answer questions and discussions

8.3.3 Road Map

Table 8.3.7 shows a roadmap for improving construction supervisor qualification system which is recommended by the Project.

Table 8.3.7 Roadmap

Plans	Road Map (Year)					
	2011	2012	2013	2014	2015	2016
General Activity(2011)						
1 Agreement with CP & PMU						
2 Hearing Opinions from Stakeholders						
3 Agreement with MOC						
Implement Unified Examination (2012, 2013)						
1 Prepare & Establish QE Center						
2 Make Question Data Base						
3 Prepare & Implement Unified Exam						
4 Revise Regulations						
Implement Optional Training Courses (2013)						
1 Revise Regulations						
2 Implement Optional Training Course						
Provide Short Term Training Courses in the Qualification Renewal (2014)						
1 Revise Regulations						
2 Prepare & Provide Short Term Training Courses						
Establish Intermediate-Level (2014) & Advanced-Level Qualification (2016)						
1 Revise Regulations						
2 Prepare & Implement Unified Exam						

8.4 IMPROVEMENT OF SITE MANAGER QUALIFICATION SYSTEM

8.4.1 Background and Rational

Why eligible Site Managers are needed in the construction sites?

- It was reported on many occasions through hearing from counterparts and local contractors in the course of initial study that lack of management in terms of construction, sub-contract and quality was caused by "Site Manager" who had no capacity and knowledge to fulfill his roles for assignment.
- There are four engineer qualifications which are for Architect, Engineer, Construction Supervisor and Construction Cost Estimator, but no qualification for Site Manager in Vietnam.
- Therefore a person who has certain academic qualification and job experience to meet with requirement stipulated in the relevant legal document can be appointed as Site Manager.
- However it is obvious that certain capacity and knowledge in terms of relevant laws, ethics and engineering are essential for Site Manager for construction project and review of qualification system for Site Manager was requested by MOC. This request was made in the course of study for Activity 4: Improve Existing Engineer Qualification System.
- In this study, roles of Site Manager for construction project will be reconfirmed with recognition of common purpose of the project, i.e. completion of construction safely to meet with required quality within required time based on sharing of responsibilities between Client, Consultant and Contractor under construction contract.
- The required experience and ability for the roles of Site Manager will be further studied. Upon identification of the difference from those required under the existing qualification system, a revised qualification system will be proposed.

8.4.2 Current Practices in Vietnam

The following legal documents are referred for this study.

- Decree 12/2009/ND-CP on Management of Construction Investment Projects
- Circular 12/2009/TT-BXD, Detailed guidelines on the issuance of Construction Practice Certificate
- Circular 25/2009/TT-BXD, Guidance on Professional Training of Construction Investment Project Management and Construction Supervision
- Decree 209/2004/ND-CP on Quality Management of Construction Works (currently under process of revision)
- Regulations relevant to engineer qualifications

(1) Qualification System for Construction Company

- Eligibility requirements for Architect, Engineer and Construction Supervisor are stipulated in Decree 12.
- These requirements are stipulated based on academic background and work experience in construction site. Completion of training course on construction supervision is required for Construction Supervisor.
- The possession of training certificate and professional certificate for individuals entering construction activities and construction supervisor and individuals working independently perform design work for construction planning, construction work and construction supervision is stipulated in Decree 12.
- Number of people having professional certificate of Construction Supervisor is required as capability of supervision consulting companies in Decree 12.
- Employment of Architect and Engineer is required as capability of construction company in Decree 12. However those Architect and Engineer for construction company don't need to be qualified and having Construction Supervisor is not required as capability of construction company.

(2) Site Manger and Contractors Representative (Site Agent)

- Appointment of Site Manager is condition for carrying out the construction works under Law on Construction.
- Academic background and work experience in construction site are indicated as qualification requirements for Site Manager in Decree 12. However neither completion of lecture class nor issues of certificate of qualification are stipulated in the Decree
- Site Manager is usually not Contractor's Representative.
- Representative of Contractor is defined in Article 1. of Contract Form guided by MOC and obligations of Contractor are stipulated in Article 11.2 and 11.3. However no clear statement of the roles of representative of Contractor and demarcation of responsibilities among construction site organization is provided in the Contract Form and Construction Law.
- Full-Time assignment of Site Agent and Site Manager to construction site is not stipulated in Construction Law and Contract Form.

(3) Management of Construction Quality by Contractors

- The following eight activities as the specific actions of quality control to be made by Construction Contractors are stipulated in Decree 209.

- Setting up quality management system
- Test of construction material and equipment
- Planning construction method and schedule
- Opening, and making entries in, construction diaries according to regulations
- Examining labor safety and environmental sanitation
- Checking and accepting internally and making construction as-built drawings
- Reporting to investors on construction progress, quality, safety, environmental sanitation
- Preparing documents for checking and acceptance

- The ability to cope with these activities shall be improved by this project and persons who should have such ability are target of Qualification System.

(4) Project Organization

- Relationship of parties under Construction Contract in Vietnam is shown on the following **Figure 8.4.1**.
- Numbers of Contractors Representative of each company in Vietnam are quite limited. Therefore there is usually no Full-Time representative on site.
- Contractual communication among Client, Consultant and Contractor is made by each representative.
- Technical matters shall be dealt by competent Site Manager and Construction Supervisor and Site Manager shall direct his Sub-Contractor from technical management point of view.

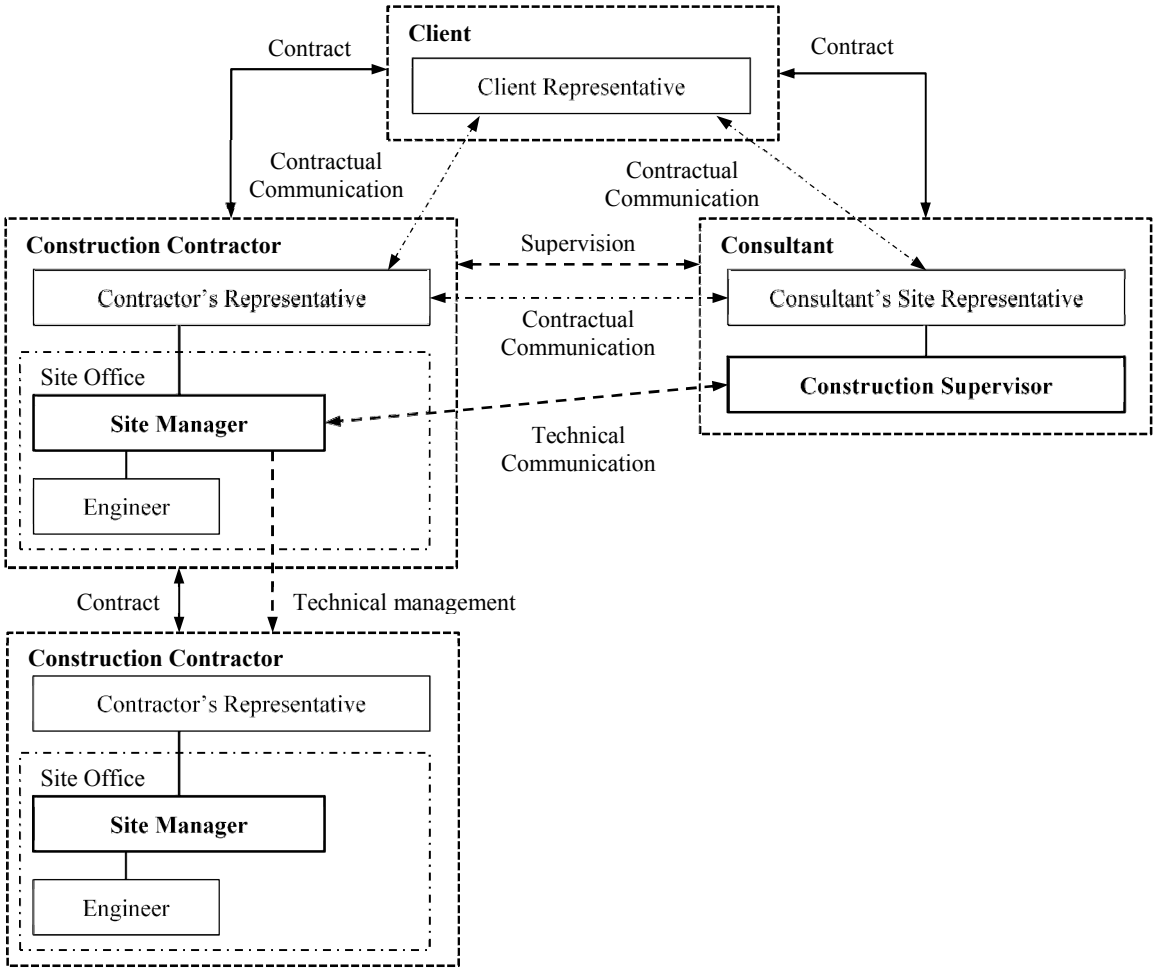


Figure 8.4.1 Project Organization

8.4.3 Overseas Practices (Practices in Japan)

(1) Contractor's Representative (Site Agent) in Japan

- It is stipulated in Standard Contract Terms and Conditions for Public Works in Japan that Site Agent shall be appointed on FULL-TIME basis at site.
- It is also stipulated in Standard Sub-Contract Terms and Conditions for Construction Works in Japan that Site Agent for Sub-Contractor shall be appointed on FULL-TIME basis at site.
- The Contractor shall notify the Client in writing of power delegated to their Site Agent as stipulated in Article 19.2 of Construction Contractors Law.
- Site Agent is the Contractor's representative under the Contract and is not necessary to be technical staff of the Contractor. Indeed Site Agent need to hold technical qualification such as Managing Engineer stated below according to tender requirement for most of the project.

(2) Managing Engineer and Chief Engineer in Japan

The Construction Contractors Law claims two major requirements for Managing Engineer and Chief Engineer.

1) Construction Company Responsibility in Japan

- The construction companies shall assign Full-Time Engineer to each business office as requirement for obtaining construction business license in order to execute construction contract appropriately and protect the Client against the risk under the Contract as stipulated in Article 7, Item 2 of Construction Contractors Law.
- In addition, construction companies should take responsibility for assigning Managing Engineers or Chief Engineers to the construction projects under contract for technical management and control of construction at site.
- For public or large important facilities or structures construction works of which total contract price is not less than 25 million JPY (for lump sum building works, not less than 50million), Managing Engineer or Chief Engineer to be appointed shall be on FULL-TIME basis regardless of main contract or sub-contract.
- FULL-TIME basis means exclusive duty prohibiting concurrent assignment for more than one project. Therefore such FULL-TIME Engineers shall be assigned continuously at all times for construction site concerned. (FULL-TIME basis appointment is stipulated in FIDIC as well. The relevant parts of clauses in FIDIC are introduced in **Appendix_8-1-1** for reference.)
- Employers and contractors should establish fair contracts and observe the contracts.
- Main contractors are not allowed to outsource whole segments of the projects to subcontractors.

2) Individual Engineer Responsibility in Japan

- A Managing Engineer should be qualified for the First-Class Engineer shown below, the Professional Engineer Qualification or those approved by the MLIT Minister.

【First-Class Engineer Qualification】

- First-class construction machine and management engineer
- First-class civil engineering works operation and management engineer
- First-class building works operation and management engineer
- First-class electrical works operation and management engineer
- First-class plumbing works operation and management engineer

- First-class landscape gardening works operation and management engineer
- First-class architect

3) Roles of Site Agent and Managing Engineer in Japan

- Roles of Managing Engineer and Site Agent are shown on the **Table 8.4.1**.
- Detail shall be referred to **Appendix_8-1-2**.

Table 8.4.1 Roles of Site Agent and Managing Engineer in Japan

SITE AGENT	MANAGING ENGINEER
CONTROL OF CONSTRUCTION AT SITE ➢ ORGANIZATION ➢ COMMUNICATION	
➢ To ensure allocation of responsibilities and duties are clearly defined	➢ **DIRECTION and SUPERVISION** to employee and sub-contractors
TECHNICAL MANAGEMENT ➢ Planning of Construction Method ➢ Quality Management ➢ Time Management ➢ Safety Management ➢ Environmental Management	
COST MANAGEMENT	
CONTRACT MANAGEMENT	

(3) Employment Relationship of Managing Engineer and Chief Engineer in Japan

Employment relationship of Managing Engineer and Chief Engineer is described in Implementation Manual of Managing Engineer System in Japan.

1) Employment Relationship Required for Managing Engineer and Chief Engineer in Japan

Direct and constant employment relationships with construction company to which Managing Engineer and Chief Engineer belong are required for ensuring appropriate execution of construction works. In addition, the construction company which ensures appropriate execution of construction works with such Managing Engineer and Chief Engineer appointed will be evaluated as excellent company in terms of technology and management.

The client is required to deal with verification on the employment relationship with such measures that the required conditions of employment relationship and obligation of submission of documents showing employment relationship are clearly stipulated in design document.

2) Definition of Direct Employment Relationship in Japan

Direct employment relationship means employment relationship between Managing Engineer etc. and construction company to which he belongs with the defined rights and obligations in respect of employment without room for intervention by third parties. The relationship is required to be verified with qualification certificate, health insurance card or letter of advice showing tax amount collected issued by local government. Therefore transferred staff and dispatched employee cannot be treated as employees with direct employment relationship.

3) Definition of Constant Employment Relationship in Japan

Constant employment relationship means employment relationship with employee who is ensured to work for the construction company to which he belongs in a certain period and to work for the company for a certain hour every day. In addition, it is necessary that both Managing Engineer etc. and construction company to which they belong are well aware each other in terms of their technical ability, the construction company can assign their engineer to construction site under their responsibility and their engineer can execute his duty with utilization of company's technology. More than 3 months employment relationship between Managing Engineer and Construction Company who employs him prior to tender application by the company is required for public construction works ordered by national and local government.

It is necessary that constant employment relationship can be verified by issue date or renewal history of qualification certificate, or issue date of health insurance card.

4) Disciplinary Actions in Japan

Construction Contractors Law in Japan provides penalties to control violations of the Law by imposing punishment and non-penal fine. In those penalties, there are penal provisions for engineers stipulated by Engineer Qualification System. The details are described in **Appendix_ 8-1-3**.

(4) Examination of Civil Engineering Operation and Management in Japan

Examination for Civil Engineering Operation and Management (CEOM) consists of two examinations in Japan. One is Academic Examination and another is Practical Writing Examination.

1) Academic Examination in Japan

Academic Examination is further divided to two parts. One is elective A-Questions and another is compulsory B-Questions.

A-Questions are established with three fields, i.e. "Civil Engineering", "Method of Technical Management and Control of Works" and "Laws and Regulations". Those are provided according to the following criteria.

- General Civil etc.
  - To have general knowledge in respect of Civil Engineering, Electrical Engineering, Mechanical Engineering and Architecture for execution of civil engineering construction
  - To have general knowledge in respect of design documents
- Method of Technical Management and Control of Works
  - To have general knowledge in respect of method of technical management and control of works, such as planning of construction method, quality management, safety management etc.
- Laws and Regulations
  - To have general knowledge in respect of laws and regulations for construction practice

Numbers of questions and numbers of answers required are shown on the **Table 8.4.2** together with time of examinations.

Table 8.4.2 Number of Questions and Number of Required Answers on Academic Examination in Japan

(1) Academic Examination (Multiple choices from 4 items)

	Subjects		Numbers of Questions	Required numbers of Answers	Type of Examination	Time of Examination
1.1	**A-**	**Questions**	**61**	**30**	Elective	2hr 30min
1.1.1	General Civil		15	12		
1.1.1.1		Earthworks	5			
1.1.1.2		Concrete	6			
1.1.1.3		Foundation works	4			
1.1.2	Specific Civil		34	10		
1.1.2.1		Structure	5			
1.1.2.2		River/ Erosion and torrent control	6			
1.1.2.3		Roads/ Pavement	6			
1.1.2.4		Dam/ Tunnel	4			
1.1.2.5		Coast/ Harbor	4			
1.1.2.6		Railways/ Coating on steel bridges	5			
1.1.2.7		Waterworks/ Sewage works	4			
1.1.3	Laws and Ordinances		12	8		
1.2	**B-**	**Questions**	**35**	**35**	Compulsory	2hr
1.2.1	Common Engineering		5	5		
1.2.1.1		Survey	2	2		

	Subjects	Numbers of Questions	Required numbers of Answers	Type of Examination	Time of Examination
1.2.1.2	Contract/ Design	3	3		
1.2.2	Technical management and control of construction at site	30	30		
1.2.2.1	Planning of construction method	4	4		
1.2.2.2	Time management	5	5		
1.2.2.3	Safety management	11	11		
1.2.2.4	Quality management	7	7		
1.2.2.5	Environment protection	1	1		
1.2.2.6	Recyclable resource of construction by-product	2	2		
	Total for Academic Examination	96	65		4hr 30min

2) Practical Writing Examination in Japan

Practical Writing Examination is established in respect of Method of Technical Management and Control of Works to meet with the following criteria.

- Technical issues taken into account, contents of review for the issues and counter measures taken at actual construction site in respect of subjects given are required to be described in writing based on each applicant's own experience.
  - To have practical advanced skill to enable to carry out soil test and test for strength etc. of civil construction materials with accuracy and take necessary measures to ensure the required strength of construction objects according to the results of those tests.
  - To have practical advanced skill to enable to produce a planning of construction method at site according to design documents and execute construction works according to the plan.

Numbers of questions and numbers of answers required are shown on the **Table 8.4.3** together with time of examinations.

Table 8.4.3 Number of Questions and Number of Required Answers on Practical Writing Examination in Japan

(2) Practical Writing Examination

	Subjects	Numbers of Questions	Required numbers of Answers	Type of Examination	Time of Examination
	Method of technical management and control of construction at site	**6**	**4**		2hr 45min
2.1	Explanation based on experience	1	1	Compulsory	
	Technical issues				
	Reviews				
	Counter measures				
	▪ Profile control in construction stage				
	▪ Temporary works for construction				
	▪ Preventive measures for accident				
2.2	Earthworks, concrete, quality and safety etc.	5	3	Elective	

3) Training for Managing Engineer in Japan

Training course for Managing Engineer in Japan is performed according to the **Table 8.4.4** under Construction Contractor Law.

Table 8.4.4 Guideline of Training Course for Managing Engineer in Japan

	Subject	Content	Time
1	Legal system regarding construction project	• Laws and ordinances • Policy regarding appropriate execution of construction project	1.5hr
2	Technical management such as construction method planning, time management, quality management etc.	• Construction method planning • Time management • Quality management • Safety management	2.5hr
3	The latest type of materials, equipment and construction methods regarding construction project	• Characteristics of materials and equipment • Method of rationalization of construction methods • Technical standards regarding materials, equipment and construction methods • Other necessary matters regarding materials, equipment and construction methods	2hr
Training for subject 1 and 2 to be performed based on the latest cases			

(5) Eligibility Requirement for Examination of Civil Engineering Operation and Management in Japan

There are eligibility application requirement for Academic Examination and Practical Writing Examination.

1) Application Requirement for Academic Examination

Application requirement for Academic Examination of 1st and 2nd CEOM are shown on the **Table 8.4.5** and **Table 8.4.6.**

Table 8.4.5 Application Requirement for Academic Examination of 1st Class CEOM in Japan

Academic Background or Qualification		Working Experience of Construction Supervision	
		Designated Subjects	Other than Designated Subjects
After graduation from University		≧ 3 years	≧ 4.5 years
After graduation from Junior College or Technical College		≧ 5 years	≧ 7.5 years
After graduation from High School		≧ 10 years	≧ 11.5 years
Others		≧ 15 years	
Qualification Holder of 2nd Class Civil Engineering Operation and Management	After passing examination	≧ 5 years	
	Applicant with working experience less than 5 years after passing examination		
	After graduation from Junior College or Technical College	N/A	≧ 9 years
	After graduation from High School	≧ 9 years	≧ 10.5 years
	Others	≧ 14 years	

Table 8.4.6 Application Requirement for Academic Examination of 2nd Class CEOM in Japan

Academic Background or Qualification	Working Experience of Construction Supervision	
	Designated Subjects	Other than Designated Subjects
After graduation from University	≧ 1 year	≧ 1.5 years
After graduation from Junior College or Technical College	≧ 2 years	≧ 3 years
After graduation from High School	≧ 3 years	≧ 4.5 years
Others	≧ 8 years	

2) Application Requirement for Practical Writing Examination

Applicant for Practical Working Examination of 1st and 2nd Class CEOM shall be passed Academic Examination of 1st Class and 2nd Class CEOM respectively last year or this year.

3) Working Experience

The **"Working Experience"** for 1st Class CEOM shown in the

Table 8.4.5 shall include more than one year **"Leading Supervisory Experience"**.

"**Working Experience**" means all technical working experience directly related to CEOM including the following experience.

- Experience as Construction Contractor in direction and supervision of Civil Engineering Construction including producing Working Drawings or experience as assistant
- Experience as Client's site supervisor including experience as assistant
- Experience as Consultant's construction supervisor including experience as assistant

The following experiences not directly related to CEOM are excluded.

- Experience in design only
- Experience in miscellaneous tasks, simple labor work and clerical work for Civil Engineering Construction

"**Leading Supervisory Experience**" means experience as Site Agent, Chief Engineer and Construction Supervisor etc. in total technical direction and supervision of Civil Engineering Construction to subordinates etc.

"Designated Subjects" means "Civil Engineering", "Urban Engineering", "Sanitary Engineering", "Traffic Engineering" and "Architecture".

(6) Method of Confirmation on Academic Background and Work Experience in Japan

Academic background and work experience are confirmed with the following method;-

- Identification Confirmation for the qualified engineers will be made by the original residence certificate issued by local government and photo.
- Academic background will be confirmed by original graduation certificate issued by school from which the qualified engineers graduated.
- Work experience in construction site will be confirmed by "Certificate of Work Experience", forming a part of application form of national qualification examination, certified by the representative of the company to which the applicant belongs.

The above requirement can be summarized as **Figure 8.4.2.**

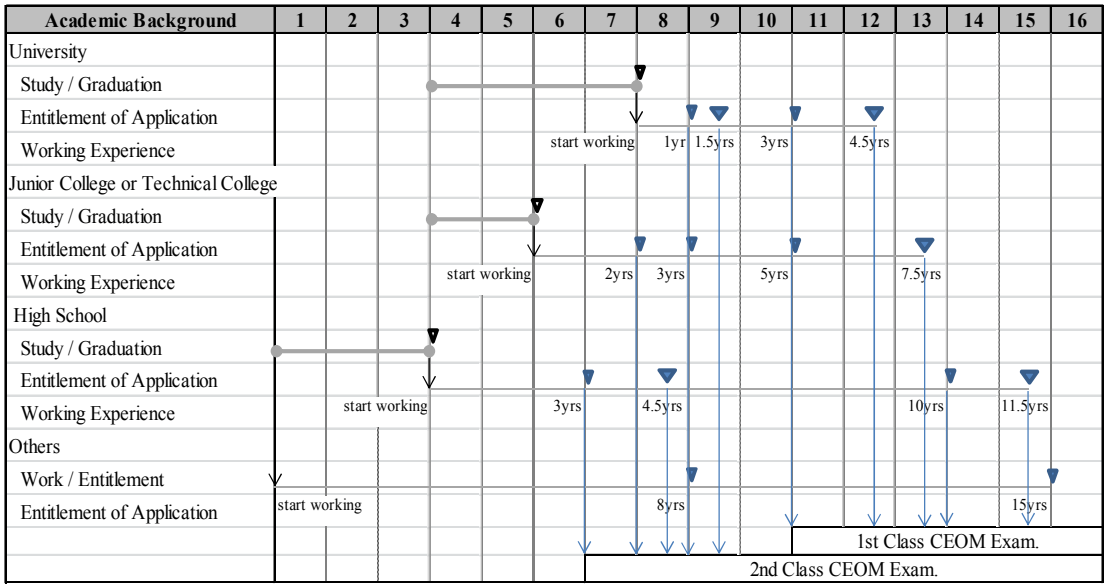


Figure 8.4.2 Eligibility Requirement for Application for Academic Examination of Civil Engineering Operation and Management

The results of the Questionnaire Survey on Qualification System in Japan carried out in 2011 are introduced in **Appendix_8-1-4** for reference in order to understand present evaluation on current qualification system in Japan.

8.4.4 Capacity Requirements for Contractors

It is important for project quality assurance as stipulated in Construction Contractors Law in Japan that technical capacity of company and individual engineer can be effectively and simultaneously developed. Therefore responsibility and technical capacity for company and engineer shall be regulated to ensure capacity of the Contractors together with engineer to be employed by them.

It is found that there are no regulations stipulating technical capacity of engineer to be employed by the Contractors in Vietnam. In addition, it is recognized that no qualification system for engineer to be employed by the Contractors is established.

8.4.5 Recommendation on Capacity Enhancement Plans of Site Manager

(1) Responsibility and Roles for Site Manager

It is confirmed that Site Agent shall take overall responsibility for the project with his organization established and maintained and communication among all stakeholders made under his direction including the following roles.

1) Technical Management

- Planning of Construction Method Statement
- Quality Management
- Time Management
- Safety Management
- Environmental Management

2) Sub-Contract Management

- Direction and supervision to sub-contractors
- Coordination among sub-contractors

3) Cost Management

- Budget, cost control and cash flow projection
- Payment certification for suppliers and sub-contractors

4) Contract Management

- Contract documents review
- Documentation of site instructions, variations and clams
- Submission of monthly progress report and payment application

"Technical Management" and "Sub-Contract Management" are essential elements of Project Management in terms of Construction quality Assurance to be handled by Site Agent.

However increase in size and complexity of construction project result in increase in work load of Site Agent. In addition, it is recognized that there is difficulty in Vietnam to appoint Site Agent on Full-Time basis for one contract package in one project. Therefore those two management need to be carried out by active expert staff, i.e. Site Manager under Site Agent's responsibility.

Under the circumstance, it is required to secure Capacity of Site Manager and Full-Time capable engineer needs to be appointed as Site Manager.

Site Manager shall take responsibility on the above Technical Management and dealing with Sub-contract Technical Management.

(2) Site Manager Qualification

The qualification system in Japan described in **Section 8.4.3(4)** has efficiently contributed with appropriate assignment of qualified engineers to quality and safety assurance of construction works and elimination of bad and disqualified contractors.

There is Construction Supervisor Qualification System in Vietnam which is currently being utilized as eligibility requirement for Construction Supervisor of Supervision Consulting Company as stated in **Section 8.4.2(1)**.

Improvement plan (draft) for Optional Training Courses, Examination System and Training Courses in Qualification Renewal recommended by this project are reviewed from the point of view of Site Manager-1 and Site Manager-2 and supplementary consideration to them is made.

The qualification system utilizing the current Construction Supervisor Qualification System modified by principle of the Japanese System which consists of "1st Class Civil Engineering Operation and Management Engineer Examination" and "Training for Managing Engineer" is proposed to be adopted in Vietnam.

It is recommended that;-

- Site Manager-1 shall hold qualification of Construction Supervisor (Advanced Class)
- Site Manager-2 shall hold qualification of Construction Supervisor (Intermediate Class)

(3) Requirement for Main Contractors who Execute State Construction Project

It is recommended that;

- Site Manager-1 in charge of technical management and sub-contract management for awarded contract shall be appointed by Construction Contractor.
- Site Manager-1 for large contract shall be appointed on full-time basis. Site Manager-1 appointed shall not be assigned for other contract concurrently.
- Site Manager-1 for small contract shall be appointed. However the Site Manager-1 appointed is allowed for assignment for other contract concurrently.
- It is recommended that the above "small contract" is defined one small contract package of which sum is less than 15 billion VND.
- Project owner has to determine suitable class of Site Manager and number of additional qualified active engineer competent to Site Manager suited to his project size, importance and difficulty.

(4) Requirement for Sub-Contractors who execute State Construction Project

It is recommended that;-

- Site Manager-2 in charge of technical management for awarded sub-contract shall be appointed on full-time basis by Construction Sub-Contractor.
- Site Manager-2 appointed shall not be assigned for other contract concurrently.

(5) Examination and Training System

The following items are component of Examination and Training System for Site Manager as an example. Those will be further reviewed and finalized in next stage.

1) Examination for Advanced Class Construction Supervisor

- Unified Examination
- Academic Examination and Practical Writing Examination
- One examination per year

2) Training for Site Manager

- One-day Compulsory Training for new application and renewal
- Validity of Training Certificate : 5 years
- Subjects for Training

- Legal system regarding construction project
- Technical management such as construction method planning, time management etc.
- The latest type of materials, equipment and construction methods regarding construction project

3) Optional Training prior to Unified Examination

- For applicant who need more knowledge for examination
- A variety of training courses including short-term and night courses

4) Subjects and Criteria of Examination and Training

Subjects and criteria of Examination for Advanced Construction Supervisor and subjects of Training for Site Manager will be reviewed in next stage.

5) Conditions of Applying Qualifications for Construction Supervisors and Site Manager in Vietnam

Eligibility requirement for application for Construction Supervisor Examination as an example is shown on the **Table 8.4.7**.

Table 8.4.7 Eligibility Requirement for Application for Construction Supervisor (CS) Examination

Academic Background	Working Experience of Construction Supervision
For Basic Class CS Examination	
After graduation from University	0 year
After graduation from Junior College or technical College	≧ 3 years
For Intermediate Class CS Examination	
After graduation from University	0 year
After graduation from Junior College or technical College	≧ 5 years
For Advanced Class CS Examination	
After graduation from University	≧ 3 years
After graduation from Junior College or technical College	Not applicable

Eligibility requirement for Construction Supervisor and Site Manager as an example is shown on the **Table 8.4.8**.

Table 8.4.8 Eligibility Requirement for Construction Supervisor and Site Manager

Academic Background or Qualification		Working Experience of Construction Supervision
Construction Supervisor for works level IV		
After graduation from University		0 year
Qualification Holder of Basic Class CS	After graduation from Junior College or Technical College	≧ 3 years
Construction Supervisor		
After graduation from University		≧ 3 years
Qualification Holder of Basic Class CS	After graduation from Junior College or Technical College	≧ 5 years
Site Manager 2		
Qualification Holder of Intermediate Class CS	After graduation from University	≧ 5 years + (One Grade-II works or TWO Grade-III works)
Site Manager 1		
Qualification Holder of Advanced Class CS	After graduation from University	≧ 7 years + (One Special or Grade-I works or TWO Grade-II works)

The above requirement can be described in the following **Figure 8.4.3**

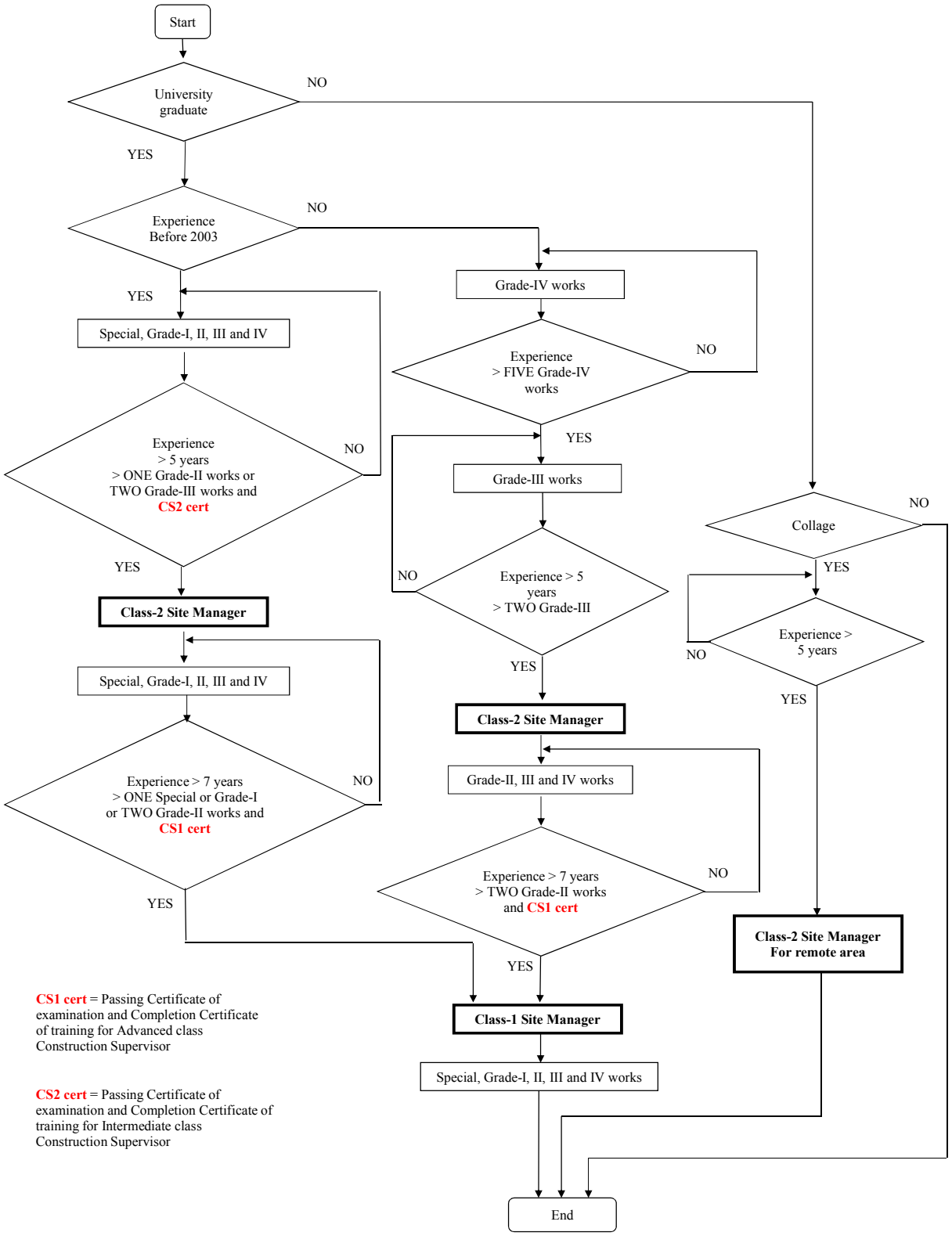


Figure 8.4.3 Flowchart of Eligibility Requirement for Site Manager

The above requirement can be summarized as shown in **Figure 8.4.4**.

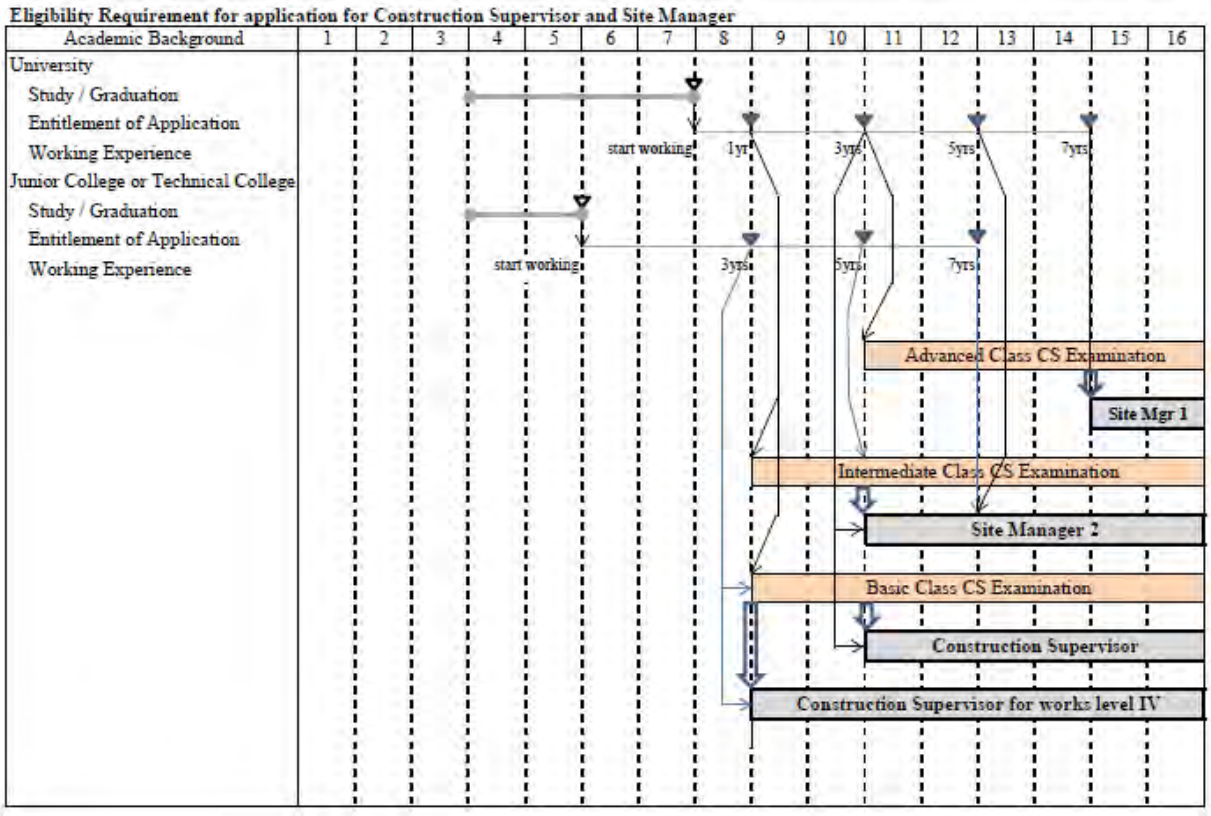


Figure 8.4.4 Conditions to be required for Application of Construction Supervisor and Site Manage

6) Qualification System Diagram

- Present qualification system in Vietnam is organized and maintained by "MOC", "DOC", "Training Centre" and companies or Career Association".
- Applicant applies to those parties to get relevant certificates according to regulations.
- New organization, i.e. Qualification Examination Center (QE Center) for Unified Examination will be established within MOC to receive application for the examination and perform and manage the examination. Advanced Training for Advanced Class Construction Supervisor will be carried out by existing Training Centre under QE Center's control.
- Upon issuance of examination certificate and training certificate for Advanced Class from MOC and Training center respectively to Applicant, he becomes qualified Site Manager.
- The relationship among the relevant parties is shown as example on the following **Figure 8.4.5**.

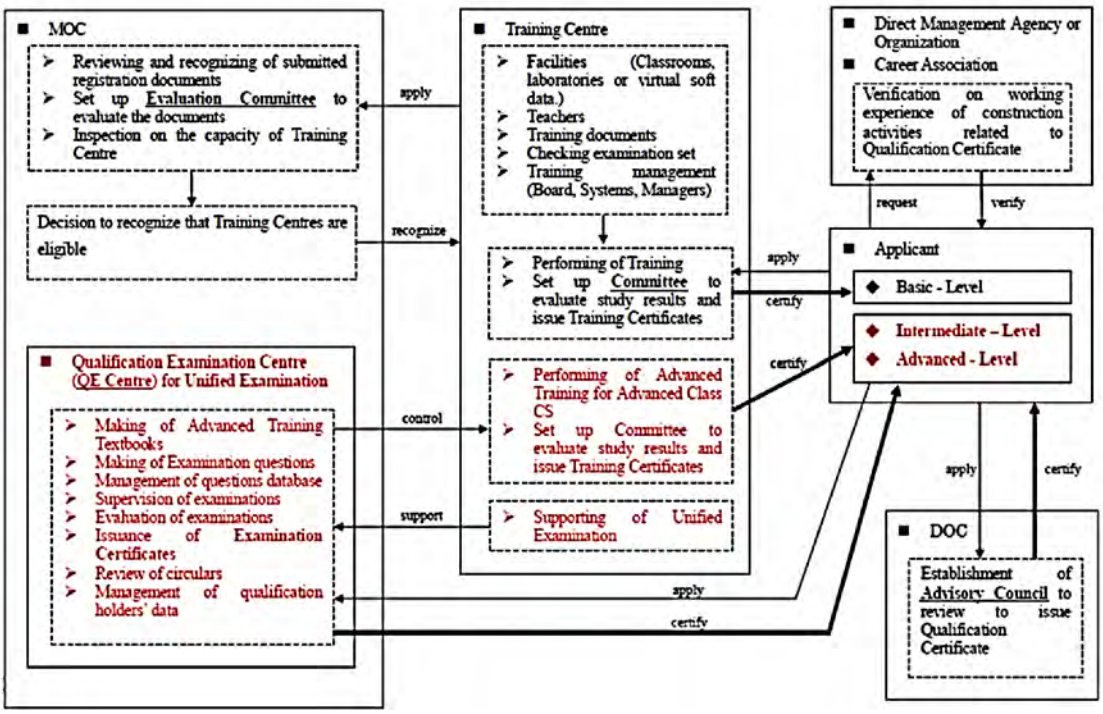


Figure 8.4.5 Qualification System Diagram (example)

7) Recommended System in a Transition Period

Current system will be revised in stages. Tentative measure to qualify Site Manager for the period before the Construction Supervisor Qualification for Site Manger is enforced and implemented will be taken as shown on the **Figure 8.4.6**.

- Firstly, roles and full-time appointment of Site Manager will be stipulated in the revised regulation.
- At the same time, QE Center will be established and Question Data Base will be formed and preparation for Unified Examination will be made by QE Centre accordingly. Revision of relevant regulations to examination system will also proceed concurrently by MOC.
- QE Center will make contract and close communication with existing Training Center in order to utilize their facilities, resources and data for Unified Examination and Advanced Training Course according to revised regulation.
- Upon establishment of Unified Examination and Advanced Training Course, QE Centre and Training Centre can commence the new system then new certificates for examination and training can be issued for passed applicants.
- Finally, after enforcement of revised law on eligibility requirement for Site Manager, success applicants can act as qualified Site Manager.

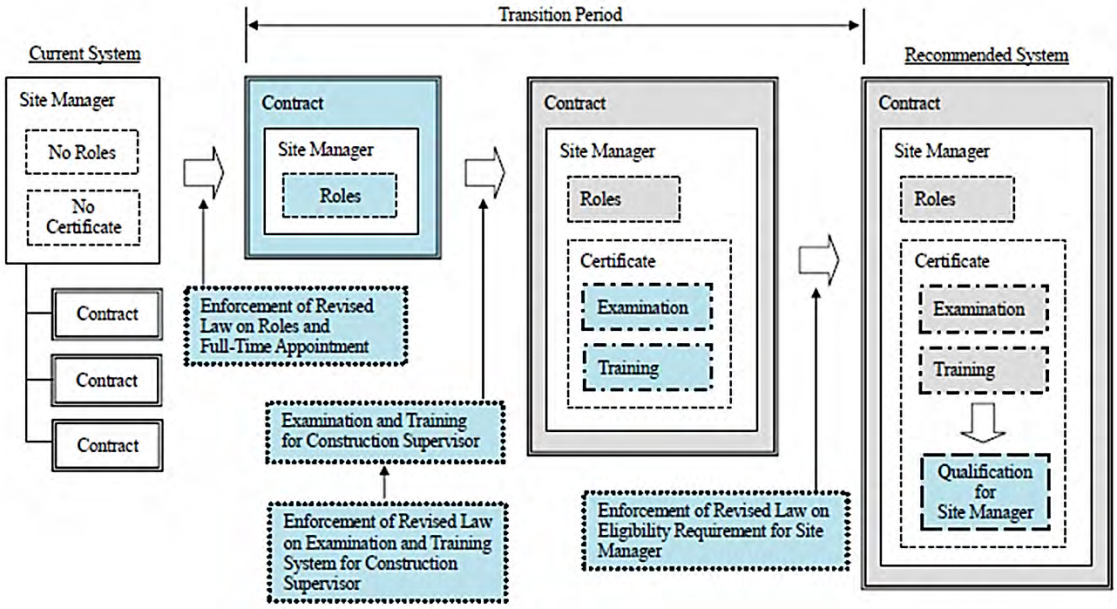


Figure 8.4.6 Recommended System in a Transition Period

8.4.6 Roadmap

It is recommended that revision of Qualification System will be implemented according to the following Roadmap.

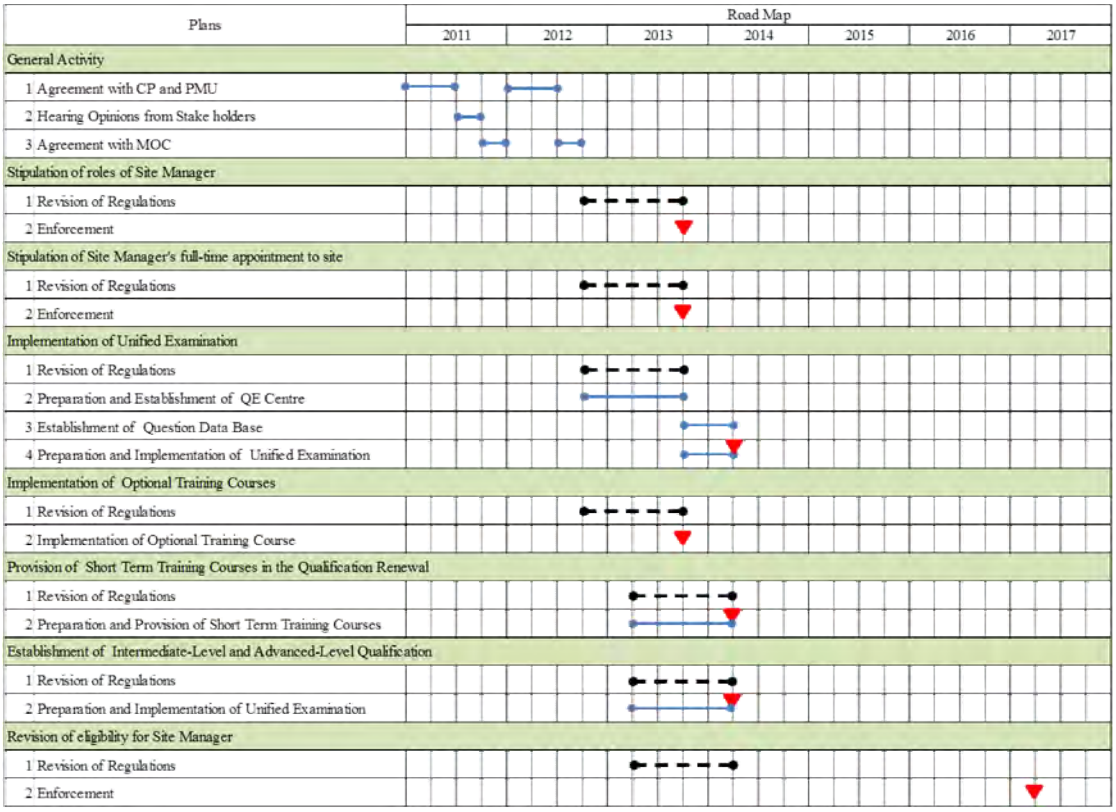


Figure 8.4.7 Roadmap

8.5 INTRODUCTION OF NEW EXAMINATION SYSTEM

8.5.1 Background

In Vietnam, 20 engineering qualifications in construction field are stipulated in Decree and Circular and given certificates to the candidates of each category after approval of qualification. However, those qualifications are decided not by examination but documental judgment or training. Therefore, it does not seem that there is no doubt in fair qualification judgment to candidate in every category. Furthermore, all qualified engineers do not get certificates at the same conditions due to different circumstances. This results that ability of each engineer is difference and is not consistent and may lead to subtle difference at engineering judgment in various aspects.

In order to solve those situations, fair and consistent qualification system is required. One of the solutions may be restrict examination for qualification at each field. In this study, unified examination system is considered and its introduction to present system is examined.

8.5.2 Objectives

Objectives of this study are as follows;

(1) To identify the problems of existing qualification system for engineers;

With analysis of existing engineer qualification system, problems to be solved should be enclosed and identified.

(2) To improve existing system by introducing examination system;

Instead of present qualification system, unified examination methods are introduced in order to implement fair selection ways.

(3) To apply the new system to 2 engineer qualification systems;

One is a construction supervisor which is treated in this project and the other is a site manager which is also treated and has no qualification at this moment.

8.5.3 Engineer Qualifications in Vietnam

(1) General

Engineer qualifications have been developed as certificates which verify engineer's capacity of performing construction practices in Vietnam. However, there is no engineering qualifications without employment restriction in Vietnam. For instance, Professional Engineer (PE) qualification in USA, Japan and other many countries is one of the engineering

qualifications without employment restriction. Engineering qualifications in Vietnam are all qualifications with employment restrictions. Those qualifications are to ensure engineer's ability which can meet specific business requirements and those who have no certificate are not allowed to get jobs associated with the qualification.

(2) Engineer Qualifications

The followings are regulations relevant engineer qualifications.

1) Construction Law

This stipulates about certificate possession and responsibility of possessors.

2) Decree No.12/2009/NĐ-CP

This stipulates obligation of certificate possession for managers who perform construction planning, design, survey and supervising.

3) Decree No.112/2009/NĐ-CP

This stipulates about cost estimation certificate.

4) Circular No. 12/2009/TT-BXD

This Circular stipulates details of construction practice certificate. The qualifications fall into 4major categories with further breakdown of 20 individual certificates as shown below; Engineers who desire to be construction design managers or chief-designers should hold a "Architecture" certificate or a "Construction Engineering" certificate.

- Architecture (3 qualifications)
  - Design of Construction Plan
  - Design of Architectural Works
  - Design of Interior-exterior works
- Construction Engineering (12 qualifications)
  - Design of Structure Works
  - Design of Electrical Works
  - Design of Electro-mechanical Works
  - Design of Water Supply and Drainage
  - Design of Heat Supply
  - Design of Ventilation and Air Conditioning

- Design of Communication Network in Construction Works
- Design of Fire Prevention and Protection
- Design in other Field
- Topographic Survey
- Geological Survey
- Hydrological Geology Survey

- Construction Supervisor (4 qualifications)

  Anyone wishing to get construction supervision jobs should hold a "Construction Supervision" certificate, regardless of their job status unlike the "Construction Engineering" certificate and "Architecture" certificate stated above.

  - Supervision of Construction Survey
  - Supervision of Construction and Finishing Work
  - Supervision of Equipment Installation Works
  - Supervision of Technological Equipment Installation

- Cost Estimate (1 qualification)

  In short, engineer qualifications in Vietnam fall into 4 categories with 20 qualifications; 1) Architecture (3 qualifications), Construction Engineer (12 qualifications), Construction Supervision (4 qualifications), and Cost Estimate (1 qualification). Among those qualifications, Architecture and Construction engineer qualifications are for manager-class or supervisor-class engineers. On the other hand, Construction Supervision and Cost Estimate qualifications are for all engineers who wish to take construction supervision and cost estimate jobs, thereby they are the sorts of vocational qualifications with employment restriction.

(3) Problems Identified on Current Qualification System of Vietnam

In present engineering qualification system of Vietnam, there are some problems identified from the analysis of the results of the investigation that proceeded in this project. Those problems organized once, they are summarized as follows from those three viewpoints.

- Authorities
  - No specific organization with regard to qualification in MOC, which should be national authority.
  - In present system, more than one DOC can issue same qualification in duplicate due to no communication among all DOCs in Vietnam. As a matter of fact, it leads to confusion.

- From the above, it is difficult to grasp the exact number of qualified engineers.

- Qualification approval system
  - Candidates who only take training can be almost qualified without examination.
  - Each training center has its own training course; thereby, level of qualification holder depends on the center.
  - Even though some of candidates have enough knowledge and experience as a qualification holder, they have to take long training course with incapable candidates.
- Qualification holders
  - Once qualified, holders will not try to continuously study to enhance the knowledge and updated information.
  - Qualified engineers cannot challenge higher-class qualification despite the fact that they have aspiration for enhancement, because there is no advanced-level qualification at present in Vietnam.

8.5.4 Framework of Improvement of Qualification System with Examination

(1) Concept of improvement

1) Introduction of examination

Among 4 engineer qualifications shown in **Part 8.5.3**, the ability applicants of Architecture and Construction Engineer qualifications just apply the application form to DOC to get the qualification, Construction Supervision and Cost Estimate qualifications are given to most of the applicants with short-term training and final test at 50 training centers nationwide in present Vietnam (up to March/2013). However, there are some problems identified in this present qualification system because ability of qualified engineers varies and is not so uniform due to inconsistency of every training center's test quality and contents. This fact means that present qualification system has meaningful unfairness in implementation method of qualification approval for engineers.

In order to improve the present state of qualification system like this, introduction of a new unified examination system in engineering qualification methods is considered to be one of the significantly good and fair ways as already implemented in advanced countries including Japan. This system also has not only advantages, but disadvantages, which is described in next section. However, it is true that this examination system is the best method in fairness in qualification and qualifying homogeneous engineers.

2) Advantages and disadvantages

In introduction of the examination system, there are some advantages and disadvantages imagined. They are itemized hereafter.

a. Advantages

(1) Homogeneous tests with same accuracy can be carried out and the unfairness due to the difference in exam questions is eliminated because of unified questions in any venue. Moreover, proficiency level of exam passers is homogenized at the higher level than that of exam-passing.

(2) In the selection of the exam sites, it is not necessary to perform it at separate training centre nationwide (50 centres) individually as before and they can be limited to several fixed places more than ten specified in the nation (later explained) ; therefore, the cost for exam will be greatly saved.

(3) Since the exam is difficult than previously, the ability and knowledge of the successful candidates will be highly improved through fairly advanced tests, then as a result, competent professionals will really turn out.

(4) Competent technical personnel can obtain engineering qualifications by taking exams without any needless training if they satisfy the conditions of exam qualification.

(5) Behalf of the trainings which have been carried out individually so far in each training facilities, with the introduction of the unified examination, management tasks for engineering qualification are simply unified nationwide in Vietnam.

(6) Exams are reduced by 1-2 times a year from every month at present, thereby the chances of the exam for candidates will be reduced; however, as a result, cost savings in exam preparation can be significantly done.

b. Disadvantage

(1) The number of successful candidates will depend on the degree of difficulty of the exam questions; however, many passers cannot be produced at an opportunity as before.

(2) Exam questions with different content must be created each time and also the staff for creating it must be ensured in each case.

(3) It is required to create a professional organization which manages a set of activities related to exam implementation such as public offering for exam candidates, question making, collection of exam fee, and conduct of exams, scoring, and judgment of pass-fail involved in the exams.

(4) Since the number of exams is reduced from each month to 1-2 times a year, the candidate's examination opportunity is greatly reduced.

(5) The number of exam venues is greatly reduced and location of the venue is limited to large and medium sized cities, it is rather inconvenient for local candidates to take exam.

(2) Examination System

1) Organization

With regard to the main organizations for examination implementation, MOC as the representative agency and local DOC as the implementation agency are recommended. This is because both MOC and all DOCs in local districts are the organizations in charge of present qualification system in Vietnam. However, in order to integrate the difference of test quality and qualification way in every DOC, unified examination nationwide should be implemented.

In the case of implementation of unified examination, the new organization that manages it in the full-time basis is required. This organization is called QE Center (Qualification Examination Center) which was already suggested in Activity-4 in this project.

a. Nature of QE Centre

QE Center should be an independent organization which is not included in any ministry because its neutrality has to be kept as nature of examination management authority. However, it may be difficult to establish it from the beginning of introduction of the new examination system. Therefore, until the new system becomes popular nationwide, it might be better for QE Center to join MOC as a department in MOC. CAMD in MOC seems to be one of the good feasible candidates for accommodation of QE Center among all divisions in MOC. The **Figure 8.5.1** shows tentative position and inclusive relation of QE Center in present MOC.

Finally, QE center shall be a completely independent body for arranging examination for engineers in the future. This is because QE Center will deal with exams in many fields not only construction, but also industrial and social science and is essentially neutral organization across the various ministries.

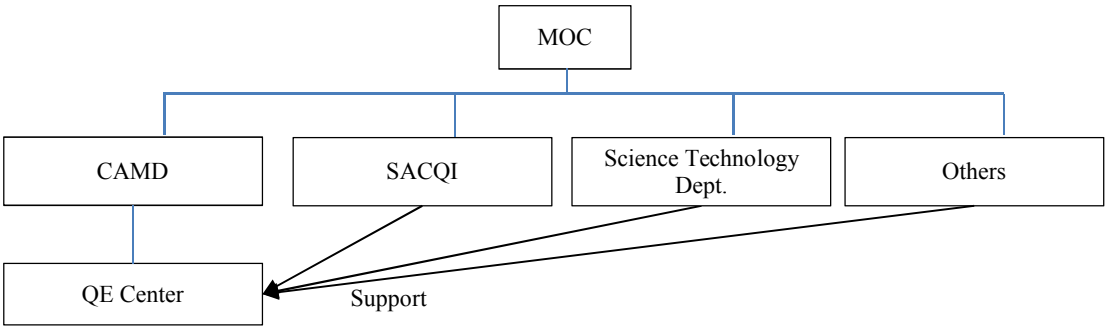


Figure 8.5.1 QE Center in MOC

b. Role of QE Centre

As main tasks of QE Center in charge of examination implementation for various kinds of engineers, the followings are enumerated.

- To prepare for examination questions
  - + Centre arranges exam paper basing on the questions members of special committee make.
- To recruit candidates for engineering qualification
  - + Centre makes public announcement with various media such as newspaper, website.
- To implement examinations
  - + Centre implements examination with many assistants at the same time in many locations placed evenly across the country.
- To supervise examinations
  - + Centre supervises all examinations so that they are carried out fairly and legally.
- To score examinations
  - + Centre scores all response sheets with help of each field's examiners besides mark sheet which can be scored by computer.
- To issue examination certificates
  - + Centre informs the list of passer to DOC, DOC shall issue certificates of qualification delivered to passers.
- To manage question database
  - + Centre accumulates all questions of exams implemented in database.
- To manage data of qualification holders
  - + Centre accumulates all passers information in database.
- To renew regulations (Decision, Circular)
  - + Centre renews regulations with help of committee if necessary.

Although main tasks of QE Center are described above, those all tasks cannot be done by only Center staff. Helps and supports from other departments in MOC and outside of MOC are required for implementation of those tasks.

c. Structure of QE Centre

QE center shall be structured like following **Figure 8.5.2**, being referred the Institution of Professional Engineers, Japan. There are 4 departments in the Center and 2 departments

of 4 handle implementation of actual examination. In total, 13~16 staffs shall reside constantly in QE Center.

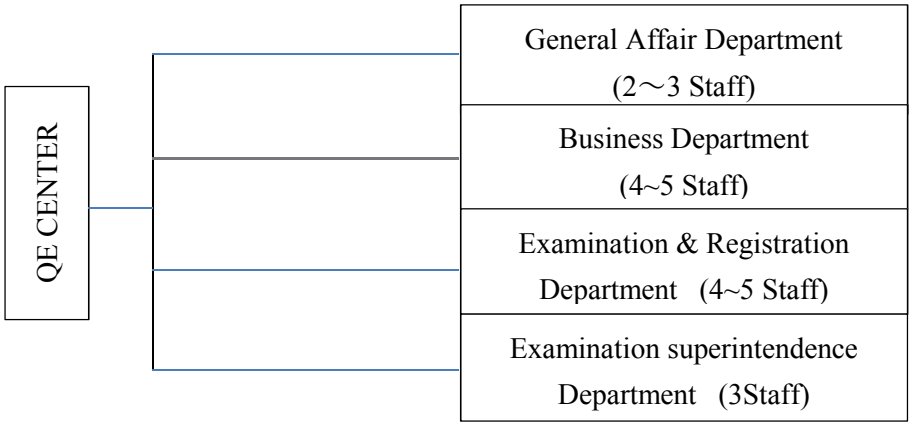


Figure 8.5.2 Structure of QE Center

d. Function of each department

Function of each department of QE Center is as following.

- General Affair Department
  - + Total management of QE center, Human resource, Administrative task, Negotiation with the outside, others which the other departments do not involved.
- Business Department
  - + Improvement and maintenance of examination system, Convening and holding of regular committee on examination system, Outsourcing of creating test questions, Selection of examiners and the correspondence, Renewing related regulations.
- Examination & Registration Department
  - + Convocation of examiners, shaping exam from the draft version by outsourcing, Check contents of all questions, Grading of exam, Registration of passers.
- Examination superintendence Department
  - + Announcement of exam conduct by various media, Acceptance of application, Ensure the venues, making exam for actual implementation, Management of question and passer database of exams from old to the latest.

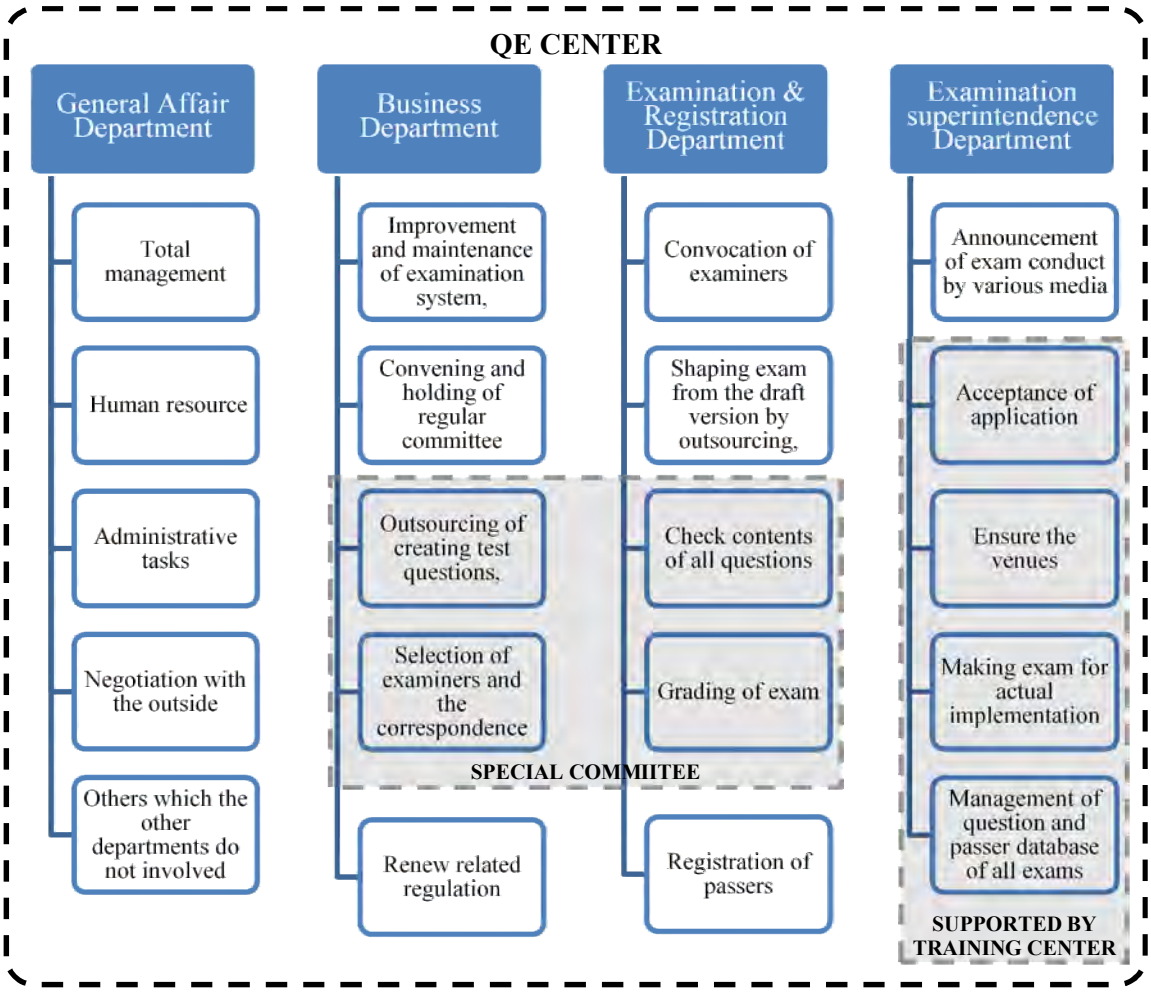


Figure 8.5.3 Function of each department of QE center

2) Unified examination

In order to implement unified examination, it is necessary to clarify many detailed points such as locations, exam making, frequency, dates, how to manage it, fee, question style and so forth. The followings are suggestions with regard to those matters by JICA team.

a. Exam location

There are 10~19 locations selected for engineer qualification exams in Japan. Those are big cities scattered nationwide in Japan for examinee's convenience. The distance from north to south and shape of national land of Japan and Vietnam are quite similar; therefore, it is natural that locations of exams also become similar between two countries. Besides, the transport condition in Vietnam has still many difficulties than Japan, so the number of exam location in Vietnam shall a few more than Japan. Considering the locations of present training centers and universities which can be venues for exams, the following 22 locations shown in **Figure 8.5.4** are suggested as representatives for the Vietnamese case.

Depending on the numbers of examinees, the number of exam locations will increase or decrease. The number of venues for exam should be decided based on the number of examinee at the time. Basically, those ten cities will be appropriate for exam venues from the point of view of population and transport links. Candidates of exam venues will be DOC's training center or universities (No class days such as holiday or weekend) in each location.

However, these cities are not fixed forever. On the basis of those 22 cities, assumed the density and the number of examinees every year, it should be acceptable that the locations of venue are changed year by year. QE Center judges it every year in the meeting. In **Table 8.5.1**, possible exam locations are shown.

Table 8.5.1 Exam locations possible in Vietnam

City (Province)	No. of venue	Population(*)	Remark
Lao Cai City (Lao Cai Province)	1	646,800	Mountains
Dien Bien City (Dien Bien Province)	1	519,300	Mountains
Son La City (Son La Province)	1	1,134,300	Mountains
Yen Bai City (Yen Bai Province)	1	764,400	Midlands
Cao Bang City (Cao Bang Province)	1	515,200	Mountains
Thai Nguyen City (Thai Nguyen Province)	1	1,150,200	Midlands
Quang Ninh City (Quang Ninh Province)	1	1,177,200	Delta
Hanoi City	2	6,844,100	Big city (Capital)
Thanh Hoa City (Thanh Hoa Province)	1	3,426,600	Coast
Vinh City (Nghe An Province)	1	2,952,000	Coast
Hue City (Thua Thien Hue Province)	1	1,114,500	Coast
Da Nang City	1	973,800	Coast
Kon Tum City (Kon Tum Province)	1	462,400	Highlands
Quy Nhon City (Binh Dinh Province)	1	1,501,000	Coast
Buon Me Thuoc City (Dak Lak Province)	1	1,796,700	Highlands
Nha Trang City (Khanh Hoa Province)	1	1,183,000	Coast
Bao Loc City (Lam Dong Province)	1	1,234,600	Highlands
Ho Chi Minh City	2	7,681,700	Biggest city
Can Tho City	1	1,214,100	Delta
Ca Mau City (Ca Mau Province)	1	1,217,100	Delta
Total	**22**		

**; Population in 2011 by province, from Statistical Yearbook of Vietnam*

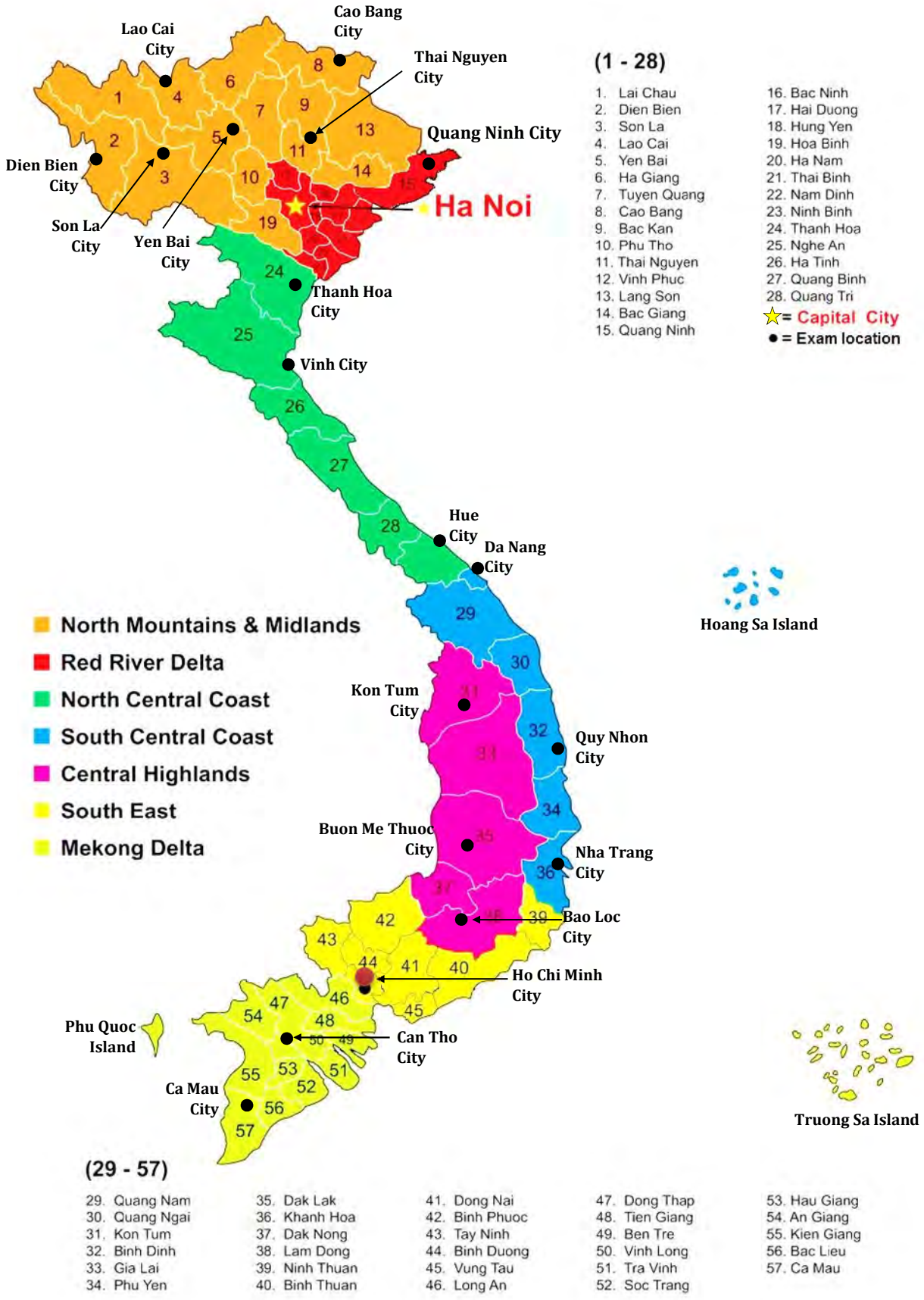


Figure 8.5.4 Location map of exam venue in Vietnam

b. Exam making

In exam making, first, special committee for exam making should be organized. Business department in QE center has to arrange the committee every time before examination. The committee has to be held confidentially due to prevention of exam questions' leaking out. Therefore, committee members are also confidentially selected and designated. Referring Japanese cases, committee members are mostly selected from the following fields. However, they vary with the nature and category of examination.

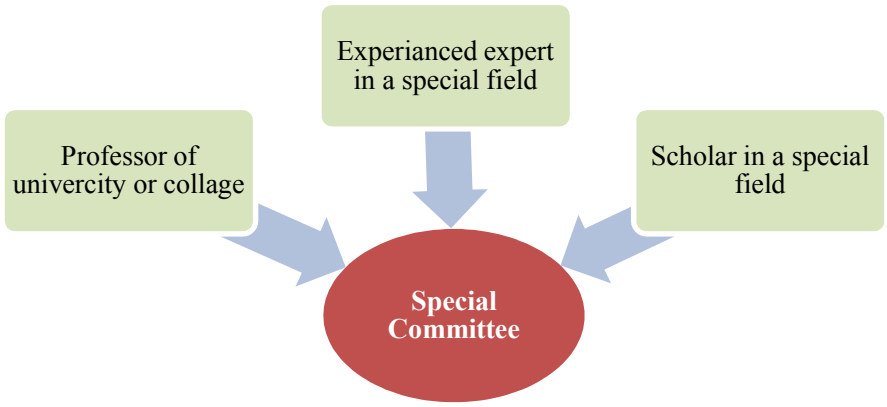


Figure 8.5.5 Configuration of special committee for examination

In the committee, sharing question making is determined and each share shall be distributed to each committee based on sharing decision. If the volume of question making exceeds a committee's work load, there may be the case that the committee asks outside. The roster of exam maker should be made in advance by approval of the committee. The special committee's roles are considered as in the followings.

- To grasp recent tendency of engineering in various categoryes
- To research state of the art technology
- To analyze results of the latest exam including rate of right answer and level of examinees
- To make appropriate exam questions to successfully select qualified engineers
- To arrange all questions for examination
- To select successful candidates (see **8.5.4(2)3) Selection of qualified engineers**)

c. Frequency

Most of the examinations of engineering qualification in Japan have only one opportunity to take exam in a year. This is the reason why examinees can have a lot of time for preparation and then level of qualified engineers can become higher and higher. In

Vietnam, present qualification system provides a chance of taking exam every month in a year. As stated in Section 4, this system leads to a decrease in the level of the engineers.

Therefore, at least twice a year or once a year is recommended as frequency of the exams eventually. Suddenly reduction of the frequency from 12 to 1 or 2 in a year will cause confusion; thereby gradual reduction is suggested through a couple of years.

Regarding date of the exam, Spring or autumn season will be appropriate for examination because the weather is calm nationwide in Vietnam.

d. Exam implementation

Proctors are composed of 3 persons in a venue. This is for the case that capacity of a venue is 70 examinees at most. Thereby, 3 proctors are required to 70 examinees at the time of examination. A proctor of 3 is a chief supervisor and mainly carries out exam progress. Other 2 proctors assist the chief and supervise the exam safely and successfully.

The hardest work on exam implementation is to temporally collect so many proctors in advance. If No. of examinees are 10,000 (average No. of examinees in Vietnam), simply 142 proctors are necessary in total. Staffs of each DOC and training center shall tentatively become proctors. It is also recommended that the roster of proctors is made in advance by research and recruitment. If a proctor does not have such an experience before, he has to learn how to supervise the exam by training beforehand. For example, in Japan, there are many cases that QE center asks staffing company to gather persons. However, this case needs a lot of money. Many volunteers such as university students are recommended in Vietnam.

e. Exam fee

Exam fee depends on the total cost of exam implementation. Therefore, it should be back-calculated after the decision of total cost estimation for the exam. Deficit should be prevented in any case.

f. Exam type

As explained before, questions required writing are adopted in many kinds of exams in Japan. Most of the exams are composed of two types of questions, which are multiple choice and writing. Features of those two types are shown in **Table 8.5.2** below.

Table 8.5.2 Features of multiple and writing type questions

Type	Merit	Demerit
Multiple type	- Easy grading - Many questions possible	- Expressive ability is not examined. - Test for only knowledge
Writing type	- Thinking and expressive ability can be examined.	- Taking much time for grading - Grading differs with graders

In order to clearly understand the difference between two types of questions, example questions of those types are shown below for reference.

(1) Multiple type

- Example question 1 (Regarding construction machine)

Which is the most appropriate answer in the following descriptions?

a. With regard to engines used in construction machinery, gasoline engine is generally used in terms of responsive to the load, fuel consumption, durability, and the like.

b. The vibration rollers have more weight in order to improve the compaction capacity, compared with the machines without vibration function.

c. Compared to the wheel type, crawler type hydraulic excavator is suitable for working in soft or uneven ground because ground pressure is low.

d. Bulldozer is suitable for excavation, transportation, and the leveling work, and not suitable for compaction work.

(Correct answer "c")

- Example question 2 (Concrete work)

Which is correct in the following descriptions regarding concrete casting work?

a. During the concrete casting, water accumulated on the surface, thereby water was removed by ladle and, casting was continued.

b. During casting, the concrete in which significant segregation was observed was re-casted

c. Concrete casting was executed from 2m higher position by free fall.

d. The concrete once casted was moved laterally by vibrator in the frame

(Correct answer "a")

- Example question3 (Asphalt pavement)

Which is not appropriate among the following descriptions on repair method selection of road asphalt pavement?

a. In the case of wide crack of surface, road body and subgrade may be damaged; thereby overlay method should be selected rather than reconstruction method.

b. In the case of deep rutting due to liquidity, surface and binder should be reconstructed.

c. In the case of large deflection on surface, road body and subgrade should be investigated and repair method shall be decided after clarifying the causes.

d. In the repair method selection work, structure of existing pavement should be surveyed and products of pavement materials should be minimized.

(Correct answer "a")

(2) Writing type

- Example question

Among the civil construction work projects you have experienced so far, select one project and answer the following questions regarding the project you selected.

<Description 1>

With regard to the project you selected, describe about following items.

1. Project name _____
2. Outline of the project
   - Owner _____
   - Construction site _____
   - Construction period _____
   - Main construction methods _____
   - Volume of construction works _____
3. Your position on the project management _____

<Description 2>

Describe technical subjects that you especially pay attention on in the accident prevention measures done in the project above mentioned. Moreover, describe precisely the matters you examined so that you can solve the subjects, reasons that led to the adoption, and corrective actions implemented on the site.

Technical subjects	
Matters examined and reasons led to adoption	
Corrective actions on the site	

As shown in **Table 8.5.2**, both types have merits and demerits. Therefore, it should be avoided that question type biases toward one type of two. In unified examination, both types should be used together. The component ratio of two types is depending on the nature of examination and generally multiple type is more than writing type in No. of questions.

At the first step of applying Examination system, multiple-choice type only is preferable because it's easier to score and suitable to the current situation of Viet Nam. In the future, when the QE center has more experience on organization and the number as well as ability examiners meets the actual requirements, the writing type should be used in the qualification examination. On the future with the developing of digital technical, the examination locations may be equipped the computer; the examination can be taken on the computer.

g. Scoring

Regarding multiple type questions, answer sheet is digitized and they are scored automatically by computer. On the other hand, regarding writing type questions, answer sheets are delivered to the members of committee and other experts pre-approved by Center and manually scored by them.

3) Selection of qualified engineers

Three ways of selection of qualified engineers are introduced and they are the followings.

(a) Fixing number of passer

(b) Fixing pass score

(c) Fixing pass rate

Each way has its advantages and disadvantages respectively. Regarding selection of qualified engineers, there is no limit of numbers of qualified engineers; thereby, it is not necessary to decide fixed number and fixed rate for passers. It is reasonable that the examinees who reached certain high score should be qualified. Consequently, it can be said that way of b, which is fixing pass score, is the most feasible and acceptable way.

In this way of selection, as a disadvantage, it is said that ability and number of exam passer vary with the difficulty of exam. However, this problem can be solved by setting deviation values of each examination. Even though difficulty of exam differ in every year's exam, examinees in same high level are selected by setting pass score based on deviation values of each test. It means that every exam has different pass score for selection of qualified engineers.

Examination & Registration Department of QE Center shall decide pass score at every exam basing on deviation value after obtaining all results of the exam. Then, they select

passers with higher score than pass score as qualified examinees. Finally, candidates of qualified engineers are selected in deliberation at special committee for authorization of official qualification. In this way, qualified engineer can be selected at last.

Examination & Registration Department shall only recommend the final passers basing on scoring and consult them with the special committee. The committee shall deliberate the candidates of final passers and officially decide authorized qualified engineers.

After authorization of qualified engineers by the committee, the DOC shall issue certificate of qualification and send it all qualified engineers. These procedures are described in **Figure 8.5.6** and **Figure 8.5.7.**

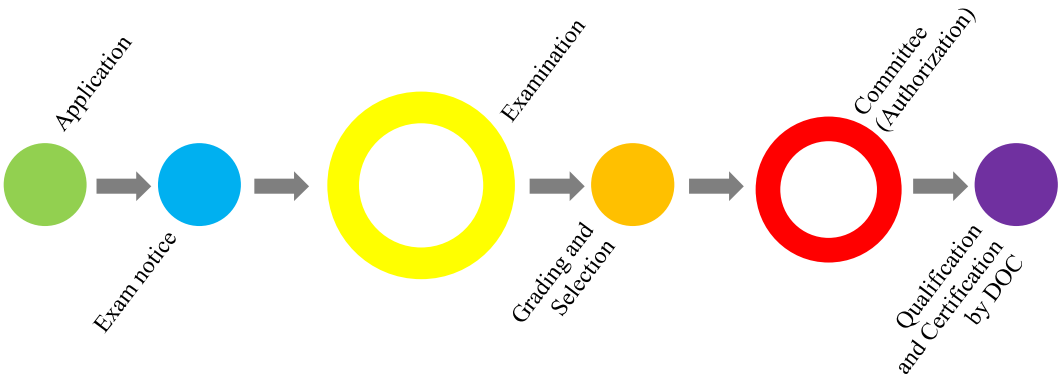


Figure 8.5.6 Certification procedure of qualification

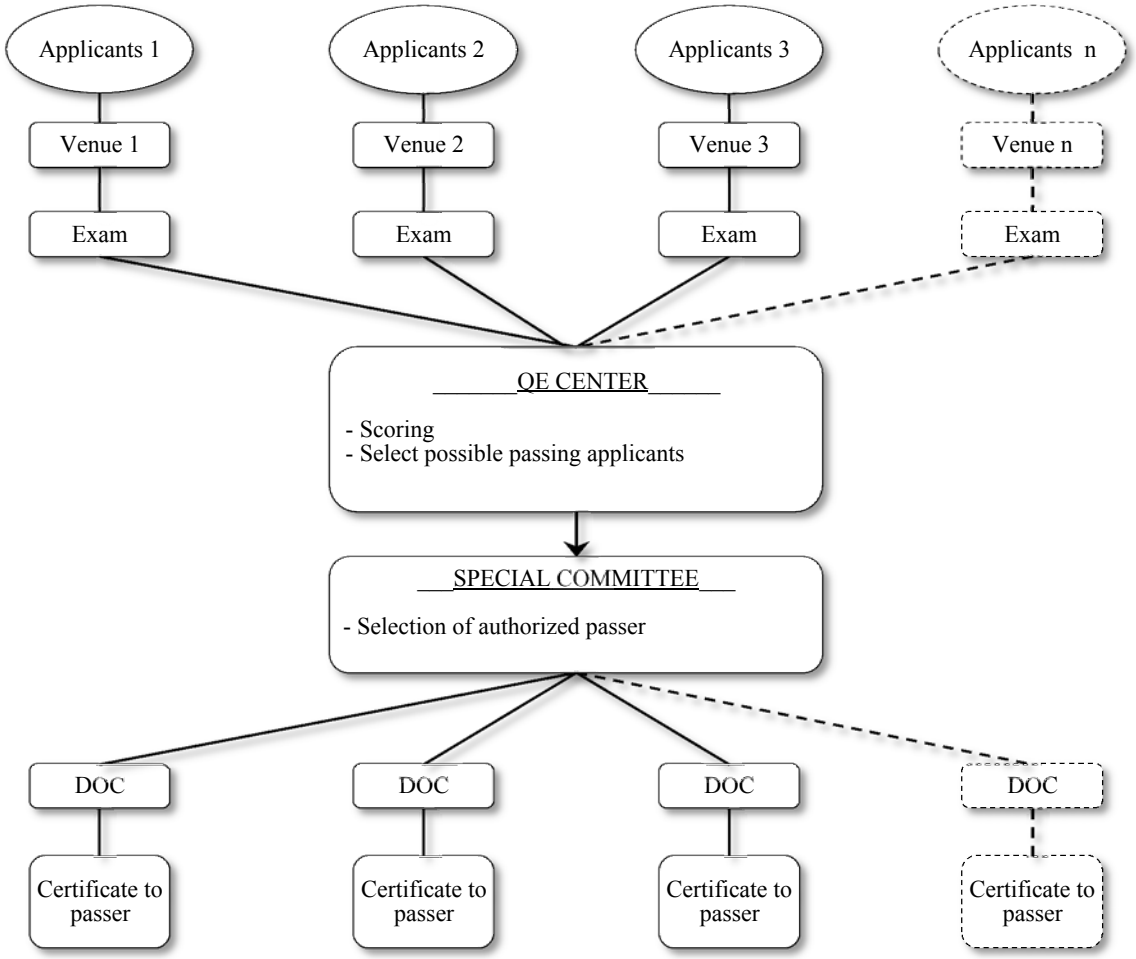


Figure 8.5.7 Procedures for selection of qualified engineers

4) Training before examination

Under present system, all applicants who want to be qualified have to take training before examination. However, for those who have enough ability, the training is not necessary. It is quite unreasonable that all applicants including competent engineers have to take specified training course. Capable engineers should be allowed to challenge the exam directly without any training. Therefore, regulation should not obliged candidates to take the training courses before taking exam.

Training before exam should be optional for candidates so that those who want to take training can take it at their own will. Applicant engineers can optionally take training course whenever the training is available. It is also desirable that the contents of the training are those for passing exams. This way can activate training and also training center itself. Training center will improve with this new system as a private body.

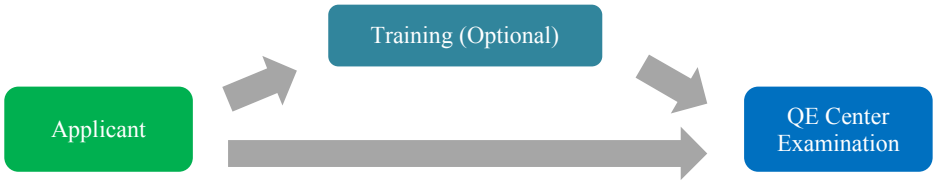


Figure 8.5.8 Training and Examination in new system

(3) Renew qualification

Regarding validity of engineer qualification, in the most of cases, qualification holders need to renew their qualification every 5 years. The procedure for renewal qualification can apply as the current one. Beside, to enhance the capacity of engineers, the project recommends developing the training course at the renewal time. The detail plan is explained at item " **8.5.4(4) Introduction of CPD system** " of this report. It means the qualification holders need to apply the administrative document to DOC and attend the training course organized by DOC when renewing qualification.

(4) Introduction of CPD system

1) Definition of CPD system

CPD system is the abbreviation of “Continuous Professional Development” and defined as system including continuous self-study and education for engineers. This system is intended to obligate existing qualification holders to keep maintaining their expertise over a long period of time even after obtaining the qualification. Furthermore, the CDP system is adopted in professional engineer qualification in Japan and has proven effectiveness so far.

2) Objectives

Engineers are required to do self-study continuously as professional experts focusing on the following points of view.

a. Involvement to progress of science technology

Engineers should always have interests in science and technology progressing constantly and endeavor to maintain and improve their ability to be able to contribute to the socio-economic development, and the improvement of safety and welfare through the acquisition of new technologies and their applications.

b. Response to changes in the social environment

Engineer should pay attention on changing social environment, international trends, and the change in demand to engineers with them and respond to them flexibly.

c. Engineer's ethics

In the light of ethics, engineer has to act and try not to damage public benefit in the use of technology involving.

3) Types of CPD system

a. Compulsory type

- Training at time of renewal

Regulation is frequently revised in Vietnam; therefore, engineers qualified have a little chance to grasp those changes. In some cases, engineers work not knowing renewal of regulations. In order to prevent those states, engineers have to take training including not only new technology but also regulation renewal regularly. Qualification holders need to renew their qualification every 5 years by application and have to take training at time of renewal, so this will be a good opportunity to take training at the time of renewal.

3 plans were introduced; however, they have not been narrowed down to a single plan. In this study, the best plan will be suggested here in **Table 8.5.3**.

Table 8.5.3 Training plan at time of renewal

Item	Plan	Remark
Coordinator	Training Center	Most appropriate
Location	DOC of every province (63)	Convenience nationwide
Lecturer	Staff of Training Center	Most appropriate
Lecture place	Meeting room in DOC	
Date	One day at time of renewal	Once or twice in a year
Training contents	Changes of regulation, technical standard, etc.	The latest information

b. Optional type

- Routine training

Professional engineers have to continuously study about their own subjects concerned to keep their ability and knowledge at high and the latest level as engineers' responsibility. Therefore, engineers have to study daily through routine training.

- Types of routine training:

As routine trainings, the followings are considered to be possible options.

+ Attendance to Seminars, workshops regarding engineering
+ Presentation of papers with any engineering subject
+ In-house training
+ Technical guidance works
+ Self-study
+ Others (the matters the Center approved as training)

Engineers should actively carry out those things for themselves and underdeveloped engineers. Through those opportunities, engineers can obtain new information and their technical judgment can be improved. Those daily activities lead to contribution to quality improvement of engineers.

- Record of training

Engineers who did routine training can resister the record of training to the DOC by submitting application document. The record is accumulated in engineer's activity as CPD data in DOC. DOC has to resister the individual record in his registered ledger of an engineer and keep it forever. CPD record is the more, the better for engineers' carrier and can become a symbol of high-level engineer. In the future, it is required for the CPD record to be counted as numerical points for training done by setting point in each training activity including weighting. By this, CPD activity can be clearly evaluated and lead to enhancement of engineer's quality in Vietnam. Furthermore, this system is required to be mandatory to all qualified engineers in the near future. **Figure 8.5.9** shows mechanism of CPD system.

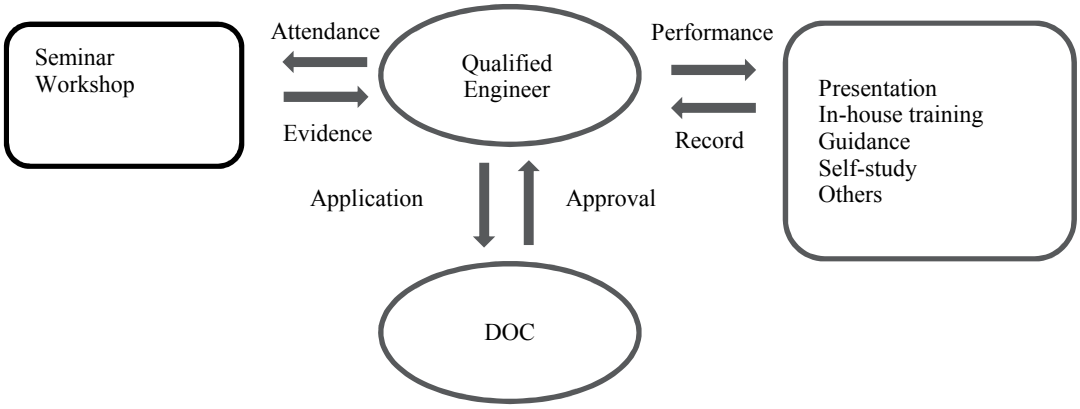


Figure 8.5.9 Mechanism of CPD system

(5) Advanced Qualification

1) Significance of qualification grading

As Japanese practice, some of the qualifications including national and private sector qualification have a grading system such as 1st-Grade and 2nd-Grade, 1st-Class and 2nd-Class and so forth. Qualifications in Japan are awarded to the applicants with passing examination in principle and the examination system can make qualification grading possible. Furthermore, with this grading system by examination methods, any candidate who passed the examination for a higher level of qualification can obtain a higher qualified position such as manager or supervisor. However, there has been no such grading qualification system so far in Vietnam.

As explained with regard to many advantages of examination system before, introduction of unified examination is significantly beneficial to present engineering qualification system in Vietnam. After introducing examination system, qualification grading will become definitely necessary in the near future as the second step. This is because candidates who try to challenge higher level will increase and examination system can make it possible by only setting different level of examination. Qualification grading has been impossible in the conventional way, which is documentary judgment; however, examination system can easily realize it.

2) Introduction of advanced qualification

It is basically required to establish 2 or 3 class grades in any engineering qualification from the view of significance of qualification grading above mentioned. Number of grading classes depends on the nature and function of engineering qualification concerned. For example, at most 3 grades including leader and chief classes are necessary in the case of construction supervising work.

Introduction of advanced qualification is to provide the higher level qualification and encourage qualification holders to challenge the higher classes. The current supervisor in Vietnam is assumed that corresponds to Basic-level of qualification.

Establishing an Intermediate-level qualification will encourage the Basic-level holders to challenge higher class of qualification in order to get higher status of job opportunity. The intermediate-level qualification shall require the higher expertise and technologies to comply with current advances in construction supervising works. The intermediate class is assumed to correspond to Chief class supervisor.

Moreover, establishing an Advanced-level qualification will also encourage Intermediate-level holders to get further higher level for their promotion. Advanced-level class is

assumed to correspond to Leader class for supervision who can manage overall supervision works and all human resources of supervision.

Each grade needs each examination with different difficulty in accordance with the different grade. Higher-class grade qualifications require applicants to take examination not only writing test, but also technical short essay or official interview in some cases. Typical grading classes in the case of 2 grades and 3grades are shown in the **Figure 8.5.10** below.

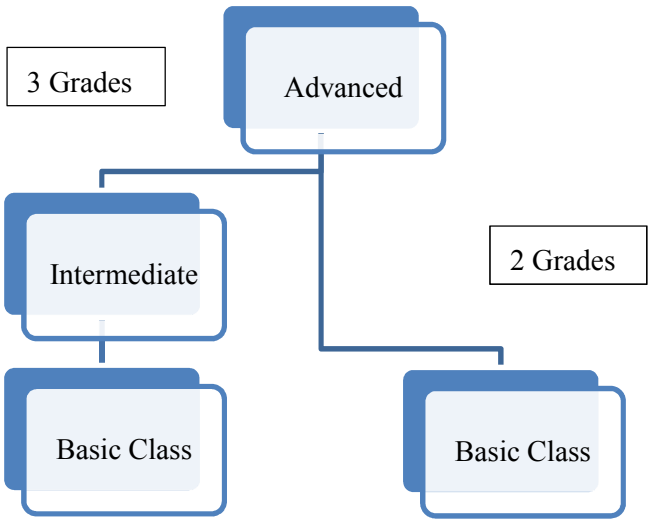


Figure 8.5.10 Grading class of qualification

8.5.5 Application of new Examination System

(1) General

Introduction of examination system into engineering qualification has been studied so far in this activity. It is clarified that examination system can remarkably enhance engineers' quality and expertise; then this system should be applied to certain engineering qualification as concrete examples. In this section, the new examination system shall be applied to two engineer qualifications for a trial.

There are four engineer qualifications officially approved in Vietnam, which are Architect, Engineer, Construction Supervisor and Construction Cost Estimator. Moreover, there is the site manager qualification as supervisor of contractors at the construction site. It is reported that site manager mostly has lack of ability for managing the construction site. Of these qualifications, the Project focuses on construction supervisor and site manager qualifications because those qualification holders are expected to play a leading and important role for managing construction projects and construction quality in the fields.

(2) Trial application of new examination system into Construction Supervisor Qualification

1) Expected technology level

According frame work in Circular 25/2009/TT-BXD - Guiding for professional training of construction investment project management and supervise construction works, the following basic knowledge shall be required

- General knowledge on Supervisor construction
  - Regulations on construction investment operation and application the regulation in supervision construction works.
  - Supervision construction profession
  - Construction and acceptance code, standard and requirement systems
  - Supervision procedure and contents of schedule, safety and health in construction works
  - Supervision on construction survey
  - Supervision on construction test, observation, measurement works
- Building, industrial, infrastructure works
  - Construction supervision on ground and foundation works of building, industry and technical infrastructure
  - Construction supervision on concrete, reinforce concrete and brick-stone structures works.
  - Construction supervision on steel and other metal structures works
  - Construction supervision on equipment installation works
  - Construction supervision on construction finishing works
  - Construction supervision on implementation technical infrastructure works at urban and industrial zone
  - Supervision on implementation, installation equipment in industrial works
- Transportation works
  - Construction supervision on bridge works
  - Construction supervision on tunnel works
  - Construction supervision on road, airport works
  - Construction supervision on port - waterway works
  - Construction supervision on railway works

- Irrigation and Hydro power works
  - Supervision on water flow conduction and construction ground, foundation of irrigation, hydro power works
  - Construction supervision on concrete, conventionally reinforce concrete (CVC), roller-compacted concrete (RCC) and brick-stone structures.
  - Construction supervision on earth-stone works
  - Supervision on installation hydraulic and M&E equipment of irrigation, hydro power works.

2) Typical Examinees

Base on Circular 25/2009/TT-BXD, Article2, Clause 3: Trainees are the individuals have technical high school's degrees and upper involving in construction activities

All applicants meet the requirement of Decree 12/2009/NĐ-CP - On Management of Construction Investment Projects (CIPs):

- Article 40 - Conditions for granting Certificate of Construction Supervisor (CS)
  - Person to be granted CS must be university graduate upwards, majored in the field suitable with registered profession in CS, directly took part in design or construction for 3 years upwards or 5 projects at least or experienced in supervision work for 3 years upwards prior to the effectiveness of Law on Construction; passed training course on construction supervision.
  - People, who possess college or junior-college degree of suitable major, took part in design or construction work or supervision work for at least 3 years or passed training course on construction supervision will be granted CS. The Certificate is only used for supervision of construction works level IV.

3) Basic information of examination

The contents of examination implementation are summarized in the below **Table 8.5.4** . For clear comparison, four cases of Japan, Vietnam, previous proposal and the new proposal planed here are introduced together. In order of the item, each content of new proposal is respectively explained hereafter.

- Implementing organization

A few officers of QE Center attend exam at all venues as supervisor; however, exam implementation is officially carried out by staff of each training center. In the case of university, staff of the nearest training center shall assist exam.

- Location

As shown in **Figure 8.5.4**, at least 22 locations are available nationwide. Basically training center is applied as venue; however, in case of no center, university or collage is possible candidate as venue (No class days such as holiday or weekend).

- Frequency

  Basically number of times of exam is 2 times a year (April and October). This is for candidates to obtain many opportunities for exam.

- Examination fee

  Examination fee is back-calculated basing on total cost necessary for the exam implementation; therefore, it should be basically fixed in a year.

- Exam duration

  Considering time and effort for applicants' gathering at exam venues, exam time is the shorter, the better; therefore, examination shall be implemented within half day. In order to finish all exams in half day, exam duration should be decreased to less than half of previous proposal. Then, category and time of exam are as shown in the **Table 8.5.4**.

- Exam type

  As explained in **8.5.4(2)2) Unified examination**, both exam types, multiple choice and writing, are adopted.

Table 8.5.4 Implementation of examination

	Japan		Current practice in Vietnam	Previous proposal	New Proposal
	Academic	**Practical**	**(Circular 25/2009/TT-BXD, Appendix 2)**	**(full day)**	**(half day)**
Implementing Organization	• Independent Organization		Training Center	QE center - MOC	QE center - MOC
Location	• 10-19 nationwide		50 training centers nationwide	More than10	More than 22
Frequency of Exam	Once a year		1 time/month	1 (or 2) a Year on (Spring or Fall)	2 times/year April and October
Examination Fee	From 1mil-2mil VND		Included in training fee	Depend on expense of QE Center	Fixed based on all expense of exam implementation
Exam Duration	• Regulation + Ethics: AM - 2h 30min • Technical Fields: PM - 2h	• Technical Fields: 2h45min	• Regulation: 30min • Management: 30min • Technical Fields: 30min	• Regulation + Ethics: AM - 1h • Technical Fields: PM - 3h	• Regulation + Ethics: 1h • Technical Fields: 1h30min
Exam type	• Multiple choice (1/4)	• Writing	• Multiple choice (1/4)	• Multiple choice (1/4)	• Multiple choice (1/4) and writing

4) Certificate procedure

The procedures of certificate of construction supervisor are shown in **Figure 8.5.11**

(a) As speculated in the requirement of Decree 12/2009/NĐ-CP, in the case of university graduates, after 3years experience (5years for college graduates), they can be worth of taking CS unified exam.

(b) Those who need training before exam can receive optional training course with application.

(c) After passing CS-Exam (Basic level), the passers can get the certificate of CS Basic level from DOC to which they belong.

(d) Those who wish the next higher level of CS (CS 2) can try CS 2-Exam after 2years' actual construction supervising experience.

(e) After passing CS 2-Exam (Intermediate level), the passers can get the certificate of CS Intermediate level from DOC to which they belong.

(f) Those who wish the highest level of CS (CS 1) can try CS 1-Exam after 2years' actual construction supervising experience as CS 2.

(g) After passing CS 1-Exam (Advanced level), the passers can get the certificate of CS Advanced level from MOC.

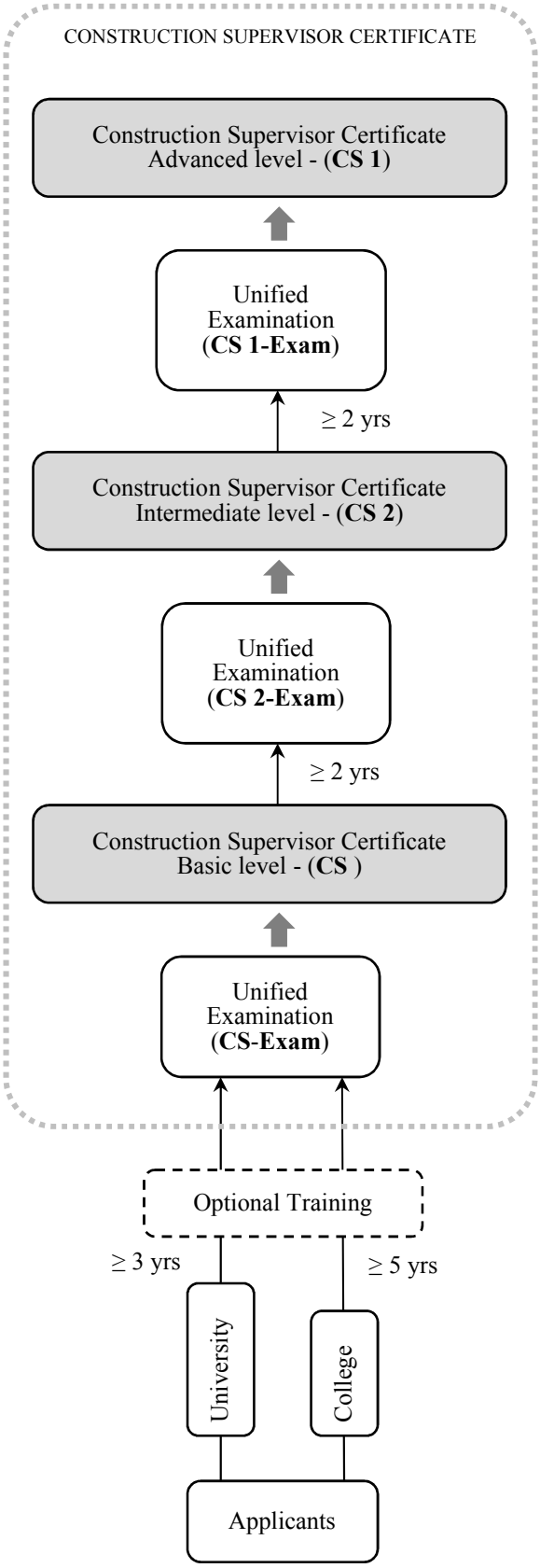


Figure 8.5.11 Procedures of certificate for construction supervisor

5) Exam question

In creating exam questions of CS (CS-2, CS-1), referring **8.5.5(2)1) Expected technology level**, and basing on the following points, component of examination question is examined and suggested as a draft as shown in **Table 8.5.5**

- As field of question, besides regulation and technical, ethics is added from the view point of recent surroundings of construction industries in Vietnam. Weight of questions is also placed on this field.
- In previous examination, 40 questions were made from not fixed various fields; however, in the new examination, all questions are issued well-balanced from the categories which are determined in advance. Therefore, overall intelligence as civil engineer is required in the new one.
- Writing test is newly added in order to measure true technical judgment ability of applicants. Almost writing test shares 30% of all. (20/70) Furthermore, category of writing test is not fixed because it may change in accordance with the nature of the test at the time.
- Correct* means the number which should be correctly answered. In total 42 in 70 should be correct for passing, which is 60%. Furthermore, in each category number of correct answer hopefully should be got by possible passers.

Table 8.5.5 Examination question component

Field	Major category		Middle Category		Number of multiple choice question		Number of writing question	
	No	Name	No	Name	Total	Correct*	Total	Correct*
Regulation	1.	Regulations and application	1.	Regulations	3	7	4	2
			2.	Application the regulation	3			
			3.	Procedure	2			
	2.	Code, standard and require.	4.	Construction	2			
			5.	Acceptance	2			
				Subtotal	**12**	**7**	**4**	**2**
Ethics	3.	Action	6.	Transparent, Fair, Honest, …	1	4	4	2
	4.	Professional knowledge improvement	7.	Technical skill	1			
			8.	Office skill	1			
			9.	Soft skill	1			
	5.	Benefit	10.	Nation and public	1			
			11.	Client	1			
				Subtotal	**6**	**4**	**4**	**2**
Technical	6.	Construction investment project management	12.	Overview	1	9	6	4
			13.	Contractor selection	1			
			14.	Contract and Design	1			
			15.	Schedule management	3			
			16.	Quality management	3			
			17.	Cost management	2			
			18.	Safety, environment, risk, …	3			

Field	Major category		Middle Category		Number of multiple choice question		Number of writing question	
			19.	Payment, settlement	1			
	7.	Knowledge on Supervisor construction	20.	Profession	2	10	6	4
			21.	Survey	2			
			22.	Test, observation, measurement	2			
			23.	Earth works	2			
			24.	Ground and foundation	2			
			25.	Concrete types	2			
			26.	Steel and other metals	2			
			27.	Particular work	2			
			28.	Installation equipment	1			
	Subtotal				**32**	**19**	**12**	**8**
Total					**50**	**30**	**20**	**12**

6) Condition of certificate

Condition of certificate of construction supervisor is summarized in **Table 8.5.6**. In the case of only CS 1 class, the certificate is issued from MOC.

Table 8.5.6 Certificate condition on Construction Supervisor

Types / Information	CS 1	CS 2	CS
	Construction Supervisor Certificate Advanced Level	**Construction Supervisor Certificate Intermediate Level**	**Construction Supervisor Certificate Basic Level**
Issue Organization	MOC	DOC	DOC
Validity	5 years	5 years	5 years
Certification procedure	Pass Unified Exam	Pass Unified Exam	Pass Unified Exam
Experience requirement	Hold CS 2 ≥ 7 years (+ BSc) ≥ 10 years	Hold CS ≥ 5 years (+ BSc) ≥ 7 years	≥ 3 years (+ BSc) ≥ 5 years
Functional requirement	Leader class supervisor Transfer technology	Chief-class supervisor Involve big projects	Supervisor construction projects

7) Optional training course before Examination

Circular No.25/2009/TT-BXD, 29 July 2009 guides for professional training of construction investment project management and supervise construction works. However, this training is an option for applicants of examination. Those who try to pass the exam are encouraged to take the training for preparation.

8) Road map

Table 8.5.7 shows a roadmap for improving construction supervisor qualification system which is recommended by the Project.

Table 8.5.7 Roadmap for improving construction supervisor qualification system

Plan		Road Map (Year)					
		2013	2014	2015	2016	2017	2018
General Activity (2013)							
1	Agreement with CPs and PMU						
2	Hearing Opinions from Stakeholders						
3	Agreement with MOC						
Implement Unified Examination (2014, 2015)							
1	Revise Regulations						
2	Prepare and Establish QE Center						
3	Make Question Data Base						
4	Prepare and Implement Unified Examination						
Implement Optional Training Courses (2015)							
1	Revise Regulations						
2	Prepare and Implement Optional Training Course						
Establish Intermidiate-Leveland Advance-Level Qualification							
1	Revise Regulations						
2	Prepare and Implement Unified Exam						

(3) Trial application of new examination system into Site Manager Qualification

1) Expected technology level

Because the Site manager plays Supervisor of Contractor role at construction site, so the knowledge shall be required are similar the knowledge of Supervisor. Beside that the knowledge on construction investment project management also is required for the Site manager.

According frame work in Circular 25/2009/TT-BXD - Guiding for professional training of construction investment project management and supervise construction works, the following basic knowledge shall be required

- Construction investment project management
  - Overview on Construction investment project management
  - Contractor selection in construction operation
  - Contract in construction operation

- Schedule management of Construction investment project
- Quality management of Construction investment project
- Cost management of Construction investment project
- Labor safety, construction environment, risk management in construction investment project
- Payment, settlement construction works investment capital

- General knowledge on Supervisor construction
  - Regulations on construction investment operation and application the regulation in supervision construction works.
  - Supervision construction profession
  - Construction and acceptance code, standard and requirement systems
  - Supervision procedure and contents of schedule, safety and health in construction works
  - Supervision on construction survey
  - Supervision on construction test, observation, measurement works
- Building, industrial, infrastructure works
  - Construction supervision on ground and foundation works of building, industry and technical infrastructure
  - Construction supervision on concrete, reinforce concrete and brick-stone structures works.
  - Construction supervision on steel and other metal structures works
  - Construction supervision on equipment installation works
  - Construction supervision on construction finishing works
  - Construction supervision on implementation technical infrastructure works at urban and industrial zone
  - Supervision on implementation, installation equipment in industrial works
- Transportation works
  - Construction supervision on bridge works
  - Construction supervision on tunnel works
  - Construction supervision on road, airport works
  - Construction supervision on port - waterway works

- Construction supervision on railway works

- Irrigation and Hydro power works
  - Supervision on water flow conduction and construction ground, foundation of irrigation, hydro power works
  - Construction supervision on concrete, conventionally reinforce concrete (CVC), roller-compacted concrete (RCC) and brick-stone structures.
  - Construction supervision on earth-stone works
  - Supervision on installation hydraulic and M&E equipment of irrigation, hydro power works.

2) Typical Examinees

Base on Circular 25/2009/TT-BXD, Article2, Clause 3: Trainees are the individuals have technical high school's degrees and upper involving in construction activities

All applicants meet the requirement of Decree 12/2009/NĐ-CP - On Management of Construction Investment Projects (CIPs): (same as construction supervisor)

- Article 40 - Conditions for granting Certificate of Construction Supervisor (CS)
  - Person to be granted CS must be university graduate upwards, majored in the field suitable with registered profession in CS, directly took part in design or construction for 3 years upwards or 5 projects at least or experienced in supervision work for 3 years upwards prior to the effectiveness of Law on Construction; passed training course on construction supervision.
  - People who possess college or junior-college degree of suitable major, took part in design or construction work or supervision work for at least 3 years or passed training course on construction supervision will be granted CS. The Certificate is only used for supervision of construction works level IV.

3) Basic information of examination

There is no exam system for site manager currently in Vietnam. In case of Japan, Construction Contractors Law claims requirement of Managing Engineer besides Site Agent at construction site and with regard to Managing Engineer, at least qualification of First-class civil engineering works operation and management engineer is required. The contents of exam are same as supervising engineer. **Table 8.5.8** shows exam contents of Japan's case and proposal for site manager in Vietnam. As shown in proposal, to become a site manager, passing the following exam is required.

Table 8.5.8 Exam implementation

	Japan		Vietnam	Proposal
	Academic	**Practical**	**Circular 25/2009/TT-BXD, Appendix 2**	**(haft day)**
Implementing Organization	Independent Organization		_____	MOC - QE Center
Location	10-19 nationwide		_____	More than 22
Frequency of Exam	Once a year		_____	2 times/year April and October
Examination Fee	From 1mil-2mil VND		_____	Depend on expense of Training Center
Exam Duration	Regulation + Ethics: AM - 2h 30min Technical Fields: PM - 2h	Technical Fields: 2h45min	_____	Regulation + Ethics: 1h Technical Fields: 1h30min
Exam type	Multiple choice (1/4)	Writing	_____	Multiple choice (1/4) and writing

4) Certificate procedure

The procedures of certificate of site manager are shown in **Figure 8.5.12**

(a) As speculated in the requirement of Decree 12/2009/NĐ-CP, in the case of university graduates, after 3years experience (5 years for college graduates), they can be worth of taking CS unified exam.

(b) Those who need training before exam can receive optional training course with application.

(c) After passing CS-Exam (Basic level), the passers can get the certificate of CS Basic level from DOC to which they belong.

(d) Those who wish the next higher level of CS (CS 2) can try CS 2-Exam after 2years' actual construction supervising experience.

(e) After passing CS 2-Exam (Intermediate level), the passers can get the certificate of CS Intermediate level from DOC to which they belong.

(f) If those who have obtained CS 2 wish to get Site manager certificate (SM 2[1]), they can take 1-month training for Site manager with application. After being trained, DOC gives them certificate of Site manager (SM 2).

(g) Those who wish the highest level of CS (CS 1) can try CS 1-Exam after 2years' actual construction supervising experience as CS 2.

[1] Explained in **8.5.5**(3)6) **Condition of certificate**

(h) After passing CS 1-Exam (Advanced level), the passers can get the certificate of CS Advanced level from DOC to which they belong.

(i) If those who have obtained CS 1 wish to get Site manager certificate (SM [12]), they can take 1-month training for Site manager with application. After being trained, DOC gives them certificate of Site manager (SM 1).

[2] Explained in **8.5.5**(3)6) **Condition of certificate**

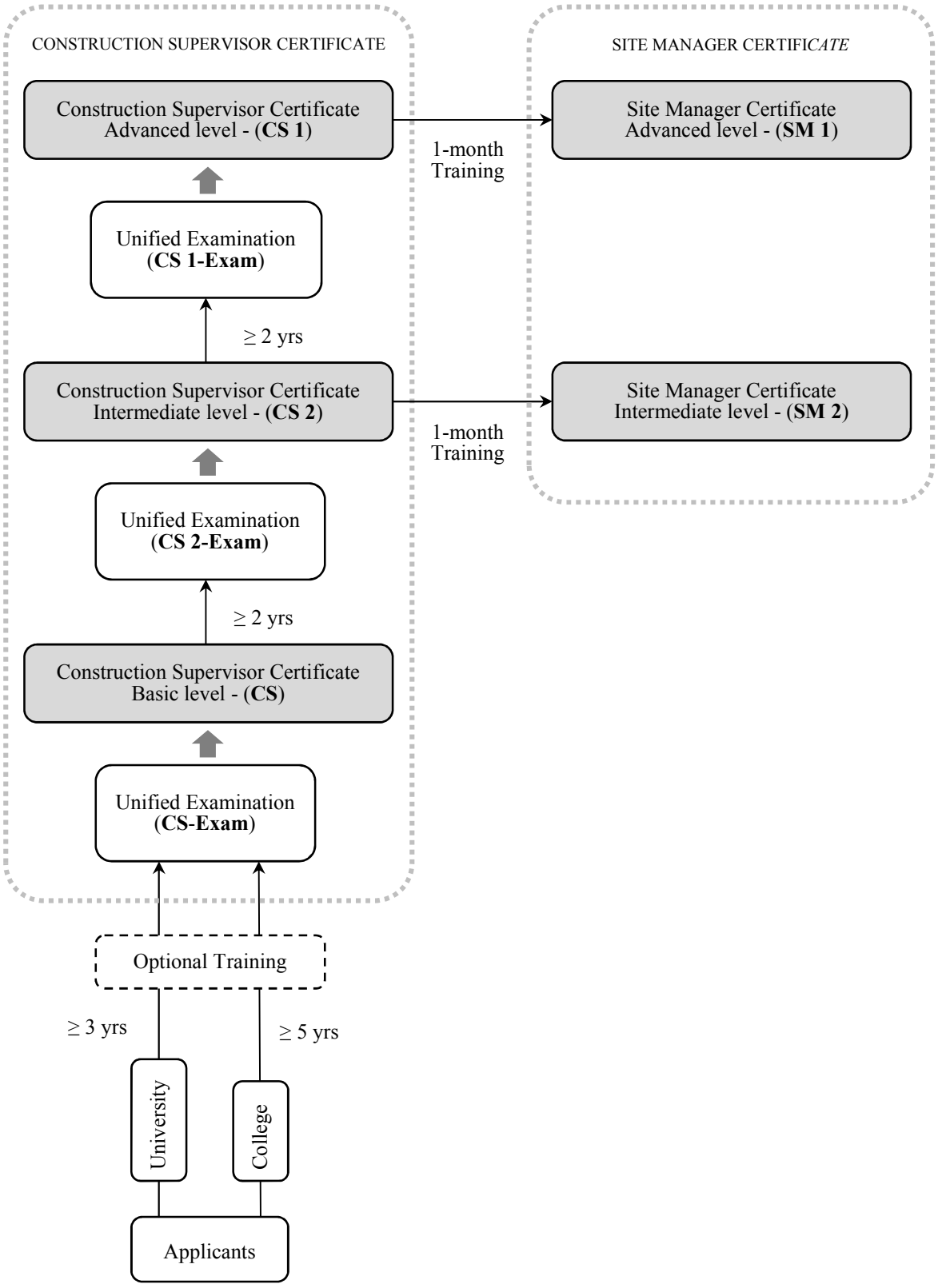


Figure 8.5.12 Procedures of certificate for site manager

5) Exam question

This is same as **8.5.5**(2)5) **Exam question.**

6) Condition of certificate

Condition of certificate of Site manager is summarized in **Table 8.5.9**. In the case of only SM 1 class, the certificate is issued from MOC.

Table 8.5.9 Certificate condition on Site Manager

Types / Information	SM 1	SM 2
	Site Manager Certificate Advanced Level	Site Manager Certificate Intermediate Level
Issue Organization	MOC	DOC
Validity	5 years	5 years
Certification procedure	Attend 1 month Training	Attend 1 month Training
Experience requirement	Hold CS 1 ≥ 7 years (+ BSc) ≥ 10 years	Hold CS 2 ≥ 5 years (+ BSc) ≥ 7 years
Functional requirement	Site manager for projects of special type, type I, type II, type III, type IV of the same category[3]	Site manager for projects of type II, type III, type IV of the same category[4]

7) Training course

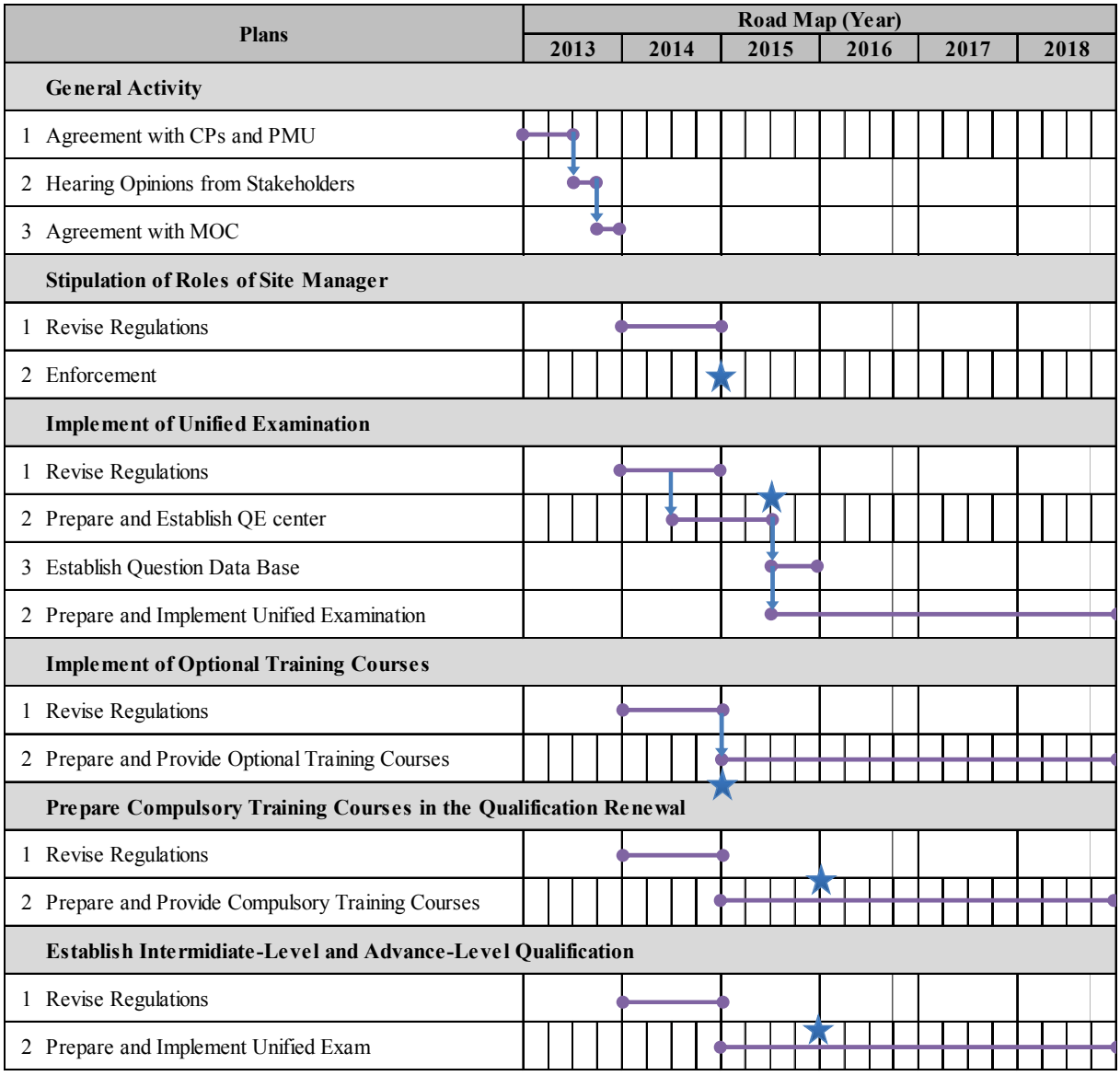
- One-month Compulsory Training for new application and renewal
- Validity of Training Certificate : 5 years
- Subjects for Training
  - Legal system regarding construction project
  - Technical management such as construction method planning, time management etc.
  - The latest type of materials, equipment and construction methods regarding construction project

[3] Refer to QCVN 03:2012/BXD "Vietnam Building Code on Principle of classification and grading of civil and industrial buildings and urban infrastructures"
[4] Refer to QCVN 03:2012/BXD "Vietnam Building Code on Principle of classification and grading of civil and industrial buildings and urban infrastructures"

8) Road map

It is recommended that Site Manager Qualification system will be implemented according to the following Roadmap.

Figure 8.5.13 Roadmap for improving Site Manager Qualification system



CHAPTER 9 DEVELOP THE FRAMEWORK FOR CONSTRUCTION QUALITY MANUAL AND STANDARD CONSTRUCTION WORK SPECIFICATION (ACTIVITY-5)

9.1 FRAMEWORK OF IMPROVEMENT

9.1.1 Development of Framework for Standard Technical Specifications

(1) Concept for Improvement

Technical specifications are one component of tendering dossiers which shows technical guidelines for construction projects. Standardization of technical specifications is intended to ensure consistency in contents and to reduce workload of a project owner preparing for specifications. However, it should be noted that the standardization of technical specification is in principle to find out common elements in the individual specifications and to standardize them into one specification, so that it should be applied for the project fields where demand for the construction projects is high and where there are many similarities in specification including materials and construction methods.

In addition, specifications should be standardized in accordance with construction project sectors. Also, in many construction projects, the standard specification is more often used with a so-called particular specification which supplements information for the specific subjects of the project. In general, the particular specification is separately handled from the standard specification and prepared by the project owner.

With these reasons, it is more appropriate that the ministries in charge of the construction sector should be deeply involved in the preparation of not only particular specifications, but also standard specifications. Characteristics of the above stated specifications are summarizes as follow.

The Project focuses on the common specifications and tries to develop the guidelines showing how to standardize common specifications which can be usable over many construction projects. However, it should be noted that the particular specifications be placed out of the scope of this Project, since development of such particular specifications be managed by sector management ministries.

1) Common Specification (General Specifications)

- It deals with common elements over the multiple numbers of projects.
- It prescribes regulations and technical standards to be applied for construction works.
- Standardization helps support project owners to reduce project preparation time.

- It provide convenience and usefulness to contractors

2) Particular Specification

- It deals with subjects very much specific for the projects. These include the scope of the work, geological conditions, utility removal, construction methods, and other details of the project and so forth which are deemed independent information for the project.
- It provides specific information for the project.

(2) Methodologies

The Project will develop the guideline showing how to compile standard technical specification, following procedures listed below.

- Introduce foreign practices (Practices in Japan)
- Define ministries roles for developing and maintaining standard common specifications
- Select construction works for standardization
- Develop structures of standard common specifications
- Select provisions for standardization
- Develop a sample standard specifications for public works

(3) Outputs

- Guidelines for the standardization of common technical specifications.
- A sample common specification which consists of general provisions and material provisions for public works. (See detail in **"GUIDELINES AND MANUALS"**)

9.1.2 Development of Framework of Construction Quality Manual

(1) Concept of Development

Quality management manuals have been widely spread in the foreign countries in order to supplement regulations and to provide detailed information which is beneficial to project owners, consultants and contractors, who are directly involved in the construction project and the quality management in the fields.

In fact, there is no fixed format for the quality management manual, but very flexible in formatting. Any information including support formation and supplemental information of regulations can be all assembled into the construction quality manuals. Information deemed

beneficial to project owners, consultants and contractors, who are directly involved in construction project and quality management, can be selected into the manual.

On the basis of the current status survey, the Project focuses on developing a framework (a Guideline) aiming at developing construction quality manuals below. These independent manuals can be assembled and integrated into the quality management manual. The manual listed herein is expected to play a key role in ensuring smooth implementation of construction project and quality management between project owners, supervision consultants and contractors.

- Manual on procedures and documents for acceptance
- Manual on laboratory tests and field tests
- Manual on measurements of completed facilities
- Manual on labor safety

However, it should be noted here quality management manuals should be in principle developed sector by sector as much as possible, as the information included in the manuals is closely associated with technical standards and field construction works, thereby information requirements may fairly differ depending upon sectors. It is necessary to understand that quality management manuals are for the purpose of construction works.

(2) Methodology

The Project will develop the guideline showing how to compile construction quality manuals, following procedures listed below.

- Introduce Japanese Practices
- Select main components contained in construction quality manuals
- Develop contents of construction quality manual.
- Study on how to use construction quality manuals
- Study on how to develop and manage construction quality manuals
- Develop a sample construction quality manual for public works

(3) Outputs

- Guidelines for developing construction quality manuals.
- A sample construction quality manual for public works. (See detail in **"GUIDELINES AND MANUALS"**)

9.2 DEVELOPMENT OF FRAMEWORK FOR STANDARD TECHNICAL SPECIFICATION

9.2.1 Rationale

- Technical specification is a part of contract dossiers and stipulates important points to note in construction which are not well prescribed in the conditions of contracts. These points include general requirement, material specifications, technical standards to be applied, construction methods, field and laboratory tests, measurements of completed structures, ways of payment and so forth. Therefore, technical specification plays a bridge role between the Employers and contractors, so that it is mandatory to enhance the quality of technical specifications in order to raise the quality of construction works.

- By regulations, the technical specifications have been prepared independently for each construction project. Therefore, project owners or employers are obliged to prepare these technical specifications before going into tendering procedures. There has been no standardized specification so far in any construction field in Vietnam. Consequently, it has caused that the contents of the specification have been variant and inconsistent even in same construction field.

- In fact, most of such tasks as making specifications have been carried out, heavily relying on outsourced consultant works due to lack of knowledge and ability of project owners. However, there is still inconsistency in each project's technical specification. Under this situation, the standardization of technical specifications is expected not only to give direct impacts on the quality enhancement of technical specifications, but to reduce the workloads of making specifications for project owners.

9.2.2 Overseas Practice (Practices in Japan)

(1) Specifications Developed by MLIT

- In Japan, any of implementation bodies more or less prepare their own construction work specifications. They are MLIT, various public bodies, local governments such as prefectures, cities and villages etc. and then wide-ranging. Although there are some similarity among them, each body has developed own specification independently.

- As a major example of Japanese practice, MLIT's specifications are here introduced for reference. **Figure 9.2.1** shows specifications developed by MLIT. MLIT has developed and managed nine major standard specifications for its public works. However, there might be some more if small specifications are counted.

- MLIT has been paying much attention on standardizing technical specifications applicable to various types of construction projects. However, standardization has been developed in accordance with construction work types as shown in the **Figure 9.2.1** . Standard specifications have been applied independently or in combination to the contacts of construction works. Application of these specifications is in principle compulsory for construction works under MLIT supervision.

- As seen in the **Figure 9.2.1** , MLIT also develops specifications for building works. However, they are not for the various types of building works, but for the government facilities like staff apartments and offices. Other ministries agree to follow these specifications when attempting to build such facilities.

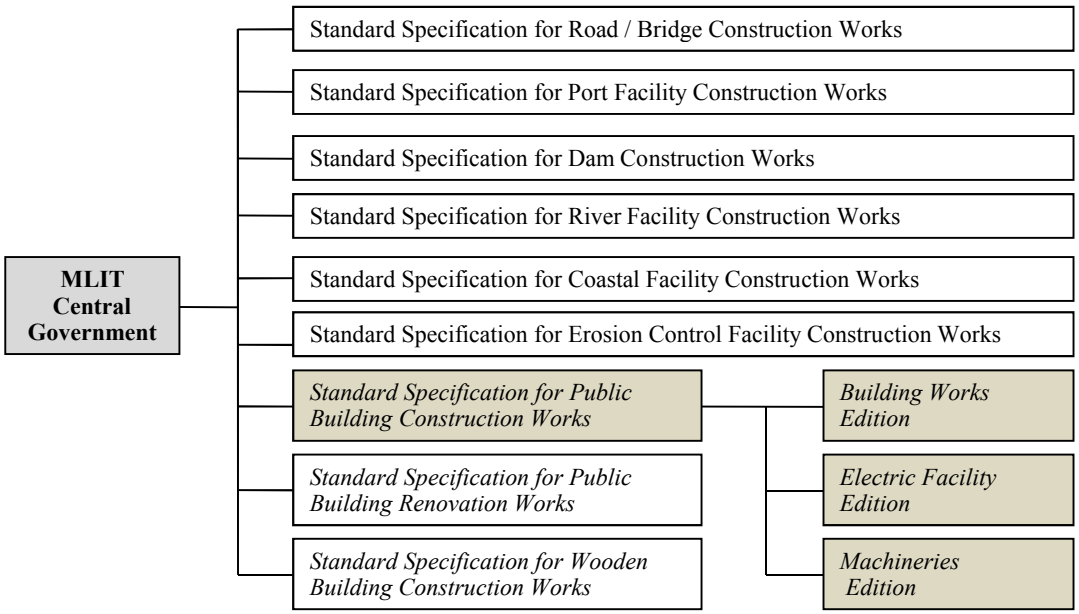


Figure 9.2.1 Technical Specifications Developed by MLIT

(2) Building Work Specifications

- The building specification comprise three sub editions; Building Works Edition; Electric facilities Edition and Machineries Edition as shown in hatched boxes in the **Figure 9.2.1 .** Current Status of technical Specifications in Vietnam

(3) Specifications Developed by Local Autonomies

- Ministerial agencies under MLIT and local municipals basically follow MLIT technical specifications, but they sometimes develop their own specifications in line with MLIT specifications.

(4) Specifications Developed by Academies

- In addition to ones published by government organizations, some academic institutes including the Japan Society of Civil Engineers, Architectural Institute of Japan, etc. are also developing technical specifications, but their uses in contracts are not compulsory, but are free in use.

(5) Compilation of Technical Specifications

- Collaborative development has been often employed in order to develop technical specifications as well as technical standards. MLIT often constitutes committees and invites many experts and academics to the committees where information is assembled and intensive opinion exchange is done for technical issues of construction works. MLIT often commissions these works to semi-public research foundations under their jurisdiction.

9.2.3 Current Status of Technical Specifications in Vietnam

- Technical specifications have already been applied to many construction work contracts until recently, but more often to the ODA funded construction works and less often to the state-budget construction works.
- Looking on a sector basis, technical specifications have been applied more often to the public work sector including roads & bridges, ports and dams than to the building work sector.
- There seem to be many project owners who are deemed unprofessional in construction work management and unfamiliar with technical specifications, so that preparation of technical specifications has been left to consultants.
- Technical specifications have never been standardized yet in all sectors. Much government effort has been directed to the guidance to consultants on how to make technical specifications.
- Ministry of Transport published a guideline on how to make technical specifications for roads/bridges construction works on August 1st, 2008. Another similar guideline for building construction works is in a formalization process and coming out early 2012, as shown in **Section 9.2.6 Reference-2; Guidelines for Editing Technical Specifications in Vietnam**

9.2.4 Guidelines for Developing Standard Technical Specifications

(1) Objectives of Standardization

As identified in current problems, because technical specifications' contents are inconsistent and varies with infrastructural fields, project owners have difficulties to make independent specification on each project. To add to these difficulties, there are likely project owners and employers who are incapable of making technical specifications.

A method to settle these problems is to standardize the technical specifications as in the case of Japanese practice. It is of course impossible to standardize all specifications, but there are many common items or contents in various technical specifications. It is possible and necessary to standardize only common portions in technical specifications.

Therefore, the objectives of standardization are;

- To provide uniform information on technical specifications;
- To share technical specifications in similar construction fields;
- To reduce project owner's workloads to make technical standards.

Inconsistency of technical specifications can be eliminated and then integrated buildings in quality can be produced in any construction field by standardization of technical specification.

In addition, it can reduce a tremendous workload and cost of making specifications for project owners. It is apparently demonstrated that effectiveness of standardization is rather enormous in Japan.

(2) When to Implement Standardization

There might be a discussion on when to start standardizing technical specifications. Current status, stated in **"9.2.3 -Current Status of Technical Specifications in Vietnam"**, explains that MOC focuses more on publishing guidance on making technical specifications for individual construction works. However, under the situation that anybody can be a project owner if appointed by decision maker, MOC is recommended to start standardization of technical specifications at an early stage in order to ensure quality of technical specifications, following MLIT practices in Japan. It is necessary that MOC first creates a standard specification for a national project, and then it is gradually adapted to local projects as a basic form.

(3) What are the Structures of Standardized Specifications

Figure 9.2.2 explains the general structure of contract dossiers for construction works which have been widely implemented in Vietnam like roads & bridge projects. Technical specification is one of the contract dossiers and normally has 7 items as basic contents as shown in **Table 9.2.2** .They are General Provisions, Technical Standards to be applied, Materials, testing, Construction Works, Measurements and Payments.

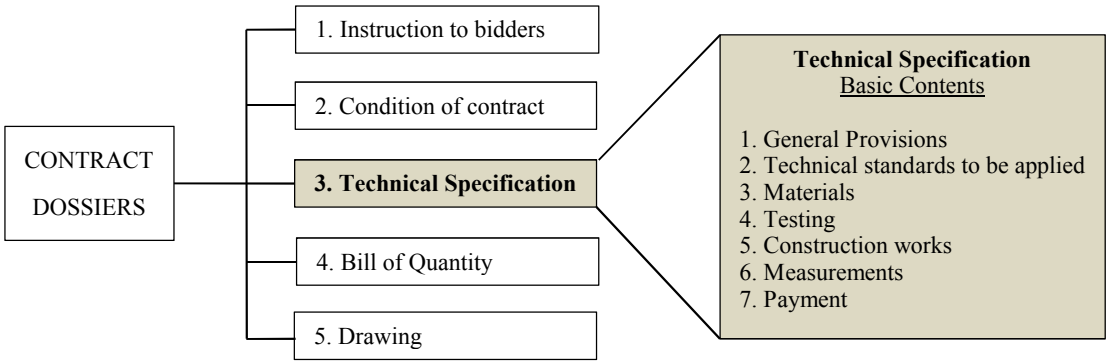


Figure 9.2.2 Structure of Technical Specifications (Before Standardization)

On the other hand, **Figure 9.2.3** illustrates the contract dossiers with standard specifications incorporated in the contract dossiers. As seen in the figure, Technical specification is divided into two types of specification, which are Standard Technical Specifications and Particular Technical Specifications. Standard specifications are generally applied coupled with particular specifications.

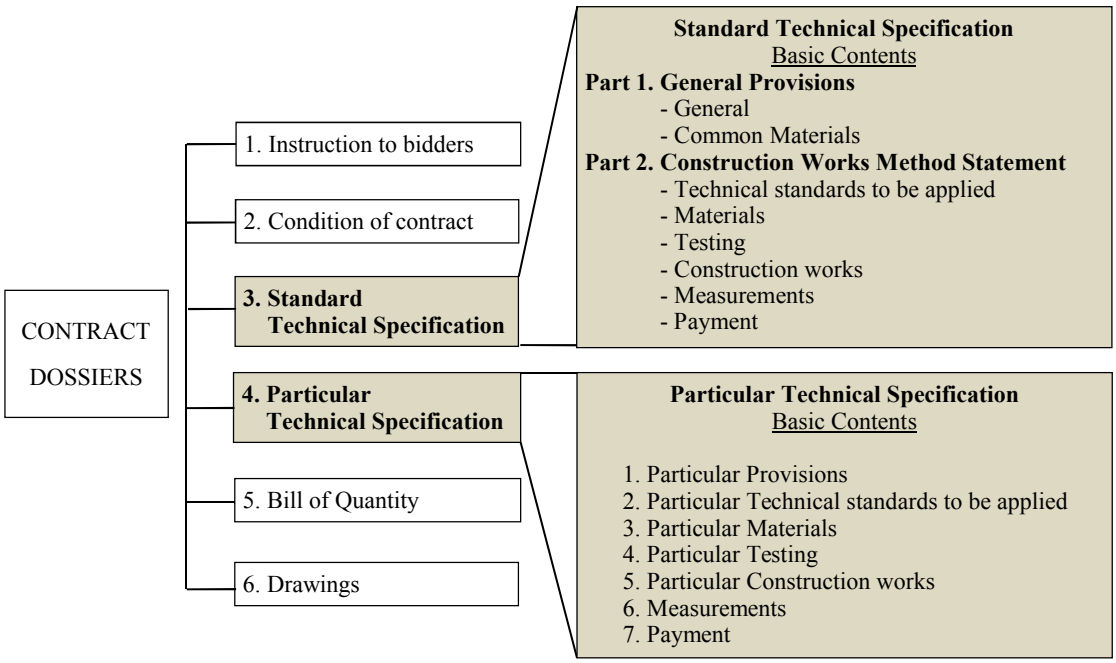


Figure 9.2.3 Structure of Technical Specifications (After Standardization)

Functions of each specification are as follows.

- Standard Specification
  - Deals with only common contents of various field projects and describes applicable regulations in any project.
- Particular Specification
  - Deals with only specific portions of the project concerned and describes applicable regulations in special construction works.

Basic contents of standard specification are generally composed of two parts: General Provisions and Construction Work Method Statements. In General Provision, general regulations regarding general matters and common materials on construction projects are described. In Construction Work Method Statements, technical standards, regulations regarding materials, testing, construction works, measurements and payments are described. Construction Work Method Statements only deal with representative common construction work methods in the field concerned. Details are generated in following **(6) How to Develop Frameworks of Standard Specifications**.

As the standard specification can only provide the information deemed standard and common over multiple construction projects, it cannot provide specific information specialized for a specific construction project. With this, the particular specification can provide more specific information and supplement the function of the standard specification.

Both specifications have the same contents structure basically, but that for the particular information is often flexible and limited to the supplementary contents to the standard specification.

(4) What are Ministry's Roles in Standardizing Technical Specifications

The ministries, including MOC, MOT, MOI and MOA which are given authority of making technical standards, are advised to recognize the necessity of standard specifications, prepare them and to disseminate information to project owners, in particular to those at the provincial-level.

The contents of standard specifications should be closely linked to the technical standards developed by each ministry. Also, work methods to be standardized should be consistent with the specialized construction sectors, so each of the above ministries is encouraged to develop its own standard specifications for its specialized construction works.

MOC is advised to encourage ministries to standardize technical specifications for their own construction sectors in relevant decrees and to disseminate a guideline on the standardization.

(5) How to Select Construction Work Fields for Standardization

The following are the conditions to be taken into account in the selection of standardization fields. Ministries attempting to standardize technical specifications are advised to place high priorities on the selection of standardization fields. Those which meet the following conditions will be high priority in standardizing technical specifications.

- Project fields with big investments
- Project fields with similarity of construction technologies
- Project fields where similar types of construction works repeatedly come out.

With these conditions considered, it is, first of all, recommended to choose the following construction fields as potentials of standardization. Basically, it is recommended to apply sector-by-sector standardization in concert with construction contracts being made by sector-by-sector.

- Road & bridge construction
- Port facility construction
- Dam construction
- School building construction (Building works / Electric Facility, Machinery Facility)
- Hospital building construction (Building works / Electric Facility, Machinery Facility)

Regarding the building works, it is recommended to select hospitals or schools to be the prime candidates of developing standard specifications. Either one of these facilities would have many similar work types and construction technologies. Also, their demands for construction are expected to grow even for the years to come. To begin with, development of standard specifications is recommended for building works, for electric facility works and for machinery facility works. Separate standardization of specifications for school and hospital construction is preferable. Of course, two standard specifications could be put together into one with respect to building works, if electricity work or machinery work specifications for special medical facilities are separately prepared as particular specifications.

It is also noted that standard specifications developed for the purpose of school or hospital construction will be hardly applied to high-rise building constructions. Their standard specifications should be developed separately, if the projects meet the above conditions.

(6) How to Develop Frameworks of Standard Specifications

Frameworks of standard specifications in general consist of the following two provisions;

- General Provisions (Part-1)
- Construction Work Method Statements (Part-2)

1) General Provisions (Part-1)

Part-1 provides general information common to all construction methods detailed in subsequent Part-2. In order to avoid repeat of information in Part-2, such common information is gathered and prescribed together as Part-1. The contents of Part-1 may differ depending upon project types.

a. Interrelation between General Provisions and Contract Conditions

The General Provision deals with points to note in order to carry out construction works, providing more general information on engineering issues rather than Part-2, but providing more specific information rather than contract conditions. As the general provisions are expected to become similar to those in the Contract Conditions, the items and contents of the standard specifications should be carefully examined in order to avoid the overlapping of information when a format on the contract conditions are determined.

b. Selection of Items and Contents

"**9.2.7 Refrence-3; Items and Contents for General Provisions**" provides detailed information on General Provisions; one for public infrastructural works (please refer **"GUIDELINES AND MANUALS"** for details) and the other for building works. The former one was created by Activity 5 with combination of present typical Vietnamese specifications and Japanese ones as a concrete example. This was developed by picking up common provisions among 6 Vietnamese infrastructural projects such as roads, bridge, hydro-power and port (See **Appendix_9-1-1**). (Final product is contained in **"GUIDELINES AND MANUALS"** and can be used as General Provisions of Standard Specification for infrastructural works which will be ordered in the future in Vietnam.)

Basically, there are no significant differences in general provisions between construction works. The following are the key items often described in general provisions. The organizations charged with standardization are advised to select items and contents best suited to the standard specifications, taking account of past practices and also overseas practices.

- General statement
- Preliminaries
- Construction supervision and work safety management
- Engineering service and submittals
- Construction quality management
- Laboratory tests and field tests
- Environmental protection and traffic protection
- Construction material management

- Inspections

c. Common Material Provisions

In addition to the above General Provisions, there are sometimes construction materials commonly used in many construction works. The General provisions can provide such material information in order to avoid overlapping of information in Part-2. For public works, which include roads, bridges, ports, irrigations and sewage construction works, the JICA Project recommends that the following common materials be integrated in the General Provisions rather than stated in Part-2 repeatedly.

- Portland cement
- Aggregate
- Bituminous materials
- Admixture
- Water
- Reinforcing steel
- Structure metal

These typical materials for public works were decided by extraction as common materials from the contents of 6 infrastructural projects' technical specifications in 4 fields such as road, bridge, hydro-power and port by JICA team. (Final products of these materials regulation are contained in **Product 5-2-2** and can be used as standard regulation in technical specification.)

In the case of the standard technical specification for building works, material information is in general prescribed as components of Construction Work Method Statements (Part-2). This is because materials for building works may differ dependent on their construction works and there are few common materials between construction works.

2) Construction Work Method Statements (Part-2)

Construction Work Method Statements are the most important provisions of the standard specifications. However, the construction work method statements may vary, heavily dependent on construction work fields as shown in **Table 9.2.2** . This is because the main reason that it is hard to make the standard specifications applicable for multi-sector construction projects.

a. Selection of Construction Work Methods

The organizations charged with standardization are advised to select key construction work methods first which are best suited to the standard specifications, taking account of past

practices and also overseas practices. As seen in **Table 9.2.2** , selected work methods should be representative components of the construction works under consideration.

For example, pavement work or concrete work is usually common and popular work in road and bridge construction field; thereby either work can be standardized in specification.

b. Breakdown Each Construction Methods

After the selection of key construction work methods, further breakdown is to be carried out for each construction method. **Table 9.2.1** below shows two sample breakdowns; Case-1 for pavement works in roads/bridges construction and Case-2 for concrete works in building construction work. As seen in the tables, one can understand that breakdown items show key actions to be taken in order.

Particular note here is that work items resulted from breakdowns should be consistent with BOQ items in the case of unit-price contracts where the standard specifications are required to clarify the ways of measurements and the units of payments in the specifications. However, for the lump sum cases, they are not necessarily needed.

Table 9.2.1 Sample of Construction Methods

Case-1; Roads/Bridges Construction	
Pavement Works (Sample)	
(1)	Application
(2)	Technical Standards
(3)	Pavement Works
(4)	Drainage Works
(5)	Curve stone Works
(6)	Approach Cushion Works
(7)	Guardrail Works
(8)	Traffic Sign Works
(9)	Lane Marking Works
(10)	Planting Works
(11)	Road Accessory Works
(12)	Bridge Accessary Works

Case-2; Building Construction Works	
Concrete Works (Sample)	
(1)	General
(2)	Quality of Concrete
(3)	Materials of Concrete
(4)	Order, Manufacture & Transportation of Concrete
(5)	Concrete Quality Management
(6)	Transportation inside construction site, casting and compaction of concrete
(7)	Curing of Concrete
(8)	Handling of Concrete during the Hot Season
(9)	Formwork
(10)	Tests
(11)	Light Weight Concrete
(12)	Winter Concreting
(13)	Mass Concrete
(14)	Plain Concrete
(15)	Handling of High-strength Concrete
(16)	Super-Plasticized Concrete

(7) How to Develop and Manage Standardization of Technical Specifications

In order to develop and manage standard technical specifications, it is important to assemble professional knowledge and expertise to develop standardization. Relevant ministries including MOC, MOT, MOI and MOA are encouraged to take initiatives in developing and managing the standardization of technical specifications and to assign this responsibility to

the professional departments in the ministries. The professional department organizes a permanent committee under the supervision of the department, where professional members are assembled from ministry user department, research institute, academic association and some representative members from consultants and construction companies.

The developed standard specifications need to be managed and maintained periodically. It is recommended to update the contents of standard technical specifications at least once every two years. Update is often caused by the establishment or the changes of technical standards. This explains the reason why a permanent organization or a committee is needed in order to develop or maintain the standard technical specifications.

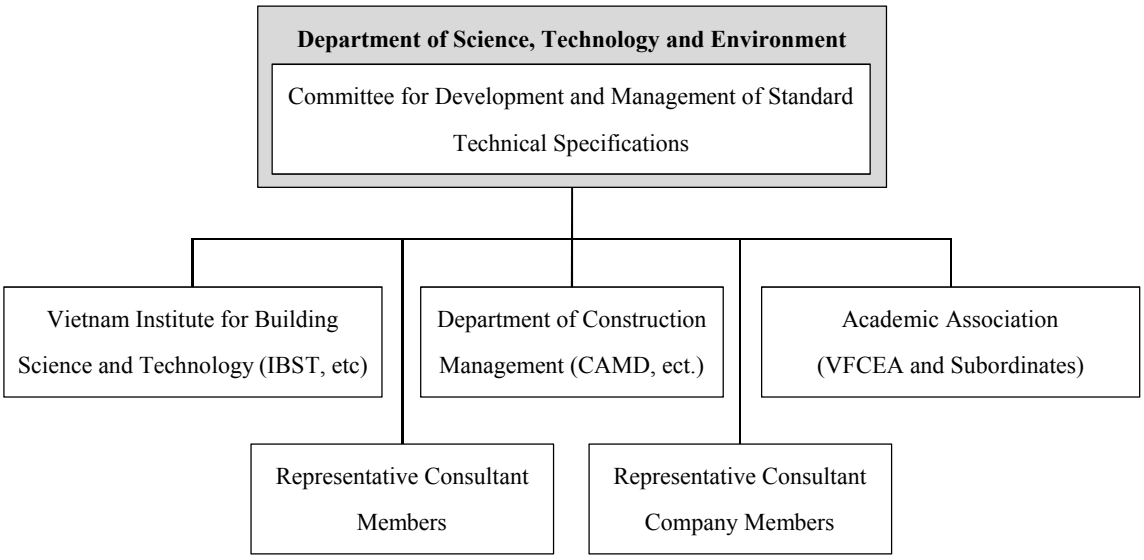


Figure 9.2.4 Institutional Arrangement

Table 9.2.2 Construction Work Method Statements Dependent on Construction Work Types

Roads/Bridges	Ports	Dam	Building Works	Electric Works	Machinery Works	Sewer Facilities
Road Renovation Works	General Construction Methods	Concrete Dams	Temporary Works	Electric Power Equipment Works	Common Works	Sewer Pipe Work
Pavement Works	Navigation Route/ Anchorage/ Vessel reservoir	Fill Dams	Earthworks	Electric Substation Equipment Works	Air Conditioning Equipment Works	Pipe & Drainage Works (Open Excavation)
Bridge Substructures	Breakwater/ Erosion Control Bank/ Training Dike	Foundation Grouting Works	Foundation Works	Power Storage Equipment Works	Automatic Control Equipment Works	Propulsion Work Method (Small Diameter)
Bridge Superstructures	Tide Embankment		Steel Bar Works	Power Generator Works	Water Supply, Drainage & Hygiene Works	Propulsion Work Method (Other than Small Diameter)
Concrete Bridge Superstructures	Shore Protection/ Wharf/ Shallow draft quay		Concrete Works	Telecommunication Works	Gas Facility Works	Propulsion Work Method (Shield Methods)
Tunnels (NATM)	Jetty/ Dolphin		Steel Structure Works	Central Control and Monitoring Facility Works	Well Drilling Works	Manhole Works
Tunnels (Sheet piles)	Harbor Road		Concrete Block, ALC Works & Extruded Cement Plate Works	Medical Facility Works	Lift facility Works	Special Purpose Manhole Works
Concrete Sheds			Water Proofing Works		Mechanical Parking Works	Pipe Joint Works
Steel Sheds			Stone Works		Medical gas Facilities	Soil Improvement
Underground Pedestrian passes			Tile Works			Miscellaneous Works
Underground Parking facilities			Wood Works			Shaft Works
Common Ducts			Roof and Roof Gutter Works			Sewage Treatment Plant
Electric Common Ducts			Metal Works			Site Preparation
Information Boxes			Plaster Works			Slope Works
Road Maintenance Works			Joinery Works			Soil Improvement
Ice and Snow Works			Curtain wall Works			Earthworks
Road Repair Works			Painting Works			Temporary Works
			Interior Works			Building Works
			Unit Facility Works			In-site Pipe & Drainage Works
			Drainage System Works			Outlet Works
			Pavement Works			In-site Road Works
			Planting Works			Retaining Wall Works
						In-site Planting Works
						Biotope Pond Works
						Miscellaneous Works
						Facility Removal Works

9.2.5 Reference-1; Contents List of Technical Specifications in Japan

The following tables show the contents list of technical specifications developed by MLIT, Hokkaido Local Government and Saitama City.

Table 9.2.3 Contents List of Specifications

Table 9.2.4	Standard Technical Specifications for Roads/Bridge Construction	MLIT
Table 9.2.5	Standard Technical Specifications for Port Construction	MLIT
Table 9.2.6	Standard Technical Specifications for Dam Construction	MLIT
Table 9.2.7	Standard Technical Specifications for Public Building Construction (Building Works Edition)	MLIT
Table 9.2.8	Standard Technical Specifications for Public Building Construction (Electric Works Edition)	MLIT
Table 9.2.9	Standard Technical Specifications for Public Building Construction (Machinery Works Edition)	MLIT
Table 9.2.10	Standard Technical Specifications for Sewer Facility Construction	Saitama City
Table 9.2.11	Standard Technical Specifications for Fishing Port Construction	Hokkaido Local Government

(1) Standard Technical Specifications for Roads/Bridge Construction

Table 9.2.4 Standard Technical Specifications for Roads/Bridge Construction

MLIT		**ROADS & BRIDGES**
Chapter	**Title**	**Sub Clause**
1.	**General Provisions**	
2.	**Materials**	
3.	**Road Renovation Works**	
		(1) Application
		(2) Technical Standards
		(3) Factory Manufacturing
		(4) Slope Protection Works
		(5) Retaining Wall
		(6) Block Works
		(7) Culvert Works
		(8) Drainage Works
		(9) Snow-fall and Rock-fall Prevention Work
		(10) Noise Barriers
4.	**Pavement Works**	
		(1) Application
		(2) Technical Standards
		(3) Pavement Works
		(4) Drainage Works
		(5) Curve stone Works
		(6) Approach Cushion Works
		(7) Guardrail Works
		(8) Traffic Sign Works
		(9) Lane Marking Works
		(10) Planting Works
		(11) Road Accessory Works

MLIT		ROADS & BRIDGES
Chapter	**Title**	**Sub Clause**
		(12) Bridge Accessary Works
5.	**Bridge Substructures**	
		(1) Application
		(2) Technical Standards
		(3) Factory Manufacturing
		(4) Abutment Works
		(5) RC Pier Works
		(6) Steel Pier Works
		(7) Bank Foundation Works
		(8) Bank Sheet Pile Works
		(9) Bank Coverage Works
		(10) Bank Retaining Wall Works
6.	**Bridge Superstructures**	
		(1) Application
		(2) Technical Standards
		(3) Factory Manufacturing
		(4) Metal Bridge Election Works
		(5) In-situ Painting Works
		(6) Bridge Deck Works
		(7) Bridge Accessary Works
		(8) Pedestrian Bridge Works
		(9) Steel Bridge Scaffolding Works
7.	**Concrete Bridge Superstructures**	
		(1) Application
		(2) Technical Standards
		(3) Factory Manufacturing
		(4) PC Bridge Works
		(5) Pre-Beam Girder Works
		(6) PC Hollow Slab Works
		(7) RC Hollow Slab Works
		(8) PC Girder Bridge Works
		(9) PC Box Girder Bridge Works
		(10) PC Cantilever Box Girder Bridge Works
		(11) PC Extruded Box Girder Bridge Works
		(12) Bridge Accessory Works
		(13) Concrete Bridge Scaffolding Works
8.	**Tunnels (NATM)**	
9.	**Tunnels (Sheet piles)**	
10.	**Concrete Sheds**	
11.	**Steel Sheds**	
12.	**Underground Pedestrian passes**	
13.	**Underground Parking facilities**	
14.	**Common Ducts**	
15.	**Electric Common Ducts**	
16.	**Information Boxes**	
17.	**Road Maintenance Works**	
18.	**Ice and Snow Works**	
19.	**Road Repair Works**	

(2) Standard Technical Specifications for Port Construction

Table 9.2.5 Standard Technical Specifications for Port Construction

MLIT		PORTS
Chapter	**Title**	**Sub Clause**
1.	**General Provisions**	
2.	**Material**	
3.	**Common Temporary Works**	
4.	**Plain and Reinforced Concretes**	
5.	**General Construction Methods**	
		(1) Common Construction Methods
		(2) Soil Disposal
		(3) Sea Bed Improvement Works
		(4) Foundation Works
		(5) Caisson Works
		(6) Block Works
		(7) Cast in Place Concretes
		(8) Riprap Work
		(9) Steel Sheet Pile Works
		(10) Concrete Sheet Pile Work
		(11) Steel Pile Works
		(12) Concrete Pile Works
		(13) Consolidation Works of Foundation
		(14) Superstructure Works
		(15) Affiliated Works
		(16) Wave Absorbing Works
		(17) Back Filling
		(18) Soil Improvement
		(19) Earthworks
		(20) Pavement Works
		(21) Maintenance Works
		(22) Demolition Works
		(23) Temporary Works
		(24) Miscellaneous Works
6.	**Navigation Route/ Anchorage/ Vessel reservoir**	
7.	**Breakwater/ Erosion Control Bank/ Training Dike**	
8.	**Tide Embankment**	
9.	**Shore Protection/ Wharf/ Shallow draft quay**	
10.	**Jetty/ Dolphin**	
11.	**Harbor Road**	

(3) Standard Technical Specifications for Dam Construction

Table 9.2.6 Standard Technical Specifications for Dam Construction

MLIT		DAMS
Chapter	**Title**	**Sub Clause**
1.	**General Provisions**	
2.	**Material**	
3.	**Concrete Dams**	
		(1) Application
		(2) Technical Standards
		(3) Soil Excavation Works
		(4) Dam Concrete Works
		(5) Concrete Formworks
		(6) Surface Finishing
		(7) Installation of Underground Facilities
		(8) Pipe Cooling Works
		(9) Joint Grouting Works
		(10) Closed Concrete Works
		(11) Drainage Works
4.	**Fill Dams**	
		(1) Application
		(2) Soil Excavation Works
		(3) Embankment Works
5.	**Foundation Grouting Works**	
		(1) Application
		(2) Technical Standards
		(3) Boring Works
		(4) Grouting Works

(4) Standard Technical Specifications for Public Building Construction (Building Works)

Table 9.2.7 Standard Technical Specifications for Public Building Construction (Building Works)

MLIT		Building Works
Chapter	**Title**	**Sub Clause**
1	**General Provisions**	
		(1) General
		(2) Documents for Construction Works
		(3) Construction Work Supervision
		(4) Materials
		(5) Construction Works
		(6) Inspections
		(7) As-build Drawings
2.	**Temporary Works**	
		(1) General

MLIT		Building Works
Chapter	**Title**	**Sub Clause**
		(2) Measurement
		(3) Temporary Works
		(4) Temporary Facility Removal Works
3.	**Earthworks**	
		(1) General
		(2) Pit Excavation & Backfilling Works
		(3) Shoring Works
4.	**Foundation Works**	
		(1) General
		(2) Tests & reports
		(3) Prefabricated Concrete Pile Works
		(4) Steel Pile Works
		(5) Cast-in-situ concrete Pile Works
		(6) Gravelling Works
5.	**Steel Bar Works**	
		(1) General
		(2) Materials
		(3) Processing & Assembly
		(4) Gas Pressure Welding Works
		(5) Special Joint Works for Steel Bars
6.	**Concrete Works**	
		(1) General
		(2) Quality of Concrete
		(3) Materials of Concrete
		(4) Order, Manufacture & Transportation of Concrete
		(5) Concrete Quality Management
		(6) Transportation inside construction site, casting and compaction of concrete
		(7) Curing of Concrete
		(8) Handling of Concrete during the Hot Season
		(9) Formwork
		(10) Tests
		(11) Light Weight Concrete
		(12) Winter Concreting
		(13) Mass Concrete
		(14) Plain Concrete
		(15) Handling of High-strength Concrete
		(16) Super-Plasticized Concrete
7.	**Steel Structure Works**	
		(1) General
		(2) Materials
		(3) Processing
		(4) High Tension Bolt Joints
		(5) General Bolt Joints
		(6) Welded Joints
		(7) Stud Bolt Welding & Steel Deck Plate Welding
		(8) Corrosion Proof Painting
		(9) Fireproof Covering
		(10) In-situ Construction

MLIT		Building Works
Chapter	**Title**	**Sub Clause**
		(11) Light Gauge Section Steel Structure
		(12) Galvanization
8.	**Concrete Block, ALC Works & Extruded Cement Plate Works**	
		(1) General
		(2) Reinforced Concrete Block Works
		(3) Concrete Block Wall Works
		(4) ALC Panel Works
		(5) Extruded Cement Plate (ECP) Works
9.	**Water Proofing Works**	
		(1) General
		(2) Asphalt Waterproofing
		(3) Modified Bitumen Waterproofing
		(4) Synthetic Polymer Waterproofing
		(5) Paint Film Waterproofing
		(6) Sealing
10	**Stone Works**	
		(1) General
		(2) Materials
		(3) Exterior Wall Wet Processing Works
		(4) Interior Wall Dry Masonry Works
		(5) Dry Works
		(6) Stone Veneer Works on Floors & Stairways
		(7) Stone Veneer on Special Portion
11.	**Tile Works**	
		(1) General
		(2) Materials
		(3) Ceramic Tile Works
		(4) Ceramic Tile Work with tiles on Formwork
12.	**Wood Works**	
		(1) General
		(2) Materials
		(3) Partitioning and Floor Frame Works for Reinforced Concrete Structure
		(4) Window & Entrance & Exit
		(5) Floor Boarding
		(6) Ground Works for Ceiling & Walls
13.	**Roof and Roof Gutter Works**	
		(1) General
		(2) Shingle Roofing with Long Metal Plates
		(3) Shingle Roofing with Folded Plates
		(4) Shingle Roofing with clay tiles
		(5) Roof Gutter Works
14.	**Metal Works**	
		(1) General
		(2) Surface Treatment
		(3) Welding & Brazing
		(4) Ground Works for Light-Weight Steel Frame ceiling
		(5) Ground Works for Light-Weight Steel Frame Wall
		(6) Metal Plate Planking Works
		(7) Aluminum Top Rail

MLIT		Building Works
Chapter	**Title**	**Sub Clause**
		(8) Handrail & Ladder Rung
15.	**Plaster Works**	
		(1) General
		(2) Mortar Paste
		(3) Finishing Works of Floor Concrete
		(4) Self-leveling Material Painting
		(5) Finishing Coat Painting
		(6) Gypsum Plaster Painting
		(7) Rock Wool Spraying
16.	**Joinery Works**	
		(1) General
		(2) Aluminum Finishing Hardware
		(3) Steel Finishing Hardware
		(4) Light-weight Steel Finishing Hardware
		(5) Stainless Steel Finishing Hardware
		(6) Wooden Finishing hardware
		(7) Finishing Hardware
		(8) Automatic Door
		(9) Automatic Hang-on Sliding Door
		(10) Heavy-Weight Shutter
		(11) Light-Weight Shutter
		(12) Overhead Door
		(13) Glasses
17.	**Curtain wall Works**	
		(1) General
		(2) Metal Curtain Wall
		(3) PC Curtain Wall
18.	**Painting Works**	
		(1) General
		(2) Surface Treatment
		(3) Anticorrosive paint
		(4) Synthetic Resin Painting
		(5) Clear lacquer Painting
		(6) Acrylic Resign Painting
		(7) Weather Resistant Paint
		(8) Gloss Synthetic Emersion Paint
		(9) Synthetic Emersion Pattern Paint
		(10) Urethane Resin Varnish Painting
		(11) Oil Stain Paint
		(12) Wood Protection Coatings
		(13) Mastic Paint
19.	**Interior Works**	
		(1) General
		(2) Vinyl Floor Sheet & Tile and Rubber Floor Tile Works
		(3) Carpet Works
		(4) Synthetic Resign Floor Painting
		(5) Flooring Works
		(6) Mat Works
		(7) Gypsum Board & Plywood Works

MLIT		Building Works
Chapter	**Title**	**Sub Clause**
		(8) Wallpaper Works
		(9) Insulation % Dew Proofing Work
20.	**Unit Facility Works**	
		(1) General
		(2) Unit Works
		(3) Precast Concrete Works
		(4) Wedge-shaped Stone and Concrete Wedge-shaped Stone Works
21.	**Drainage System Works**	
		(1) General
		(2) Materials
		(3) Construction
22.	**Pavement Works**	
		(1) General
		(2) Subgrade Works
		(3) Base Course Works
		(4) Asphalt Pavement Works
		(5) Concrete Pavement Works
		(6) Colored Pavement Works
		(7) Permeable Pavement Works
		(8) Drainage Pavement Works
		(9) Block Pavement
		(10) Gutter, Corner Stone & Side Ditch Works
		(11) Gravelling
23.	**Planting Works**	
		(1) General
		(2) Foundation Works for Planting
		(3) Planting
		(4) Lawn and Spray-seeding Works
		(5) Rooftop Gardening

(5) Standard Technical Specifications for Public Building Construction (Electric Works)

Table 9.2.8 Standard Technical Specifications for Public Building Construction (Electric Works Edition)

MLIT		Electric Works
Chapter	**Title**	**Sub Clause**
1.	**General Provisions**	
2.	**Electric Power Equipment Works**	
		(1) Materials
		(2) Construction
3.	**Electric Substation Equipment Works**	
		(1) Materials
		(2) Construction
4.	**Power Storage Equipment Works**	
		(1) General
		(2) Materials
		(3) Construction

MLIT		Electric Works
Chapter	**Title**	**Sub Clause**
5.	**Power Generator Works**	
		(1) Materials
		(2) Construction
6.	**Telecommunication Works**	
		(1) Materials
		(2) Construction
7.	**Central Control and Monitoring Facility Works**	
		(1) Materials
		(2) Construction
8.	**Medical Facility Works**	
		(1) General
		(2) Ungrounded Power Distribution Switch Board
		(3) Nurse Call Facility

(6) Standard Technical Specifications for Public Building Construction (Machinery Works)

Table 9.2.9 Standard Technical Specifications for Public Building Construction (Machinery Works Edition)

MLIT		Machinery Works
Chapter	**Title**	**Sub Clause**
1.	**General Provisions**	
2.	**Common Works**	
		(1) General
		(2) Plumbing Works
		(3) Heat Insulation, Painting, Anti-Corrosion Works
		(4) Related Works
3.	**Air Conditioning Equipment Works**	
		(1) Materials
		(2) Construction
4.	**Automatic Control Equipment Works**	
		(1) General
		(2) Materials
		(3) Construction
5.	**Water Supply, Drainage & Hygiene Works**	
		(1) Materials
		(2) Construction
6.	**Gas Facility Works**	
		(1) General
		(2) City Gas Facility Works
		(3) LPG Facility Works
7.	**Well Drilling Works**	
		(1) General
		(2) Drilling Facilities
8.	**Lift facility Works**	
		(1) General
		(2) Standard Elevator Facilities
		(3) Standard Hydraulic Elevator Facilities

MLIT		Machinery Works
Chapter	**Title**	**Sub Clause**
		(4) Popular Model Elevator Facilities
		(5) Emergency Elevator Facilities
		(6) Machine Room-less Elevator Facilities
		(7) Freight Exclusive Elevator Facilities
		(8) Escalator Facilities
9.	**Mechanical Parking Works**	
		(1) General
		(2) Two-story Parking Facilities
10.	**Medical gas Facilities**	
		(1) General
		(2) Gas Facilities

(7) Standard Technical Specifications for Sewer Facility Construction

Table 9.2.10 Standard Technical Specifications for Sewer Facility Construction

SAITAMA CITY		SEWER FACILITIES
Chapter	**Title**	**Sub Clause**
1.	**Sewer Pipe Work**	
		(1) General Provisions
		(2) Regulations & Technical Standards
		(3) Pipe & Drainage Works (Open Excavation)
		(4) Propulsion Work Method (Small Diameter)
		(5) Propulsion Work Method (Other than Small Diameter)
		(6) Propulsion Work Method (Shield Methods)
		(7) Manhole Works
		(8) Special Purpose Manhole Works
		(9) Pipe Joint Works
		(10) Soil Improvement
		(11) Miscellaneous Works
		(12) Shaft Works
2.	**Sewage Treatment Plant**	
		(1) General Provisions
		(2) Regulations & Technical Standards
		(3) Site Preparation
		(4) Slope Works
		(5) Soil Improvement
		(6) Earthworks
		(7) Temporary Works
		(8) Building Works
		(9) In-site Pipe & Drainage Works
		(10) Outlet Works
		(11) In-site Road Works
		(12) Retaining Wall Works
		(13) In-site Planting Works
		(14) Biotope Pond Works
		(15) Miscellaneous Works
		(16) Facility Removal Works

(8) Standard Technical Specifications for Fishing Port Construction

Table 9.2.11 Standard Technical Specifications for Fishing Port Construction

Hokkaido Government		FISHING PORTS
Chapter	**Title**	**Sub Clause**
1.	Dredging & Sea Bed Excavation Works	
2.	Soil Improvement Works	
3.	Mat Works	
4.	Riprap Foundation Works	
5.	Pile and Sheet Pile Works	
6.	Anchor reinforcement Works for Sheet Pile Revetment	
7.	Concrete Works	
8.	Caisson Works	
9.	Concrete Block Works	
10.	Filling Works	
11.	Upper Concrete Works	
12.	Pavement Works	
13.	Accessory Works	
14.	Welding & Cutting Works	
15.	Reclamation and Backfilling Works	
16.	Water Pollution Prevention Curtain	

9.2.6 Reference-2; Guidelines for Editing Technical Specifications in Vietnam

Table 9.2.12 shows the manuals for editing technical specifications which are already published under development in Vietnam.

Table 9.2.12 Manuals for Editing Technical Specifications in Vietnam

Title	Date of Issue	Publisher
GUIDELINES FOR EDITING TECHNICAL SPECIFICATION FOR ROADS AND BRIDGES	1 August 2008	Ministry of Transportation
PROPOSED CONTENTS OF THE GUIDELINES FOR EDITING TECHNICAL SPECIFICATION FOR BUILDING WORKS	Under development	Vietnam Association of Structural Engineering and Construction Technology (VASECT)

(1) Guidelines for Editing Technical Specifications for Roads and Bridges (Published by, 1 August 2008, MOT)

Table 9.2.13 Contents List of MOT Manual

Chapter	Items	Contents
PART -A	General Specification	(1) Forewords
		(2) General Requirements
		(3) Laboratories and Testing Equipment

Chapter	Items	Contents
		(4) Site Engineering Services
		(5) Additional Geological Survey
		(6) Traffic Assurance
PART- B	Particular Specification	(1) Site Works
		(2) Earthworks
		(3) Drainage Systems
		(4) Pavement
		(5) Concrete and Bridge
		(6) Steel and Metal Structures
		(7) Other Items
		(8) Electricity, Lighting and Other Utilities

(2) Proposed Contents of the Guidelines for Editing Technical Specifications for Building Works (Draft, Vietnam Association of Structural Engineering and Construction technology (VASECT)

Table 9.2.14 Draft Contents List of VASECT Manual

Chapter	Items	Contents
PART - 1	General Requirements	(1) Technical Standard and Definitions
		(2) Requirement on Administration
		(3) Requirement on Quality
		(4) Requirement on Products
		(5) Requirement on Implementation
		(6) As-Built Documents
		(7) Prohibition
PART- 2	Preparation for Execution	(1) Preparation or Materials
		(2) Land Acquisition
		(3) Ground Leveling
		(4) Site Management
		(5) Geological Survey
		(6) Site Testing
		(7) Laboratory Testing
PART - 3	Piling Works	(1) General Requirements for Piling Works
		(2) General Requirements for Reinforced Concrete Piles
		(3) Normal Concrete Pre-Stressed Concrete Piles
		(4) Bored Piles
		(5) Driving Piles
		(6) Steel Piles
		(7) Wooden Piles
		(8) Testing of Piles
PART - 4	Concrete Works	(1) Concrete and Admixtures
		(2) Reinforced Concrete
		(3) Cast in-situ Concrete
		(4) Finishing of Concrete Floor
		(5) Pre-stressed Concrete
		(6) Pre-stressed Concrete

Chapter	Items	Contents
PART - 5	Steel Structure	(1) Structure Steel
		(2) Steel Floor
		(3) Combined Steel Floor
		(4) Metal Processing
		(5) Metal Staircase
		(6) Hand Rail
		(7) Hand Rail Combination with Safety Glass
		(8) Deck and Frame
		(9) Cover Combination for Expansion Connection
PART - 6	Equipment	(1) Specific Equipment
		(2) Facility Equipment
		(3) Technology Equipment
		(4) Electricity Works
		(5) Communication Equipment
		(6) Equipment for Security and Safety
PART - 7	Finishing	

9.2.7 Refrence-3; Items and Contents for General Provisions

Table 9.2.15 shows samples of general provisions, one for public works developed by JICA Project team and the other for public building works published by MLIT in Japan.

Table 9.2.15 Contents List of General Provisions

Title	Date of Issue	Publisher
STANDARD SPECIFICATION FOR PUBLIC WORKS, GENERAL PROVISIONS, DF REPORT	November, 2011	JICA Project Team
STANDARD SPECIFICATIONS FOR PUBLIC BUILDING WORKS IN JAPAN	6 December 2010	Public Building Association, MLIT

(1) Items and Contents for Public Works (Roads/bridges, Hydro-power, ports)

Table 9.2.16 shows sample items and contents to be noted in the general provisions. They are among representative items and contents specialized for the general provisions for public works such as roads, bridges, ports, dams or the like. However, there may be no big differences between construction sectors. Activity-5 of this JICA Project has developed sample general provisions applicable for public works in Vietnam. The report in the above table provides further information on these general provisions.

Table 9.2.16 General Provisions for Public Works (JICA Project Team)

Section	Items		Contents
1	General	1	Description
		1.1	Main contents and application
		1.2	Scope of application
		1.3	Abbreviations
		1.4	Units of measure
		1.5	Definition of the terms
		2	Requirements
		2.1	Contract document confirmation
		2.2	Requirements
2	Preliminaries	1.	Description
		2.	Requirements
		2.1	Materials, equipment and plants
		2.2	Project meetings
		2.3	Commencement of the works
		2.4	Insurance and warranty
		2.5	Protection of works
		2.6	Protection of utilities and existing structures
		2.7	Protection of cultural asses
		2.8	Working-in and dealing-with existing water flows
		2.9	Maintenance of existing waterway
		2.10	Temporary installations
		2.11	Preservation of secrets
3	Mobilization and demobilization	1.	Description
		2.	Requirements
		2.1	Contractor's Mobilization
		2.2	Subsidiary requirements
		2.3	Demobilization
4	Engineering Services	1.	Description
		2.	Requirements
		2,1	Setting out of the work
		2.2	Additional geotechnical engineering services
5	Submittals	1.	Description
		2.	Requirements
		2.1	Submittals classification and list
		2.2	Submittals requirements
		2.3	Project records
		2.4	Drawings
		2.5	Photographs and videos
6	Program of Work	1.	Description
		2.	Requirements
		2,1	General
		2.2	Program composition and contents
		2.3	Schedules
		2.4	Submittal and approval
7	Construction Work Safety	1.	Description
		2.	Requirements
		2.1	General
		2.2	Safety plan

Section	Items		Contents
		2.3	Safety manager
		2.4	Special requirements for safety
8	Maintenance and Traffic Protection	1.	Description
		2.	Requirements
		2.1	General
		2.2	Traffic control plan
		2.3	Traffic supervisor
		2.4	Special requirements for traffic control
9	Environmental Control and Protection	1.	Description
		2.	Requirements
		2.1	General
		2.2	Avoidance of nuisance
		2.3	Contractor's plan for environmental control and Protection
		2.4	Special requirement for environmental control
10.	Laboratory and Engineer's Equipment	1.	Description
		2.	Requirements
		2.1	Material testing laboratory
		2.2.	Submittals
		2.3	Testing procedures
		2.4	Special requirement
		2.5	Certificate of satisfactory laboratory operation
11.	Quality Control	1.	Description
		2.	Requirements
		2.1	Reference standards
		2.2	General
		2.3	Quality control plan (QCP)
		2.4	Special requirements for quality control
12.	Material Management	1.	Description
		2.	Requirements
		2.1	Material testing laboratory
		2.2	Submittals
		2.3	Testing procedures
		2.4	Special requirement
		2.5	Certificate of satisfactory laboratory operation
13.	Inspections	1.	Description
		2.	Requirements
		2.1	General
		2.2	Significance of inspection
		2.3	Types of inspection
		2.4	Request of inspection
		2.5	Engineer's authority
		2.6	Assistance of contractor

(2) Items and Contents for Building Works

Table 9.2.17 also shows sample general provisions selected from the MLIT Standard Specifications for Public Building Works in Japan. These standard specifications have been applied to build staff apartments for relevant ministries. One may understand that detailed items and contents look very similar to those for civil construction works shown in **Table 9.2.16** .

Table 9.2.17 General Provisions for Building Works (MLIT Specifications)

Section	Items	Contents	
1.1	General	1.1.1	Application
		1.1.2	Definition of Terminology
		1.1.3	Administration Procedures for Work Implementation
		1.1.4	Registration of Construction Work Data
		1.1.5	Document Formats
		1.1.6	Handling of Design Drawings
		1.1.7	Coordination with neighbor works
		1.1.8	Dispute & Settlement
		1.1.9	Temporary Construction Work Suspension
		1.1.10	Documents for Change in Construction Period
		1.1.11	Handling of Patents & Copyrights
		1.1.12	Handling of Cultural Assets
		1.1.13	Conformity of Regulations
1.2	Construction Work Documents	1.2.1	Implementation Schedule
		1.2.2	Work Implementation Plans
		1.2.3	Shop Drawings
		1.2.4	Records of Construction Works
1.3	Work Supervision	1.3.1	Work Supervision
		1.3.2	Construction Work Supervisor
		1.3.3.	Electrical Safety Engineer
		1.3.4.	Safety Engineer for Temporal Electricity
		1.3.5.	Construction Conditions
		1.3.6	Construction Quality Management
		1.3.7	Construction Work Safety management
		1.3.8	Treatment of Disposals generating at sites
		1.3.9	Traffic Safety Management
		1.3.10	Safety Management during Disasters
		1.3.11	Environmental Protection during Works
		1.3.12	Curing
1.4	Materials	1.4.1	Consideration from Material View to Environment
		1.4.2	Material Qualities
		1.4.3	Carry-in of Materials
		1.4.4.	Material Inspection
		1.4.5.	Tests for Material Inspection
		1.4.6	Material Storage
1.5	Construction Works	1.5.1	Construction Works
		1.5.2	Vocational Qualities
		1.5.3	Vocational Quality Holders
		1.5.4	Staged inspection & Reporting
		1.5.5	Inspection during Works
		1.5.6	Tests for Inspection during Works
		1.5.7	Attendants of Inspections
		1.5.8	New Construction Work Proposal
		1.5.9	Concentration Measurements for Chemical Substances
1.6	Inspections	1.6.1	Inspection
		1.6.2	Engineering Examination
1.7	As-Built Drawings	1.7.1	Final Documents
		1.7.2	As-Built Drawings
		1.7.3	Materials for Maintenance

9.3 FRAMEWORK OF QUALITY MANAGEMENT MANUAL

9.3.1 Rationale

- Basic functions of construction project and quality management have been well developed by MOC in the form of regulations including the Decree No.12, Decree No.209 and relevant Circulars and Decisions. In fact, the regulations have been playing an important role in developing construction project and quality management in Vietnam.
- In order to further enhance construction quality, it is important to enhance the capacity closely associated with construction work management and supervision in the fields. However, In general, regulations have a lot of limitation in providing detailed information associated with construction field works.
- Quality management manuals have been widely spread in the foreign countries in order to supplement regulations and to provide detailed information which is beneficial to project owners, consultants and contractors, who are directly involved in the construction project and the quality management in the fields.
- Although there is no fixed format for the quality management manual, the Project recommends that construction quality management manuals should be fully utilized. In this Project, the framework of quality management manuals will be developed as well as a sample manual for the purpose of civil works[1].
- Quality Management Manual is one of the inevitable tools for the good quality products that can sustain their lives for long time.

9.3.2 Overseas Practices (MLIT in Japan)

MLIT prepares « Guidelines for Construction Work Supervision, Inspection and Contractor Work Performance Evaluation » and « Standards for Civil Work Supervision ». The following are the outlines of these materials.

[1] Civil Works ; Here in this section, it means public works including road/bridge works, river works, seashore works, disaster prevention works, dam works, etc.

(1) Guidelines for Construction Work Supervision, Inspection and Contractor Work Performance Evaluation

1) Objectives

The guideline elaborates on the procedures of construction work supervision, inspection and contractor work performance evaluation, which is prepared for MLIT staff to have common understanding on construction work supervision, inspection and contractor work evaluation.

2) Contents

Its contents structure is shown in **Table 9.3.1** .

Table 9.3.1 Contents List

Chapter	Major Contents
Chapter-1: Outline of the guideline	• Outline of the construction work supervision, inspection and contractor work performance evaluation • Related regulations • Related technical standards
Chapter-2: Construction work supervision	• Legislation of the guideline • Supervision methods • Points of supervision • Smooth implementation of design change • Reinforcement of supervision to low-price bidding projects • Approval of completed works for interim payments
Chapter-3: Inspection	• Inspection types • Inspection standards • Inspection work flow • Roles and responsibilities for inspection • Implementation of inspection • Report of inspection results
Chapter-4: Contractor work performance evaluation	• Outline of contractor work performance evaluation • Regulatory function of the guideline • Explanation on how to use the guideline

(2) Standards for Civil Work Supervision

1) Objectives

The standards are prepared not only for MLIT staff, but also for consultants and contractors in construction projects. The standards are in general prepared by regional bureaus under the MLIT headquarters. Providing consolidated information on the key subjects of supervision focusing on the measurements of work completed facilities and laboratory/field tests, the standards intend to eliminate mishandling and misinterpretation of these tasks, thereby to facilitate supervision on civil works.

2) Contents of the Standards

The standards are composed of three elements as shown in **Table 9.3.2** .

Table 9.3.2 Major Contents of Standards for Civil Work Supervision

Chapter	Major Contents
Chapter-1: Standards for Civil Work Supervision	• Definition of management subjects in supervision • Methods of supervision • Construction schedule management
Chapter-2: Standards for Final Measurements	• Measurements of work completed facilities • Comparison between actual dimensions and design dimensions • Data preservation
Chapter-3: Standards for Quality Management	• Methods of laboratory and field tests • Test standards to be referred. • Reporting

3) Standard for Civil Work Supervision (Chapter-1)

This Chapter describes the standard of general procedures for the supervision of civil works like definition of management subjects in supervision, methods of supervision and construction schedule management.

4) Standards for Final Measurements (Chapter-2)

Final measurements shall be executed in order to examine whether completed facilities meet design conditions. The contractor shall measure the size, number, shape, thickness, angulations, flatness, and so forth of the completed facilities based on the standard and make comparison between design values and measurements in the drawings. Final measurements are the most important component for facility acceptance.

The procedures of final measurements are as follows.

- Check the frequency of inspection and pick the inspection points without any bias.
- Measure the size of completed objects at the site and observe their unevenness.
- Confirm that the measurements satisfy the completion standard or not.
- Judge the advisability based on the confirmation and comparison with design sizes.

Table 9.3.3 shows a part of the MLIT standards. The whole contents of that are attached in **"GUILDINES AND MANUALS".**

5) Standards for Quality Management (Chapter-3)

Quality management shall be implemented in order to examine whether that the quality of construction facilities and materials conform to the quality specified in the contract dossiers.

The contractor shall carry out the required tests so as to prove quality of facilities in accordance with the test standards.

The procedures of quality management are as follows.

- Observe the execution sites and their pictures and then confirm the construction works were properly done in accordance with the design drawings.
- Confirm the quality control data; investigate test items, test frequencies, and standard value which are regulated in quality control standard.
- Judge the advisability with standard values and observation of the construction sites.

Table 9.3.3 shows a part of the MLIT standards. The whole contents of that are attached in **"GUILDINES AND MANUALS"**.

Table 9.3.3 Standards for Final Measurement (MLIT Case)

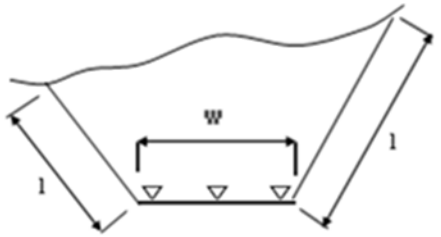
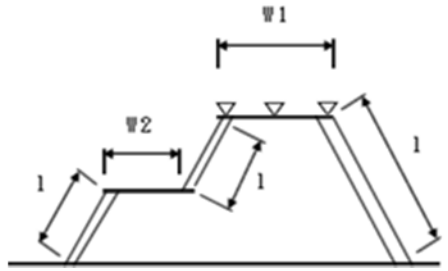
Field	Work Item	Measurement Item				Measurement Location	
1 Road earthworks	Excavation works	Standard Height		▽	± 50	Per 40 meters away from the operating extension places, define a point. In case that of the extension fewer than 40 meters, define 2 points per operating places. The standard height will be measured at the central line and edges of highway.	
		Length of slope	l<	5m	- 200		
		Length of slope	l≧	5m	Length of slope -4%		
		Width		W	- 100		
1	Embankment Construction Roadbed Embankment Construction	Standard Height		▽	± 50	Per 40 meters away from the operating extension places, define a point. In case that of the extension fewer than 40 meters, define 2 points per operating places. The standard height will be measured at the central line and edges of highway.	
		Length of slope	l<	5m	- 100		
		Length of slope	l≧	5m	Length of slope -2%		
		Width	W1,	W2	- 100		

Table 9.3.4 Standards for Quality Management (Tests, MLIT Case)

Types of Works	Classification	Testing Division	Testing Items	Testing Methods	Standard Value	Testing Standard	Summary
Cement-concrete	Materials	Essential	Aggregate's Consistency and Water absorption Rate Test	JIS A 1109 JIS A 1110 JIS A 5005 JIS A 5011-1～3	Density in oven-dry condition: above 2.5 Water absorption Rate of fine aggregate: under 3.5% Water absorption Rate of coarse aggregate: Under 3.0% Refer to application for standard value of crushed sand and macadam, Blast-furnace slag aggregate, Ferronickel slag fine aggregate, Copper slag fine aggregate,	Performing before starting construction, and over one time every month during the construction, changing the producing place.	JIS A 5005 Crushed sand and macadam JIS A 5011-1 Blast-furnace slag aggregate JIS A 5011-2 (Ferronickel slag fine aggregate JIS A 5011-3 （Copper slag fine aggregate)
Road earthwork	Execution	other	Density of building site test	The maximum particle diameter ≦53mm： JIS A 1214 JIS A 1210 A-B method The maximum particle diameter ＞53mm： The pavement examining method manual 1-7-2	・filled up ground ：Not less than 85% of maximum dry density ・roadbed ：Not less than 90% of maximum dry density Others 、 Based on a drawing and specification.	In the case of filled up ground, carry out with the rate of one time per 1,000 m3. However, in case of the construction below 5,000 m3 is 3 times or more per construction. In the case of a road bed, carry out with the rate of 1 time per 500 m3. However, the construction below 1,500 m3 is 3 times or more per construction.	even if it meets the mentioned standard value, when the point which is remarkably less than the standard value exists, after talking with a supervisor staff, rolling compaction shall be (re-) performed

9.3.3 Practices in Vietnam

Quality management manuals have never been spread in Vietnam. This is partly because those regulations including decrees and circulars, which prescribe the general rules of construction project and quality management, have been well prepared by MOC.

However, with advances in construction technology and in project scale, further detailed information and breakdown of tasks rather than those stipulated in the regulations will be required. Manuals play a bridge role between contract dossiers and technical standards, and can supplement the regulations in order to avoid misunderstanding, mishandling and misinterpretation of the regulations.

9.3.4 Frameworks of Quality Management Manual

In fact, there is no fixed format for the quality management manual, but very flexible in formatting. Any information including support formation and supplemental information of regulations can be all assembled into the construction quality manuals. Information deemed beneficial to project owners, consultants and contractors, who are directly involved in construction project and quality management, can be selected into the manual.

On the basis of the current status survey, the Project recommends that much focus be placed on the development of the manuals stated below. These independent manuals can be assembled and integrated into the quality management manual. The manual listed herein is expected to play a key role in ensuring smooth implementation of construction project and quality management between project owners, supervision consultants and contractors.

- Manual on procedures and documents for acceptance
- Manual on laboratory tests and field tests
- Manual on measurements of completed facilities
- Manual on labor safety

It should be noted here quality management manuals should be in principle developed sector by sector as much as possible, as the information included in the manuals is closely associated with technical standards and field construction works, thereby information requirements may fairly differ depending upon sectors. It is necessary to understand that quality management manuals are for the purpose of construction works.

MOC is kindly requested to encourage relevant ministries, MOC, MOT, MOI and MOA, to develop their own quality management manuals in order to facilitate field construction works.

The manuals listed above are briefly outlined below;

(1) Manual on Procedures and Document Preparation for Acceptance

The manual is intended to focus on the enhancement of construction work management. The word « acceptance » has two notions which include « daily quality management » and « acceptance of completed facilities » in Vietnam. The daily quality management is the most fundamental management methods to be implemented by contractors, and its daily records are assembled to the source materials for acceptance and interim payment. It is therefore very important to standardize the recording methods of the quality management data prior to construction works. It is also important to clarify the formats for quality management including acceptance and to compile them in the quality management manual. Preliminary agreement on these formats would reduce conflicts which often arise between the above three stakeholders, thereby contribute to better construction project and quality management.

(2) Manual on Laboratory Tests and Field Tests

The manual is focused on the quality management of construction facilities. Many laboratory and field tests are required in the course of construction works. However, detailed information on these tests is in general prescribed in the technical specifications and technical standards. The manual aims to consolidate the information on work items, points of measurements and tolerances with illustrations and show them to consultants and contractors as easy reference in order to avoid mishandling, misinterpretation and misconduct of these tests.

(3) Manual on Measurements of Completed Facilities

The manual is focused on the quality management of construction facilities. The measurement of facilities upon completion of construction works is an important element to confirm the quantities of completed facilities which will be source data for the payment of construction works. The manual shows test methods including test classification, test timing, base standards, standard values, test methods, depending upon structure types.

(4) Manual on Labor Safety (to be taken care in Activity-6)

The manual is focused on the labor safety during construction works. Labor safety is now becoming a hot issue in construction project management. However, due to the lack of reference materials, stakeholders in construction works including project owners, consultants and contractors can hardly take concrete actions to the labor safety. The manual aims to provide information on relevant regulations, safety policy, safety educations, protective equipment and safety measurements including case studies on near-miss accidents to the stakeholders. The material will be used in many ways in order to raise stakeholder's awareness to labor accidents.

9.3.5 Guidelines for Developing Quality Management Manual

(1) Development of Manual

Information included in the manuals is closely associated with field construction works; thereby information requirements may fairly differ depending upon sectors, so that quality management manuals should be in principle developed sector by sector. MOC, MOT, MOI and MOA are encouraged to develop their own quality management manuals based on their technical standards and technical specifications.

The following are the brief guidelines for developing quality management manuals, taking civil works[1] as a sample. It is also assumed that quality management manual consists of the following volumes.

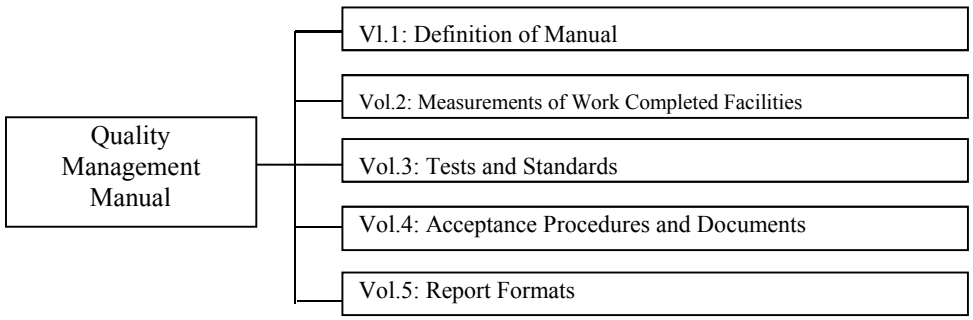


Figure 9.3.1 Manual Structure

1) Volume-1; Definition of the Manual

Definition of the manual is placed at the beginning of the manual so that the user can understand how to use the manual efficiently. This volume should include the following clauses;

- Purpose of the manual
- Status of the manual including legal status
- Structure of the manual
- Usage of the manual
- Contents of all Volumes
- Reporting

The actual descriptions of each clause as an example are shown in the followings.

[1] Civil works here indicate public works including road/bridge, ports, irrigations, dam works, and similar works.

a. Purpose of the Quality Management Manual

The purposes of quality management manual are;

- To secure the good quality of construction products in any construction project
- To implement quality management activities exactly and smoothly
- To assist persons in charge of quality control for their good performance

The ultimate objective of the manual is to secure the good completed products satisfied with the regulations described in the contract dossiers and to hand over them to the owner with official acceptance approval.

The manual is utilized by the all persons involved in projects (the owner, the engineer and the contractor); therefore, it has to be a user-friendly manual showing the keys to construction quality assurance. Quality management manual is one of the inevitable tools for the good quality products that can sustain their lives for long time.

b. Status of Quality Management Manual including Legal Status

It becomes the half-finished handling to use the manual at the level of merely reference materials, and if it is used in that way, as a result, the case that quality control duties are not surely and appropriately carried out will occur. Therefore, it is desirable for the manual to be handled as one of official contract documents as well as standard specifications. In Japan, it becomes a right official document in the public works project.

It is better that the manual is not an additional contract document to the present five dossiers which are Instruction to bidders, Condition of contract, Technical specification, Bill of quantity, and Drawings but, a quasi-official contract document whose treatment is stipulated in Technical specification where the manual should be used for all quality control activities in a project. Consequently, the contractor must implement measurements of completed facilities and quality control tests as they are described in a manual and the project owner also must have duties to watch whether they were carried out surely.

As stated already, it is desirable for the quality management manual to be made in each sector individually and it should be applied to all construction projects of each sector as an associate contract document of the project contracts.

As a rule, high-grade public construction projects like the project of the country level are objects to be applied; however, local projects should also be applied by all means in the future and if all items do not correspond in the local project, it will become acceptable with the additional description that "omit the chapter not to be corresponded".

If the contents of the quality management manual are carried out steadily in this way, the quality of the construction products can be naturally secured at high-level and after receiving the appropriate maintenance duties afterwards, the construction products can

last their life for a long time. It is recognized that every day's construction and quality management is very important considering life-cycle of construction products.

c. Structure of Quality Management Manual

This is already explained in section **9.3.5(1)**

d. Usage of Quality Management Manual

(1) Users

The users of these manuals are all stakeholders regarding public works, who are owners, employers, contractors and consultants. The users who particularly and frequently utilize the manuals are contractors and consultants among them and they use them when quality examinations in a laboratory or construction site are carried out, when measurement inspections are executed at the time of work completion, and when the procedures at the time of the hand-over are implemented with approval acceptance.

Before these events are performed, contractors and consultants have to carefully examine each event's contents and methods etc. from manuals and learn them well. It is because the event is carried out surely, precisely and smoothly. If either does not understand well, the event will not be performed according to plan, thereby useless time is much spent and it is non-efficiency.

When witness of consultant is necessary, the contractor must submit a document for request of appearance to consultants with the designated date and time beforehand. After an event, the contractor must immediately report the results to consultants by prescribed format. The consultant who received a report has to strictly check whether the event was carried out according to the manual's stipulation or not and whether the result is satisfactory or not.

It is necessary for the owner and employer to confirm the approval act that the consultant performed without relying on only consultants in the responsibility of a side receiving the final construction products. Therefore, it is also necessary for them to understand even the basic contents of the manual. Particularly, in the event of acceptance, they have heavy responsibility in the fact that they receive the completed facilities for eternal use. They have to have rather enough knowledge about acceptance so that they can point out the mistake which the consultants might make in the event.

(2) How to Use Manual

As described in the section of structure of the manual, the manual consists of five volumes (see 9.3.5) and the main contents among them are Vol. 2 Measurements of work completed facilities, Vol. 3 Tests and standards, and Vol. 4 Acceptance procedure and documents.

Each volume is briefly explained in an order from Vol.1 below.

- **Vol.1 Definition of Manual**

The basic information about the manual such as the purpose of the manual, status of the manual, structure, usage etc. is here explained and explanation which is understood what kind of thing this manual is written.

Moreover, the whole table of contents is also indicated so that the whole contents can be looked through. At first, users read this part and then understand the overall constitution and essence of the manual. After that, they go into the part necessary and learn how to manage the events.

- **Vol.2 Measurements of Work Completed Facilities**

In this Vol., it is judged whether the measurement values of completed facilities are within tolerance values or not at every construction facility so that the output of the construction in a certain time for a basis of the progress payment in the middle of construction is quantitatively expressed with its volume numerically and completed objects are created exactly as a design plan at the time of construction completion. The contractor measures the facilities beforehand, fills in a predetermined style format, and achieves results compared with the acceptable value.

Although all the checks are principles looked at the results, consultants may measure portions such as key points by arbitrary extraction from all facilities due to time limitation, and check whether contractor's result is right or not.

If there are the some parts which do not satisfy with standard values as acceptable values, the contractors have to finish restoration work by the time of consultant's inspection only in the case of easy restoration to be done. When un-restorable, the cause is considered and found and even if the acceptable value is not kept, the measures where the facility is kept structurally satisfactory in practice is devised and that is explained to a consultant at the time of an inspection.

The contractor executes the devised measures with approval of owners and consultants on the contractor’s responsibility. After finish of restoration work, it will go into the procedures of formal halfway payment and handover.

- **Vol. 3 Test and Standard**

In this Vol., various examinations for use materials and construction objects under construction carried out in order to secure good quality in quality control duties and their results are drawn and confirmed whether they pass standard value or not based on the test and standard of the contents of this Vol. and finally judged their success. The contractor also implements the tests and fills the results in a fixed format as a report to consultants

before the presence of the consultants. When a test result does not meet the standard value by the judgment of the consultant, contractor has to change materials or carry out the fresh construction work again.

This Vol. shows what kind of materials and what kind of execution of work should be examined by suitable tests and also how and when they should be done, thereby, all the tests should be carried out according to those contents of Vol. 3.

This information was individually written in particular technical portion of specifications in previous case; however, this manual includes all tests and their standards necessary and organizes them exhaustively by classification of each construction method. As a result, the manual is very understandable and easy to use for all stakeholders. Because a result report style varies according to each examination, the contractor must pay attention in reporting with related format showed in Vol. 5 by all means.

- **Vol. 4 Acceptance Procedures and Documents**

This Vol. shows standards to judge whether construction is completed according to drawings of contract dossiers at the time of the partial payment and completion of the all construction works at the time of handover. This inspection is the very important judgment materials which decide whether a middle payment is performed and the acceptance to the project owner is performed. Judgments have varied with construction fields and work methods so far; however, with the establishment of this manual, all construction works are integrated and their acceptance regulation was standardized, and then consistency could be kept in all public works projects with various construction methods.

- **Vol. 5 Report Formats**

In this Vol., all standardized report formats recording results about quality control of the construction and arranged as reporting document are accumulated. The contents are three kinds of report formats; (1) Measurement data of work completed facilities, (2) Tests results, (3) Documents for acceptance activity.

There have not been such unified formats in the whole public construction so far and each consultant and contractor has individually made them in every construction work. Even in same construction work, there has not been the same one. It varies among consultants and contractors and its unification should be measured.

If there is a unified format decided at every report contents in this way, time for making every different format is saved and all construction works can use unified format. The contractor and consultant only take out necessary style formats from this Vol., copy them, fill out them, and send them to the receiver.

(3) Contents of All Volumes

Regarding not only Vol.1 Definition of manual, but also Vol.2, Vol.3, Vol.4 and Vol.5, all tables of contents are described here and it can make users look up the necessary parts very easily.

(4) Reporting

As for the report, the most of them are delivered from contractors to consultants. After performing measurements and examinations etc. in any report, contractors have to fill the data in predetermined format and report it to consultants immediately. Contractors have to convey the results such as the measurement or the examination as raw data honestly to consultants and never fill the manipulated data in the form. Even if the data are not values reaching a pass level, the real data must be reported and possible reasons or causes after analysis should be added as excursus in the report.

In this case, contractors should make possible solutions and measures against unsuccessful data and then suggest them to consultants expecting supervising consultants' judgments and estimations. For example, in the case of materials, material change is proposed and in the case of measurement of completed facility, some measure actions to be taken including a fresh start of the construction are proposed by contractors.

Finally, the measures must be repeated until the result satisfies the standard value in order to secure fixed quality. In view of the importance of the result, contractors have to suggest their own ideas and try to support the judgment of consultants.

2) Volume-2; Measurements of Work Completed Facilities

In measurements of work completed facilities, the size, number, shape, thickness, angulations, flatness, etc. of the completed objects are measured and then checked whether they satisfy the tolerance values or not by the supervisor. This activity varies with construction work methods, thereby; construction work methods shall be first classified so that each work's measurement criteria are rationally clarified.

a. Selection of Construction Works

Construction work methods of civil works are basically classified into those three categories such as common works, general works and special field works. Common works, general works and special field works signify common construction work methods, ordinary construction work methods and peculiar construction work methods in special field of all civil works respectively. Common construction work methods and general construction work methods are described in **Table 9.3.5** and in **Table 9.3.6** respectively.

Table 9.3.5 Common Construction Works

Common Construction Work Methods
• Rebar work
• Sheet Pile
• Slope-crib works
• Shot Crete
• In situ concrete retaining wall
• Precast retaining wall
• Anchor
• Gutter
• In situ concrete waterway
• Water basin
• Underground duct
• Planting

Table 9.3.6 General Construction Works

General Construction Work Methods	
Article	**Section**
Foundation work	Foundation (Seawall)
	Precast pile
	Cast in place pile
	Caisson pile
	Open-caisson foundation
	Pneumatic caisson foundation
	Steel pipe sheet pile
Rock block work	Concrete block work
	Plant-block work
	Rock laying (stretching) work
General pavement	Asphalt pavement
	Concrete pavement
	Thin-layer color pavement
	Brock pavement
Ground improvement work	Subgrade stability processing work
	Substitute work
	Surface stability processing work
	Pile net work
	Sand mat
	Vertical drain
	Compaction improvement
	Solidification work
Temporary work	Earth retaining・cofferdam work
	Consecutive underground wall (wall type)
	Consecutive underground wall (Pillar line type)
	Slope spraying work
Light weight embankment	Light weight embankment

In special field's works, Road works, River works, Seashore works, Dam works, Sabo works and so forth are included. Each special field has its own construction work methods individually. Quality management of those special works is not commonly treated in a manual thereby; it is stipulated in each technical specification in each project.

b. Selection of Points to Measure

As for the measurements of work completed facilities, the manual needs to show the points to measure and standard values to be compared with measured values in the same formats. The points to measure in principle include length, width, thickness, and so forth. Rather than stating in sentences, simple illustrations will provide clear instruction to the users. It should be noted that points to measure should be carefully selected in order to facilitate the calculation of work volumes consistent with BOQ pay items.

c. Selection of Standard Values

Measured data need to be compared with standard values in order to make judgment on facility performance. The standard values including tolerances can be quoted in general from technical specifications for the project and technical standards applied to the project. It is desirable that these values are quoted and enumerated in a table in advance so that judgments by comparison become smooth and immediate.

d. Compilation of Information on Measurements

All indexes including standard values on measurements for completion need to be compiled into a table format by construction work method for users' convenience. **Table 9.3.7** shows a sample table format. This table format is newly developed and arranged from **Table 9.3.3** for Vietnamese construction projects by this Activity.

Table 9.3.7 Compiled Table Format of Information on Measurements

Work field	Kind of work	Work method	Measurement Item	Standard value	Measurement location	Measurement place
Common, General etc.	Pavement Earthwork etc.	Asphalt Embankment etc.	Height ,length size etc.	Tolerance values	Principal location and pitch	Figure where Locations are displayed

3) Volume-3; Tests and Standards

Tests for quality assurance of the construction objects are implemented on the materials used and objects themselves under construction. Therefore, all tests shall be classified depending on the construction work methods and the conditions whether they are intended for materials or objects, and whether they are essential or not for quality assurance.

a. Selection of Construction Work Methods

As tests may differ depending upon construction materials and work methods, the material and construction work methods should be properly selected. Classification by construction work methods differs from that of measurements because tests and measurements are quite different in their nature. Classification depending on construction work methods on the quality tests are shown in **Table 9.3.8.**

b. Selection of Test Methods

All tests necessary for quality assurance shall be listed up and classified in accordance with construction work methods. A necessary test method shall be selected from the work methods concerned shown in the **Table 9.3.8.**

Table 9.3.8 Classification by Construction Work Methods for Testing

Classification by Construction Work Methods	
Field	**Work method**
Common works	Cement concrete
	Welding
	Gas welding
	Gas cutting
	Pile work
Earthworks	Anchor
	Shot Crete
	Shot Crete slope crib
	Solidification work
	Reinforcing retaining wall
Pavement works	Simple pavement
	Subbase
	Upper Subbase
	Asphalt stabilized base
	Cement stabilized base
	Asphalt pavement
	Roller compacted concrete
	Mastic asphalt pavement
	Stabilized subgrade work
	Surface stability processing work
Tunnel works	Lining concrete(NATM)
	Shot Crete(NATM)
	Rock bolt
Road works	Road earthwork
River/seashore works	River/seashore work
Sabo works	Sabo work
Maintenance works	Roadbed reconstruction
	Surface reconstruction
	Plant recycle pavement

c. Compilation of Information

As is the case of measurements in the previous section, compilation of information into table formats will facilitate users to refer to the tests and standards. Considering the classification of construction work methods, the project suggests the following **Table 9.3.6** for the framework of tests and standards. All tests necessary for quality assurance are classified with following categories and then shall be absolutely carried out by the contractor.

Table 9.3.9 Compilation of Information on Testing

Worked	Work method	Classification	Testing division	Testing item	Testing method	Standard value	Test standard	Summary
Common Earthwork etc.	Concrete Welding etc.	Essential or not	Material or Execution	Compression test, CBR test, etc.	AASHTO, ASTM, etc.	Within ±1.2%, Under 50%, etc.	Location, No. of test pieces, etc.	Remark

4) Volume-4; Acceptance Procedures and Documents

(2) How to Develop and Manage Quality Management Manual

The ways of developing and managing the quality management manual are basically the same as those for standardization of technical specifications.

It is recommended to organize a permanent committee where professional members are assembled from every organization such as ministries, research institutes, academic associations, and some representative consultants or construction companies for developing and maintaining the manual.

It is also recommended to update manual contents at least every two years by the committee so that the manual can follow the renewal and the changes of technical standards.

CHAPTER 10 GUIDELINE FOR THE FORMULATION OF BUILDING FACILITY MAINTENANCE PROCEDURES (ACTIVITY - 5)

10.1 BACKGROUND

Under the current Law on Construction in Vietnam, building facility owners are obliged to conduct maintenance after facility construction is completed. However, facility owners are in general said to be nonprofessional in building facility maintenance, so that the regulation stipulates the measure that design consultants develop maintenance procedure manuals and then project owners implement facility maintenance following procedures shown in the manual.

This Guideline on the Preparation of Maintenance Procedure Manuals for Building Facilities is to support design consultants to develop maintenance procedure manuals for building facilities.

10.2 OBJECTIVE

The Guideline on the Preparation of Maintenance Procedure Manual for Building Facilities (Hereinafter called as "the Guideline") aims to show guidelines to building facility design consultants who develop maintenance procedure manuals for building facility owners. The Guideline shows not only the regulations relevant to building facility maintenance, but also general procedures and technical guidelines for developing Maintenance Procedure Manuals (Hereinafter called as "Maintenance Manuals") for facility owners.

In developing Maintenance Manuals, design consultants should fully understand the stipulations of Decree 114 and other relevant regulations and develop Maintenance Manuals following this Guideline. Also, building facility owners should implement maintenance for their building facilities, observing regulations concerned and the contents shown in the maintenance Manuals..

In developing Maintenance Manuals following this Guideline, the stipulations of relevant regulations are to be preferentially treated if inconsistency is detected between regulations and this Guideline.

10.3 CURRENT STATUS OF BUILDING FACILITY MAINTENANCE IN VIETNAM

In Vietnam, Law on Construction stipulates facility maintenance of all infrastructures including building facilities. In addition, Decree 114 and relevant circulars which are promulgated under Construction Law stipulate details of facility maintenance procedures. Current regulations stipulate that responsibility for facility maintenance belongs to facility owners or authorized persons. However, in reality, there are many facility owners or

authorized persons who are unfamiliar with construction and maintenance management, in particular in the building facility maintenance sector. I addition, there are also many who do not fully understand the legal framework under Construction Law and regulations relevant to facility maintenance including Decree 114 and Circular 02. With this reason, The regulations enhance the responsibility of design consultants to make maintenance procedure manuals and submit to facility owners or authorized persons for approval. Upon approval of these manuals, facility owners or authorized persons need to develop maintenance plans and implement maintenance based on these plans. However, guidelines to design consultants in developing maintenance procedure manuals have not been well prepared for the consultants, so that it is pointed out that there exist maintenance procedure manuals which are short of quality and contents.

10.4 INTRODUCTION OF FOREIGN PRACTICES (PRACTICES IN JAPAN)

Before developing the Guideline, the Project introduced practices in Japan regarding building facility maintenance. Comparison of the legal framework between Japan and Vietnam is shown in Error! Reference source not found.. Also, Error! Reference source not found. shows the practices of local Governments concerning the selection of building facilities on which owners are obliged to conduct regular reports to local Governments.

10.5 FUNCTIONAL REQUIREMENTS OF THE GUIDELINE

Based on the current status survey and the practices in Japan, the Projects recommends that the Guideline should include the following two conditions;

(1) It can disseminate information on relevant regulations to facility owners or authorized persons.

(2) It can show detailed technical and practical information on inspection frequencies, inspection methods and diagnosis on inspection results.

10.6 DEVELOPMENT OF THE DRAFT GUIDELINE ON THE PREPARATION OF MAINTENANCE PROCEDURE MANUAL FOR BUILDING WORKS

10.6.1 Structure of the guideline

To meet the functional requirements stated above, the Project developed the Guideline, classifying it into the following two parts;

1) Part-1: Outline of the current regulations regarding building facility maintenance

In this part, interpretation is made focusing on regulations relevant to facility maintenance. Design consultants are requested to fully understand all provisions in the relevant regulations and to develop maintenance procedure manuals for building facilities.

2) Part-2: Components of the Maintenance Procedure Manual for building facilities

In this part, step-by-step explanation to develop Maintenance Procedure Manuals is made in line with contents shown below. Recommendations are also made in the components shown with the letter of "Recommendation".

(a) Objectives

(b) Author information

(c) Regulations, technical standards and technical specifications to be applied

(d) Formulation, appraise, approval and adjustment of construction facility maintenance procedure manual

(e) Selection of inspection facilities *(Recommendation)*

(f) Development of maintenance plans

(g) Facility check, maintenance and repair *(Recommendation)*

(h) Types of inspection *(Recommendation)*

(i) Frequencies of inspection *(Recommendation)*

(j) Quality inspection for maintenance

(k) Inspection items (Focuses of inspection) *(Recommendation)*

(l) Inspection methods *(Recommendation)*

(m) Criteria of diagnosis on inspection results *(Recommendation)*

(n) Check list and data preservation *(Recommendation)*

(o) Construction facility monitoring

(p) Quality management of maintenance

(q) Construction facility maintenance for facilities which do not have maintenance procedure manuals

(r) Use of facilities that expire life expectancy

(s) Reporting of construction facility maintenance

(t) Treatment of facilities that show quality degradation and unable to ensure safety for operations

(u) Consultation with qualified agencies or competent state authorities *(Recommendation)*

(v) Labor safety during facility maintenance *(Recommendation)*

10.6.2 Draft guideline

Developed draft guideline on the Preparation of Maintenance Procedure Manuals for Building Facilities is attached in the project reports, [GUIDELINES & MANUALS] edition.

10.6.3 Actions to be taken hereafter

MOC is kindly requested to take the following actions to institutionalize the Guideline.

- To have more discussions on the technical issues in the Guideline with professional organizations.
- To disseminate the Guideline through training courses to design consultants
- To study on engineer qualifications which can meet the demand of professional engineers for building facility inspection.

Table 10.6.1 Comparison of Vietnamese and Japanese system

Ordinances / Essential Points for Maintenance	Vietnam	Japan			
	- Decree 114 Maintenance Works - Circular 02 Civil Building - Circular 08 Maintenance Buildings - TCXDVN 318-2004 Reinforced concrete building maintenance - TCXDVN 373-2006 Evaluate the Damage Status of Buildings - TCXDVN 270-2002 Survey & Evaluate Brick - Stone Buildings - Circular 16/2008/TT-BXD instruction on certifying the quality of construction works, - Articles of Housing Law: 75, 76, 77, 78, 79, 80, 81, 82.	Building Standard Law	Other major ordinances		
			Fire Service Act		
		Article 8 Maintenance Article 12 Periodical Report	Article 8 Fire Prevention Manager Article 8-2-2 Periodical Inspection and Report	Article 17-3-3 Inspection of fire defense equipment	Law for Maintenance of Sanitation in Buildings
Objective of the ordinance	Maintenance of the site, building facility and building equipment in a state complying with legal requirements	Maintenance of the site, building facility and building equipment in a state complying with legal requirements	Maintenance of the facility in a safe state in terms of fire prevention and evacuation	Maintenance of the fire defense equipment in fully operative condition in terms of fire prevention and evacuation	Ensuring environmental hygiene in building facilities a large number of people use by stipulated maintenance procedures during operation including inspection, reporting and cleaning.
Obligation of the owner	To check, inspect, evaluate quality of the building, implement maintenance and report to competent authorities	Owner of specific facility is obligated to organize specialist's periodical inspection and report to the administration.	Owner of specific facility is obligated to assign the fire prevention manager and have him/her prepare fire defense plan, conduct drills for fire extinguishing activities and manage and maintain the equipment and the structure in terms of evacuation or fire prevention, etc. In addition to above, owner is also obligated to commit qualified inspector to inspect if the above mentioned management and maintenance are carried out lawfully and report to the fire chief or the fire station chief.	Owner of specific facility is obligated to organize specialist's periodical inspection and report to the fire chief or the fire station chief.	Owner of specific facility is obligated to assign licensed engineer to supervise maintenance of the facility Owner of specific facility is obligated to maintain the facility according to the ordinance Owner of facility that is not specified is obligated to make effort to maintain the facility in a good state according to the ordinance

Ordinances / Essential Points for Maintenance	Vietnam	Japan			
		Building Standard Law	Other major ordinances		
			Fire Service Act		
	- Decree 114 Maintenance Works - Circular 02 Civil Building - Circular 08 Maintenance Buildings - TCXDVN 318-2004 Reinforced concrete building maintenance - TCXDVN 373-2006 Evaluate the Damage Status of Buildings - TCXDVN 270-2002 Survey & Evaluate Brick - Stone Buildings - Circular 16/2008/TT-BXD instruction on certifying the quality of construction works, - Articles of Housing Law: 75, 76, 77, 78, 79, 80, 81, 82.	**Article 8 Maintenance Article 12 Periodical Report**	**Article 8 Fire Prevention Manager Article 8-2-2 Periodical Inspection and Report**	**Article 17-3-3 Inspection of fire defense equipment**	**Law for Maintenance of Sanitation in Buildings**
Objects applied with the ordinance	Maintenance - all building facilities except for detached houses in rural area / one storied houses not facing street Measurement - large scale building facilities - facilities on the verge of collapse	Facilities the head of the local government specifies out of the Special Buildings with floor area over 100m2 and offices over 1,000m2, their building equipment, lifts and play facilities, etc.	- Following facilities capable to accommodate over 30 people (small multi-tenant building, etc.) 1. Ones whose parts for specific use are located on the basement floor or over the 2nd floor 2. Ones with single stairway - Specific building facilities capable to accommodate over 300 people (department store, play center, movie theater, hospital, elderly nursing home, etc.)	Specified Properties: Super market, inn, shop, restaurant, play center, hospital, clinic, etc. Other properties: Mill, office, warehouse, corporative housing, parking building, bath house, etc.	Specified building facilities with floor area over 3,000m2 (Theater, department store, assembly hall, library, museum, art museum, play center shop, office, school, hotel, etc.)

Ordinances / Essential Points for Maintenance	Vietnam	Japan			
		Building Standard Law	Other major ordinances		
			Fire Service Act		Law for Maintenance of Sanitation in Buildings
	- Decree 114 Maintenance Works - Circular 02 Civil Building - Circular 08 Maintenance Buildings - TCXDVN 318-2004 Reinforced concrete building maintenance - TCXDVN 373-2006 Evaluate the Damage Status of Buildings - TCXDVN 270-2002 Survey & Evaluate Brick - Stone Buildings - Circular 16/2008/TT-BXD instruction on certifying the quality of construction works, - Articles of Housing Law: 75, 76, 77, 78, 79, 80, 81, 82.	**Article 8 Maintenance Article 12 Periodical Report**	**Article 8 Fire Prevention Manager Article 8-2-2 Periodical Inspection and Report**	**Article 17-3-3 Inspection of fire defense equipment**	
Required Qualification for Inspectors	- Architectural certificate - Civil Engineering certificate - Engineer with the qualifications issued by SACQI specifies on Inspection for buildings - Building equipment certificate: Qualified Inspection for Building equipment issued by Vietnam Metrology Institute - Elevator, escalators: Qualified Inspection Engineer on Elevator, escalator & lifts from the Supplier.	- 1st class Kenchiku-shi - 2nd class Kenchiku-shi - Qualified design Inspector - Engineer with the qualification MLIT minister specifies > Building facilities: Qualified survey engineer on specific buildings > Building equipment: Qualified inspection engineer on building equipment > Lifts, escalators and play facilities: Qualified inspection engineer on lifts, etc.	Fire Prevention Manager: Taking the required training sessions Inspector: Taking the required training sessions in addition to, such as, - having experience of fire prevention manager with specified period - licenses such as Kenchiku-shi, with specified period experience on fire prevention management - being a fire fighter with specified period experience of supervisory	For the facilities with floor area over 1,000m2: - Fire Defense Equipment Officer - qualified fire defense equipment inspector For the facilities with floor area under 1,000m2: - Fire Defense Equipment Officer - qualified fire defense equipment inspector - Fire Prevention Manager - owner, manager or possessor, etc.	Not required

Ordinances / Essential Points for Maintenance	Vietnam	Japan			
		Building Standard Law	Other major ordinances		
			Fire Service Act		
	- Decree 114 Maintenance Works - Circular 02 Civil Building - Circular 08 Maintenance Buildings - TCXDVN 318-2004 Reinforced concrete building maintenance - TCXDVN 373-2006 Evaluate the Damage Status of Buildings - TCXDVN 270-2002 Survey & Evaluate Brick - Stone Buildings - Circular 16/2008/TT-BXD instruction on certifying the quality of construction works, - Articles of Housing Law: 75, 76, 77, 78, 79, 80, 81, 82.	**Article 8 Maintenance Article 12 Periodical Report**	**Article 8 Fire Prevention Manager Article 8-2-2 Periodical Inspection and Report**	**Article 17-3-3 Inspection of fire defense equipment**	**Law for Maintenance of Sanitation in Buildings**
Inspection Frequency	Periodical inspection - Theaters, schools, hospitals, stadiums, supermarkets, etc. : 3 years - Hotels, offices, construction industrial workss, urban technical infrastructure works : 5 years - National or world cultural relics : annual Sudden inspection: after storm, earthquake, flood, fire, big crash, or unusual accidence (Circular 08/2006 on Maintenance Works).	Inspection frequency shall be specified by the head of the local government with the period of; - building facilities: 6months to 3 years - building equipment and the others: 6months to 1 year	Fire prevention management: from time to time to keep safe status Inspection period: 1 year	Inspection period - fire defense equipment inspection: 6 months - general inspection: 1 year Reporting period - Specified Properties: 1 year - Other Properties: 3 years	Inspection items and frequency are as follows: - interior air environmental analysis: 2months - measurement of free residual chlorine in tap water: 1week - tap water analysis for other inclusion: 6 months or 1year - clean out of drainage: 6months - pests control (insect/rats): 6months - special cleanout: 6 months - cleanout of sump pit: 6 months Public health center is supposed to instruct the owner for detail of

Ordinances / Essential Points for Maintenance	Vietnam	Japan			
	- Decree 114 Maintenance Works - Circular 02 Civil Building - Circular 08 Maintenance Buildings - TCXDVN 318-2004 Reinforced concrete building maintenance - TCXDVN 373-2006 Evaluate the Damage Status of Buildings - TCXDVN 270-2002 Survey & Evaluate Brick - Stone Buildings - Circular 16/2008/TT-BXD instruction on certifying the quality of construction works, - Articles of Housing Law: 75, 76, 77, 78, 79, 80, 81, 82.	Building Standard Law	Other major ordinances		
			Fire Service Act		Law for Maintenance of Sanitation in Buildings
		Article 8 Maintenance Article 12 Periodical Report	Article 8 Fire Prevention Manager Article 8-2-2 Periodical Inspection and Report	Article 17-3-3 Inspection of fire defense equipment	
Inspection items and focused points	All items of buildings including: structural system (foundation, column, roof, walls, floors …), damage signs (slope, subsidence, crack …), equipment inside buildings. To be carried out according to the maintenance manual prepared by the consultant.	Notifications under the law stipulate the inspection items and the focused points in detail.	Inspection items: Fire prevention management, fire prevention equipment, condition of water supply for fire defense and facilities necessary for fire extinguishing activities. Focused points are legal conformity as well as the following points. - if the fire prevention manager has been assigned - if the fire extinguishing/reporting/evacuation activities are conducted - obstacles around the fire doors - obstacles in the stairways - check of indications on items proving flame retardant etc.	Notifications under the act stipulate the inspection items and the focused points in detail. For summary, see below. Fire defense equipment inspection: - Mainly carried out on each equipment/device - Visual inspection (focused on deployment condition, damages, etc.) - Function test (focused on simplified operation test) General inspection: - Mainly carried out on total function of the equipment - Function test (focused on total operation test)	inspection.

Ordinances / Essential Points for Maintenance	Vietnam	Japan			
			Other major ordinances		
			Fire Service Act		
	- Decree 114 Maintenance Works - Circular 02 Civil Building - Circular 08 Maintenance Buildings - TCXDVN 318-2004 Reinforced concrete building maintenance - TCXDVN 373-2006 Evaluate the Damage Status of Buildings - TCXDVN 270-2002 Survey & Evaluate Brick - Stone Buildings - Circular 16/2008/TT-BXD instruction on certifying the quality of construction works, - Articles of Housing Law: 75, 76, 77, 78, 79, 80, 81, 82.	**Building Standard Law** **Article 8 Maintenance Article 12 Periodical Report**	**Article 8 Fire Prevention Manager Article 8-2-2 Periodical Inspection and Report**	**Article 17-3-3 Inspection of fire defense equipment**	**Law for Maintenance of Sanitation in Buildings**
Acceptance criteria	To be carried out according to the maintenance manual prepared by the consultant. Also, law conformity shall be secured.	Notifications under the law stipulate the criteria mainly in terms of the following points. - Being maintained in conformity to specified articles of the law - Being without fatal degradation or damage - Being duly operative to achieve the required functions - Being in good state for safe operation (ex. no obstacles around the fire doors)	Legal conformity, observance of requirements on fire prevention management and being kept without obstacles around the fire doors and in the stair ways, etc.	Notifications under the law stipulate the criteria in detail for each equipment/device and system of equipment, respectively.	Conformity with the criteria stipulated in the ordinances and municipal bylaws in detail for each inspection item.

Table 10.6.2 Japanese application instances by local governments

OBJECTS AND FREQUENCY - Buildings obligated for periodical inspection and report based on Article 12 of Building Standard Law -												
Designated buildings according to Building Standard Law			**Examples of the specific regulations by local government ordinances** Note) 1. Local governments are supposed to supplement/adjust Building Standard Law with detailed ordinances. 2. Numbering of floor is according to the US way. (ex. "the 2nd floor" means 1foor above the floor near ground level)									
Classification	Category	Period / Frequency	Sapporo City			Kobe City			Kumamoto Prefecture			
			Applicable buildings		Period / Frequency	Applicable buildings		Period / Frequency	Applicable buildings		Period / Frequency
			Stipulated Category	Scale/Description		Stipulated Category	Scale/Description		Stipulated Category	Scale/Description	
Special Buildings (applicable if the floor area >= 100m3)	Theaters, assembly halls and auditorium halls, etc.	6 Months to 3 Years	Theaters, assembly halls, auditorium halls and entertainment halls	Condition of the part served for left mentioned purpose is either of followings: - located on or above the 3rd floor - floor area is over 200m2	3 years	Theaters, assembly halls, auditorium halls and entertainment halls	Condition of the part served for left mentioned purpose is either of followings: - located on the basement floor or above the 3rd floor and the floor area is over 100m2 - Total floor area of the building is over 200m2	approx. 3 years (to be designated)	Theaters, assembly halls, auditorium halls and entertainment halls	Floor area served for left mentioned purpose is on or above 300m2	3 years
	Hospitals, clinics (having hospitalization capacity), hotels, inns, apartments, condominiums, and dormitories, etc.		Hospitals, clinics (having hospitalization capacity), elderly nursing homes and child welfare facilities	Condition of the part served for left mentioned purpose is either of followings: - located on or above the 3rd floor - floor area is over 500m2	3 years	Hospitals, clinics (having hospitalization capacity), elderly nursing homes and child welfare facilities, hotels and inns	Condition of the part served for left mentioned purpose is either of followings: - located on the basement floor or above the 3rd floor and the floor area is over 100m2 - Total floor area of the building is over 300m2	approx. 3 years (to be designated)	Hotels and inns	The whole building has 3 or more floors and the part served for left mentioned purpose is over 300m2	3 years
			Inns and hotels	Condition of the part served for left mentioned purpose is either of followings: - located on or above the 3rd floor - floor area is over 300m2		apartments and condominiums	Total floor area of the building is over 500m2 and the part served for left mentioned purpose is over 100m2 with location on basement floor or floor above 5th floor		Hospitals, clinics (having hospitalization capacity), elderly nursing homes and child welfare facilities		
Buildings (applicable if the floor area >=	Schools and gymnasiums, etc.	6 Monthsto3 Years	Schools and gymnasiums	Condition of the part served for left mentioned purpose is either of followings:- located on or	3 years	Museums, art museums, library, bowling alleys, swimming pools,	Total floor area of the building is over 2,000m2 and the part served for left mentioned purpose is over	years (to be designated)	-	-	

OBJECTS AND FREQUENCY - Buildings obligated for periodical inspection and report based on Article 12 of Building Standard Law -

Designated buildings according to Building Standard Law			Examples of the specific regulations by local government ordinances Note) 1. Local governments are supposed to supplement/adjust Building Standard Law with detailed ordinances. 2. Numbering of floor is according to the US way. (ex. "the 2nd floor" means 1foor above the floor near ground level)									
Classification	Category	Period / Frequency	Sapporo City			Kobe City			Kumamoto Prefecture			
			Applicable buildings		Period / Frequency	Applicable buildings		Period / Frequency	Applicable buildings		Period / Frequency
			Stipulated Category	Scale/Description		Stipulated Category	Scale/Description		Stipulated Category	Scale/Description	
				above the 3rd floor - floor area is over 5,000m2		exercise facilities, gymnasiums and schools	100m2 with location on basement floor or floor above 2nd floor				
			Bowling alleys, skiing ground, ice rink, swimming pools and exercise facilities	Condition of the part served for left mentioned purpose is either of followings: - located on or above the 3rd floor - floor area is over 2,000m2		-	-		-	-	
	Department stores, markets, exhibition halls, Cabarets, hostess bars, nightclubs, bars, dancehalls, amusement arcades, pinball parlors, mahjong parlors, etc.		Cabarets, hostess bars, nightclubs, bars, dancehalls, amusement arcades, pinball parlors, mahjong parlors, public bath houses, restaurants	Condition of the part served for left mentioned purpose is either of followings: - located on or above the 3rd floor - floor area is over 500m2	Annual	Department stores, markets, shops, exhibition halls	Total floor area of the building is over 500m2 or the part served for left mentioned purpose is over 100m2 with location on basement floor or floor above 2nd floor	approx. 3 years (to be designated)	Department stores, markets, shops	The whole building has 3 or more floors and the part served for left mentioned purpose is over 1,000m2	3 years
	Garages, repairing factories for vehicle, etc.		Not required			Not required			Not required		
Other buildings (applicable if over 5 storied and the floor area >= 1,000m3) and equipment	Office buildings, etc.	6 Monthsto3 Years	Offices	Condition of the part served for left mentioned purpose is either of followings:- located on or above the 5th floor - floor area is over 1,500m2	3 years	Offices	Total floor area of the building is over 1,000m2 and the part served for left mentioned purpose ranges over 4 floors or more	approx. 3 years (to be designated)	Offices	The whole building has 5 or more floors and the part served for left mentioned purpose is over 1,000m2	3 years
	Others		Underground shopping malls	All applicable	Annual	Public bath houses	Total floor area of the building is over 500m2 and the part served for left mentioned purpose is over	years (to be designated)	-	-	

OBJECTS AND FREQUENCY - Buildings obligated for periodical inspection and report based on Article 12 of Building Standard Law -

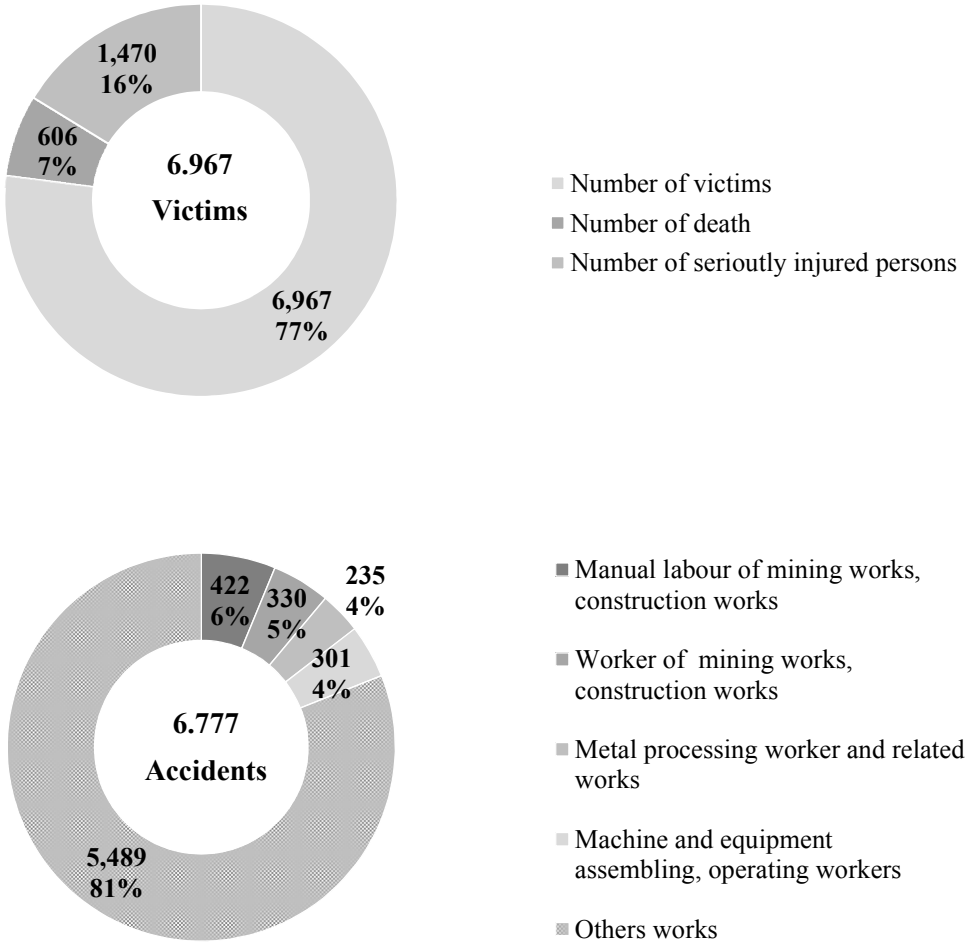
Designated buildings according to Building Standard Law			Examples of the specific regulations by local government ordinances Note) 1. Local governments are supposed to supplement/adjust Building Standard Law with detailed ordinances. 2. Numbering of floor is according to the US way. (ex. "the 2nd floor" means 1foor above the floor near ground level)									
Classification	Category	Period / Frequency	Sapporo City			Kobe City			Kumamoto Prefecture			
			Applicable buildings		Period / Frequency	Applicable buildings		Period / Frequency	Applicable buildings		Period / Frequency	
			Stipulated Category	Scale/Description		Stipulated Category	Scale/Description		Stipulated Category	Scale/Description		
							100m2 with location on basement floor or floor above 2nd floor					
	Building service equipment for the above shown buildings	6 Months to1 Years	・Mechanical driven ventilation system	All applicable	Annual	Mechanical driven ventilation system	Having fire dampers driven with smoke detectors with thermal fuse	approx. 1 year (to be designated)	Mechanical driven ventilation system	Ones set as per Building Standard Law	Annual	
			・Mechanical driven smoke exhaust system	All applicable		Mechanical driven smoke exhaust system	Having smoke exhaust fans		Smoke exhaust system	Including passive exaust system		
			・Emergency lighting equipment	All applicable		Emergency lighting equipment	Ones without battery		Emergency lighting equipment	Ones set as per Building Standard Law		
	Elevators and escalators		Elevators	All except for detached houses	Annual	-	-		Elevators	Ones installed in buildings (except detached houses) and independently constructed for sight seeing	Annual	
			Escalators						Escalators	Ones installed in buildings and independently constructed for sight seeing		
	Play facilities		Elevated facilities	Water chute, coaster, etc.	Annual	-	-		Elevated facilities	Water chute, coaster, etc.	Annual	
			Rotating facilities	Carousels, Ferris wheels, octopus, etc.					Rotating facilities	Carousels, Ferris wheels, octopus, etc. driven by motors		
									Water slide	Height is over 4m		

CHAPTER 11 DEVELOPMENT OF CONSTRUCTION WORK SAFETY MANUAL (ACTIVITY 6)

11.1 FRAMEWORK OF DEVELOPMENT

11.1.1 Concept of Development

Labor accidents during construction works is a growing concern in the society, so that the Government has been urged to take prompt actions to reduce accidents. Annual statistics of labor accidents reported that 6,777 labor accidents occurred in 2012 in the whole country. It caused 6,967 victims. Of which 606 lives was lost and 1,470 seriously injured persons, as shown in the above charge of **Figure 11.1.1**. The below charge also explains that about 19% of accidents occurred in the works related with construction field.



(Source) Announcement No. 543/TB-LDTBXH of MOLISA about work accidents situation in 2012

Figure 11.1.1 Labor Accidents in 2012

11.1.2 Methodology

In order to reduce labor accidents during construction works, much focus should be directed to the construction activities in the fields, in particular raising stakeholder's awareness in construction sites is an essential issue. The Project directs its attention to the stakeholders of construction projects including main contractors, subcontractors and field workers and make a construction safety manual in order to support safety activities to be taken during construction works. The Project first carries out surveys and assessment on the labor accidents in the fields and on the current status of regulations, safety standards and safety provisions in the contract documents. Then, the Project formulates a framework of the safety manual aiming to clarify objectives, inter-relation with regulations and technical specifications, structures, contents of the manual, how to use the manual and how to manage the manual including data update.

The construction safety manual will consist of two main chapters; Chapter (1) prescribes the outline of regulations relevant to labor safety management and Chapter (2) prescribes sample potential hazardous accidents to which stakeholders need to pay more attention.

(1) Develop Safety and Health Manual in Construction

As provisions relevant to the labor safety are delivered in various documents such as regulations, contract documents, technical specifications etc. it is challenging for the stakeholders to cite information and to make use of them in the field labor safety management. The Project assembles relevant information and put them into the Chapter (1) of the safety manual.

(2) Develop Case Studies on Accidents and Near misses in Construction

In order to reduce labor accidents during construction works, raising awareness to labor accidents is the key to success. This also needs cooperation with all stakeholders involved in construction works. In particular in Japan, the manual which illustrates potential hazardous accidents (Hiyari-Hatto cases) has played an important role in raising people's awareness to the labor accidents. The Project edits Hiyari-Hatto cases.

(3) Outputs

- Safety and health manual in construction
- Case studies on accidents and near misses in construction

11.1.3 Rationale

Public awareness to labor safety during construction works is rising rapidly with increase in construction works nationwide. Currently, contractors are obliged to formulate labor safety plans in their method statements which are in general issued to project owners for approval when construction contracts were made. However, rather important is to equip engineers with knowledge and expertise in labor safety and let them implement safety measures through the daily supervision of construction works. Of these safety measures, it is critically important to raise worker's awareness to labor safety getting directly involved in the construction works in the sites. It is therefore urgently needed to prepare materials on labor safety and provide managerial information to field engineers and more practical information to field workers.

With these reasons, the Project develops "Safety and Health Manual in Construction" and "Case Studies on Accident and Near Misses Handbook".

11.2 OVERSEAS PRACTICES (PRACTICES IN JAPAN)

11.2.1 MLIT Practices in Japan

In Japan, safety manuals and handbooks containing examples of labor accidents have been widely used in the construction works in order to raise labor safety awareness and to enhance safety knowledge for the people who are directly engaged in construction works. They can refer to these materials and labor safety rules and principles from these materials. On the government side, MLIT has been tackling labor safety, preparing safety manuals from the viewpoints of laws and related ordinances. Also, regional development bureaus under MLIT sometimes develop their own safety manuals based on their original experiences, featuring regional natural environment and culture. In addition, regional development bureaus also prepare the statistical data on labor accidents obtained in the regional construction works. Consultants and contractors can anytime refer to these information and the results of analysis and incorporate them into their labor safety programs. Speaking of prefecture level, prefectures often develop their own safety and health manuals, focusing on more particular conditions of each prefecture.

11.2.2 Semi-public Organization Practices

In addition to the above, Japan International Safety and Health Association offers website information on labor safety and introduces some examples of industrial labor accidents including near-miss cases. Contents of examples are as follows:

- Details of accidents
- Causes of accidents
- Countermeasures against potential accidents

More than 2,300 accidents are currently registered in the website.

11.2.3 Contractor's Practices

(1) Safety Supervisor-centered Labor Safety Planning

In accordance with the Industrial Safety and Health Law in Japan, contractors are obliged to assign safety supervisors to each construction project. The safety supervisors, who are stationed at their construction sites, take initiative in formulating labor safety plans and implementing labor safety plans in the fields. In addition, contractors have been making their efforts such as periodically holding labor safety trainings to their workers including subcontractors using labor safety manuals and video tapes. Nowadays, contractor's awareness towards labor safety is fairly high such as developing their own labor safety manuals and video tapes.

(2) Sanctions

When labor accidents occur at construction sites, contractors should inform immediately not only to the project owners, but to the Labor Standards Inspection Offices stationed in many regional cities. If serious fatal accidents unfortunately occur at construction sites, the Labor Standards Inspection Office gives instructions to contractors to find out the causes of incidents, to review existing labor safety plans and to implement again labor safety trainings to their workers. With these procedures, construction works are in general suspended for a while. In addition, sanctions, dependent on the severity of incidents, is imposed on the contractors. According to the MLIT sanction plans, the contractors are not allowed to participate in new construction projects for a while, in general from one month to 4 months dependent on the severity of incidents. Also, their work performance is evaluated lower which is definite handicap for contractors to participate in new construction projects.

11.3 PRACTICE IN VIETNAM

(1) Industrial Safety and Health Law and Related Ordinances

In Vietnam, the law system of safety and Health is formulated under the Labor Code. The Occupational Safety and Health are stipulated as articles (Article 95～108) in Chapter 9 of Decree 06 which was promulgated on January 20th 1995. An outline of safety and health regulations is shown in **Figure 11.3.1**.

Many laws and regulations, such as Decrees, Circulars, Decisions and Standards, are promulgated by the Vietnam government and ministries. Decrees, Circulars and Decisions are compulsory. However, there are two types in Standards. One is compulsory and the other one

is noncompulsory. The government and/or each ministry which promulgate standard decide its character individually.

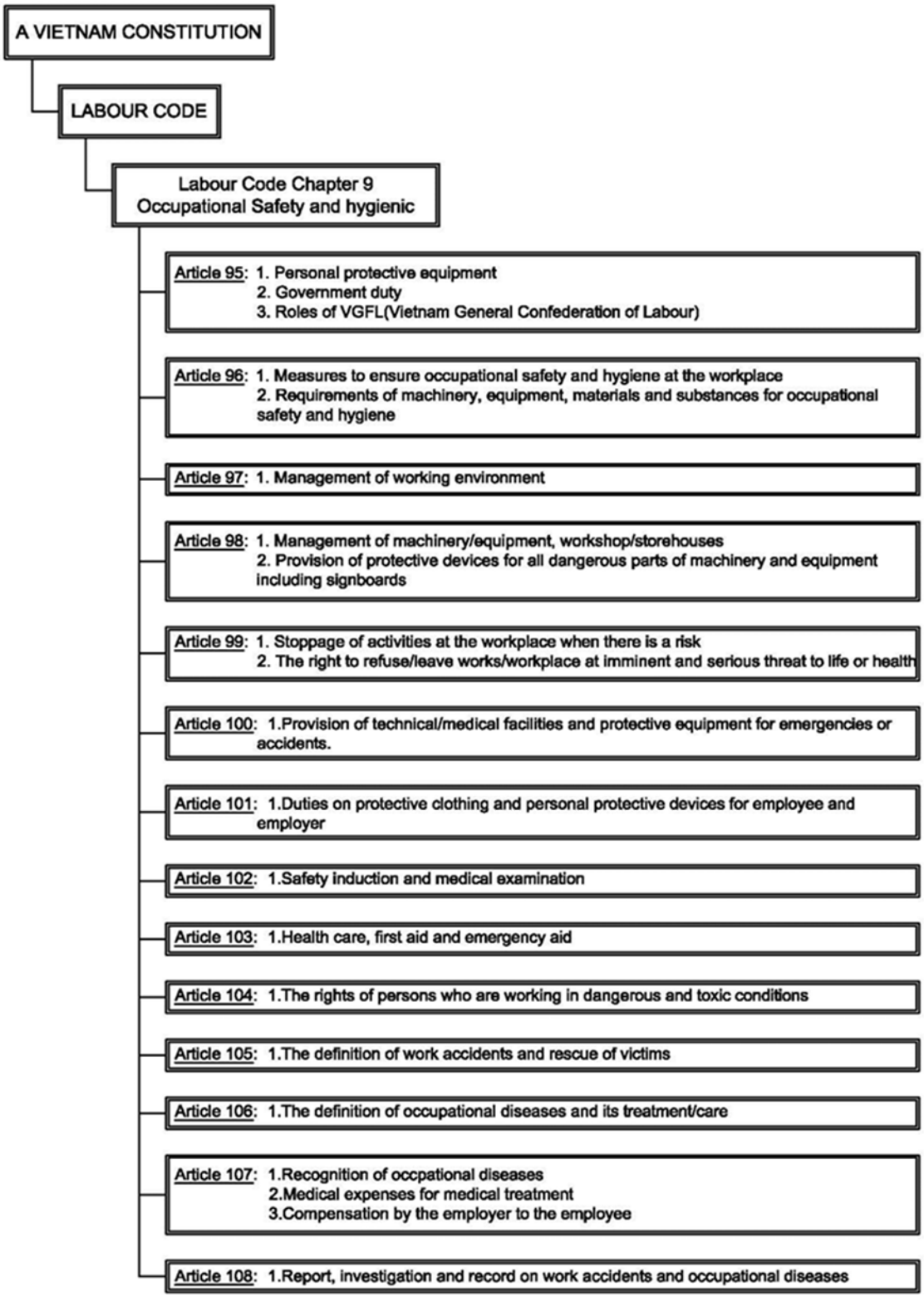


Figure 11.3.1 Law System of Safety and Health in Vietnam

(2) MOC's Approach to Safety and Health

Pursuant to the Construction Law (promulgated November 26th, 2003), Decree No.17/2008/ND-CO (promulgated February 4th, 2008, defining the functions, tasks, powers and organizational structure of the MOC) and Decree No.12/2009/ND-CP (promulgated February 12th, 2009, on management of work construction investment projects), MOC promulgated Circular No.22/2010/TT-BXD on December 3rd, 2010. Though many standards for safety and health have been issued by MOC and other ministries individually, the Circular No.22/2010/TT-BXD is the first circular (=compulsory) promulgated by MOC to stipulate general rules of safety and health on construction.

Almost the same time, MOC instructed IBST (Institute for Building Science and Technology) to revise the "Code of practice for building safety technique: 1991 version" for the sake of improving safety and health on construction field. The final version of "Code of practice for building safety technic" was submitted to CAMD in May, 2012.

(3) Safety and Health Management System on Construction Sites

Necessary items to establish/maintain safety on site are mostly described in Circular No.22/2010/TT-BXD. Main items are follows.

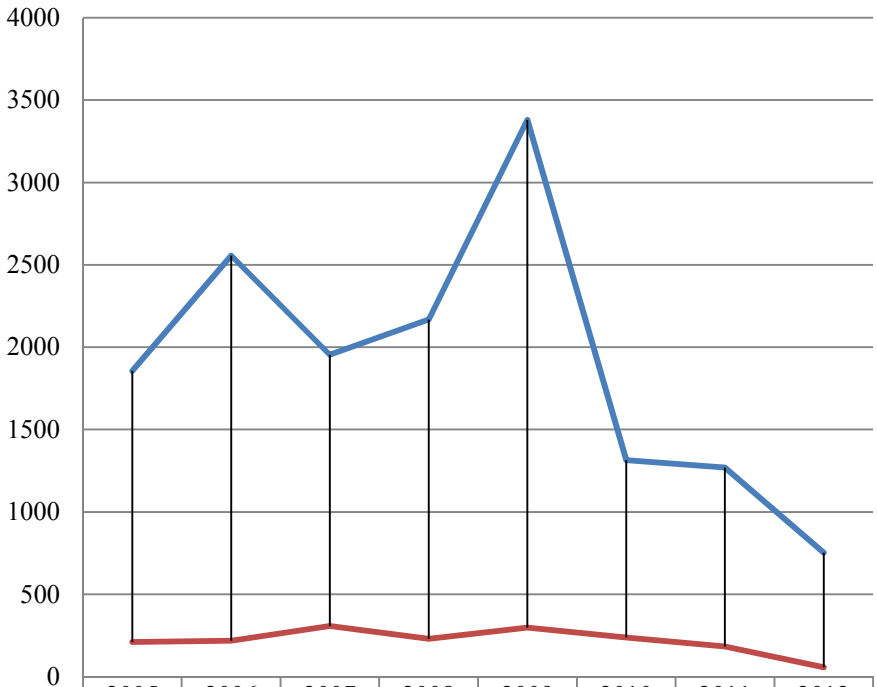
- Establish a safety committee
- Set up a full-time or part-time safety manager for the observation of labor safety
- Provide construction method statement, safety and health plan
- Furnish sufficient personal safety equipment for workers
- Provide safety trainings. Workers must be trained in labor safety and must possess labor safety cards.
- Provide medical check-up to all workers at the construction site
- Workers are allowed to work only jobs suitable to their professional qualifications. Select and arrange suitable workers at site according to their professional qualifications.
- When contractor's violations against labor safety rules are found, suspend the arranged construction work for night are suspended and a contractor is instructed to take remedies. If the contractor fails to take remedies, the construction is stopped or the contract is terminated.
- Install notice/warning boards at the construction site
- Supplies and materials must be placed neatly based on the approved site plan.
- Trenches and foundation pits must be fenced with warning boards. Lighting must be

It is the role of DOC (Department of Construction, under the control of MOC) to observe the compliance of contractor for such rules. However, only few construction sites are inspected by DOC due to the limited staff of DOC. Regarding the safety plan and safety manager, according to information obtained through hearing from five Japanese-affiliated sites, it is found that all sites submitted a safety-plan and a full-time safety manager are employed .

(4) Increase of Accidents on Site

Both total number of accidents and fatal accidents in construction industry are high despite legal groundwork for safety and health is improving. (Many laws, ordinances and regulations for safety and health have already promulgated in Vietnam and the quality and quantity of contents stipulated in laws/ordinances/regulations are reasonably enough to manage safety and health for sites. The problem is that there are some difficulties to find particular items from laws/ordinances/regulations because they are not well classified.)

The number of total accidents and fatal accidents in construction industry are shown in **Figure 11.3.2.**



	2005	2006	2007	2008	2009	2010	2011	2012
Total of accidents	1857	2555	1954	2167	3379	1314	1269	752
The number of fatal accidents	210	218	307	230	297	237	182	57

(Source) Announcement No. 543/TB-LDTBXH of MOLISA about work accidents situation in 2012

Figure 11.3.2 Situation of Occupational Accidents on Construction and Mining

MOLISA (Ministry of Labor, Invalids and Social Affairs) announces the statistical results of accident every year. The causes of work accidents are extracted from the reports and summarized in **Table 11.3.1**

Table 11.3.1 Causes of Work Accidents

No.	Causes	No. of accident / Percentage of total accident				
		2009 Jan-Jun	2010 Jan-Jun	2011 Jan-Jun	2012 Jan-Jun	2013 Jan-Jun
	Caused by the employer side					
1	Lack of safety induction/training	138 (7.05%)	77 (2.9%)	102 (2.9%)	153 (5%)	436 (13.1%)
2	Lack of machinery maintenance	92 (4.7%)	112 (4.3%)	64 (1.8%)	107 (3,5%)	708 (21.31%)
3	Lack of safety equipment	68 (3.47%)	85 (3.2%)	46 (1.3%)	72 (2.4%)	
4	Lack of safety process and method	109 (5.56%)	72 (2.8%)	194 (5.6%)	190 (6,2%)	436 (13.1%)
5	Work by unqualified/inadequate labors	77 (3.93%)	38 (1.5%)	39 (1.1%)		109 (3.27%)
6	Lack of safety equipment for labor	38 (1.94%)	18 (0.7%)		65 (2.1%)	
7	Other causes	337 (17.2%)	616 (23.6%)	1058 (30.7%)	246 (8%)	
	Caused by the labor side					
1	Violation against safety method/rules	656 (33.5%)	766 (29.3%)	766 (29.3%)	1106 (36%)	817 (24.59%)
2	No usage of personal safety equipment	85 (4.34%)	87 (3.3%)	87 (3.3%)	121 (4%)	106 (3.2%)
3	Violation against other work regulations	148 (7.56%)	105 (4.0%)	105 (4.0%)	67 (2.2%)	602 (18.11%)

(Source) Annual Announcement of MOLISA about work accidents situation

11.4 FINDINGS

From the above table, it is found that "Violation against safety method and rules" by labors is the biggest cause of accidents. It was also pointed out by counterparts that the safety awareness of labor is very low. As results, many accidents happens due to labors easily engaged in dangerous behavior and dangerous works without self-consciousness.

MOLISA also pointed out the causes of accident in its reports as follows.

- There are quite enough legal documents on labor safety. However, there are not enough sanctions and those sanctions are not strict enough. So employers and laborers do not observe regulations.

- There are not enough government labor inspectors. In recent years, there are not enough supplements for the government labor inspectors. This fact does not match the rapid development of the number and scale of enterprise. So the authorities could not carry out closer inspection and could not detect and prevent work accidents.
- There are many small enterprises, cooperatives and trade villages. However, they are not fully guided in labor safety regulation, the process and method of working. They are not timely inspected. So there are numbers of violation and risk of working accidents and occupational diseases.

11.5 ACTIONS TO BE TAKEN

Based on the above statistical results, analysis of MOLISA, opinions of counterparts and the study of JICA team, it was agreed by MOC and the JICA study team to prepare a "Safety and Health Manual in Construction". The purpose of manual was discussed between counterparts, PMU and JICA study team many times for 4 months. And three parties agreed the following purposes.

- The manual is used by the government staff at the office/site where they manage.
- Safety rules, laws, knowledge and common sense that everyone at construction sites must obey are summarized in the manual.
- When management staffs conduct a safety patrol at site, it is recommended that they understand the contents of the manual and advise contractors/consultants to rectify/correct/improve safety and health matters that are against law and/or the manual.
- The manual can be used for self-study of safety and as a text for workshop and/or seminar.

(1) Labor Accidents in Vietnam

Currently, the survey has reported that provisions concerning labor safety and health in Vietnam are spread over Degrees, Circulars and Decisions, Technical Standards. This sometimes makes it difficult for contractors to quote information from related regulations in preparing labor safety and health measures for their construction sites. To cope with these difficulties, the labor safety manuals where information on relevant regulations and labor safety measures is assembled are expected to contribute to the planning of labor safety measures in the fields.

To begin with this activity, the analysis was carried out by the Project team on the causes of labor accidents in Vietnam in an attempt to select manual contents. Counterpart members gave advice to the Project to include labor safety measures against "Falling" and "Electrification" due to high frequency in occurrence in the construction sites. These two

accidents are shown as the worst No.1 and 2 fatal accidents in the statistical data provided by MOLISA.

Table 11.5.1 Labor Accident Statistics in Vietnam

Cause of Accident	Jan-Jun, 2011		Jan-Jun, 2012		Jan-Jun, 2013	
	Total No. of accident	No. of death	Total No. of accident	No. of death	Total No. of accident	No. of death
Falling	246	61	167	39	863	81
Electrocution	134	45	236	73	327	31
Stuck between objects	945	32	933	16	598	57
Falling objects, burying	293	54	252	25	664	61
Trip and fall by objects	351	9	331	14		
Throw out	51	8	84	9	327	31
Traffic accident	205	25	198	9	436	41

(Source) Annual Announcement of MOLISA about work accidents situation

11.5.2 Basic Concept of Labor Accidents

It is very important to raise safety awareness among people and to enhance their capacities on labor safety. Knowing the causes of accident is one of the actions for these purposes. However, Herbert W. Heinrich reported that to know the causes of accidents was not good enough. He was born in 1986 and an assistant superintendent of the engineering and inspection division of a private company when he published the book titled "Industrial Accident Prevention, A Scientific Approach" in 1931. In this book, he stressed the following findings.

- **Behind one big injury accident, there are 29 small injury accidents and 300 minor accidents that do not result in injuries as seen in**
- **Figure** 11.5.1**.**

Since his study, which was based on the labor accidents that occurred in the 1920s, many researchers have analyzed new accidents and derived new results. For example, Frank E. Bird, Jr, who was the director of engineering service for an insurance company, analyzed 1,753,489 labor accidents reported from 297 cooperating companies in the year of 1969. He derived the following 1-10-300-600 relations in an accident pyramid as shown in

Figure 11.5.1.

Also Tye and Peason derived the similar relations in 1974 1nd 1975.The ratio Tye and Peason was 1 (Fatal or serious injury) – 3 (Minor injuries) – 50 (First aid treatment injuries) – 80 (Property damage accidents) – 400 (Near misses).

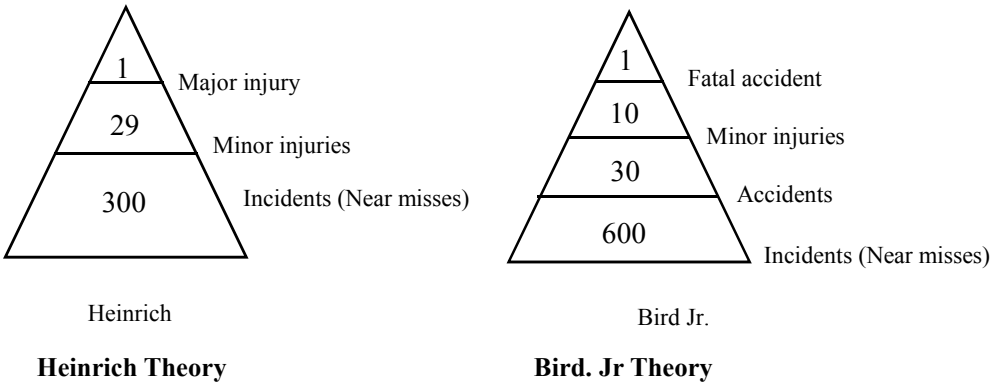


Figure 11.5.1 Heinrich Theory and Bird. Jr Theory

Although the figures vary from study to study, the basic principle remains the same. The "Near Misses" are the potential to be more serious incidents. Of course, not all near misses cause fatal or serious injuries. However, if appropriate actions are taken at this level, potential of more serious injuries can be reduced dramatically. This is the main reason to prepare and introduce the "Case Study on Accidents and Near Misses Handbook" in this project. Similar handbooks are also used in Japan for the safety induction and education to superintendents and workers.

11.5.3 Design Concept

Base on the studies and analysis so far, it is found that to increase the safety awareness of labor is the most effective action to decrease accidents on construction sites. Therefore, it was agreed by MOC and JICA study team to prepare the "Safety and Health manual in Construction" and "Case Study on Accidents and Near Misses Handbook". These books are mainly designed for MOC but it can also be used for the general civil works and building works.

At the beginning of office work in Hanoi, the timeline of preparing safety manual was submitted to the PMU by JICA study team at MOC's office. This timeline was approved by the PMU and it was agreed that JICA study team conducted their work based on the timeline in cooperation with PMU and counterparts. The timeline of preparing safety manual is shown below.

Table 11.5.2 The Timeline of Preparing "Safety/Health Manual" and "Case Studies on Accident and Near Misses"

Actitities	2011					2012					
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
A. Study the current conditions of safety and health											
A.1 Labor Code and Chapter 9 of Labor Code											
A.2 Articles of Chapter 9 (Occupational Safety and Hygienic)											
A.3 Decrees and Circulars											
B. Preparing Safety Manual											
B.1 Prepare items in safety/health Manual											
B.2 Discussion with counterparts for items in safety/health manual											
B.3 Submit items of Safety/Health Manual to MOC for concurrence		▼									
B.4 Concurrence on items of Safety/Health Manual by MOC			▼								
B.5 Prepare the Safety/Health Manual item by item											
B.6 Concurrence on the Draft Safety Manual					▼						
C. Preparing Case Studies of Potential Accidents											
C.1 Prepare samples of case study of potential accidents											
C.2 Discussion with counterparts for contents of case study											
C.3 Concurrence on items/styles of Case Studies of Potential Accidents					▼						
D. Modifications on Manuals for Final Version											
E.1 Modify manuals based on comments/advice											

E. Assignment of JICA Safety Management Expert	7/30 8/29 31days		9/25 10/27 33days		11/12 12/22 41days					5/17 6/15 30days	

11.6 SAFETY AND HEALTH MANUAL IN CONSTRUCTION

Many discussions for safety and health matters were held with counterparts for 5 months and the progress of JICA study team went almost on schedule. As a result, the final version of "Safety and Health Manual in Construction" was submitted to PMU on June 7th, 2012. It was agreed between PMU and the Project team that some construction sites would be selected by PMU for the trial, where the manual is used on sites for several months. Comments from sites after trial, such as opinions against contents, usability of manual and so on, are reflected in the future version of manual. The following are the outline of the manual;

(1) Expected Users

Government staff, supervision consultants, contractors, subcontractors

(2) Content List

Chap. I; Introduction

Chap. II; Regulations and technical standards on safety and health and safety management (**Figure 11.3.1**)

II.1 Outline of regulations and technical standards on safety and health and safety management (**Table 11.6.1**)

II.2 Rights and duties of Employers and Workers Responsibilities of POs, PMUs and Consultants, Contractors

II.3 General Issues on Labor Safety

II.3.1 Safety management system and Safe induction

II.3.2 Regular safety management and safety education

II.3.3 Working wear and protective equipment

II.3.4 Keeping things tidy and in order

II.3.5 Walkways at site

II.3.6 First-aid tools

II.3.7 Signage for hazards

II.3.8 Strict requirements of employment (License, Age, Sex, Previous illness, Medical check, etc.)

II.3.9 Application for construction permits - Specific work

II.3.10 Signals

Table 11.6.1 Labor Safety Related Regulations

Contents		Government-level regulations			Ministry-level Regulations	
		Articles (Vietnam Labour laws)	Decree (NĐ) Circular (TT) Decision (QĐ)	Vietnam standard (TCVN) *Not compulsory*	Decree (NĐ) Circular (TT) National regulation (QCVN)	Vietnam standard on construction (TCXDVN) *Not compulsory*
A.	**General**					
A-1	Personal protective equipment	95.1	•Decision no.10/2008/CT-TTg	•TCVN 2291:197	•Circular No. 10/1998/TT-BLĐ TBXHm, issued by MOLISA	
A-2	Government duty	95.2	•Decree No.06/CP			
A-3	Roles of VGFL(Vietnam General	95.3	•Decree No.06/CP			
A-4	Measures to ensure occupational safety and hygiene at the workplace	96.1	•Decree No.06/CP		•Joint Circular No. 01/2010/TTLT-BL ĐTBXH-BYT, issued by MOLISA-MOH	
A-5	Requirements of machinery, equipment, materials and substances for occupational safety and hygiene	96.2	•Decree 39/2009/N Đ-CP,		•Circular No.37/ 2010/TT-BLĐ TBXH, issued by MOLISA	
A-6	Management of working environment	97.1	•Decision No. 20/2004/CT-TTg		•Circular No. 22/TT-BXD, issued by MOC	
A-7	Management of machinery/equipment, workshop/storehouses	98.1			•Circular No. 01/2010/TT-BLĐ TBXH, issued by MOLISA	

Chap.- III Safety Measurements by Incident

(**Figure 11.6.1**, **Figure 11.6.2** and **Figure 11.6.3**)

III.1 Prevention of Falling

III.2 Prevention of danger caused by falling/littering

III.3 Prevention of danger caused by collapse/rolling

III.4 Prevention of danger caused construction vehicles

III.5 Prevention of danger caused by electricity

III.6 Prevention of danger caused by hauling, loading and unloading

III.7 Prevention of danger to public

III.8 Prevention of danger caused by fire and explosion

III.9 Prevention of danger caused by tunnel works

III.10 Prevention of danger caused by offshore operation

III.11 Prevention of health disorder

APPENDIX

1. Manual check lists
2. Work license required
3. Format of labor safety and health

(3) Illustration

Some of illustrations included in the Manual are shown on following figures.

1. Prevention of falling

1.1 Pipe Footing

Pipe footing is composed of vertical pipes, horizontal pipes, planks, cramps, joints, metal bases and so on

Check points *(Refer to TCXDVN 296-2004: Scaffolding - Safety Requirements)*

(1) Is maximum loading capacity of footing shown at the conspicuous place?

(2) Are metal fittings to wall used? (TCXDVN 296-2004, Article 5.1.2.4.9)

(3) Are metal bases for pipes used as base jack? (TCXDVN 296-2004, Article 4.2.1)

(4) Are horizontal pipes near metal base installed?

(5) Are metal bases located at the right space? (TCXDVN 296-2004, Article 5.1.2.4.2~4)

Load type	Pipe cross section	a(m)	b(m)
Light load (125kg/m2)	Φ 50mm	3,0	1,2
Average load (250kg/m2)	Φ 50mm	2,4	1,0
	Φ 64mm	2,4	1,8
Heavy load (375kg/m2)	Φ 64mm	1,5	1,5

(6) Is the height of first footing step less than 2m?

(7) Is the total width of scaffold planks more than 30cm? Is the gap between scaffold planks less than 1cm? (TCXDVN 296-2004, Article 4.4.4)

(8) Are cross bracing used to reinforce the footing? (TCXDVN 296-2004, Article 5.1.2.4.9)

(9) Are handrail fixed, height is 0,9~1,15m? (TCXDVN 296-2004, Article 4.5.2)

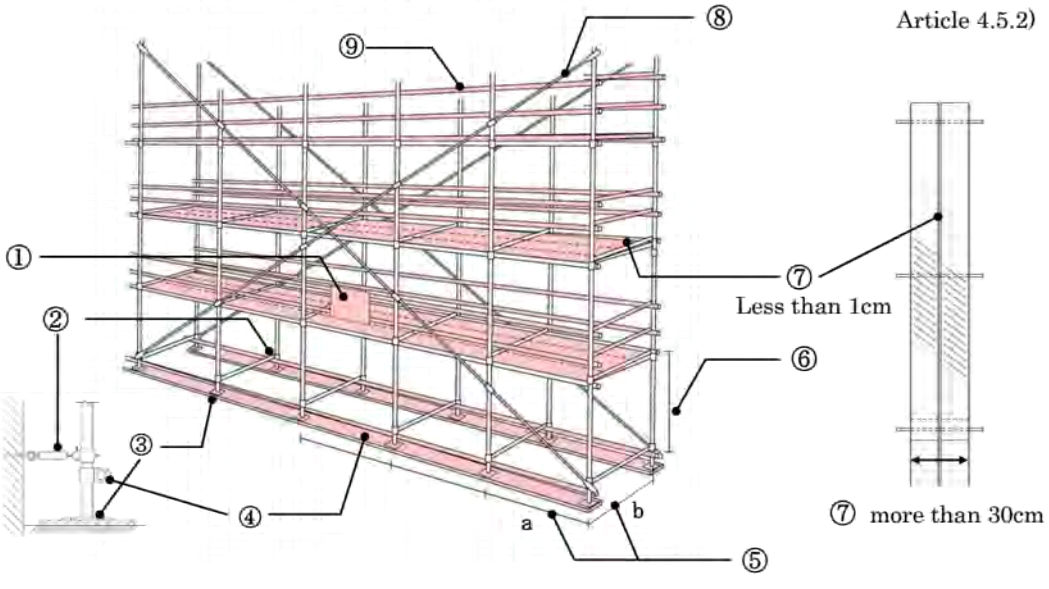


Figure 11.6.1 Prevention of Falling

(Manual, Chapter III, Sample)

3. Prevention of danger caused by collapse/rolling

3.3 Excavation of natural ground

The following points are required to check before excavation of natural ground. Excavation for tunnel and quarry are not subject of this item.

Check points: *(Referenced from Decision 1338/2006/QĐ-BXD, TC 49-05: Technical Guideline for retaining and keeping excavation; TCVN 5308-1991: Code of practice for building safety technique; TCVN 5178-1990: Technical safety regulation for open-pit mining and processing.)*

(1) Following points must be surveyed before excavation. (1338/2006/QĐ-BXD, TC 49-05, Article 4.1.1)
- Condition of geological and geological formation
- Existence of cracks, water leakage, high temperature gas/steam in soil
- Existence of buried objects and its condition

(2) Is a chief supervisor appointed for excavation more than 2m deep?

(3) Existence and condition of loose rocks, cracks and leakage must be checked before starting excavation and/or after an earthquake with a seismic intensity of moderate. (TCVN 5308:1991, Article 12.1.11)

(4) Collapse potential area must be protected by supports and/or protection nets. "Keep Out" sign must be set up. (TCVN 5308:1991, Article 12.1.7)

(5) Lightings must be set up for night works. (TCVN 5308:1991, Article 1.19)

(6) A safety slope must be kept. (TCVN 5178:1990, Article 1.3)

(7) Overhang excavation is prohibited. (TCVN 5308:1991, Article 12.1.13)

(8) Are drainage facilities and surface drainage set up? (TCVN 5178:1990, Article 2.1.1)

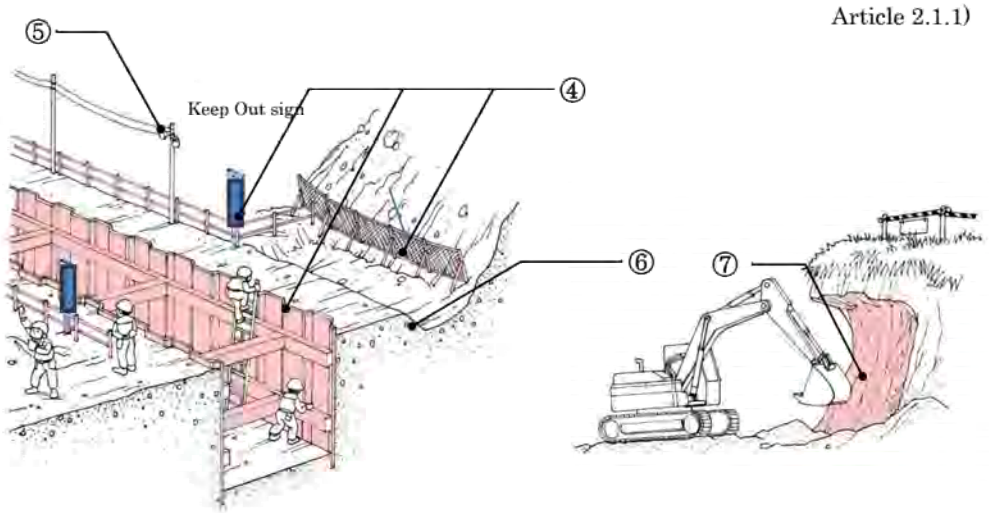


Figure 11.6.2 Prevention of Danger Caused by Collapse/Rolling (Manual, Chapter III, Sample)

4. Prevention of danger caused by construction equipment

4.8 Slinging works

Precaution for slinging works is highlighted in this clause. The most suitable slinging tools must be chose based on the weight and shape of load.

Check points ***(Refer to: TCVN 4244:1986 Code for the safe technique of crane. Equipment; TCVN 5308:1991 Code of practice for the building safety technique)***

(1)	Check the damage of sling wire such as shapeless and cut	(TCVN 4244:1986 Appendix 4)
(2)	Unifilar wire is not recommended to hang loads. Prural wires should be used.	(TCVN 4244:1986 Article 5.2.12~14)
(3)	When load off the ground, lifting must be stopped and keep the load stable. Can not lift and move horizontally at the same time.	(TCVN 4244:1986 Article 6.5.14,e)
(4)	Sling wires must be protected by pads at the acute angle corner of loads.	(TCVN 4244:1986 Article 5.2.2)
(5)	Sleepers must be laid down under the loads.	(TCVN 4244:1986 Article 6.5.14,j)
(6)	No person can stand under the loads.	(TCVN 4244:1986 Article 6.5.14,g)
(7)	A lead rope must be used to handle the long load.	TCVN 5308:1991 Article 17.1.10)
(8)	A signalman must be arranged for the crane works.	(TCVN 4244:1986 Article 6.4.7)
(9)	An angle between two wires must be less than 60°	(TCVN 4244:1986 Appendix 3)
(10)	Check the damage of hook, shackle and other metal attachments	(TCVN 4244:1986 Article 6.4.18)

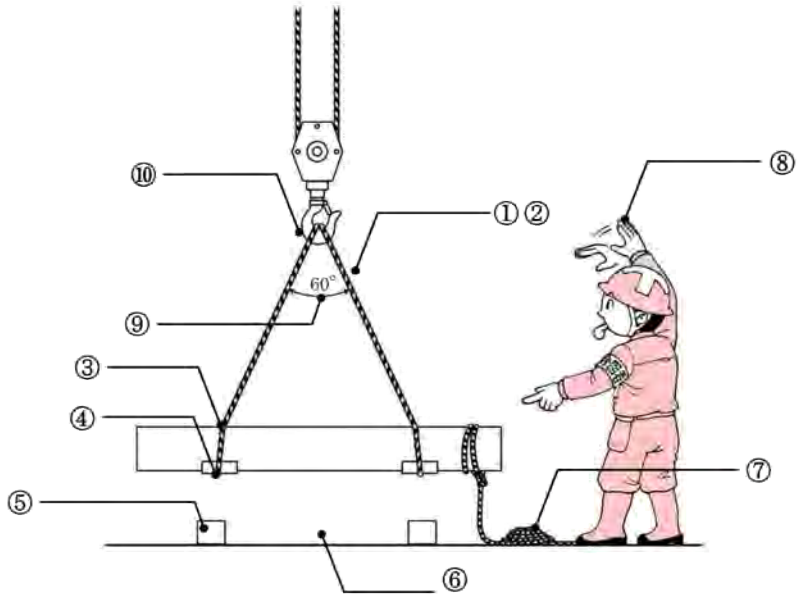


Figure 11.6.3 Prevention of Danger Caused Construction Vehicles (Manual, Chapter III, Sample)

11.7 CASE STUDY HANDBOOK ON LABOR ACCIDENTS AND NEAR-MISS INCIDENTS

It is expected that the handbook is practically used by staff of MOC and other related people in Vietnam to reduce accidents. All examples are shown with pictures for easy understanding by workers.

The Project team selected 93 samples of labor accidents and near-miss incidents out of 542 samples. These 93 samples were translated into English and Vietnamese. However, only 43 samples are employed for this handbook after close discussion with the counterparts who know the construction circumstance in Vietnam very well. 50 samples which are not used for the handbook are stored in disks, so that MOC can easily replace samples in the handbook to other samples according to the target people of handbook. The final version of the handbook and electric data were submitted to MOC on December 7th, 2012.

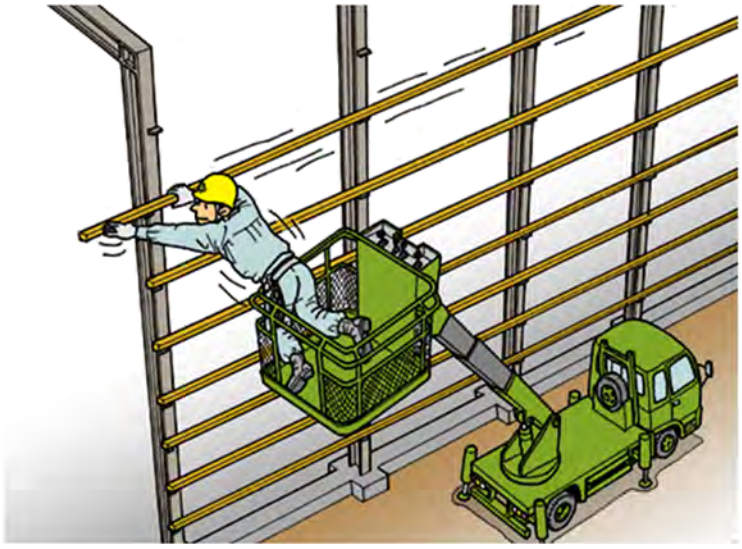
Figure 11.8.1, **Figure 11.8.2**, **Figure 11.8.3** and **Figure 11.8.4** shown on next pages are samples of this Handbook.

11.8 MANAGEMENT OF MANUAL AND HANDBOOK

Safety management of construction continues for many years in Vietnam. Accordingly, it is necessary to improve, revise and correct the manual and handbook on its continuous process of safety management. Therefore, it is recommended that MOC manages the "Safety and Health Manual in Construction" and "Case Study Handbook on Labor Accidents and Near-Miss Incidents".

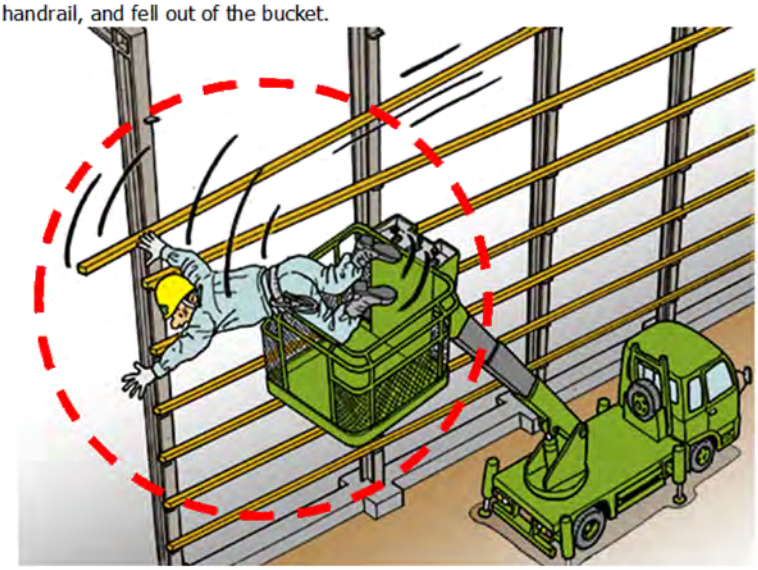
What kind of accident is about to happen?

When trying to attach furring strips (the base materials for a wall) to a steel frame, the worker is extending his reach from an aerial lift while working alone.
Can you predict what's about to happen?



Look what happened!

The worker reached out too far from the work platform, allowed his upper body to extend beyond the handrail, and fell out of the bucket.



Tips for preventing similar accidents

1 Place the aerial lift at a height and location where work can be performed comfortably, and ensure that work can be performed safely from that location.
2 Always use a safety belt when performing aerial work, even on the working platform.
3 Ensure that all relevant workers are familiar with the work procedures for performing aerial work.

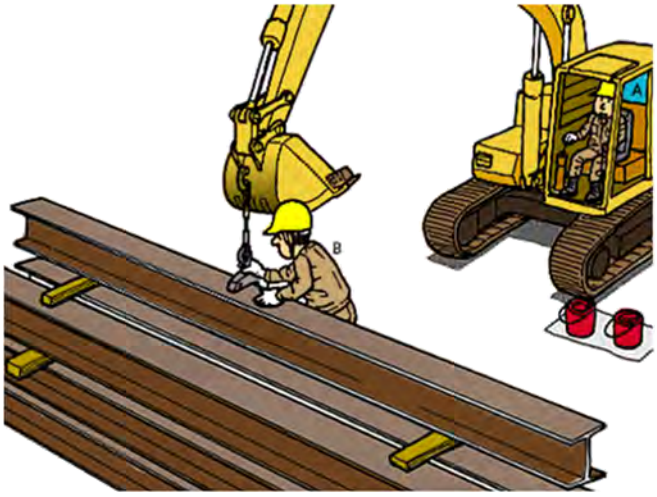
Figure 11.8.1 Case Study (Sample-1)

What kind of accident is about to happen?

In a material stock yard, an operator worker A and another worker B are working in pair using a hydraulic excavator. Their job is to paint the surfaces of the I-beams one by one that are stacked up there. First the topside of an I- beam is painted. Then it is turned over with a lateral slinging clamp hung to a hook fixed to the bucket of the hydraulic excavator and the rear side is painted. After painting on both sides, it is stacked up using the same clamp.

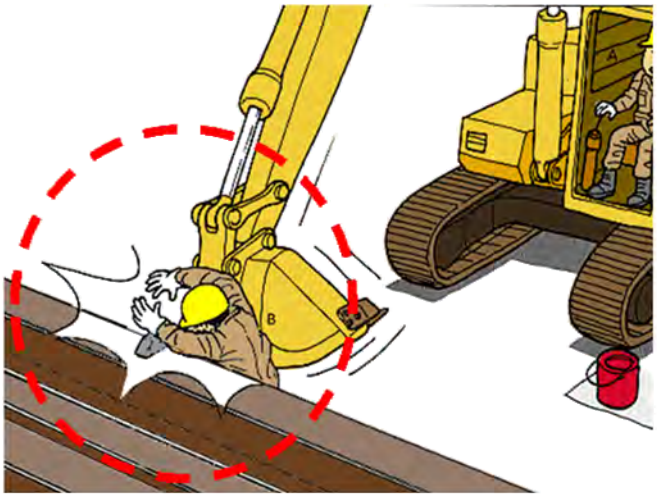
The operator A has finished a special training course for operating movable type cranes, but has yet to finish a training course for operating construction vehicles, and so far has little experiences with them.

Now what accident do your anticipate from this picture?



Look what happened!

The worker B was trying to unfasten the clamp from an I-beam that has finished painting, when the inexperienced operator A moved the bucket control lever by mistake. The bucket hit the worker B hard on the chest and killed him.



Tips for preventing similar accidents

1 Do not allow any worker to operate construction vehicles without the required license.
2 Post a signalman where a job obliges a worker to enter and there is the danger of bodily injuries to him/her by a possible contact with a construction machine in operation.
3 Do not allow a construction machine to be used for any other purpose than its primary application.

Figure 11.8.2 Case Study (Sample-2)

Examples of Near Misses and Near Accidents

Remembering he has forgotten to support the boom cylinder on a wheel loader.

What happened!

A mechanic has come back to it and pulled the connecting pin. Then the cylinder dropped and nearly hit him.

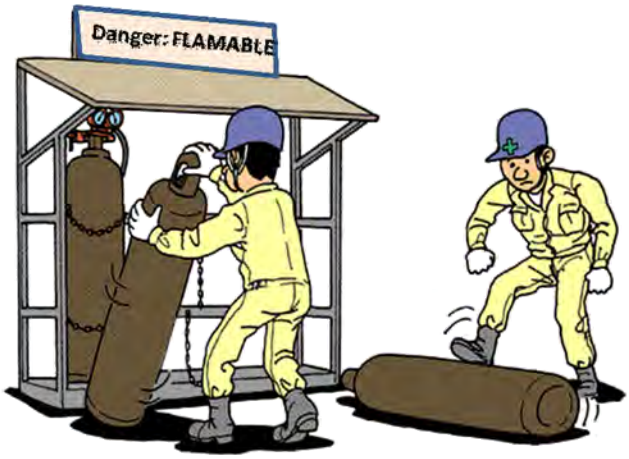
Corrective Action

Ensure that the boom cylinder is suppoerted by the props or bracing before pulling off the connecting pin.

Figure 11.8.3 Case Study (Sample-3)

Examples of Near Misses and Near Accidents

Workers A and B are replacing oxygen cylinders in a cylinder installation yard. Worker A is now taking down an empty cylinder weighing 50 kg, while Worker B is kicking off a new cylinder to move it to the yard. It is charged with oxygen at the pressure ratio of 150 kg/square cm.



Various Points of Hazard

1 The two workers do not use a special cart for transporting gas cylinders. There is the danger of damage to both the workers and the cylinders alike.
2 If a highly pressurized gas cylinder is rolled over the ground, there is always the danger of gas leakage.

Figure 11.8.4 Case Study (Sample-4)

CHAPTER 12 DEVELOPMENT OF TRAINING SYSTEM AND TRAINING PLANS (ACTIVITY-7)

12.1 DEVELOPMENT AND IMPLEMENTING TRAING PROGRAMS

(1) Concept of Development

In order to enhance capacities of construction project management and quality assurance, dissemination of capacity enhancement plans to the end users is also an important issue in addition to the development of capacity enhancement plans. Current practices of training programs in MOC, including information dissemination and training programs, has explained that there are two major training programs implemented by MOC;

- Information dissemination mainly for the enforcement of new regulations and technical standards, and
- Training programs for enforcement of regulations on engineer qualifications and for enforcement of regulations and technical standards.

The former is conducted with free of charge by the MOC departments in charge of preparing regulations. It is implemented in the form of seminars or workshops, and in general three opportunities are given to the stakeholders for the enforcement of one new regulation.

The latter is conducted based on a business scheme. For instance, any training centers, which are approved by MOC and given business licenses, can provide training courses on engineer qualifications in response to the market demands. In this context, CQM can also play a role of giving training programs to the public, making use of its business license. In this respect, CQM is not a representative organization authorized by MOC.

The document and interview surveys conducted in the Project have revealed that understanding of regulations and awareness about construction quality assurance and labor safety are not high due to lack of training programs and training opportunities, in particular for the stakeholders in the regions. In fact, stakeholders' demands for the capacity enhancement programs may differ depending upon stakeholders. Taking this point into consideration, training programs should be carefully planned.

Focus points of this activity are as follows.

- Conduct a baseline survey and develop recommendations on the capacity enhancement plans for MOC training programs.
- Develop during-project training programs for the dissemination of project outputs and implement training programs.
- Develop post-project training programs for the dissemination of project outputs.

(2) Methodology

1) Conduct a Baseline Survey and Develop Recommendations on the Capacity Enhancement Plans for MOC Training Programs

Before going into main topics of this activity that includes planning of during-project and post-project training programs and their implementation, the Project thoroughly conducted a baseline survey on the current MOC training programs and makes a brief recommendation on the comprehensive training programs in MOC provided by the Academy for Managers of Construction and Cities (AMC). In this activity, analysis will be conducted including training program demand analysis, stakeholders' analysis, training program analysis and training implementation body analysis, taking account of not only project outputs, but also future expectation of construction works and construction quality assurance in the future.

2) Develop During-project Training Programs for the Dissemination of Project Outputs and Implement Training Programs

The Project will develop during project training courses for the purpose of technology transfer and raising lecturers and implement these training courses. The Project plans basically two times of training courses in Vietnam in a year. However, the number of the training courses may change subject to the implementation of other seminars and workshops handling with similar topics of construction project management and quality assurance. In particular, as project outputs to be disseminated to the stakeholders are expected to come out in the latter half of the project period, during-project training programs may change their nature from training programs on the project outputs to information dissemination to stakeholders, which cover the subjects such as the principles of construction work management and their quality assurance, introduction of foreign practices and so forth,

3) Develop Post-project Training Programs for the Dissemination of Project Outputs.

Post-project training programs will be developed to disseminate project outputs on the basis of the following design concepts;

- To transfer practical technologies to the direct stakeholders to be involved in the tasks assigned by project outputs,
- To disseminate technologies or information needed for each stakeholder, and
- To diversity training implementation bodies in cooperation with private sectors.

The training programs will be developed in accordance with the following steps. In formulating training programs, following the above concepts, care should be paid not to put

much workload to MOC, so that phased programs and cooperative training with private-sector would be incorporated in the draft training programs.

- To identify project outputs
- To identify stakeholders
- To clarify stakeholders' task assignments that will be the requirements for technology transfer.
- To select training program implementation methods
- To develop training programs

(3) Outputs

Following output are produced through the activity.

- Recommendations on Capacity Enhancement Plans
- Training programs for During and Post Project
- Implementation of Trainings

12.2 CURRENT STATUS OF SCHOOL EDUCATION AND TRAINING IN THE CONSTRUCTION SECTOR

The Baseline Survey herein conducted started with a macroscopic survey on school education and training programs in Vietnam, as universities and colleges in Vietnam in the construction sector often offers training courses.

12.2.1 School Education Involved in the Construction Sector

(1) General View of Organizations Involved in School Education

The ministries who are responsible for the state management of school education in the construction sector are the Ministry of Education and Training (hereinafter MOET), the Ministry of Construction (hereinafter MOC) and Ministry of Labour, Invalids and Social Affairs (hereinafter MOLISA). MOET is responsible for the state management of all types of school education while MOC functions for the state management in construction with MOET for professional upper secondary education and vocational upper secondary and College program, and so does MOLISA for the preliminary vocational program for less than one year within the framework of vocational training. **Figure 12.2.1** shows structure of school education and training programs.

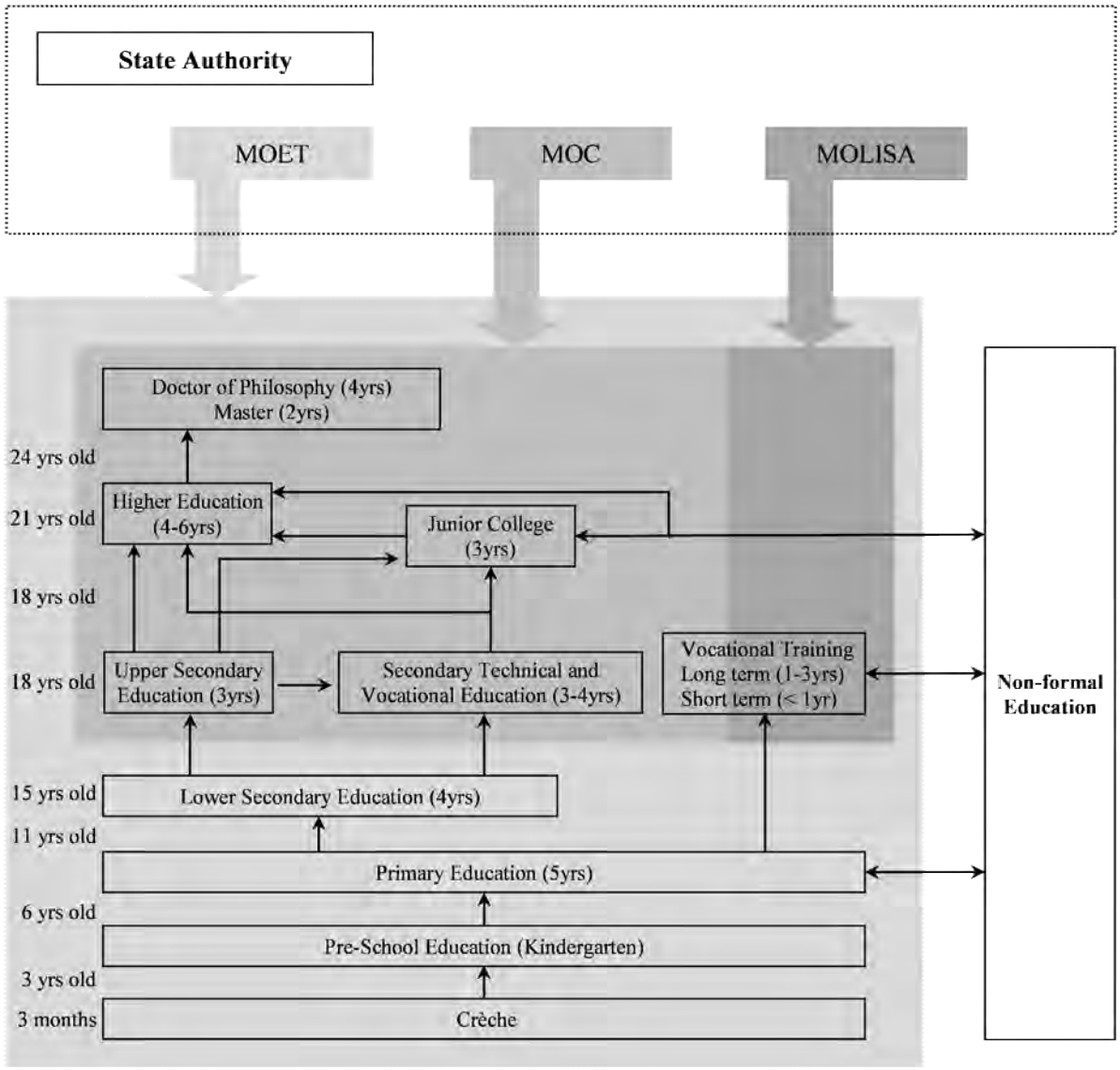


Figure 12.2.1 Structure of Formal Education and the State Management in the Construction Sector

Source: Ministry of Education and Training (http://en.moet.gov.vn) for the part of "Education Framework".

Note: (1) In the MOET web site, the chart is name as "Education Landscape" and noted as "Updated on 02/10/06".

(2) The above part, "State Management Authority" with the abbreviation of the three ministries with the attached arrows from the ministries are added at the Report Draft Meeting on 8 September, 2011.

(3) About the Responsibilities of the MOET, please see the above section on legal backgrounds and documents, especially about Decree 115/2010/ND-CP dated 24/12/2010. MOET is responsible for the state management in Education in general. In other words, all schools and institutes indicated in the chart are under the state management of MOET.

(2) Number of Implementation Bodies under MOC

There are 33 schools and institutions in the formal education sector under MOC[1] as shown in **Table 12.2.1**.

Table 12.2.1 Number of Schools under MOC

	Universities	Academy of Managers	Construction Technical Colleges	Construction Technical Secondary Schools	Vocational Colleges of Construction	Vocational Secondary Schools of Construction	Total
Total in Construction	2	1	6	10	7	7	33
MOC	2	1	6	1	1		11
Enterprises				7	6	4	17
Localities				2		3	5

Source: *The Master Plan on Human Resource Development of the Construction Period 2011-2020 (MOC, March 2011),Page 17, "Table 7: Network of training establishments under the Construction sector according to the level of training", Page 13, Table 9: " system of training network under the Construction Sector according the decentralized management "*

Note: *i) In the original text the table is separated into two as noted above.*

ii) "Academy of Managers" is correctly the Academy of Managers for Construction and Cities.

iii) The two postgraduate institutes, Vietnam Institute for Building Science & Technology (IBST), and the Vietnam Institute of Architecture, Urban & Rural Planning are excluded in the original table, although the Master Plan indicates them in the main text (Page 17).

(3) Training Courses and Participants under MOC

According to the statistics available in the Master Plan 2011-2020[2], the number of trainees in the formal education sector has increased at every education level since 2004, and led to the accumulation of more than 278,000 persons as trained. The majority of trainees are produced through vocational schools that train about 70 percent of trainees in the formal education sector for construction. **Table 12.2.2** shows numbers of trainees through school education under MOC. In the table, the «Full-time training» is equivalent to a regular course, «Not full-time training» an irregular course and «Nomination training» is one which does not use state budgets, but financed by individual trainees or companies on a contract basis.

[1] Master Plan on Human Resource Development of the Construction Period 2011-2020 (hereinafter, Master Plan 2011-2020)
[2] Master Plan on the Human Resource Development of the Construction Sector Period 2011 -2020 (published by MOC in November, 2010

Table 12.2.2 Number of Trainees through School Education under MOC

	Sum of 2004-2010		2009		2010 (estimated)	
Training level	**Number**	**%**	**Number**	**%**	**Number**	**%**
Postgraduate	1,281	0.46	233	0.51	245	0.48
Doctor (PhD)	77	0.03	13	0.03	15	0.03
MA	1,204	0.43	220	0.48	230	0.46
University	18,345	6.61	3,136	6.83	3,448	6.82
Full-time training	10,845	3.92	1,699	3.70	1,867	3.70
Not full-time training	7,182	2.58	1,377	3.00	1,511	2.99
Nomination training (without examination)	318	0.11	60	0.13	70	0.14
College	14,476	5.15	3,079	6.70	3,386	6.69
Full-time training	12,459	4.47	2,321	5.05	2,553	5.05
Not full-time training	1,976	0.67	744	1.62	813	1.61
Nomination training (without examination)	41	0.01	14	0.03	20	0.04
Secondary schools	39,887	14.33	6,623	14.42	7,328	14.49
Full-time training	35,797	12.86	6,120	13.33	6,775	13.41
Not full-time training	4,017	1.44	503	1.10	543	1.07
Nomination training (without examination)	73	0.03		0.00	10	0.02
Vocational training	204,427	73.43	32,855	71.54	36,140	71.54
Long-term	101,450	36.44	14,848	32.33	16,332	32.33
Short-term	102,977	36.99	18,007	39.21	19,808	39.21
Total 1	**278,416**	**100.00**	**45,926**	**100.00**	**50,547**	**100.00**

(4) Training Courses and Participants outside of the MOC's State Management

In the construction sector, there are people who are educated or trained at schools outside of the state management of MOC. **Table 12.2.3** summarizes the numbers at different levels of education. According to the table, almost 200,000 trainees are trained in the formal sector outside the MOC supervision since 2004, leading accumulation of increasing numbers of trainees from 33,000 in 2004 to 44,000 in 2010. These are as great as of the 70 % of the number of trainees produced under MOC. The majority of profession is "Industrial & Civil Engineering" followed by "Transportation Engineering" and "Water Supply and Drainage Profession".

Table 12.2.3 Number of Trainees through School Education outside of the MOC State Management

Training system	Outside of MOC related schools / institutes													Sub Total	
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*K*	*L*	*M*	*N*	*P*	*Q*
	Industrial and Civil Engineering	Transport Engineering	Water supply and Drainage	Urban waste management	Construction economics	Architectural design	Construction machinery	Building material production	Plaster	Concrete	Steel structure professing	Carpenter work, scaffolding	Others	Outside of MOC	And Upper
Total since 2004														0	
Postgraduate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
University	14,230	6,450	2,230	1,730	2,360	5,485	1,345	0	0	0	0	0	4,080	38,210	38,210
College	24,170	6,775	1,760	1,325	2,620	50	1,055	0	0	0	0	0	0	37,755	75,965
Professional secondary school	38,405	16,820	1,510	1,270	1,080	100	2,610	0	0	0	0	0	600	62,395	138,360
Vocational training	32,115	5,170	11,740	0	0	0	6,040	2,300	1,180	210	1,850	530	250	61,385	199,745
Year 2009														0	
Postgraduate														0	0
University	2,480	1,120	215	495	380	1,030	130							5,850	5,850
College	7,615	1,375	335	605	645		345							10,920	16,770
Professional secondary school	5,580	2,575	175	150	160		370							9,010	25,780
Vocational training	480	300	120											900	26,680
Vocational secondary school	900	250	1,150				2,300	300	220	40	250	60		5,470	32,150
Technical worker	9,540	750	3,100					300	250	60	270	100		14,370	46,520
Year 2010														0	
Postgraduate														0	0
University	2,120	1,140	325	225	330	1,055	165							5,360	5,360
College	5,135	1,490	150		295		430							7,500	12,860
Professional secondary school	5,395	2,645	120	190	190	100	360							9,000	21,860
Vocational training	470	300	50											820	22,680
Vocational secondary school	880	730	1,411				1,200	100	180	30	230	60		4,821	27,501
Technical worker	12,830	870	2,725					250	300	60		90		17,125	44,626

Source:

The Master Plan on Human Resource Development of the Construction Period 2011-2020 (MOC, March 2011), Appendix 8: The number of people being trained at schools outside of the MOC every year.

Note: *i) The table limits the information within the Accumulated figures since 2004, in 2009, and in 2010 although the original data covers all year since 2004.*

ii) "Total Since 2004" is calculated from the 5 years data (from 2004 to 2008).

iii) Sub-Total is also calculated and added by the draft writer of the report.

iv) The column of "And Upper" is calculated as the addition of the column from the top to the equivalent line.

For example, the data of college and upper is the addition of the number of universities and college, and the professional secondary school is the addition of the professional secondary school, college, and universities.

12.2.2 Short-term Training Courses in the Construction Sector

(1) General View of Short-term Training Courses in the Construction Sector

The related organizations working for short-term training courses under the state management of MOC can be seen in **Table 12.2.4** .

Table 12.2.4 Organizations Working for Short-term Training under the MOC's State Management

	Organizations (Including the MOC Department)
Authorities	SACQI, CAMD, CQM, Science and Technology Department, Organization and Personnel Department, Economic Department
Implementers	Universities and Colleges under the MOC, Academy for Mangers of Construction and Cities (hereinafter, AMC), and Private / Joint Stock Enterprises
Organizations to be targeted	DOCs, CICs, Private and Joint Stock Enterprises (Contractors and/or Consultants)

(2) Organizations Short-term Training Courses

Table 12.2.5 summarizes Authorities for State Management and Implementers of training courses.

Table 12.2.5 Short-term Training Courses Authorized by MOC and their Implementers

No.	Main Subject / Course Title	Authority for State Management	Implementers					
			Associations	University and Colleges	Academy	CQM	Institutes	Private Enterprises
1	Supervision	SACQI, CAMD	X	X		X	X	X
2	Project Management	SACQI, CAMD	X	X		X	X	X
3	Inspection	SACQI		X		X		
4	Cost Estimation	Economic		X			X	X
5	Material Testing	SACQI, CQM, ST				X	X	
6	Site Management	N/A	X	X	X	X	X	X

Table 12.2.6 Number of Qualification Training Implementers Authorized by MOC

	Project Management	Supervision	Cost Estimation	Training for Testers
Associations	3	5	4	-
Institutes including Academy and CQM	5	4	9	2
Universities/ Colleges	5	13	7	-
Enterprises	13	11	23	1
Total	26	33	43	3

Source: SACQI, MOC

Note: 1) The categorization of implementers is discussed at the Meeting on 16 September, 2011.

2) The total number of training centers for supervision is 39 as of November, 2011.

3) The location of the authorized training center for supervision" as follows; Hanoi: 26, Da Nang: 2, Binh Duong: 1, Dong Nai: 1, Ho Chi Minh City: 6, Nam Dinh: 1, Phu Yen: 1, and Quang Ninh: 1.

Table 12.2.7 shows the targets of short-term training courses. The implementers of qualification training are authorized by the relevant department in MOC.

Table 12.2.7 Targets of Short -term Training Courses

No.	Main Subject / Course Title		Implementers		Target Category		Qualification	
			Positions	Organizations	Private	Public	Qualified	Not
1	Supervision	SACQI, CAMD	Any	DOCs, Contractors	X	X	X	
2	Project Management	SACQI, CAMD	Any	DOCs, Contractors	X	X	X	P
3	Inspection	SACQI	Supervision	DOCs, Contractors		X		X
4	Cost Estimation	Economic	Any	DOCs, Contractors	X	X	X	
5	Material Testing	SACQI, CQM, ST	Lab Staff	DOCs, Contractors	X	X		X
6	Site Management	N/A	Any	DOCs, Contractors	X	X		X

(3) Short-term Training Courses Organized by CQM

1) Overview of Training Course by CQM

In 2010, Viet Nam Center for Technology of Construction Quality Management (hereinafter as CQM) implemented 35 training courses as seen in **Table 12.2.8**. Among them, training for Inspection and training of Verification of Construction Qualification Skill are considered as directly related to the CQM's original tasks. However, from the point of view of number of courses and targeted people, training for Project Management and Supervision also take great parts for its implementation, almost the same or greater parts compared to the CQM's original tasks. Among these training courses, Project Management courses are implemented upon the request by corporations.

CQM cannot implement training courses with experiment related training courses as it does not have laboratory facilities. Only those implementers with laboratories such as the Institute of Building Science and Technology (hereinafter, IBST) can conduct training courses at the practical levels such as training for Testers (noted in the Table) for Quality Assurance of Construction.

Table 12.2.8 Short-term Training Courses by CQM in 2010

Program Type	Program Title	No. of Courses	Attendants	
			Number	Man * Day
Training	Training of Management of construction building investment project skill	8	620	3150
Training	Training about Construction supervision skill	3	280	1680
Training	Training of Inspection and Certification of full satisfaction of Force-bearing	3	145	290
Training	Training of Verification of construction qualification skill	5	554	2216
Training	Training of Site manager	5	505	1515
Training	Training of Tender skill	5	394	1182
Seminar	Sciences seminar "Photometric System with Construction Qualification"	2	400	400
Other	Disseminate the Normative Law of Construction inspection	3	224	672

Source: CQM, MOC

Table 12.2.9 Short-term training courses by CQM from 11/2012 to 8/2013

Program Type	Program Title	No. of Courses	Attendants
Training	Improvement of Project Management	3	180
Training	Improvement of Supervision Skill	3	218
Training	Improvement of Construction Quality Inspection Capacity	3	142
Training	Improvement of Making Bill of Quantity and Cost Estimation Qualification	1	70
Training	Guidance on Making Built-in Document and Payment Document	1	68
Training	Improvement of Qualification of Site Manager	1	62
Training	Improvement of Project Evaluation Qualification	2	139
Training	Improvement of Tendering Qualification	1	145
Training and Disseminating Rules and Regulations	Training courses to disseminate outputs of the Project for Capacity Enhancement in Construction Quality Assurance sponsored by JICA	6	823
Training and Disseminating Rules and Regulations	Training courses to disseminate construction related relevant rules and regulations	11	2,180

2) Teaching Methods

Teaching methods taken in training courses implemented by CQM is 'Lecturing' by a teacher to trainees. This may be related to the fact that the attended number in a course / class is great. The problem that the training does not directly involve the practical technologies at the

construction sites is also found in **12.2.2(6) Short-term Training Courses for Public Servants**, and **12.2.5 Major Findings in the Study.**

(4) Short-term Training Courses at Universities, Colleges, Academies and Others

Table 12.2.10 shows the examples of Short-term training courses conducted by two universities and an association. As can be seen in the table, short-term training courses held by the two universities are in somehow related to qualification training courses; Supervision (Sp in the table), Cost Estimation (CE), and Project Management (PM) that is stipulated in the same document, Circular No.25/2009/TT-BXD, with the training courses for Supervision. According to the responsible of SACQI, this situation can be related to the facts ; 1) these courses can easily attract participants, and 2) training course fees are fixed.

On the other hand, the Vietnam Federation of Civil Engineering Associations (Hereinafter, VFCEA) implemented other types of training courses such as 'Green Architecture, sustainable development and energy saving' that follows the recently promulgated law for environment, and 'Development Consultancy for Region'. These training courses target workers at MOC and the Departments of Construction (hereinafter, DOC), however, they are out of the framework of the training courses for capacity development organized by Department of Personnel and Organizations and other departments of MOC. These training courses are implemented with the support of organizations abroad.

The baseline survey clarified that the trend of focusing on the training courses for qualification is found not only with universities but also with the departments of MOC.

Table 12.2.10 Example of Short-term Training Implementation in 2010

Implementer of training courses	Implemented training courses	Subjects / Topics of Training courses, Seminar, & Workshop			Total attendants	<Day x Man> in Year 2010			
		T	S	W		Total	T	S	W
University of Technology	15	Sp, CE, PM			760	10,372	10,372	0	0
HCMC University of Technology	10	Sp, PM			618	8,205	8,205	0	0
VECAS	18	Tn, FIDIC, Sp, GA	DC	NA, IC	985	1,890	1,020	345	525

Source: Questionnaire collected through the baseline survey

Note: 1) Abbreviation in the Table

T=Training, S=Seminar, W=Workshop, Sp=Supervision, CE=Cost estimation, PM= Project Management, Tn=Tendering, FIDIC = Federation Internationale des Ingenieurs –Couseils (International Federation of Consulting Engineers), GA=Green Architecture, sustainable development and energy saving, DC=Development Consultancy for Region, NA= New Approach and Solution to renovation of consultancy business, IC=Idea Contribution to Planning for Hanoi Capital HCMC= Ho Chi Minh City, VECAS = Vietnam Engineering Consultant Association

2) The HCMC University did not answer the days spent for each training course. There the calculation of <Day x Man> are based on the assumption that the university spend the regulated number of day for the qualification training courses.

(5) Short-Term Training Courses for CIC Staff Members

Although CQM is expected to play a role as a major part of training organization for CIC staff training, there are other training implementers involved.

Table 12.2.11 also shows examples of training courses that staff members of four (4) CICs attended to in 2010. As the right part of the above table shows, the staff members of Dak Lak and Da Nang CICs do not have any opportunities to attend training courses directly related to laboratory practicality. Even those staff members of the Saigon CIC where many staff members have training opportunities, the training courses are limited to a one-day training course and a workshop when 105 members and 150 members attended to respectively.

The situations can be summarized that there is not enough training courses for practical techniques targeting CIC staff members. This is very similar to the training courses for Short-term training courses, and also the training courses for public servants in general where there is significant lack of practicality at the actual site level knowledge and skills.

Table 12.2.11 Example of Training Courses that CIC Staff Members Attended in 2010

CIC Name	Total Number	Staff Under 30 years old		<Day x Man> of Training course, seminar & workshop				<Day x Man>	<Day x Man> Laboratory related trainings			
		No.	%	l/o	T	S	W	Total	l/o	T	S	W
Sai Gon	217	45	20.74	2y x 2	105	0	150	255	?	105	0	1 x150
Dak lak	26	12	46.15	0	143	2	0	145	0	0	0	0
Da Nang	22	6	27.27	0	0	14	0	14	0	0	0	0
Nam Dinh	62	15	24.19	35	811	0	35	846	7 x 5	5 x 2 20 x 3 18 x 9	0	0

Source: Questionnaire collected through the Baseline Survey

Note: i) This table is made from the training course lists that they submitted.

ii) l/o=Long Term Training or overseas training, T=Short-term Training, S=Seminar, W=Workshop,

iii) 2y x s in the Saigon CIC row means that the CIC now has two master trainees. As the subjects or the major are not known, "<Day x Man> Laboratory Related Trainings" is marked "?".

iv) No. is the number of staff members under 30 years old.

(6) Short-term Training Courses for Public Servants

1) Organizations Involved in Short-term Training Courses for Public Servants

The organizations working for short-term training courses for Public Servants who belong to MOC, DOCs and other local governmental offices are summarized in **Table 12.2.12.**

Table 12.2.12 Organizations Working for Short-term Training for Public Servants

	Organizations (Including the MOC Department)
The Responsible in MOC	Department of Personnel and Organizations
Other related	Department of Planning and Finance
Implementer of Training Courses	AMC
Organizations that have training target individuals	Departments in MOC, DOCs

For details in relation to these organizations for the planning, monitoring and evaluation please see **12.2.4 Planning, monitoring and evaluation of education and training in the construction sector**

2) Training Courses

Short-term training courses for Public Servants are planned and managed by the Department of Personnel and Organizations and Academy for Managers of Construction and Cities (hereinafter as AMC). **Table 12.2.13** shows the list of training courses implemented by AMC. The table has summarized that there are 23 courses where 15,825 trainees attend to 217 classes in total. AMC also conducts training courses on international cooperation, for foreign languages, and for refreshers. Therefore AMC accommodates about 21,000 trainees in a year. It is observed that a number of trainees in a class are great in some courses. This could be considered with relation to the teaching style of lecturing to trainees.

In the list, the first training course, Grade Promotion (or Grade-up) Training[1] in the category, G-3 is implemented by AMC under the state management of Ministry of Home Affaire (hereinafter, MOHA).

[1] Grade-up training is the training course that one needs to attend to for promotion from ordinary level to Expert, Chief Expert, then to Senior Expert, with the duration of three, two and one month/s respectively. Within the three training courses, the training for Expert is implemented at AMC while the training course for Chief expert is done at the Institute of Public Administration under MOHA, where trainees from other ministries. At the Grade-up training framework, there is no specific training on construction except to be treated as a case study, however, trainees mainly study three subjects of A) Public Administration, B) Political Argument, C) Computer & foreign language (English).

Table 12.2.13 List of Training Courses Implemented by AMC in 2010

Category	No.	Training Course Title (Types)	Basic Data			Target of Training Course		
			Number of classes	Total number	Avg. number	Qualification	Civil Servants only	Local level
G-1	II	Training of Supervision	38	2,896	76	✓		
	III	Training of Construction Valuation/Tendering	23	1,391	60	✓		
	VI	Training of Real Estate Business	4	158	40	✓		
	XVII	Training of Cost Estimation	2	50	25			
G-2	I	Training of Project Management /& Consultancy	44	3,237	74		✓	
	IV	Training for Director for Project Management Consultancy	3	105	35		✓	
	V	Training for Site manager	13	529	41		✓	
	VIII	Training for Inspector of Construction	2	145	73			
G-3	VII	Training of Grade Promotion Examination of Enterprise, Experts and Chief Experts	5	223	45		✓	
	XIX	Training of Public Administration	1	145	145		✓	
G-4	X	Training of Construction Management for Professional of communes	11	1,022	93		✓	✓
	XI	Training of Urban Management for Professional of communes	19	1,063	56		✓	✓
	XII	Training of Construction Planning for New rural area	22	2,876	131		✓	✓
	IX	Training of legal knowledge of People's Council of all level	3	235	78		✓	✓
G-5	XIII	Training of legal knowledge and construction inspection	8	653	82			
	XIV	Training of Document of As-built, acceptance, payment and liquidation	2	102	51			
	XV	Training of enterprise audit	2	76	38			
	XVI	Training of leading skills for enterprise management	8	343	43			
	XVIII	Training of Practice for quantity estimation and formulation of Bill Quantity	1	28	28			
	XX	Training of knowledge and skill for factory manager	1	53	53			
	XXI	Training of quality management	1	22	22			
	XXII	Training of Political Argument K18	1	120	120			
	XXIII	Other training	3	353	118			

Source: Department of Personnel and Organizations

Note: The categorization of the training courses are as follows; G-1: Training Courses for Qualification, G-2 : Training Courses that involve trainees out of public servants, G-3: Training Courses that target only public servants, G-4 : Training Courses that target only public servants at local levels, and G-5 : Training Courses out of the above noted categories.

12.2.3 Legal Documents on Education and Training Systems in the Construction Sector

(1) Legal Documents on School Education

In the Vietnamese legal system, all legal documents on school education is under the Education Law (No: 38/2005/QH11), with its Amending and Supplementing articles of the

Education Law (No. 44/2009/QH12), which stipulates the formal education in general. In the law, Article 32 defines the category of professional education into the two main categories, professional upper secondary education, and vocational training as noted in the next table.

Table 12.2.14 Categorization of Professional Education
(Article 32 of the Education Law)

Category of Education		Duration to be required	Requirement Level for Learners
Professional upper secondary Education		Three to four years	Lower secondary education diplomas
		One to two years of studies	Upper secondary education diplomas
Vocational Training	Vocational upper secondary and college program	One to three years	(not noted)
	Preliminary vocational program	Less than one year	(not noted)

In case of the construction sector, legal documents for professional upper secondary education and vocational upper secondary and college programmers, most part of the above table except the last line, are usually issued by MOET alone or by both of MOET and MOC. Legal documents for primary vocational program, the last part of the table, are issued by both of MOET and MOLISA. This categorization matches to the responsible organizations or ministries of the state management of education and training programmers

(2) Legal Documents on Short-term Training

The legal document in relation to short-term training courses[1] are mainly issues by MOC. There is no comprehensive legal document on the state management of short-term training under MOC. There are three types of legal documents from the point of view of how to deal with short-term training courses in the construction sector.

- Qualification training courses stipulated in the designated legal documents
- Training courses stipulated as one of the functions of the related organization, and
- Non-official / Qualification training courses stipulated in legal documents on a particular issue in the construction sector.

In the first category, there is Circular on the training of Project Management and Specification[2].

The organizations targeted in the second category, for example, are MOC and DOCs. Within the framework of the state management by the organizations, the needs of administrative

[1] About the qualification training course for supervision, please see <3.11 Construction Supervisor Qualification System > in details.
[2] Circular 25/2009/TT-BXD: Guidance on Professional Training of Construction Investment Project Management and Construction Supervision.

management of the training and information dissemination on technical and practical issues is stipulated[1].

Safety Management is an example in the third category. In the Circular[2] on labor safety in work construction, project managers are required for the provision of training opportunities on safety[3], while workers are required for training[4].

(3) Legal Documents on Training for Public Servants

In relation to training courses for Public Servants who belong to MOC and DOCs, Decision No. 959/ QD-BXD (dated on 3rd Nov, 2011) on "issuance of planning for training and retaining for staff and public servants of MOC for the period of 2011 – 2015" stipulates the ways of planning (please see the part on organizations).

12.2.4 Planning, monitoring and evaluation of education and training in the construction sector

Every decade, the Master Plan on Human Resource Development of the Construction[5] analyses and evaluates the situations of education and training in the construction sector, and then plans the education and training activities in the sector for the next decade. While planning, monitoring and evaluation of (1) School Education and (3) Training for public servants are effectively conducted as follows, there can be found problems for (2) Short-term Training.

(1) Planning, Monitoring and Evaluation of School Education

The data of enrolment and complement of the courses of each school are also collected and analyzed every year. The result of analysis is reflected to the targeted number of enrolment of each school and education level. Allocation of teachers and budgeting for school education are also based on these data. In 2012, MOC expects the total enrolment of 24,296 students that can be broken down to 51 at PhD, 340 at Masters, 3,375 at Universities, and 6,600 at College level (all the above-noted are for full-time students) and others[6].

[1] Decree 17/2008/ND-CP: Defining the functions, tasks, powers and organizational structure of the Ministry of Construction, Article 2; Joint Circular 20/2008/TTLT-BXD-BNV: Guiding the functions, asks, powers and organizational structure of specialized bodies belonging to the provincial level People's Committee, the District Level People's Committee, and tasks as well as powers of the Commune level People's Committee in the field of state management of the construction industry, Article 3.
[2] Circular 22/2010/TT-BXD: On labor safety in work construction
[3] Article 6 of the above noted Circular
[4] Article 9 of the above noted Circular
[5] The Master Plan is prepared by the Department of Personnel and Organization of MOC, and then submitted to the Ministry of Planning and Investment (MPI).
[6] Others cover 1,750 at College (Part-Time), 3,150 and 450 for Up-Grading courses (full time and part time respectively), also 8,300 and 260 at Junior College ((full time and part time respectively).

(2) Planning, Monitoring and Evaluation of Short-term Training

Planning of short-term training in the construction sector is basically done by Implementers of training courses. The framework of the state management of short-term training courses are limited into the activities such as the appraisal of Implementers of training courses for qualification, and monitoring and evaluation of courses.

Implementers of short-term training courses for qualification, such as Implementers of courses for Supervision for example, are officially required to submit a simplified report on the basic data on training courses (numbers of training courses held, and number of participants in a course)[1] However, about only half of the required Implementers submit reports to the responsible in SACQI, MOC as of November 2011. Those Implementers for non-qualification training courses are not required for the submission or reporting basic data on training courses. Under these circumstances, it is hardly assumed that monitoring and evaluation for short-term training courses are adequately conducted.

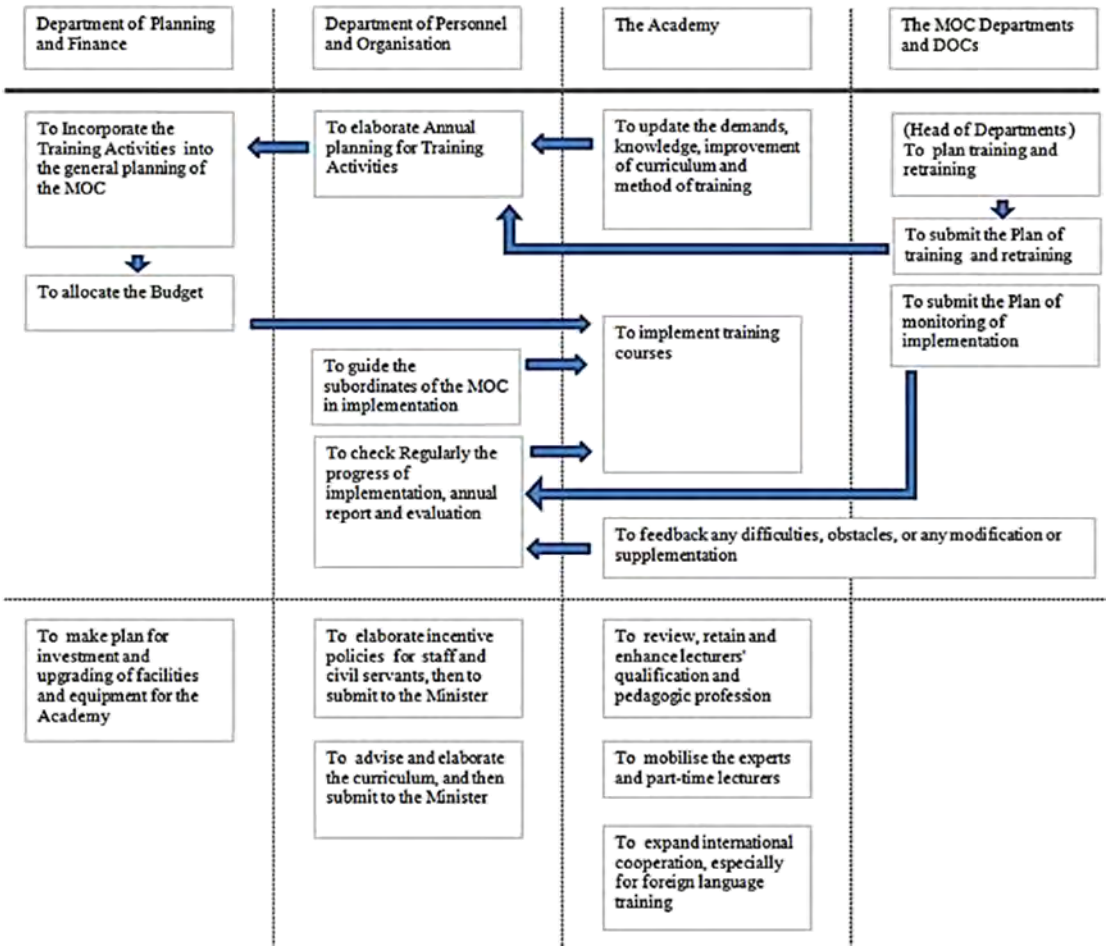
(3) Planning, Monitoring and Evaluation of Short-term Training for Public Servants

Similar to school education, training (often called, Training and Re-Training) for public servants is planned reflecting the current situations based on the statistical data of each department through annual human resource survey. There is a series of forms for the survey that covers common factors such as the level of tasks of allocated employees, education levels, specializations, ages, and the requirement of training courses as well as their language levels and computer skills.

In relation to the training courses for public servants, the responsibilities of the above-noted organizations are clearly stipulated in the recent document[2]. The next chart shows the process of planning as stipulated according to the documents. It is stipulated that the Department of Personnel and Organizations plans training courses based on the above-noted data as survey result (including the requirement of training) submitted by each department in the right column. In the same document, it is also stipulated that the feed-back is also conducted after the implementation of training courses.

[1] Circular 25/2009/TT-BXD: Guidance on Professional Training of Construction Investment Project Management and Construction Supervision

[2] Decision No. 959/ QD-BXD on "Issuance of planning for training and retaining for staff and civil servants of the MOC for the period of 2011 – 2015" (dated on 3rd Nov, 2011)



Source: Decision 959/ 2011/ QD-BXD (3 Nov, 2011), Part VI: Responsibilities for implementation

Note: (i) The explanation after "To" in boxes are taken from the source, however, shortened, and placed under the categorized organizations, except the box under the academy for "To implement training courses".

(ii) The second upper framework shows the process of planning with the arrows added by the draft writer. The bottom framework shows other responsibilities.

Figure 12.2.2 Responsibilities of the MOC Organizations for Planning, Implementation, Monitoring and Evaluation of Training and Retraining Courses by the Academy

12.2.5 Major Findings in the Study

The followings are the summary of major findings identified through the Baseline Survey on the Education and Training System in the Construction Sector, categorizing training as follows;

(1) School Education

- In viewing university-level and college-level education systems, their education systems have been well organized and implemented.

- Curriculums prepared for secondary and vocational schools are focused on providing practical technology-based knowledge and information on the representative construction works in particular to technicians and to workers in the construction sites.
- However, in general, school education has a limitation of providing practical training, with focus on On-the-Job Training that needs flexibility in training program organization, and also focuses specialized for construction project management and quality management including labor safety.
- It is therefore needed to develop more practical training schemes, separately from school education.

(2) Government Staff Training

- The government staff training has been well organized and implemented as seen in **Table 12.2.13.** These training courses are to provide management and administrative information and knowledge needed to perform their duties.
- Besides the above government staff training, other technical training courses specialized for the construction project and quality management are not currently available.

(3) Technical Training (On-the-Job Training)

- In order to enhance construction project and quality management in the fields, it is important to provide technical trainings focusing on the management technologies including construction supervision, inspection, material testing and site management, besides providing management training programs. CQM is a prime organization under MOC which can provide technical training to DOCs and CICs. However, due to the limitation of capacity and facility, their training programs are not site-oriented, but lecture training.

(4) Training for the Engineer Qualifications based on Regulations

- These training courses have been developed closely associated with engineer qualification systems. There are more than 30 organizations who conduct the training courses. MOC has authority in approving organizations that provide training courses. The basic frameworks of these training courses including curriculums, durations of training courses and examinations, etc., are all stipulated by related legal documents.
- However, the currently-on-going training courses focus only on basic knowledge and information, which are a minimum requirement for each engineer qualification, without the contents to meet demands responding the social and economic development.

- It is therefore needed to discuss both, to strengthen these currently-on-going qualification training courses, as well as to upgrade engineer qualifications independently from other training programs.

(5) Summary of Findings

MOC, as a state management organization in construction, plays a leading role in infrastructure development in Vietnam. In order to enhance capacity of construction project management and quality management in the fields, it is important to concentrate on enhancing the capacities of On-the-Job Training which provide direct impacts on the construction project and quality management in the fields.

With the reasons stated above, the Project will focus on the further development of On-the-Job Training. The frameworks of its capacity enhancement plans are further discussed in the following sections.

12.3 DEVELOPMENT OF CAPACITY ENHANCEMENT PLANS FOR MOC TRAINING PROGRAMS

In line with the Baseline Survey, the frameworks of capacity development plans are developed.

12.3.1 Demand Analysis

On the basis of the Baseline Survey and the discussions in the course of the Project implementation, a brief demand analysis on training courses was made. Major findings are described as follows;

(1) Stakeholder Analysis

- **Table 12.3.1** shows the expected beneficiaries of training regardless of implementation bodies. As construction project and quality management require knowledge and experience specialized for the construction sector, staff involved in construction need to undertake trainings in order to equip with fundamental rules including relevant regulations, law conformity, procedures of project management and so forth.
- In viewing organizations, there are two main categories; (1) Central-level and provincial-level organizations, and (2) Construction state management organizations, professional sector organizations and non-professional sector organizations. The construction state management organizations play an important role in supervising law conformity of construction projects and in publishing construction permits (CPs) to private sector building work projects.

- Much concern has been directed to the Non-professional project management organizations. As they are not professional in construction, much attention should be paid on how to raise their capacities in construction project management.
- Regarding staff category, there are four types of expected beneficiaries; (1) Construction state management staff (MOC, DOC), (2) State authority staff (Other than MOC/DOC staff), (3) Project management staff and (4) Inspection and test staff. Since the responsibilities assigned to these staff differs each other, training programs need to be prepared for each staff category.

Table 12.3.1 Stakeholder Analysis

Category	Organization Category	Beneficially Category
State Management in Construction	MOC/Ministerial Agencies	State Management Staff
		Project Management Staff
	Provincial-level/Agencies	State Management Staff
		Project Management Staff
		Inspection & Test Staff
Professional Sector	MOT, MOA, MOI/Ministerial Agencies	State Authority Staff
		Project Management Staff
		Inspection & Test Staff
	Provincial-level/Agencies	State Authority Staff
		Project Management Staff
		Inspection & Test Staff
Non-Professional Sector	MOE, MOH/Ministerial Agencies	State Authority Staff
		Project Management Staff
		Inspection & Test Staff
	Provincial-level/Agencies	State Authority Staff
		Project Management Staff
		Inspection & Test Staff

(2) Training Program Analysis

- **Table 12.3.2** shows the brief demand analysis on training programs, showing expected training programs and beneficiaries. Masked portions are the training programs which have been already implemented.
- As shown in the table, there are some training programs which are preferably supplemented to the existing programs. In particular, training courses on construction permits (CPs), including design inspection and mid-term and final inspection, need to be obliged to State management staff (MOC and DOC staff), since CP examinations provide significant impacts on the building quality upon completion of construction. MOC subordinate institutes and CQM are recommended to share responsibilities in providing technical training, taking their professionalism into account.
- MOC including CQM and other subordinate organizations are encouraged to focus on the training courses given to State authority staff, while associations including VFCEA,

VECAS and VNBAC are encouraged to provide training courses to contractors and consultants in the private sector.

Table 12.3.2 Training Program Analysis

Categories	Training Programs	Beneficiaries			
		Construction State Management Staff	State Authority Staff	Project Management Staff	Inspection and Test Staff
Regulations	Enforcement and revision of regulations on construction project management and quality management	X	X	X	
	Regulation on sanctions	X	X	X	
Project Management	Construction project management	X	X	X	
	Tendering & contract management	X	X	X	
	Construction supervision	X	X	X	
	Construction permits (Design Inspection), mid-term/ final inspections	X			
	Technical design inspection	X	X	X	
	Cost estimation	X	X	X	
	Quality management and acceptance	X	X	X	X
Project Site Management	Inspections				X
	Material Testing				X
New Technology	Inspection technology	Voluntary	Voluntary	Voluntary	Voluntary
	Test technology	Voluntary	Voluntary	Voluntary	Voluntary
	Construction technology	Voluntary	Voluntary	Voluntary	Voluntary
JICA Project Outputs	Construction state audit	X	X	X	
	Construction company registration	X	X		
	Contractor work performance evaluation	X	X	X	
	Labor safety and hygiene	X	X	X	

(3) Implementation Body Analysis

- Focusing on On-the-Job Training courses, there are two (2) prime implementation bodies under MOC and two (2) external associations as listed in **Table 12.3.3**. As discussed below, there seem to be demarcation in the selection of training programs.
- AMC shown below is conducting training courses for central-level and provincial-level government staff. Also, AMC training programs already cover a wide range of training programs, intended to provide overall knowledge and technologies on construction project and quality management as shown in **Table 12.3.4**
- On the other hand, CQM provides technology-oriented training programs for DOC and CIC staff, dealing with demand responsive training programs as shown in the table.
- VECAS also provide their own programs to construction companies and consultants in the private sector as shown in the table.

Table 12.3.3 Implementation Bodies for On-the-Job-Training Programs

Implementation bodies	Training programs	No. of Programs	Trainees	
			Central-level	Provincial-level
Academy for Managers of Construction and Cities (AMC)	Training courses for government staff by staff grade.	23 courses	X	X
Viet Nam Center for Technology of Construction Quality Management (CQM)	Training courses for DOCs and CICs	34 courses		X
Vietnam Federation of Civil Engineering Associations (VFCEA)	Training courses and seminars for construction companies	N/A	X	X
Vietnam Engineering Consultant Association (VECAS)	Training courses and seminars for consultants	N/A	X	X

Table 12.3.4 Training Programs by Implementation Body

Training Programs	AMC	CQM	VECAS
Supervision	X		
Construction valuation and tendering	X		
Cost estimation	X		
Project management and tendering	X		
Director for project management consultancy	X		
Inspection of construction	X		
Construction management for professional staff of communes and wards	X		
Legal knowledge and construction inspection	X		
Document of As-built, acceptance, payment and liquidation	X		
Practice for quantity estimation and formulation of Bill Quantity	X		
Construction management of building investment skills		X	
Construction supervision		X	
Inspection and certification of full satisfaction of force-bearing safety		X	
Verification of Construction Qualification skill		X	
Site manager skill		X	
Tendering skill		X	
Science seminar on photometric system with construction qualification		X	
Disseminate the normative law of construction inspection		X	
Tendering			X
FIDIC			X
Construction Supervision			X
Green architecture, sustainable development and energy saving			X
Development of consultancy for regions			X
New approach and solution for renovation of consultancy business			X
Idea contribution to the planning for Hanoi City			X

12.3.2 Principle of Development

On the basis of the Baseline Survey and the demand analysis stated in the previous sections, the following principles are set in advance of developing frameworks.

- It is necessary to develop training programs which can meet stakeholders' demands.
- It is necessary to select training programs which correspond to current project environment.
- Existing training schemes need to be made use of, rather than creating new schemes.

12.3.3 Enhancement of Training of Academy for Managers of Construction and Cities (AMC)

In line with the past experience, AMC is recommended to develop further training programs for the government administration and Project management staff in the Government including relevant agencies, and to open training opportunities to the following stakeholders stated below, in particular to those in the Project management and in the Non-professional sectors.

(1) Expected Trainees

It is recommended that training programs should be addressed to the following stakeholders. Care should be paid on Non-professional state authority staff and Project management staff.

- State management staff in construction
  - MOC and DOC officers
- State authority staff in charge of construction project management
  - Non-Professional ministries/provincial-level organizations/related agencies
- Project management staff
  - Project owners, PMU/PMC staff

(2) Enhancement of Training Programs

- Training programs need to be developed to meet the requirements for the above trainees. **Table 12.3.5** shows the candidate training programs to be supplemented.
- Focuses need to be placed on providing administration or management information to stakeholders, rather than technical information.
- Of these candidate programs, the programs on the regulation enforcement/revision and on the sanctions need to be reinforced and implemented independently from other programs.

Table 12.3.5 Recommended AMC Training Programs

Categories	Training Programs	Beneficiaries		
		Construction State Management Staff	State Authority Staff	Project Management Staff
Regulations	Enforcement and revision of regulations on construction project management and quality management	X	X	X
	Regulation on sanctions	X	X	X
Project Management	Construction project management	X	X	X
	Tendering & contract management	X	X	X
	Construction supervision	X	X	X
	Construction permits (Design Inspection), mid-term/ final inspections	X		
	Technical design inspection	X	X	X
	Cost estimation	X	X	X
	Quality management and acceptance	X	X	X
Project Site Management	Inspections			
	Material Testing			
JICA Project Outputs	Construction state audit	X	X	X
	Construction company registration	X	X	
	Contractor work performance evaluation	X	X	X
	Labor safety and hygiene	X	X	X

Note: Masked training programs are ones which have been already implemented.

(3) Enhancement of Implementation Methods

- It is recommended to study further the legalization of training obligation to Non-professional project management staff.
- Professional organizations, which include MOT, MOA and MOI, are encouraged to develop their own training programs for construction project management and project site management in corresponding to their specialized sector projects, except for the training on regulations.

(4) Special Note

It should be noted that as the development of AMC training programs is beyond the scope of this JICA Project, MOC is kindly advised to further develop AMC training programs on its own, taking account of the framework stated above.

12.4 DEVELOPMENT OF DURING-PROJECT TRAINING PROGRAMS AND IMPLEMENTATION OF THE TRAINING PROGRAMS

The Project has implemented two workshops and six times of training courses as shown below;

12.4.1 MOC-JICA Joint Coordination Workshop

Two workshops were co-organized by the MOC and the JICA project. For the preparation, operation and implementation of the workshop, the SACQI and CQM played a great roles.

(1) Workshop 2012

- **Program title**: The Workshop On Construction Quality Assurance and Safety Management
- **Objective**: To promote understanding construction quality assurance system and technologies proposed and improved by the Project
- **Date**: 9 February, 2012
- **Venue**: The Conference Hall, MOC, Hanoi, Vietnam
- **Program**: Shown in **Table 12.4.1.**
- **Organizers**: MOC and JICA
- **Participants**: About 200 people attended to the workshop (from MOC, other ministries, DOCs, CICs, PMUs, Contractors, Consultants, Research Institutes, Associations, Media) .

Please note that there are people who registered without writing the organization names.

Table 12.4.1 Workshop on Construction Quality Assurance and Safety Management

Time	Agenda	Presenter
8:00~8:30 (30')	Registration	
8:35~8:50 (7')	Opening remarks by the Deputy Minister of the MOC	Mr. Nguyen Thanh Nghi, Deputy Minister of MOC Mr. Nagase,
(8')	Message from the Representative of JICA Office	Deputy Chief Representative of JICA Vietnam Office
8:50~9:10 (20')	Introduction of the Project for Capacity Enhancement in Construction Quality Assurance	Dr. Le Quang Hung, Chief of SACQI - MOC, Director of PMU
9:10~9:45 (35')	Topic 1: Institutional Issues for the Improvement of Construction Quality Q&A: No Q & A.	Mr. Kato Tsuneo JICA Expert Team Leader
9:45~10:15 (30')	Topic 2-1:Contractor Registration & Construction Package Database System	Mr. Hoang Tho Vinh, Vietnam expert, Deputy director of CAMD – MOC
10:15~10:35 (20')	Topic 2-2: Construction Contractor Performance Evaluation System Q&A: No Q & A	Mr. Ngo Lam, Vietnam Expert, Head of Decision No.3 SACQI - MOC
10:35~10:50 (15')	Coffee break	
10:50~11:05 (15')	Topic 3: Introduction of Manuals for Safety Management Q&A: No Q & A	Mr. Nguyen Duc Toan, Vietnam expert, Lecture of Ha Noi University of Civil Engineering

Time	Agenda	Presenter
11:05~11:20 (15')	Topic 4: Engineer qualification system for supervising engineers Q&A: No Q & A	Mr. Nakasuka Satoshi Construction Quality Assurance Advisor
11:20~11:50 (30')	Q & A for all topics	
11:50~12:00 (10')	Closing remarks of the Workshop	Mr. Nguyen Thanh Nghi,, Deputy Minister of MOC

(2) Workshop 2013

- **Program Title**: The Workshop on Quality Assurance and Safety Management in Construction
- **Objective**: To promote understanding over construction project management, construction quality assurance and safety management.
- **Date**: November 1st, 2013
- **Venue**: Kim Lien Hotel (Address: 5-7, Dao Duy Anh Str., Ha Noi)
- **Program**: Shown in **Table 12.4.2**.
- **Organizers**: MOC and JICA
- **Participants**: About 200 (from MOC, other ministries, DOCs, CICs, PMUs, Contractors, Consultants, Research Institutes, Associations, Media) people attended to the workshop.

Table 12.4.2 Workshop on Quality Assurance and Safety Management in Construction

Time		Agenda / Activity	Speaker
8:00 – 8:30	30	Registration	
8:30 – 8:40	10	Opening remarks	Mr. Nguyen Thanh Nghi, Vice Minister of Construction Mr. Yamamoto Kenichi, Senior Representative of JICA Viet Nam Office
8:40 – 8:50	10	KEYNOTE: International Cooperation between Ministry of Construction, Vietnam and Ministry of Land, Infrastructure, Transport and Tourism, Japan	Mr. SHICHIJO Makio Director, Overseas Project Division, Policy Bureau, MLIT
8:50 – 9:30	40	Current Situation of Construction Projects in Japan	Mr SHIRATO Masami, Construction Works Inspector, Engineering Affairs Division, MLIT
9:30 – 9:50	20	Current Topic on the Enhancement of legal framework under Decree 15 and related circulars	Mr Hoang Hai Director General, SACQI, MOC
9:50 – 10:05	15	Discussion	
10:05 – 10:0	20	Coffee Break	
10:20 – 10:50	30	Final Report on Project for Capacity Enhancement in Construction Quality Assurance	Mr Tsuneo KATO, JICA project team,. Team Leader

Time		Agenda / Activity	Speaker
10:50 - 11:10	20	Guideline for Preparing Technical Specifications for Buildings and Industrial Works	Mr. Ha Minh, Deputy Director General, CONINCO
11:10 – 11:40	30	Registration System Construction Package Database System Contractor Performance Evaluation System	Mr. Masafumi YAMAUCHI JICA project team, Expert
11:40 – 12:20	40	Discussion	
12:20 – 14:00	100	Lunch Break	
14:00 – 14:30	30	Draft Guideline for the Formulation of Building Facility Maintenance Procedures	Mr Shunji ABE JICA project team, Expert
14:30 – 14:50	20	Major Contents of Draft of Construction Law (Revision)	Mr Hoang Tho Vinh Deputy Director General, CAMD, MOC
14:50 – 15:00	10	Coffee Break	
15:00 – 15:40	40	Views on the Revision of Construction Law	Mr Tsuneo KATO, JICA project team,. Team Leader
15:40 – 16:20	40	Discussion	
16:20 – 16:30	10	Closing Remarks of the Workshop	

12.4.2 CQM Training Courses to Spread-out Project's Outputs

Nine training courses were implemented in 2012 and 2013 by the Ministry of Construction with MOC funds in order to spread out the project's outputs to stakeholders as shown in **Table 12.4.3**. Details of these training courses are described below the table.

Table 12.4.3 CQM Training Courses

No.	Date	Venue	Participants No.
No.1	Nov 2nd , 2012	Guest House of National Defense Ministry, No. 33A – Pham Ngu Lao St., Ha Noi City	120
No.2	Nov 23rd , 2012	Kim Thơ Hotel – No. 1A Ngo Gia Tu St. - Tan An – Ninh Kieu – Can Tho City	90
No.3	Nov 28th , 2012	Vien Dong Hotel – No.275A Pham Ngu Lao St., District 1, HCMC	130
No.4	Dec 15th , 2012	Bamboo Green Hotel, No. 177, Tran Phu Street, Da Nang City	110
No.5	Dec 19th , 2012	Viet Trung Hotel, No.667 Nguyen Binh Khiem Str., Dong Hai, Hai An, Hai Phong	100
No.6	Dec 24th, 2012	Luxury Hotel, No.24 Tran Phu Street, Nha Trang City, Khanh Hoa Province	90
No.7	Oct 25th, 2013	Muong Thanh Hotel, No. 38, Le Loi Street, Hue City, Thua Thien Hue Province	200
No.8	NovemberNov 15, 2013	My Tra Hotel, Le Dung Street, Cao Lanh City, Dong Thap Province	250
No.9	NovemberNov 22, 2013	Blue Moon Hotel, No.4, Phan Boi Chau Street, Da Lat City, Lam Dong Province	

(1) 1st Training Course

- **Program**: The program of the 1st training course is shown in **Table 12.4.4**.
- **Term**: 01 day, 2 November, 2012
- **Venue**: Guest House of National Defense Ministry, No. 33A – Pham Ngu Lao St., Ha Noi City
- **Participants**: Around 120 persons from Departments of Construction, Construction Inspection Centers and construction companies in and around Ha Noi attended this training course.

Table 12.4.4 Program of the 1st Training Course to Spread-out the Project's Outputs

Time	Agenda	Presenter
8:00 – 8:30	Registration	Organizing Committee
8:30 – 8:40	Opening	Mr. Le Quang *Deputy Director General, SACQI, MOC*
8:40 – 9:50	Safety management of construction works in Japan	Mr. Nakasuka Satoshi *Advisor on construction quality assurance, JICA Project Team*
	Prevention of public accidents	Mr. Inoue Sadafumi *JICA Expert on construction management*
9:50 – 10:10	Break	
10:10 – 11:10	Regulations & Technical standards on labor safety and health and safety management (*Project for Capacity Enhancement for Construction Quality Assurance*)	Mr. Phan Dang Tho *Deputy Chief Inspector, MOLISA*
	Outline of regulations & technical standards on labor safety & health	
	Rights & duties of employers and workers	
	General issues on safety	
11:10 – 11:30	Discussion	
11:30 – 13:30	Lunch	
13:30 – 14:30	System of selection, registration and evaluation of contractors/consultants	Mr. Hoang Tho Vinh *Deputy Director General, CAMD, MOC*
	Improvement of the construction supervisor qualification system	
14:30 – 15:30	• Individual safety & health management (Project for Capacity Enhancement for Construction Quality Assurance) • Prevention of danger caused by falling/littering • Prevention of danger caused by electricity • Prevention of danger caused by collapse/rolling • Prevention of danger caused construction vehicles • Prevention of danger caused by hauling, loading and unloading • Prevention of danger caused by tunnel works • Prevention of danger caused by fire and explosion • Prevention of danger caused by offshore operation • Prevention of health disorder • Prevention of danger to public	Dr. Pham Duc Toan *University of Civil Engineering*
15:30 – 15:50	Break	Dr. Pham Duc Toan *University of Civil Engineering*
	• Case studies on accidents in construction • Falling down • Buried/Crushed by objects • Collapse/Rolling • Construction vehicles • Hauling/Loading and Unloading • Fire & Explosion • Health disorder • Electricity related accidents • Others	
16:20 – 16:50	Discussion	
16:50 – 17:00	Closing remarks & awarding certificates	Leader of SACQI, MOC

(2) 2nd Training Course

- **Program**: The program of the 2nd training course is shown in **Table 12.4.5**
- **Term**: 01 day, 23 November, 2012
- **Venue**: Kim Thơ Hotel – No. 1A Ngo Gia Tu St. - Tan An – Ninh Kieu – Can Tho City
- **Participants**: Around 90 persons coming from Departments of Construction and construction companies in and around Can Tho City attended this training course.

Table 12.4.5 Program of the 2nd Training Course to Spread-out the Project's Outputs

Time	Agenda	Presenter
8:00 – 8:30	Registration	Organizing Committee
8:30 - 8:50	Opening	Head of SACQI, MOC
8:40 - 9:15	Construction project management & quality assurance in Japan	Mr. Kato Tsuneo Team Leader, JICA project team
9:15 – 9:50	Prevention of Public Accidents	Mr. Inoue Sadafumi JICA Expert on construction management
9:50 –10:10	Break	
10:10-10:30	• Regulations & Technical standards on labor safety and health and safety management • Outline of regulations & technical standards on labor safety & health • Rights & duties of employers and workers • General issues on safety	Dr. Pham Duc Toan University of Civil Engineering
10:30-11:30	• Individual safety & health management (Project for Capacity Enhancement for Construction Quality Assurance) • Prevention of danger caused by falling/littering • Prevention of danger caused by electricity • Prevention of danger caused by collapse/rolling • Prevention of danger caused construction vehicles • Prevention of danger caused by hauling, loading and unloading • Prevention of danger caused by tunnel works • Prevention of danger caused by fire and explosion • Prevention of danger caused by offshore operation • Prevention of health disorder • Prevention of danger to public	Dr. Pham Duc Toan University of Civil Engineering
11:30-13:30	Lunch	
13:30-14:15	• Case studies on accidents in construction • Falling down • Buried/Crushed by objects • Collapse/Rolling • Construction vehicles • Hauling/Loading and Unloading • Fire & Explosion • Health disorder • Electricity related accidents • Others	Dr. Pham Duc Toan University of Civil Engineering
14:15-16:00	• Improve project management method and clarify responsibilities of stakeholders (Act.1) • Improve State agencies' inspection (Act.2)	Mr. Le Văn Thinh Head of Inspection Division No.1 - SACQI - MOC
16:00-16:15	Discussion	
16:00	Closing remarks and certificate awarding	Head of SACQI, MOC

(3) 3rd Training Course

- **Program**: The program of the 3rd training course is shown in **Table 12.4.6**.
- **Term**: 01 day, 28 November, 2012
- **Venue**: Vien Dong Hotel – No.275A Pham Ngu Lao St., District 1, HCMC
- **Participants**: Around 130 persons coming from Departments of Construction and construction companies in and around Ho Chi Minh City attended this training course.

Table 12.4.6 Program of the 3rd Training Course to Spread-out the Project's Outputs

Time	Agenda	Presenter
8:00 – 8:30	Registration	Organizing Committee
8:30 - 8:40	Opening	Head of SACQI
8:40 - 9:15	Safety management of construction works in Japan	Mr. Nakasuka Advisor on construction quality assurance, JICA Project Team
9:15 – 9:50	Contractor/consultant registration system & construction package database system	Mr. Yamauchi Masafumi JICA Expert
9:50 –10:10	Break	
10:10– 11:30	Improve project management method and clarify responsibilities of stakeholders (Act.1) Improve State agencies' inspection (Act.2)	Mr. Le Văn Thinh Head of Inspection Division No.1 - SACQI - MOC
11:30 -12:00	Discussion	
12:00 – 13:30	Lunch	
13:30 – 14:30	Develop project management technologies in construction quality assurance (Act.5) Guideline of standardization of technical specifications	Mr. Tran Chung Head of Quality Division, VN Federation of Civil Engineering Association
14:30 –15:00	Regulations & Technical standards on labor safety and health and safety management Outline of regulations & technical standards on labor safety & health Rights & duties of employers and workers General issues on safety	Dr. Pham Duc Toan University of Civil Engineering
15:00 –15:30	Individual safety & health management (Project for Capacity Enhancement for Construction Quality Assurance) Prevention of danger caused by falling/littering Prevention of danger caused by electricity Prevention of danger caused by collapse/rolling Prevention of danger caused construction vehicles Prevention of danger caused by hauling, loading and unloading Prevention of danger caused by tunnel works Prevention of danger caused by fire and explosion Prevention of danger caused by offshore operation Prevention of health disorder Prevention of danger to public	Dr. Pham Duc Toan University of Civil Engineering
15:30 -15:45	Case studies on accidents in construction Falling down Buried/Crushed by objects Collapse/Rolling Construction vehicles Hauling/Loading and Unloading Fire & Explosion Health disorder Electricity related accidents Others	Dr. Pham Duc Toan University of Civil Engineering
15:45-16:00	Discussion	
16:00	Closing remarks and certificate awarding	Head of SACQI, MOC

(4) 4th Training Course

- **Program**: The program of the 4th training course is shown in **Table 12.4.7**.
- **Term**: 01 day, 15 December, 2012
- **Venue**: Bamboo Green Hotel, No. 177, Tran Phu Street, Da Nang City
- **Participants**: Around 110 persons coming from Departments of Construction and construction companies in and around Da Nang attended this training course.

Table 12.4.7 Program of the 4th Training Course to Spread-out the Project's Outputs

Time	Agenda	Presenter
8:00 – 8:30	Registration	Organizing Committee
8:30 – 8:40	Opening	Organizing Committee
8:40 - 9:20	Construction project management & quality assurance in Japan	Mr. Kusano Seiichi JICA Expert
9:20 – 10:00	Introduction on Safety and Health Manual in Construction & Case Studies on Accidents and Near Misses in Construction (Act. 6)	Mr. Inoue Sadafumi JICA Expert
10:00-10:15	Discussion	
10:15–10:30	Break	
10:30 -11:30	Regulations & Technical standards on labor safety and health and safety management	Mr. Phan Dang Tho Deputy Chief Inspector – MOLISA
11:30	Discussion	
Lunch		
13:30 –14:45	Improve State agencies' inspection (Act.2)	Mr. Nguyen Gia Chinh Deputy Director General – Legal Affairs Dept. - MOC
14:45-15:30	Consultant registration system (Act.3)	Mr. Nguyen Kim Duc Head of Inspection Division No.2 – SACQI – MOC
15:30-16:15	Regulations on verification and State verification in Viet Nam	
16:15-16:30	Discussion	
16:30	Closing remarks and certificate awarding	Leader of SACQI, MOC

(5) 5th Training Course

- **Program**: The program of the 4th training course is shown in **Table 12.4.8**.
- **Term**: 01 day, 19 December, 2012
- **Venue**: Viet Trung Hotel, No.667 Nguyen Binh Khiem Str., Dong Hai, Hai An, Hai Phong
- **Participants**: Around 100 persons coming from Departments of Construction and construction companies in and around Hai Phong attended this training course.

Table 12.4.8 Program of the 5th training course to Spread-out the Project's Outputs

Time	Agenda	Presenter
8:00 – 8:30	Registration	Organizing Committee
8:30 – 8:40	Opening	Organizing Committee
8:40 - 9:20	Safety management of construction works in Japan	Mr. Satoshi Nakasuka JICA Advisor on construction quality assurance
9:20 – 10:00	Contractor/consultant registration system & Construction package database system	Mr. Yoshiro Kunimasa JICA Expert
10:00-10:15	Discussion	
10:15–10:30	Break	
10:30 -11:30	Develop project management technologies in construction quality assurance (Act.5) Guideline of standardization of technical specifications	Mr. Tran Chung Head of Quality Division, VN Federation of Civil Engineering Association
11:30	Discussion	
Lunch:		
13:30-15:00	Improve project management method and clarify responsibilities of stakeholders (Act.1)	Mr. Le Van Thinh Head of Inspection Division No.1 – SACQI – MOC
	Improve State agencies' inspection (Act.2)	
15:00 – 16:00	Regulations and rules on inspection and state inspection in Viet Nam	Mr. Nguyen Kim Duc Head of Inspection Division No.2 – SACQI - MOC
16:00-16:15	Discussion	
16:15	Closing remarks and certificate awarding	

(6) 6th Training Course

- Program: The program of the 4th training course is shown in **Table 12.4.9.**
- Term: 1 day, 24 December, 2012
- Venue: Luxury Hotel, No.24 Tran Phu Street, Nha Trang City, Khanh Hoa Province
- Participants: Around 90 persons coming from Departments of Construction and construction companies in and around Khanh Hoa Province attended this training course.

Table 12.4.9 Program of the 6th Training Course to Spread-out the Project's Outputs

Time	Agenda	Presenter
8:00 – 8:30	Registration	Organizing Committee
8:30 – 8:40	Opening	Mr. Le Quang, Deputy Director General, SACQI, MOC
8:40 - 9:20	Construction project management & quality assurance in Japan	Mr. Kato Tsuneo JICA Project Team Leader
9:20 – 10:00	Contractor/consultant registration system & Construction package database system	
10:00-10:15	Discussion	
10:15–10:30	Break	
10:30–11:30	Improve State agencies' inspection	Mr. Nguyen Gia Chinh Deputy Director General – Legal Affairs Dept. - MOC
11:30	Discussion	
Lunch		

Time	Agenda	Presenter
13:30-14:30	Technical specifications for infrastructure facilities	Mr. Tran Chung Head of Quality Division, VN Federation of Civil Engineering Association
14:30 – 15:30	Regulations and rules on inspection and state inspection in Viet Nam	Mr. Nguyen Kim Duc Head of Inspection Division No. , SACQI, MOC
15:30-16:00	Discussion	
16:00	Closing remarks and certificate awarding	Mr. Le Quang Deputy Director General of SACQI, MOC

(7) 7th Training Course

- Program: The program of the 7th training course is shown in **Table 12.4.10**
- Term: 1 day, 25 October, 2013
- Venue: Muong Thanh Hotel, No. 38, Le Loi Street, Hue City, Thua Thien Hue Province
- Participants: Around 200 persons coming from Departments of Construction and construction companies in and around Thua Thien Hue Province attended this training course.

Table 12.4.10 Program of the 7th Training Course to Spread-out the Project's Outputs

Time	Agenda	Presenter
7:30 – 8:00	Registration	Organizing Committee
8:00 – 8:10	Opening remarks	Mr. Le Quang Deputy Director General, SACQI, MOC
8:10-8:20	Speech by DOC of Thua Thien Hue Province	Mr. Nguyen Dai Vien Deputy Director, DOC of Thua Thien Hue Province
8:20 – 9:10	Capacity Enhancement in Construction Quality Assurance	Mr. Kato Tsuneo JICA Project Team Leader
9:10 – 10:00	Development of Standard Specifications and Manual for Construction Quality Assurance	Mr. Kusano Seiichi JICA Expert
10:00 –10:15	Break	
10:15 –11:30	Promulgation of Decree 15/2013/ND-CP dated February 6, 2013 on the quality management of construction works and relevant Circulars	Mr. Le Quang Deputy Director General, SACQI, MOC
Lunch		
13:30 -15:30	Promulgation of Decree 15/2013/ND-CP dated February 6, 2013 on the quality management of construction works and relevant Circulars (cont.)	Mr. Le Quang Deputy Director General, SACQI, MOC
15:30-16:30	Discussion	
16:30	Closing remarks	Mr. Le Quang Deputy Director General, SACQI, MOC

(8) 8th Training Course

- Program: The program of 8th training course is shown in **Table 12.4.11**
- Term: 1 day, November 15, 2013
- Venue: My Tra Hotel, Le Duan Street, Cao Lanh City, Dong Thap Province
- Participants: Around 250 persons coming from Departments of Construction and construction companies in and around Dong Thap Province attended this training course.

Table 12.4.11 Program of the 8 th Training Course to Spread-out the Project's Outputs

Time	Agenda	Presenter
7:30-8:00	Registration	Organizing Committee
8:00-8:05	Opening remarks	Mr. Le Quang Hung Director General, SACQI, MOC
8:05-8:10	Speech by DOC of Dong Thap Province	Ms. Le Thi Thanh Phuong Deputy Director, DOC of Dong Thap Province
8:10-9:10	Regulations on construction work design verification, appraisal, and approval	Mr. Le Quang Hung Director General, SACQI, MOC
9:10-10:10	Capacity Enhancement in Construction Quality Assurance	Mr. Kato Tsuneo JICA Project Team Leader
10:10-10:30	Break	
10:30-11:30	Guideline on Preparation of Construction Work Technical Specifications	Mr. Kusano Seiichi JICA Expert
Lunch		
13:30-15:30	Major contents of revised Construction Law	Mr. Le Quang Deputy Director General, SACQI, MOC
	Contractor registration system	
15:30-16:00	Discussion	
16:00	Closing remarks	SACQI, MOC

(9) 9 th Training Course

- Program: The program of the 9th training course is shown in Table 12.4.12
- Term: 1 day, November 22, 2013
- Venue: Blue Moon Hotel, 4 Phan Boi Chau Street, Da Lat City, Lam Dong Province
- Participants: Around 150 persons coming from Departments of Construction and construction companies in and around Lam Dong Province attended this training course.

Table 12.4.12 Program of the 9 th Training Course to Spread-out the Project's Outputs

Time	Agenda	Presenter
7:30-8:00	Registration	Organizing Committee
8:00-8:05	Opening remarks	Mr. Le Quang Deputy Director General, SACQI, MOC
8:05-8:10	Speech by DOC of Lam Dong Province	Leader of DOC of Lam Dong Province
8:10 – 9:20	Major contents of the revision of Construction Law	Mr. Le Quang Deputy Director General, SACQI,
	Contractor registration and performance evaluation system	

		MOC
9:20 – 9:40	Break	
9:40 – 10:30	Capacity enhancement in construction quality assurance	Mr. Kato Tsuneo JICA Project Team Leader
10:30 – 11:10	Draft guideline on the formulation of the maintenance procedure manuals for building facilities	Mr. Tanaka Takuya JICA Expert
11:15 – 12:00	Regulations on construction work design verification, appraisal, and approval	Mr. Le Quang Deputy Director General, SACQI, MOC
12:00 – 12:30	Discussion	
12:30	Closing remarks	

12.5 DEVELOPMENT OF POST-PROJECT TRAINING PROGRAMS FOR THE DISSEMINATION OF PROJECT OUTPUTS

Development of post-project training programs was carried out hereinafter in this section. The study flowchart is in **Figure 12.5.1** shown below. Also; **Table 12.5.1** shows the results of this analysis from STEP-1 to STEP-3.

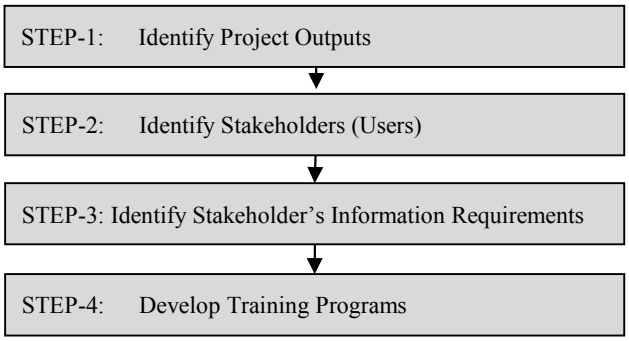


Figure 12.5.1 Study Flow

12.5.1 Identification of Planning Conditions

(1) Identification of Project Outputs (STEP-1)

There are three types of project outputs; (1) Recommendations, (2) Systems and (3) Manuals, whose outlines are briefly described as follows;

- Recommendations are the outputs of the studies on institutional capacity enhancement including Activity-1, Activity-2 and Activity-4. These recommendations produced in the Project will be incorporated into the revision plan of regulations including Decree 209, Decree 12, relevant Circulars and Construction Law, so that outputs to be disseminated to the end users will be the revised regulations.
- Systems include computer software and databases developed in the studies of Activity3.

- Manuals consist of the outputs of technology development on construction project and quality management in Activity-5 and Activity-6.

(2) Identification of Stakeholders (STEP-2)

The table has clarified that the stakeholders fall into the following three levels. The stakeholders are to be targeted in developing action plans for the training courses hereinafter.

1) State management in construction (Level-1)

- State management in construction includes MOC and DOCs that are in charge of enforcing regulations in construction that do not necessarily turn out to be project implementation bodies.
- MOC (SACQI, CAMD) and DOCs

2) State authority in implementation (Level-2)

- State authority in construction includes central ministries, ministerial agencies and provincial-level organizations that are directly involved in the implementation of construction works, given enforcement of construction regulations.
- Sector management ministries, ministerial agencies, provincial-level departments, project owners, PMUs

3) End users (Level-3)

- End users include organizations or individuals directly involved in construction projects in the private sector that represents private consultants and construction companies.
- Consultants and Contractors

(3) Identification of Information Requirements (STEP-3)

In order to implement capacity enhancement plans (project outputs), stakeholders require different levels of information in consistent with their own purposes. **Table 12.5.1** summarizes information requirements by the types of stakeholders, comprising the following information;

- Information on general guidance for state authorities that need to know outlines;
- Information initially registered by End users (equivalent to registered data by users);
- Information on operation and management of the capacity enhancement plans.

Training programs need to be developed in order to meet the demands of each stakeholder.

Table 12.5.1 Analysis on Stakeholders and Their Information Requirements

STEP-1: Project Outputs	Responsible Organization	STEP-2: Stakeholders	STEP-3: Information required by Stakeholders
Activity 1 & 2: Improve project management methods and clarify responsibilities between stakeholders focusing on construction quality assurance.			
Related regulations in the new Decree 209, new Decree12, new Construction Law and relevant new Circulars.	SACQI	DOCs Sector management ministries Ministerial agencies Consultants Contractors	General guidance on the new Decree 209, Decree12, Construction Law and relevant Circulars.
Activity 3: Develop and apply company registration systems for construction companies and consultants.			
Activity 3-1-1 Construction Package Information System Related regulations in the new Decree 209, new Decree12, new Construction Law and relevant new Circulars.	CAMD	DOCs Sector management ministries Ministerial agencies	General guidance on company registration system
		CAMD database manager	General guidance on company registration system Operation manual Data management (web data/ hardcopy/e-mail) System management (Web-site operation)
		Project Owners	General guidance on company registration system Operation manual Data input/revision Web-site data operation
Activity 3-1-2 Construction company registration system Related regulations in the new Decree 209, new Decree12, new Construction Law and relevant new Circulars.	CAMD	DOCs Sector management ministries Ministerial agencies	General guidance on company registration system
		CAMD database manager	General guidance on company registration system Operation procedures Data input (Postal & mail data) Data management (Data verification) System management (Web-site data management)
		Contractors	General guidance on company registration system Operation procedures Data input Web-site data operation
Activity 3-1-3 Consultant company registration system Related regulations in the new Decree 209, new Decree12, new Construction Law and relevant new Circulars.	CAMD	DOCs Sector management ministries Ministerial agencies	General guidance on company registration system
		CAMD database manager	General guidance on company registration system Operation manual Data management (web data/ hardcopy/e-mail) System management (Web-site operation)
		Consultants	General guidance on company registration system Operation manual

STEP-1: Project Outputs	Responsible Organization	STEP-2: Stakeholders	STEP-3: Information required by Stakeholders
			Data input Web-site data operation
Activity 3-2 Contractor work performance evaluation system Related regulations in the new Decree 209, new Decree12, new Construction Law and relevant new Circulars.	CAMD	DOCs Sector management ministries Ministerial agencies	General guidance on company registration system
		CAMD database manager	General guidance on company registration system Evaluation manual Data management System management
		Evaluator (Project Owners, PMUs. etc.)	General guidance on company registration system Evaluation manual Web-site data input Data transfer to CAMD
		Consultants	General guidance on company registration system Evaluation manual Web-site data input Data transfer to CAMD
Activity 4: Improve existing engineer qualification system			
Related regulations in the new Decree12, Circular 12 and new Construction Law	CAMD	DOCs Sector management ministries	General guidance on new qualification system
		CAMD (Examination Centre)	General guidance on new qualification system Planning of examinations Implementation methods of examinations Scoring methods of examinations Coordination with examination implementation bodies and training centers Engineer registration and database management
		Training centres	General guidance on new qualification system Possible training programs
		Construction companies Consultants	General guidance on new qualification system Application procedures
Activity 5: Develop project management technologies in construction quality assurance			
Related regulations in the new Decree 209, new Decree12, new Construction Law and relevant new Circulars. Building facility maintenance procedure manual	SACQI	DOCs Sector management ministries Ministerial agencies	General guidance on new qualification system
		Consultants	General guidance on maintenance procedure manual Building facility maintenance procedure manual
Activity 6: Strengthen of Road Maintenance Institutions			

STEP-1: Project Outputs	Responsible Organization	STEP-2: Stakeholders	STEP-3: Information required by Stakeholders
Safety and health Manual in Construction Case Studies on Accidents and Near Misses in Construction Related regulations in the new Decree 209, new Decree12, new Construction Law and relevant new Circulars.	CAMD	DOCs Sector management ministries Ministerial agencies Construction companies Consultants	General guidance on new qualification system Safety and health manual in construction Case studies on accidents and near misses in construction

12.5.2 Development of Training Programs

Figure 12.5.2 and **Table 12.5.2** summaries the training courses recommended in this Project. The training programs are featured by the following points;

(1) Training Objectives

Training objective is to meet information requirements on the capacity enhancement plans needed for stakeholders, ranging from state authorities, management and operation organizations to End users, and to let them fully understand the plans for the smooth implementation of the plans. With these objectives, of importance in developing training programs is to disseminate information to End users.

(2) Apply Phased Programs

As there are many types of stakeholders expected to be involved ranging from state authorities to End users, applying phased training programs is recommended as follows;

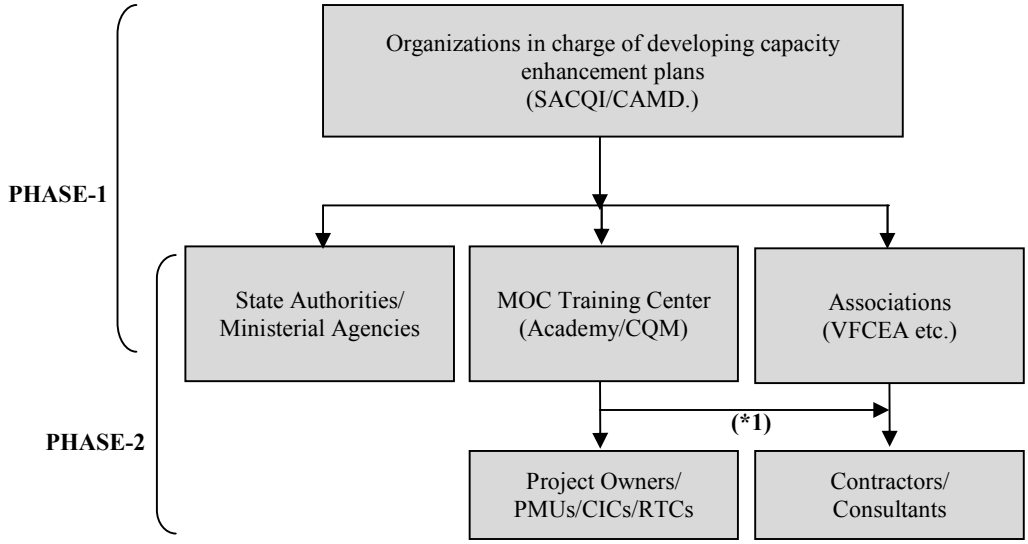
1) PHASE-1

In the PHASE-1, as seen in **Figure 12.5.2**, SACQI and CAMD of MOC, these are the organizations in charge of developing capacity enhancement plans, will conduct training programs to (1) State authorities and ministerial agencies, (2) MOC training centers, and (3) Associations which are the representative organization of private-sectors. MOC training centers including academy and CQM are requested to get involved in these training programs.

2) PHASE-2

In the PHASE-2, MOC academy is proposed to provide training programs for institutional issues to project owners and PMUs, while CQM is to provide those on technical issues to CICs, RTCs, contractors and consultants. CQM is proposed to provide training programs on the Activity-3 relevant technologies including contractor/consultant registration, project package information database and contractor performance evaluation system, in particular those on data registration and system operation. In addition, CQM is also proposed to provide training programs on Labor safety and Hygiene during construction works in conjunction with Activity-6 outputs.

With these measures, SACQI and CAMD of MOC can reduce workloads of providing training programs and disseminate information to End users.



*Note: (*1): CQM also provides technical training to contractors and consultants.*

Figure 12.5.2 Phased Training Programs

(3) Training Program Styles and Timings

As shown in **Table 12.5.2,** there are mainly two types of training programs; (1) Seminars or workshops and (2) Regular training courses as seen in Training Style in the tables. The former trainings are those for PHASE-1 programs, while the latter for PHASE-2 programs. In order to disseminate information to End users, it is critically important to share responsibilities with professional training organizations in MOC.

In order to cope with the frequent change in staff assignment for Project Owners (POs) and PMUs, regular training programs which are held once or twice a year need to be implemented.

(4) Collaboration with External Organizations

In general, stakeholders would increase as cascades come near to End users, in particular contractors and consultants. However, it is critically important to let them fully understand capacity enhancement plans for successful implementation. With this purpose, collaboration with associations like VFCEA which are the representative organizations of private construction sectors is indispensable.

Table 12.5.2 Training Programs for the Project Output Dissemination

Activity	Products: Targeted contents in Particular	Current Situation (As of Sep 2012)	Organizer in Charge	PHASE-1			PHASE-2			Training Style (Products)	Timing and frequency	Remarks (Other dissemination measures)
				Implementer	Trainees/ Participants	Training components	Implementer	Trainees/ Participants	Training components			
Act-1/2	Recommendations are integrated into Decree209	New Decree 15 come into effect on April 15, 2013	SACQI	SACQI	• Ministries • DOCs • Any agencies other than Ministries and DOCs	• Information dissemination	SACQI (or Training centers)	• POs • PMUs	• Information dissemination	Seminar Workshop Training courses	One time right after promulgation	MOC Website, MOC magazines
				SACQI	• Associations of construction sector (VFCEA etc.)	• Information dissemination	Association (VFCEA, etc.)	• Construction companies • Consultants	• Information dissemination			
	Recommendations are integrated into Decree12	Discussion on the revision plan is now underway.	CAMD	CAMD	• Ministries • DOCs • Any agencies other than Ministries and DOCs	• Information dissemination	CAMD (or Training centers)	• POs • PMUs	• Information dissemination	Seminar Workshop Training courses	One time right after promulgation	MOC Website MOC magazines
				CAMD	• Associations of construction sector (VFCEA, etc.)	• Information dissemination	Association (VFCEA, etc.)	• Construction companies • Consultants	• Information dissemination			
	Recommendations are integrated into Construction Law	Discussion on the revision is now underway	CAMD	CAMD	• Ministries • DOCs • Any agencies other than Ministries and DOCs	• Information dissemination	CAMD	• POs • PMUs	Information dissemination	Seminar Workshop Training courses	One time right after promulgation	MOC Website MOC magazines
				CAMD	• Associations of construction sector (VFCEA, etc.)	• Information dissemination	Association VFCEA, etc.)	• Construction companies • Consultants	Information dissemination			
Act 3-1-1	Construction package information system	Under development		CAMD	• Ministries • DOCs • Any agencies other than Ministries and DOCs	• Overall guidance • New circulars				Seminar Workshop	Once a year	Manuals need to be downloaded from website.
							CAMD	• Project	• Overall	Regular	Twice a year	

Activity	Products: Targeted contents in Particular	Current Situation (As of Sep 2012)	Organizer in Charge	PHASE-1			PHASE-2			Training Style (Products)	Timing and frequency	Remarks (Other dissemination measures)
				Implementer	Trainees/ Participants	Training components	Implementer	Trainees/ Participants	Training components			
							(or Training centers)	Owners	guidance • New circulars • Data input • Data revision • Data management • (Web data/ Hardcopy/ e-mail)	training courses		
				CAMD	• CAMD Database Manager	• Overall guidance • New circulars • Data input • Data revision • Data management • (Web data/ Hardcopy/ e-mail)				On-the-job Training	On request	
Act 3-1-2	Construction company registration system	Under development	CAMD	CAMD	• Ministries • DOCs • Any agencies other than Ministries and DOCs	• Overall guidance • New circulars				Seminar Workshops	Once a year	Manuals need to be downloaded from website.
				CAMD	• Associations of construction sector (VFCEA, etc.)	• Overall guidance • New circulars • Data input • Supporting data (Note) • System operation	Association (VFCEA etc.) CQM	• Contractors	• Overall guidance • New circulars • Data input • Supporting data (Note) • System operation	Workshops Training courses	Once a year	
				CAMD	• CAMD Database manager (If needed)	• Overall guidance • New circulars • Data input • Supporting data (Note) • Data verification • System operation				On-the-job Training	On request	
Act 3-1-3	Consultant registration system	Under development	CAMD	CAMD	• Ministries • DOCs • Any agencies	• Overall guidance • New circulars				Seminar Workshops	Once a year	Manuals need to be downloaded from website.

Activity	Products: Targeted contents in Particular	Current Situation (As of Sep 2012)	Organizer in Charge	PHASE-1			PHASE-2			Training Style (Products)	Timing and frequency	Remarks (Other dissemination measures)
				Implementer	Trainees/ Participants	Training components	Implementer	Trainees/ Participants	Training components			
					other than Ministries and DOCs							
				CAMD	• Associations of construction sector (VFCEA, etc.)	• Overall guidance • New circulars • Data input • Supporting data (Note) • System operation	• Association (VFCEA etc.) • CQM	• Consultants	• Overall guidance • New circulars • Data input • Supporting data (Note) • System operation	Seminar Workshop	Once a year	
				CAMD	• CAMD Database manager (If needed)	• Overall guidance • New circulars • Data input • Supporting data (Note) • Data verification • System operation				On-the-job Training	On request	
Act 3-2	Contractor performance evaluation system	Under development	CAMD	CAMD	• Ministries • DOCs • Any agencies other than Ministries and DOCs	• Overall guidance • New circulars				Seminar Workshop	One a year	Manuals need to be downloaded from website.
							CAMD (Training centers)	• Project Owners • Evaluators • PMUs	• Overall guidance • New circulars • Evaluation methods • System operation • Data transfer to CAMD	Regular training courses	twice a year	
				CAMD	• Associations of construction sector (VFCEA, etc.)	• Overall guidance • New circulars • Evaluation methods	Association (VFCEA etc.) CQM	• Consultants	• Overall guidance • New circulars • Evaluation methods	Seminar Workshop	Twice a year	
				CAMD	• CAMD Database Manager	• Overall guidance • New circulars • Evaluation				On-the-job Training	On request	

Activity	Products: Targeted contents in Particular	Current Situation (As of Sep 2012)	Organizer in Charge	PHASE-1			PHASE-2			Training Style (Products)	Timing and frequency	Remarks (Other dissemination measures)
				Implementer	Trainees/ Participants	Training components	Implementer	Trainees/ Participants	Training components			
						methods • System operation • Database management						
Act-4	Decree 12 Circular 12 Others	Under discussion	CAMD	CAMD Examination Center	• Ministries • DOCs	• Guidance on new qualifications and regulations • Implementation of exams				Workshop	Once after the enforcement of regulation	MOC Website MOC magazines
				CAMD Examination Center	• Associations of construction sector (VFCEA, etc.)	• Information dissemination	Association (VFCEA, etc.)	• Construction companies • Consultants	• Information dissemination	Workshop	Once after the enforcement of regulation	
				CAMD Examination Center	• Existing training Centers	• Information dissemination				Workshop	Once after the enforcement of regulation	
				CAMD	• Examination Center • (MOC)	• Guidance on new qualifications and regulations • Planning of exams • Implementation of exams • Scoring of exams. • Engineer registration and database management				Workshop	Once after the enforcement of regulation	
Act-5	Related regulations (Decree209, Decree12, Construction Law, Circulars) Building facility maintenance procedure manual.	Under discussion	SACQI	SACQI	• Ministry level • DOCs • PMUs	• Information dissemination				Support subject of Seminars		
				SACQI			SACQI (Training centers)	• Project Owners • PMUs • Contractors • Consultants	• Construction safety	Regular Training courses	Twice a year	
				SACQI	• Associations of construction sector (VFCEA etc.)	• Information dissemination	Association (VFCEA, etc.) CQM	• Construction companies • Consultants	• Information dissemination	Seminar Workshop	Once a year	

Activity	Products: Targeted contents in Particular	Current Situation (As of Sep 2012)	Organizer in Charge	PHASE-1			PHASE-2			Training Style (Products)	Timing and frequency	Remarks (Other dissemination measures)
				Implementer	Trainees/ Participants	Training components	Implementer	Trainees/ Participants	Training components			
Act-6.	• Safety and Health Manual • Case studies on accident and near-miss handbook	Printing is completed	CAMD	CAMD	• Ministries • DOCs Agencies other than Ministries and DOCs	• Information dissemination				Seminar Workshop	Once a year	Manuals need to be downloaded from MOC website.
							CAMD (Training centers)	• Project Owners • PMUs • Contractors • Consultants	• Construction safety	Regular Training courses	Twice a year	
				CAMD	• Associations of construction sector (VFCEA etc.)	• Information dissemination	Association (VFCEA, etc.) CQM	• Construction companies • Consultants	• Information dissemination	Seminar Workshop	Once a year	

(5) Enhancement of CQM Training Functions

Following the training programs stated in the previous section, CQM is now proposed to play an important role in providing technical training programs to stakeholders. As already shown, outputs of this Project consists of recommendations in the form of regulations, computer software systems and databases and technical manuals.

In order to ensure successful implementation of capacity enhancement plans produced in this Project, training programs should cover not only regulations, but also technical issues of the outputs. CQM is deemed a sole organization in MOC which can meet the demand of providing technical training programs not only to state authorities, but to private sectors. It is necessary to reinforce training functions and make it further contribute to enhancing capacity in construction project management and work quality management.

Thus, following trainings at Phase 1, CQM is recommended to provide technical trainings in timely manner to meet the progress of project development. Following show outline of each training. **Table 12.5.3** shows project outputs which may need technical training programs for stakeholders.

1) Technical Training on Activity3

According to the development schedule of activities, technical trainings are to be provided.

- Activity 3-1-2/3-1-3: Construction Company / Consultant Registration System (CRG)

Technical training is required for construction company and consultant to understand the new system and to develop competent capacity to register. It is preferable to be implemented in computer based classroom training, however, due to number of stakeholder to be addressed, it is advised to be implemented in Workshop / Seminar.

- Activity3-2: Contactor Performance Evaluation System

Technical training is also required for construction companies and consultant aiming them to fully understand the new performance evaluation system. According to the prioritized target projects for evaluation in phases by project grades, target trainees (contractor and consultant) is also required to be prioritized accordingly.

2) Technical Training on Activity 5: Building Facility Maintenance Procedure Manual

Building Facility Maintenance Procedure Manual is under process of development during the project. It is recommended to hold Workshop/Seminar to inform the current progress of work and discuss with relevant stakeholders for further improvements and enforcement.

3) Technical Training on Activity 6 : Safety Manual

"Safety and Health manual in Construction " and " Case Study Handbook on Labor accident and Near- Miss Incidents" are prepared and disseminate during the project. CQM is advised to hold Workshop/Seminar to disseminate information to raise aware of labor safety and health in construction to contractors and consultants who actually involved in site works.

Table 12.5.3 Requirements of Technical Training

Activity	Project Outputs	Organizer in Charge	Training Organizers	Stakeholders (Trainees)	Training components
Act 3-1-2	Construction company registration system	CAMD	Association (VFCEA etc.) CQM	Contractors	• Overall guidance • New circulars • Data input • Supporting data (Note) • System operation
Act 3-1-3	Consultant registration system	CAMD	Association (VFCEA etc.) CQM	Consultants	• Overall guidance • New circulars • Data input • Supporting data (Note) • System operation
Act 3-2	Contractor performance evaluation system	CAMD	Association (VFCEA etc.) CQM	Consultants	• Overall guidance • New circulars • Evaluation methods
Act-5	Building facility maintenance procedure manual.	SACQI	Association (VFCEA etc.) CQM	Consultants	• Information dissemination
Act-6.	Safety Manual Near-miss cases	CAMD	Association (VFCEA etc.) CQM	Contractors Consultants	• Information dissemination

12.6 RECOMMENDATION ON HUMAN CAPACITY DEVELOPMENT ON CONSTRUCTION PROJECT MANAGEMENT FOR REGIONAL GOVERNMENT

12.6.1 Human Capacity Development on Construction Project Management for regional government in Japan

(1) Characteristics of Human Capacity Development on Construction Management for Regional Government in Japan

- Training center for staff and official of regional authorities as well as private companies involved in infrastructure development are established and provided regular intensive training relevant to managing field of MLIT.
- MLIT College providing regular intensive official training for capacity development of staff and officials of MLIT, also offers trainings to staff and officials of regional authorities and agencies.

(2) Japan Construction Training Centre (JCTC)

1) Background

The Japan Construction Training Center (JCTC), a public foundation, was founded with financial support from National Governor's Association in 1962 with an objective of strengthening management capacity of regional government officers in infrastructure construction, operation and maintenance. In 1983, JCTC strengthened its functions, upon receiving request from Japan Association of City Mayor and National Association of Towns and Villages. It's been 50 years since its establishment and about 180 thousand of people have participated in its training programs.

2) Objectives

To enhance capacity of regional government staff and private company staff who are involved in infrastructure development.

3) Participants

- Central government staff (G)
- Regional government staff (G)
- Ministerial agency/public corporation staff (G)
- Private-company staff (P)
- Membership (M)

4) Type of Program offered

- Training courses:
  - Public Official training: targeting National / local governments, foundations
  - General Training: targeting officials as well as private companies
  - Special training: Training target are limited.
- Qualification exams
- Statutory Project Supervisor Training

a. Training courses

12 training programs of total of about 91courses.in 2013 as shown in **Table 12.6.1**

Table 12.6.1 Training courses in 2013

No.	Training field		Training Courses	Trainees		
				G	G & P	M
1)	Business management	1	Public works tendering system	X		
		2	Comprehensive evaluation tendering	X		
		3	Prevention of legal conflict in construction	X		
		4	Asset management		X	
		5	PPP/PFI		X	
		6	Lessons learnt from Audit Board inspection		X	
		7	GIS		X	
		8	Presentation skill in construction		X	
2)	Project supervision	1	Cost estimate for public works	X		
		2	Construction work supervisor	X		
		3	Construction work quality control and inspection	X		
		4	Exercise on construction work implementation plan		X	
		5	Construction work supervision		X	
		6	Concrete work supervision		X	
		7	Maintenance and repair of concrete structures		X	
		8	Construction technologies for young engineer (Base course)		X	
		9	Labor safety management during construction		X	
		10	Temporary works		X	
		11	Points of public works – Planning and design		X	
		12	Points of public works – Construction work, supervision and inspection		X	
3)	Soil & geology	1	Geological survey		X	
		2	Geological design		X	
		3	Measures against soil pollution		X	
4)	Disaster prevention	1	Disaster restoration	X		
		2	Countermeasures right after large disasters		X	
		3	Flood control		X	
		4	Earthquake resistant design		X	
		5	Slope protection		X	
		6	Measures against land slides		X	
5)	Tunnel	1	NATM construction technology		X	
6)	Land & right-of-way acquisition	1	Basics on Land	X		
		2	Land Administration (Compensation)	X		
		3	Land Administration (land)	X		
		4	Land Compensation for Professionals	X		
		5	Land investigator	X		
		6	Legislation relevant to land		X	
		7	Land for Professionals		X	
		8	Land Negotiation		X	
		9	Property Evaluation and land price survey		X	
7)	River and dam	1	Dam Management for managers	X		
		2	River Structural Engineering Design		X	
		3	River Development planning and evaluation		X	
		4	Good practice on River side development		X	
		5	Dam Management		X	
		6	Dam Construction Engineer		X	
		7	Comprehensive Dam Engineering		X	
		8	Practice on Dam Operation		X	

No.	Training field		Training Courses	Trainees		
				G	G & P	M
		9	Chief Dam Management Engineers (lecture /Practice)		X	
		10	Dam Management Engineers(Practice)			X
8)	Erosion control	1	Planning and design of Erosion Control		X	
		2	Prevention of Erosion disaster			
9)	Roads	1	Road administration – General	X		
		2	Road administration – Recent policy		X	
		3	Road planning – Exercise		X	
		4	City/town/village roads		X	
		5	Traffic safety measures for City/town/village roads		X	
		6	Road pavement technologies		X	
		7	Road technologies – Special technologies			X
10)	Bridges	1	Bridge design		X	
		2	Bridge design and construction technology		X	
		3	PC bridge technology		X	
		4	New technology and construction of PC bridges		X	
		5	Bridge maintenance repair		X	
11)	Urban planning	1	Development Permission	X		
		2	Development Permission for Professionals	X		
		3	Urban Planning		X	
		4	Urban Regeneration		X	
		5	Land Readjustment		X	
		6	Housing development technical training		X	
		7	Streetscape		X	
		8	Transport and town planning		X	
		9	Park and Urban green space		X	
		10	Swage system		X	
		11	Swage system management		X	
		12	Landscape planning		X	
		13	Public involvement in town planning		X	
12)	Building facilities	1	Building Standards Act	X		
		2	Quantity survey on public buildings	X		
		3	Quantity survey on public building facility (electricity)	X		
		4	Building Environment	X		
		5	Building Design		X	
		6	Building RC Structure		X	
		7	Design and Construction of Timber framed building		X	
		8	Anti-earthquake technology for building		X	
		9	Building Renewal		X	
		10	Building facility (Electricity)		X	
		11	Building facility (Ventilation)		X	
		12	Building Construction Management		X	
		13	Building Construction Supervision		X	
		14	Building maintenance and management		X	
		15	Practice on Building confirmation		X	

(Note) *G: Government staff*

P: Private company staff

M: Membership

b. Examination for licensing qualification

As the accredited training institution by MLIT, JCTC also offers examination of following three (3) licenses and one (1) certificate stipulated under Construction Industry Act and Land Readjustment Act, once a year at main regions.

- Civil work construction management engineers
- Piping construction management engineers
- Landscape work construction management engineers, and
- Land use and construction management engineer

c. Statutory training for Project supervisor

Construction industry Act stipulate that engineers who manage construction site requires sufficient skill and knowledge. Especially for the project over certain size is stipulated to assign "Construction Supervisor" who have expertise knowledge and skill. With this regards, the Act stipulate that the supervisor to take training under the accredit training institution. This Centre offer this stipulated training for "Construction Supervisor". Training is 1 day training offered at main regions

1) Training fees

Trainees have to pay trainees fee to JCTC including training, venue, accommodation and meals. Local officials can apply subsides for training fee from Municipal Development Corporation.

12.6.2 Recommendations for Human Capacity Development on Construction Project Management for Regional Government

(1) Rising Needs of Training

Since the year 2000, the Vietnamese Government has accelerated the decentralization policy of some of the government functions from central ministries to the Provincial-level People's Committees (hereinafter to be referred as PPC). With this policy, responsibilities given to PPC are gradually expanding in particularly in infrastructure development sector, so capacity enhancement of PPC staff is now becoming an important factor in the sector.

In addition, study on the capacity enhancement in construction quality assurance is now underway through JICA Project for the project for capacity enhancement in construction quality assurance. Upon completion of the Project, MOC is encouraged to disseminate information on the Project products to nationwide and Provincial-level People's Committees currently in charge of national road maintenance and operation in the regions.

(2) Planning of Training Program

In the Japanese practices described above, training programs specialized for regional government staff including government agency and private company staff. are developed by Japan Construction Training Center (JCTC), a public foundation approved by MLIT. Referring this practice to the current situation of Vietnam, the project team formulated draft training plans as shown in **Table 12.6.2**

MOC is recommended to initiate development of training program specialized for training of staff and officials of Provincial, District and Commune level People's Committees, and private companies in regions focused on infrastructure construction project management and maintenance These trainings are provided at Training Centre established for this purpose, or utilizing existing training centers approved by MOCs as listed in **Table 12.6.3.** MOC is proposed to discuss the plan with PPCs for approval, so that Training Centre is developed and managed with funds of PPCs and tuition fees under the supervision of MOC.

Table 12.6.2 Planning of Training Programs for Provincial-level People's Committees

Plans	Classification and Participants	Focuses of Training Programs	Main Topics	Training Implementation Body	Consensus and Finance
Practice in Japan	• Training on infrastructure construction and maintenance management • Regional Government staff (Prefectures, cities/towns/ villages) and Private company staff	• Business management • Project supervision • Soil and geology • Disaster prevention • Roads/Tunnel/Bridges • River and dam • Erosion control • Urban planning • Building facility • Land/ right-of-way acquisition	• Training programs for infrastructure administration and management.	• Japan Construction Training Centre (Prefecture-level training is integrated into one center)	• Based on consensus of prefecture governors • Financial support (Capital investment) from prefectures • Training fees from participants
MOC-level plan	Training on infrastructure construction management and maintenance for DOC/DOT/DOA/DOI staff in Provincial, District and Commune People's Committees, private companies.	• Legal frame (Regulations) • Housing infra. Management • Transport infra. Management • Irrigation infra. Management • Industrial infra. Management • Technical infra. Management	• Business management • Project supervision • Soil & geology • Disaster prevention • Tunnel • Land & right-of-way acquisition • River and dam • Erosion control • Roads • Bridges • Urban planning • Building facilities	• Foundation of integrated training centre for ministry level (Hanoi), or • Training centers (Housing/ Transportation/ Industry / Irrigation/ Urban infrastructure sector)	• Consensus of the Heads of PPCs • Capital investment from PPCs for training facilities • Training fees from participants

(Note)

Refer JCTC training course (Table 1) for further detail of training on infrastructure construction management and maintenance.

Table 12.6.3 Training Center Approved by MOC (As of March 2013)

No.	Name	Management Unit	Building	Industrial	Infrastructure	Transport	Irrigation	Hydropower
1	Institute for Building Science and technology	MOC	X	X	X	X	X	X
2	Academy of managers for construction and cities	MOC	X	X	X	X	X	X
3	University of Architecture Ho Chi Minh City	MOC	X	X	X			
4	College of Construction No.3	MOC	X	X	X			
5	University of Architecture Ha Noi	MOC	X	X	X	X	X	X
6	Ha Noi Institute for research, education and training to official staff	Company	X	X	X	X	X	X
7	Institute for research, training and development management skill	Company	X	X	X	X	X	X
8	Apave Vietnam and Southeast Asian Ltd.		X	X	X			
9	University of Construction	MOET	X	X	X	X	X	X
10	University of Transport and Communication	MOET				X		
11	Ho Chi Minh City Open University	MOET	X	X	X	X	X	X
12	University of Technology - Ho Chi Minh City National University	NUHCM	X	X	X	X		
13	Lac Hong University	MOET	X	X	X			
14	Institute of Transport Science and technology	MOT				X		
15	Vietnam Center for Technology of Construction Quality Management – CQM	MOC	X	X	X	X	X	X
16	Management Consultant Development and Training JSC.	Company	X	X	X	X	X	X
17	Centre for applied information technology in construction - Vietnam federation of civil engineering association	Society	X	X	X	X	X	X
18	Institute for open training and research development - Binh Duong university	MOET	X	X	X			
19	Construction price JSC.	Company	X	X	X	X	X	X
20	Tender consultant training and business development JSC.	Company	X	X	X	X	X	X
21	Economic management training and research JSC.	Company	X	X	X	X	X	X
22	Institute for Southeast Asian Resource research and development JSC.	Company	X	X	X	X	X	X
23	Institute of construction economics sciences - Vietnam union of science and technology association	Society	X	X	X	X	X	X
24	Vietnam Institute of Architecture, Urban and Rural Planning	MOC	X	X	X	X	X	X
25	College of transport	MOT				X		
26	College of Construction and Industrial	MOI	X	X	X	X	X	X
27	Vietnam Education JSC.	Company	X	X	X	X	X	X

No.	Name	Management Unit	Building	Industrial	Infrastructure	Transport	Irrigation	Hydropower
28	Centre for Science training and construction technology transfer -Vietnam federation of civil engineering association	Society	X	X	X	X	X	X
29	Vietnam Construction consultant association	Society	X	X	X	X	X	X
30	University of Transport Ho Chi Minh City	MOT	X	X	X	X		
31	Song Da Kinh Bac JSC.	Company	X	X	X	X	X	X
32	Phuong Nam Training and Real estate assessment	Company	X	X	X	X	X	X
33	Management training and international cooperation JSC.	Company	X	X	X	X	X	X
34	University of Transport technology	MOT	X	X	X		X	X
35	Centre for Training and Information- Institute of Transport Science and technology	MOT	X	X	X		X	X
36	Centre for Science technology and Investment consultant -University of technology Da Nang	MOET	X	X	X	X	X	X
37	College of Construction Nam Dinh	MOC	X	X	X	X		
38	Business administration School - Vietnam National Coal - Mineral Industries Group	Society	X	X	X	X	X	X
39	Institute for Research and human resource management consultant - Human resource, talented person development technology association	Society	X	X	X	X	X	X
40	Institute for Direction and business administration technology - Ho Chi Minh City Business association	Society	X	X	X	X	X	X
41	Centre University of Construction	MOC	X	X	X	X	X	X
42	Water Resources University	MARD						
41	Centre University of Construction	MOC				X	X	X
42	Water Resources University	MARD						
43	College of Construction No.1	MOC	X	X	X			
44	Mien Tay Construction University	MOC	X	X	X	X		
45	Sub-Institute of Transport Science and technology in the southern Vietnam - Institute of Transport Science and technology	MOT				X		
46	Ha Noi Training and Investment Consultant JSC.	Company	X	X	X	X	X	X
47	College of Urban construction work	MOC	X	X	X	X	X	X
48	Institute for International Development - Vietnam Southeast Asian Science Studies Association	Society	X	X	X	X	X	X
49	Institute for training and management development - Branch of Davilaw intellectual property JSC.	Company	X	X	X	X	X	X
50	Centre for Research and Development Construction Technology - Au Lac Investment and Construction JSC.	Company	X	X	X	X	X	X

(Source) MOC Homepage http://www/moc.gov.vn

CHAPTER 13 COUNTERPART TRAINING IN JAPAN, VIETNAM-JAPAN SEMINAR AND EQUIPMENT & MACHINERY SUPPLY

13.1 C/P TRAINING IN JAPAN

In Total of 50 officials, which are 11 officials in the first year (2010) and the second year (2011), and 12 officials in the third year (2012) and 16 officials in the fourth year (2013) are participated in the counterpart training in Japan. Among all participants to 26 officials are fully funded by JICA and 24 officials are partially funded by JICA and DOC/MOC.

The details of the training are as follows:

(1) Training in 2010

1) Training Program

Program of C/P Training in 2010 is shown in **Table 13.1.1** .The training is conducted from November 28th to December 11th , 2010 and 11 participants are trained.

Table 13.1.1 Program of C/P Training for Construction Quality Assurance

DATE		CONTENT	PLACE
28-Nov	Sun	Arrival Japan (Hanoi - Narita)	
29-Nov	Mon	Briefing / Orientation	JICA Tokyo
		【Lecture】 Introduction of construction quality assurance in Japan	Katahira & Engineers International
30-Nov	Tue	【Lecture】 System of Quality Control in Japan - Legal system for quality control and safety management according to the Japanese experience - Responsibility and ethical practice of project owner and contractor	Ministry of Land, Infrastructure and Transportation (MLIT)
		【Lecture】 Management for information of Contractor and Evaluation - Registration and Evaluation of contractor (business evaluation, technical capacity evaluation) - Exclusion of defective contractor and inadequate contractor, Sanction	MLIT
1-Dec	Wed	【Site Visit】 - Urban Highway (Shield Tunnel)	Tokyo
2-Dec	Thu	【Lecture】 CORINS(Construction Records Information Service) and TECRIS(Technical Consulting Records Information Service)	JACIC (Japan Construction Information Center)
		(Move to Kobe)	
3-Dec	Fri	【Site Visit】 / Akashi Kaikyou Bridge (Long span Bridge)	Kobe
		(Return to Tokyo)	
4-Dec	Sat	Day-off	
5-Dec	Sun	Day-off	
6-Dec	Mon	【Lecture】	Kanto Regional Development

DATE		CONTENT	PLACE
		Management and Inspection at Construction Site - Management method of project owner (organization, quality, safety, modifying design) - Efficient inspection (simplifying inspection items and documents)	Bureau, MLIT
		【Site Visit】National Road Bridge	
7-Dec	Tue	【Lecture】 Management and Inspection at Construction Site - Inspection and evaluation of construction works (inspection criteria, method, evaluation, award system) - Application of Sanction	Kanto Regional Development Bureau, MLIT
		【Site Visit】 Pilling, Box Culvert etc.	
8-Dec	Wed	【Site Visit】 - National Institute for Land and Infrastructure Management - Public Works Research Institute	Tsukuba
9-Dec	Thu	【Lecture】 Safety Management at Construction Site	JCSHA(Japan Construction Safety and Health Association)
		【Site Visit】High-rise Building, Urban Development	Urban Renaissance Agency
10-Dec	Fri	Discussion & Evaluation	JICA Tokyo
11-Dec	Sat	Leave Japan (Narita - Hanoi)	

2) Training Participants:

(1) Nhu Nguyen Hong Cuong, Deputy Director, Viet Nam Center for Technology Construction Quality Management, SACQI, Ministry of Construction (MOC)

(2) Nguyen Minh Truong, Senior Official, Division of Construction Quality Inspection No.2, SACQI, MOC

(3) Nguyen Trong Thai, Official, Division of Construction Quality Inspection No.1, SACQI, MOC

(4) Ha Ngoc Hong, Deputy Director, Hanoi City Department of Construction Directorate, Ha Noi DOC

(5) Ngo Tinh Tuy, Chief of the Authority, SACQI, MOC

(6) Nguyen Huy Quang, Director, Consultant & Inspection JSC of Construction Technology & Equipment (CONINCO)

(7) Le Cong Khanh, Deputy Director, Center of Construction Quality Inspection- Dak Lak Department of Construction

(8) Nguyen Le Thi, Manager, Technical Inspection Department No.6, Quality Assurance & Testing Center

(9) Vu Quoc Khiem, Department Chief, Management and Economy Construction, Centre for Quality Verification and Economy

(10) Ta Chi Nhan, Director, Center for Construction Verification and Planning, Can Tho City's Department of Construction

(11) Pham Anh Tuan, Vice Director General, Sai Gon Construction Quality Control

(2) Training in 2011

1) Training Program

Program of C/P Training in 2011 is shown in **Table 13.1.2**. The training is conducted from November 28th to December 9th, 2011and 12 officials are participated.

Table 13.1.2 Program of C/P Training for Construction Quality Assurance

DATE		CONTENT	PLACE
28-Nov	Mon	Arrival Japan (Hanoi - Narita)	
29-Nov	Tue	Briefing / Orientation	JICA Tokyo
		【Lecture】 - Introduction of Construction Quality Assurance in Japan	KEI
30-Nov	Wed	【Lecture】 - Registration System of Construction Contractors in Japan - Bidding System of Public Construction Works for Construction Quality Assurance	Ministry of Land, Infrastructure and Transportation (MLIT)
		【Lecture】 - Management of Construction Quality Assurance in Japan (System, Regulation, Current Problems & Countermeasures) - Construction Quality Assurance System for Buildings	MLIT
1-Dec	Thu	【Visit of Construction Site】 - High-rise building for office and residence	Tokyo
		【Visit of Construction Site】 - Skyscraper for residence at Tokyo Urban Redevelopment Area	Tokyo Bay Area
		【Lecture】 - CORINS (Construction Records Information Service) and TECRIS (Technical Consulting Records Information Service)	JACIC (Japan Construction Information Center)
2-Dec	Fri	【Lecture】 - Safety Management at Construction Site	JCSHA (Japan Construction Safety and Health Association)
		【Visit of Construction Site】 - Tokyo Ring Road	Chiba Pref.
3-Dec	Sat	Day-off	
4-Dec	Sun	Day-off	
5-Dec	Mon	【Lecture】 - Management and Inspection at Construction Site - Evaluation of Construction Works (Technical inspection and Performance evaluation)	Kanto Regional Bureau, MLIT
		【Lecture】 - Construction Quality Management Method for Project Owner (Implementation Structure, Process, Quality, Safety)	
6-Dec	Tue	【Visit of Construction Site】 - Tokyo Gate Bridge	Tokyo
		【Visit of Construction Site】 - Urban Shield Tunnel for Tokyo Metropolitan Expressway	Tokyo

DATE		CONTENT	PLACE
7-Dec	Wed	【Lecture】 - Role of Research Institution - Non-Destructive Testing	Tsukuba
		【Site Visit】 - Experiment Facilities of Research Institution for Civil works and Buildings	
8-Dec	Thu	Discussion & Evaluation of Training	JICA Tokyo
9-Dec	Fri	Leave Japan (Narita - Hanoi)	

2) Training Participants:

(1) Mr Le Van Thinh - Head of Division- Construction Quality Inspection No. 1 – State Authority for Construction Quality Inspection, MOC

(2) Mr Nguyen Hong Linh - Secretary, Co-coordinator, Project Management Unit, State Authority for Construction Quality Inspection, MOC

(3) Mr Nguyen Viet Son- Head of General Affair & Planning - Vietnam Center for Technology of Construction Quality Management (CQM)-State Authority for Construction Quality Inspection, MOC

(4) Mr Tran To Nghi - Deputy General Director- Authority for Works Construction Management –Ministry of Agriculture and Rural Development. (MARD)

(5) Mr Duong Ngoc Thanh - Vice Head of Construction Quality Management- Ho Chi Minh City Department of Construction

(6) Mr Nguyen Van Do - Director, Bac Giang Province Construction Inspection Center

(7) Mr Hoang Quang Dat - Director, Lao Cai Province Construction Inspection Center

(8) Mr Dinh Khac Tiep- Director, Nam Dinh Province Construction Inspection Center

(9) Mr Pham Huu Duy- Director, Quang Binh Province Construction Inspection Center

(10) Mr Giang Quoc Doanh - Director, Ba Ria-Vung Tau Province Construction Inspection Center

(11) Mr Tran Tien De - Deputy General Director, Sai Gon Construction Quality Control Joint Stock Company.

(3) Training in 2012

1) Training Program

Program of C/P Training in 2012 is shown in **Table 13.1.3** . The training is conducted from November 12th to November 23rd , 2012 and 12 officials are participated.

Table 13.1.3 Program of C/P Training for Construction Quality Assurance

DATE		CONTENT	PLACE
12-Nov	Mon	Arrival Japan (Hanoi - Narita)	
13-Nov	Tue	Briefing / Orientation	JICA Tokyo
		【Lecture】 - Introduction of Construction Quality Assurance in Japan	KEI (Project)
14-Nov	Wed	【Lecture】 - Registration System of Construction Contractors in Japan - Bidding System of Public Construction Works for Construction Quality Assurance	Ministry of Land, Infrastructure, Transportation and Tourism (MLIT)
		【Lecture】 - Management of Construction Quality Assurance in Japan (System, Regulation, Current Problems & Countermeasures) - Construction Quality Assurance System for Buildings	
15-Nov	Thu	【Visit of Construction Site】 - Urban Shield Tunnel for Tokyo Metropolitan Expressway	Tokyo or Yokohama
		【Lecture】 - CORINS (Construction Records Information Service) - TECRIS (Technical Consulting Records Information Service)	JACIC (Japan Construction Information Center)
16-Nov	Fri	【Visit of Construction Site】Skyscraper	Tokyo
		【Lecture】 - Safety Management at Construction Site	JCSHA (Japan Construction Safety and Health Association)
17-Nov	Sat	Day-off	
18-Nov	Sun	Day-off	
19-Nov	Mon	【Lecture】 - Management and Inspection at Construction Site - Evaluation of Construction Works - Construction Quality Management Method for Project Owner	Kanto Regional Bureau, MLIT
		【Visit of Construction Site】Public Construction Works	
20-Nov	Tue	【Visit of Construction Site】	
21-Nov	Wed	【Lecture】 - Role of Research Institution - Non-Destructive Testing	Tsukuba
		【Site Visit】 - Experiment Facilities of Research Institution for Civil works and Buildings	
22-Nov	Thu	Discussion & Evaluation	JICA Tokyo
23-Nov	Fri	Leave Japan (Narita - Hanoi)	

2) Training Participants:

(1) Mr. Le Quang, Deputy Director General, State Authority for Construction Quality Assurance (SACQI), MOC

(2) Mr. Vu Quoc Anh, Deputy Head, Inspection Division No.1, SACQI, MOC

(3) Ms. Tran Thu Dung, Accountant, National Acceptance Council, PMU, SACQI, MOC

(4) Mr. Nguyen Quoc Dan, Head, General Office, MOC

(5) Mr. Tran Huu Ha, Deputy Director General, Dept. of Science, Technology & Environment, MOC

(6) Mr. Nguyen Ngoc Long, Standing Vice Chairman, Vietnam Bridge & Road Association

(7) Mr. Bui Dinh Thu, Director, CIC of Lang Son

(8) Mr. Luong Duy Chinh, Director, CIC of Ninh Binh

(9) Mr. Nguyen Quoc Thinh, Deputy Director, CIC of Hoa Binh

(10) Mr. Tran Huy Chuong, Director, CIC of Dong Nai

(11) Mr. Tran Huu Thang, Director, CIC of Ha Tinh

(12) Ms. Duong Thi Thai, Deputy Director, CIC of Thai Nguyen

(4) Training in 2013

Two training of "Non-destructive testing for construction work" and "Training on Quality Assurance on Construction and Building Works Projects" are provided.

1) Training for Non-destructive testing for construction work

a. Training Program

Program of Non-destructive testing for construction work is shown in **Table 13.1.4** . The training is conducted from October 1st to 12th , 2013 and 4 officials are participated.

Table 13.1.4 Program of C/P Training for Non-destructive testing for construction work

DATE		CONTENT	PLACE
1-Oct	Tue	Arriving to Japan	
2-Oct	Wed	Briefing	JICA Tokyo
		Program Orientation	KEI (Project)
		【Lecture】Introduction to Non-destructive Testing in Japan	
3-Oct	Thu	【Lecture】Introduction to Non-destructive Testing	Non-Destructive Inspection Co., Ltd
		【Lecture】Introduction to Non-destructive Testing	
4-Oct	Fri	【Lecture】Basics and Type of Liquid Penetrant Testing	TASETO Co., Ltd
		【Lecture】Equipment and Material for Penetrant Testing	
		【Lecture】Actual situation and safety assurance of Solvent Removable Penetrant Testing	
		【Practice】Solvent Removable Penetrant Testing	
5-Oct	Sat	Day-off	
6-Oct	Sun	Day-off	
7-Oct	Mon	【Lecture】Basics and Types of Magnetic Particle Testing	ACTION CREATION HEART Ltd.
		【Lecture】Equipment and Material for Penetrant Testing	

DATE		CONTENT	PLACE
		【Lecture】Actual situation of Magnetic Particle Testing	
		【Practice】Yoke Method Magnetic Particle Testing	
8-Oct	Tue	【Lecture】Basics of Ultrasonic Testing	Japan Power Engineering and Inspection Corporation
		【Lecture】Equipment of detecting flaw	
		【Lecture】Performance and maintenance of testing equipment, material for testing, Introduction to Ultrasonic Vertical and Angle Beam Testing	
9-Oct	Wed	【Practice】Ultrasonic Vertical and Angle Beam Testing	Japan Power Engineering and Inspection Corporation
		【Practice】Ultrasonic Vertical and Angle Beam Testing	
10-Oct	Thu)	Travel（Tokyo→Tsukuba, Ibaraki Pref.）	
		【Lecture】Non-destructive Testing for Reinforced Concrete	Building Research Institute
		【Lecture】Non-destructive Testing by rebound hammer	Public Works Research Institute
		Travel（Tsukuba, Ibaraki Pref.→Tokyo）	
11-Oct	Fri	Preparation	
		Evaluation Meeting	
12-Oct	Sat	Leaving Japan	

b. Training Participants:

(1) Mr. Do Viet Ha - Vice Director, CQM

(2) Mr. Nguyễn Anh Tuấn - Head of Training Department , CQM

(3) Mr. Le Hoa - Director, Da Nang construction inspection center

(4) Mr. Pham Tha - Director, Dong Thap construction inspection center

2) Training for Quality Assurance on Construction and Building Works Projects

a. Training Program

Program of Quality Assurance on Construction and Building Works Projects is shown in **Table 13.1.5**. The training is conducted from October 21st to November 23rd , 2012 and 12 officials are participated.

Table 13.1.5 Program of C/P Training for Quality Assurance on Construction and Building Works Projects

DATE		CONTENT	PLACE
21-Oct	Mon	Arriving to Japan	
22-Oct	Tue	Briefing	JICA Tokyo
		Program Orientation	KEI (Project)
		【Lecture】Construction Quality Assurance in Japan	
23-Oct	Wed	【Lecture】 Registration System of Construction Contractors in Japan	MLIT
		【Lecture】 Bidding and Contract System of Public Construction Works for	

DATE		CONTENT	PLACE
		Construction Quality Assurance	
		【Lecture】 Construction Quality Assurance in Japan	
		【Lecture】Construction Quality Assurance System on Buildings Works	
24-Oct	Thu	【Lecture】 - Outline of Metropolitan Expressway Co.,Ltd. - Construction Quality Assurance	Metropolitan Expressway Co.,Ltd
		【Site Visit】Rainbow Bridge	
		【Lecture】 - Technical Consulting Records Information System (TECRIS) - Construction Records Information System (CORINS)	Japan Construction Information Centre
25-Oct	Fri	【Site Visit】Construction site of Skyscraper	Taisei Cooperation
		【Site Visit】Construction site of Expressway	NEXCO Central, Atugi Office
26-Oct	Sat	Day-off	
27-Oct	Sun	Day-off	
28-Oct	Mon	【Lecture】Site Supervision and Inspection on Construction Works	Kanto Regional Bureau, MLIT
		【Site Visit】Construction site on Civil works in Urban area	
29-Oct	Tue	Travel（Tokyo→Tsukuba）	
		【Lecture】Outline of Research Institute	Public Works Research Institute
		【Lecture】Non-Destructive testing	
		【Site Visit】Site on Dam Hydraulic Experiment , and Pavement Running Experiment etc.	
		Travel（Tsukuba→Tokyo）	
30-Oct	Wed	Travel（Tokyo→Tsukuba）	Building Research Institute
		【Lecture】Research on Building maintenance	
		【Site Visit】Experiment Facilities of Research Institution for Civil works and Buildings	
		Travel（Tsukuba→Tokyo）	
31-Oct	Thu	Preparation	
		Evaluation Meeting	
1-Nov	Fri	Leaving Japan	

b. Training Participants

Among all participants, 6 participants are fully funded and the rest of 6 are partially funded by JICA.

(1) Mr. Tran Chung - Project Expert, Head of Quality Division, VFCEA

(2) Mr. Nguyen Xuan Phuong - Deputy Chief Secretariat, SACQI, MOC

(3) Mr. Pham Duc Ky - Official, SACQI, MOC

(4) Mr. Le Quoc Anh - Official, SACQI, MOC

(5) Mr. Duong Minh Nghia - Deputy Chief Secretariat, Office of National Acceptance Council, SACQI, MOC

(6) Mr. Vu Van Huan - Official (in charge of construction quality), Department of Personnel and Organization, MOC

(7) Mr. Do Quoc Trung – Director, Construction Technology Center, IBST

(8) Mr. Tran Nam Binh - Deputy Director, Construction Planning and Inspection Center of Khanh Hoa province (Khanh Hoa CIC)

(9) Mr. Nguyen Van Giang - Director, Ha Giang CIC

(10) Mr. Dinh Van Giang - Director, Hai Phong CIC

(11) Mr. Dang Hoang Thai - Director, Construction Planning and Inspection Center of Binh Phuoc Province (Binh Phuoc CIC)

(12) Mr. Tran Thanh Son - Director, Construction Engineering and Technological Science Center (NAGECCO)

13.2 SEMINARS

(1) Seminar on Construction Quality Assurance for Senior Officials in Japan

1) Training Program

Seminar on Construction Quality Assurance was held in Japan inviting Vietnamese senior officials in construction sector. The details of the seminar are as follows:

- Program: Japan-Vietnam Senior Officials' Seminar on Construction Projects is shown in **Table 13.2.1**.
- Objectives of Seminar
  - Encouraging to make a common understanding between Japan and Vietnam on the construction project management
  - Strengthening cooperation in construction sector for ODA projects
- Seminar term: from 28 February 2011 to 4 March 2011

Table 13.2.1 Japan-Vietnam Senior Officials' Seminar on Construction Quality Assurance

TIME		CONTENTS	PRESENTER
1st Part	13:30～13:40	Opening Remark	Mr.Yoshiaki Nanami, Director, International Policy Unit for Infrastructure, Policy Bureau, MLIT JICA Mr.Tran Ngoc Thien, Director General, Construction Activity Management Department, MOC
	13:40～14:10	Construction Quality Assurance in Japan	Mr. Hiroto Yatsuki, Construction Works Inspector, Engineering Affairs Division, Minister's Secretariat, MLIT
	14:10～14:40	Construction Safety Management in Japan	Dr.Yukitake Shioi, Emeritus Professor, Hachinohe Institute of Technology
	14:40～15:20	Construction Quality Assurance and Safety Management in Vietnam	Mr.Bui Trung Dung, Deputy Director General, State Authority for Construction Quality Inspection, MOC

TIME		CONTENTS	PRESENTER
	15:20～15:40	Discussion	
	15:40～15:50	Coffee Break	
2nd Part	15:50～16:30	The situation of Construction Sector and Construction Projects in the future in Vietnam	Mr.Dang Trung Thanh, Vice Director General, Transportation Construction Quality Management Department, MOT
	16:30～17:30	The advanced Technology in Japan and Introduction of Projects	Mr.Hajime Suzuki, Senior Executive Director, OCAJI Shimizu Corporation Mr.Kazuyuki Yamaguchi, General Manager, International Divisions Group, International Marketing Division, Penta-Ocean Construction
	17:30～17:50	Discussion	
	17:50～18:00	Closing Remark	Vietnamese Side Mr.Yasuhiro Okumura, Director for International Engineering, International Policy Unit for Infrastructure, Policy Bureau, MLIT

2) Participants:

- Japanese Side: Ministry of Land, Infrastructure and Transportation (MLIT)

  The Overseas Construction Association of Japan Inc. (OCAJI) & Members of OCAJI

- Vietnamese Side: Ministry of Construction (MOC) SACQI, CAMD

  Ministry of Transportation (MOT) TCQM, DPI

  HCMC People's Committee DOC

  Total 6 persons

(1) Mr. Bui Trung Dung, Deputy Director General, State Authority for Construction Quality Inspection (SACQI), Ministry of Construction

(2) Mr. Nguyen Thanh Hang, Deputy Director General, Planning and Investment Department, Ministry of Transport

(3) Mr. Tran The Ky, Deputy Director General, Department of Transport, Ho Chi Minh City

(4) Mr. Dang Trung Thanh, Deputy Director General, Transportation Construction Quality Management Department, Ministry of Transport

(5) Mr. Nguyen Van Hiep, Deputy Director, Quality Control of Construction Project, Department of Construction, Ho Chi Minh City

(6) Mr. Tran Ngoc Thien, Director General, Construction Activity Management Department, Ministry of Construction

(2) Quality Assurance Seminar for Senior Officials in Ho Chi Minh City

Following up the Senior Officials Seminar in Japan in March 2010, the Vietnamese Ministry of Construction, the Japanese Ministry of Land, Infrastructure Transport, and Tourism (MLIT), and Japan International Cooperation Agency (JICA) jointly organized a seminar from 13 to 14 October 2011 in Ho-Chi Minh City. The details of the seminar are as follows:

- Program title: 2nd Vietnam-Japan Seminar on Construction Quality and Construction Project Management; Detailed program is shown in **Table 13.2.2**.
- Objectives of Seminar:
  - To make a common understanding between Japan and Vietnam on the construction project management
  - To strengthen the cooperation in construction sector
- Seminar period: 13 October 2011 (Thu) to 14 October 2011 (Fri)
- Place:
  - Majestic Hotel, Ho Chi Minh City, Viet Nam (on 13 October, 2011)
  - Two construction sites in the City (Sai Gon Airport Plaza and East-West High Way)
- Co-organizer: Co-organized by Ministry of Construction (MOC), Ministry of Land, Infrastructure, Transport & Tourism (MLIT), and Japan International Cooperation Agency (JICA)
- Participants: There were approximately 200 participants including 47 participants from the MOC, MOT, MARD, MOIT and DOCs, 45 participants from the Japanese contractors. The list of the participants is attached as annex.

Table 13.2.2 Program for Quality Assurance Seminar for Senior Officials in Ho Chi Minh City

TIME	PROGRAM	PRESENTER
8:00～8:30 (30)	Registration	
8:30～8:45 (15)	Opening address	MOC: Mr. Bui Pham Khanh, Ministry of Construction of Vietnam, Vice Minister MLIT: Mr. Yuichi Ishikawa, MLIT, Overseas Project Division, Policy Bureau, Director JICA: Mr. Toshio Nagase, JICA Vietnam Office, Deputy Chief Representative
1st Subject: System of Construction Quality Management		
8:45～9:15 (30)	The Current Status of Construction Management in Viet Nam & Some Solutions	Vietnam side: Dr. Le Quang Hung - MOC, State Authority for Construction Quality Inspection (SACQI), Director General (1)
9:15～9:45 (30)	Construction Quality Assurance in Japan Part I: Current Situation of Public	Japan side: Mr. Masamitsu Waga, MLIT, Minister's Secretariat, Engineering Affairs Division,

TIME	PROGRAM	PRESENTER
	Works & System for Construction Quality Assurance, etc. Part II: Measures of Low Bid & Improvement of Cash Flow, etc.	Deputy Director (1)
9:45～10:00 (15)	Some Management Issues of Construction Investment Projects	Vietnamese side: Mr. Hoang Tho Vinh, MOC, Construction Activity Management Department (CAMD), Deputy Director General (1)
10:00～10:15 (15)	Coffee Break	
10:15～11:00 (45)	Recommendation for Improving the Project Quality Management System in Vietnam	Japanese side: Mr. Tsuneo Kato - The JICA expert of Project for Capacity Enhancement in Construction Quality Assurance (1)
	Development of Construction Contractor Registration and Performance Evaluation System	Japanese side: Mr. Jun Takeuchi - The JICA expert of Project for Capacity Enhancement in Construction Quality Assurance (1)
	Development of Standard Specifications & Manuals for Construction Quality Assurance	Japanese side: Mr. Seichi Kusano - The JICA expert of Project for Capacity Enhancement in Construction Quality Assurance (1)
11:00～11:15 (15)	The Current Situation of and Solutions for Construction Quality Management in the Area of HCM City	Vietnam side: Mr. Nguyen Van Hiep - Deputy Director - HCMC DOC (1)
11:15～11:30 (15)	Exchange Opinions	
11:30～13:00	Lunch	
2nd Subject: Construction quality management by contractors/consultants		
13:00～13:15 (15)	Capacity Building For Supervising Consultants in Transport Work Construction	Vietnamese side: Mr. Dang Trung Thanh - Ministry of Transport (MOT), Construction & Quality Management Bureau (TCQM), Deputy Director General (1)
13:15～13:30 (15)	Management of Water Resource Work Quality - Problems & Solutions	Vietnamese side: Mr. Tran To Nghi, Ministry of Agriculture and Rural Development (MARD), Authority for Work Quality Management, Deputy Director General (1)
13:30～14:00 (30)	Quality Assurance System for Construction of Obayashi Part I: What is Quality Management in Construction Works? Part II: Quality Assurance in Construction; Examples of Construction Site Problems	Japanese side: Mr. Satoru KAWAUCHI (Mr) Obayashi Corporation, Overseas Business Division Business Development Department Deputy General Manager (1)
14:00～14:15 (15)	The Current & Future Construction Quality Management System of Construction Corporations in Vietnam	Vietnamese side: Cotec Construction Joint Stock Company (COTECONS) (1)
14:15～14:30 (15)	Coffee Break	
14:30～14:45 (15)	Presentation from Consultant & Inspection Joint Stock Co. of Construction Technology and Equipment - CONINCO	Vietnamese side: Representative from CONINCO (1)
14:45～15:15 (30)	Construction Quality Management by Shimizu Corporation	Japanese side: Mr. Shun-ichi Sakamoto

TIME	PROGRAM	PRESENTER
	Part I: Initiative of Quality Assurance Part II: Introduction of Advanced Technology	Shimizu Corporation, Civil Engineering Technology Division Planning Department General Manager (1)
15:15～15:30 (15)	The Current & Future Construction Quality Management System of Construction Corporations in Vietnam	Vietnam Urban & Industrial Zone Development Investment Corporation - IDICO
15:30～15:45 (15)	Introduction about Construction Joint Stock Co. No 1 (COFICO)	Representative from COFICO (1)
15:45～ 16:00 (15)	Exchange Opinions	
16:00～16:10 (10)	Closing Address	Vietnamese side: Dr. Le Quang Hung, MOC, SACQI, Director General Japanese side: Mr. Yuichi Ishikawa, MLIT, Overseas Project Division, Policy Bureau, Director

(3) Construction Works Maintenance Seminar in Da Nang City

- Following up the Senior Officials Seminar in Ho Chi Minh City in October 2011, the Vietnamese Ministry of Construction, the Japanese Ministry of Land, Infrastructure Transport, and Tourism (MLIT), and Japan International Cooperation Agency (JICA) jointly organized the above-mentioned seminar from 21 to 22 September 2012 in Da Nang City. The details of the seminar are as follows:
- Program title: 3rd Viet Nam - Japan Seminar on Construction Quality & Construction Project Management (Theme: Enhancement of Maintenance in Construction Quality Management System in Vietnam)
- Objectives: To create common understanding between Japan and Vietnam about construction quality management
- Seminar period: 21 September 2012 (Fri) to 22 September 2012 (Sat)
  - The program schedule on 21 September is shown in Table 13.2.3.
  - The program on 22 September is site visits.
- Place:
  - Life Style Resort - Da Nang City, Viet Nam
  - Two construction sites in the City (Tien Son Sports Palace and Hanoi-HCMC Railway Line Bridges Safety Improvement Project)
- Organizer:
  - Ministry of Construction (MOC),
  - Ministry of Land, Infrastructure, Transport & Tourism (MLIT);
  - Japan International Cooperation Agency (JICA)

- Participants: There were over 200 participants including representatives of both Vietnam side and Japan side.

Table 13.2.3 Enhancement of Maintenance in Construction Quality Management System in Vietnam

TIME	AGENDA	PRESENTER
8:00～8:30 (30')	Registration	
8:30～8:50 (20')	Opening remarks	MOC: Mr. Bui Pham Khanh, Ministry of Construction of Vietnam, Vice Minister Da Nang City: Mr. Nguyễn Ngọc Tuấn - Vice Chairman of DA Nang PPC MLIT: Mr. Yuichi Ishikawa, Director of Oversea Project Division, Policy Bureau JICA: Mr. Nagase Toshio, Senior Representative of JICA Vietnam Office
8:50～9:15 (25')	Maintenance of construction works in Viet Nam - Real situation & Solutions.	Vietnam side: Mr. Le Quang, Deputy Director General, State Authority of Construction Quality Inspection, MOC
9:15～9:40 (25')	Policies for the maintenance of infrastructures -Road & Bridges-	Japan side: Mr. Yuichi Ishikawa, Director, Overseas Project Division, Policy Bureau, MLIT
9:40～9:55 (15')	Maintenance of construction works in Da Nang City - Real situation & Solutions	Vietnam side: Mr. Le Tung Lam, Deputy Director, DOC of Da Nang City
9:55 ～10:15 (20')	Coffee break	
10:15～10:35 (20')	Maintenance of irrigation facilities in the past time in Viet Nam	Vietnam side: Dr. Nguyen Trung Anh, Deputy Head, Construction Quality Management Division, Dept. of Work Construction Management, Ministry of Agriculture & Rural Development
10:35 ～ 11:05 (30')	Maintenance for dams in Japan	Japan side: Mr. Makoto Kuno, Senior Engineer, Water Resource Engineering Center, Japan Water Agency
11:05 ~ 11:30 (25')	Discussion	
11:30 ~ 13:30	Luncheon	
13:30～13:50 (20')	Management & maintenance of roads - Real status & Solutions	Vietnam side: Dr. Bui Khac Diep, Dept. of Transport Infrastructure, Ministry of Transport
13:50～14:15 (25')	Maintenance management of railway bridges	Japan side: Mr. Yasushi Nakagawa, Associate General Manager(Southeast Asia Area), International Division, Tekken Construction Corporation
14:15～14:40 (25')	Maintenance of iron bridges	Japan side: Mr. Aritake Maki, Assistant Manager, Technical Department, YCE Corporation
14:40 ～15:00 (20')	Coffee break	
15:00～15:20 (20')	Maintenance of building works in Viet Nam	Vietnam side: Associate Prof. Dr. Tran Chung, Vietnam Institute for Building Science & Technology

TIME	AGENDA	PRESENTER
15:20～15:50 (30)	Maintenance management of workshops in Viet Nam	Japan side: Mr. Kentaro Tani, Manager, Marketing & Business Development Department, Taisei Construction Corporation
15:50～16:20 (30')	Improvement of the construction facility maintenance in Viet Nam	Japan side: Mr. Tsuneo Kato, Team Leader, JICA/MOC's Project for Capacity Enhancement in Construction Quality Assurance
16:20～ 16:40 (20')	Discussion	
16:40 ～16:50 (10')	Closing remarks	Japan side: Mr. Shigeru Kishida, First Secretary, Japanese Embassy to the Socialist Republic of Viet Nam Vietnam side: Mr. Le Quang, Deputy Director General, SACQI,MOC

13.3 EXCHANGE PROGRAM FOR THE MOC'S SENIOR OFFICERS AND CONSTRUCTION INDUSTRIES' SENIOR EXECUTIVES IN JAPAN

1) Program

A delegation headed by Deputy Minister Nguyen Thanh Nghi, comprising the MOC senior officials and construction industries` senior executives visited Japan from 30 July to 5 August 2012 as follows:

- Period: From 30 July to 5 August 2012
- Program: See **Table 13.3.1**

Table 13.3.1 Agenda for Exchange Program for the MOC's Senior Officials and Construction Industries' Senior Executives

DATE		CONTENT	PLACE	DETAILS
30/ (Mon)	AM	Hanoi - Tokyo (JAL 752)	Tokyo	23:50 Departure from Hanoi 06:55 Arrival to Tokyo
	PM	Courtesy Call to JICA and JICA's Briefing Site Visit (Sky Tree)		12:45-14:10: Welcome Lunch invited by JICA 14:30-15:00: Courtesy Call to JICA (Mr. Nghi) 15:00-15:30: Briefing by JICA 16:00-17:30: Visit of Nikken Sekkei 18:00-19:30: Site Visit (Sky Tree) [19:30-21:30: Dinner invited by Nikken Sekkei]
31/7 (Tue)	AM	Courtesy Call to Ministry of Land, Infrastructure, Transport and Tourism (MLIT) Exchange opinion and view with MLIT and concerned parties about urban underground infrastructure	Tokyo	09:30-11:30: Exchange opinions and views on Planning and Management of urban underground infrastructure (Japanese side: Vice Minister Mr. Sato and relevant department) - Shield tunnel method - Multi-purpose underground utility conduit - Underground use for urban express way - Underground use for car park 11:30-12:00: Courtesy Call to MLIT (Vice Minister Mr. Tsugawa) 12:00-14:00: Lunch (Vietnam side)
	PM	Meeting with MLIT and concerned parties about Eco-city and advanced technologies		14:00-16:30: Exchange opinions and views on eco-city (Japanese side: City bureau and J-CODE members) ※ Agenda will be discussed between the city bureau of MLIT and the urban development agency of MOC. 16:30-17:30: Exchange opinions on advanced technologies with Japanese private companies

DATE		CONTENT	PLACE	DETAILS
				- Construction technology to construct underground space by Kashima corporation - Eco- city technology by Shimizu corporation
		Meeting with Japan Society of Civil Engineers (JSCE)		18:00-19:00: Meeting with Japan Society of Civil Engineers - Introduction of seminar which will be held in Hanoi in August 19:30-21:00: Welcome reception invited by MLIT
1 (Wed)	AM	Visit of Construction Sites	Tokyo	09:00-11:00: Construction site of Tokyo Shibuya Station (Underground structure) - Introduction of urban planning - Visit of construction site 11:00-13:00: Lunch (Vietnam side)
	PM	Meeting with Yokohama city and visiting MM21	Yokohama Tokyo	14:00-16:00: Visit of Yokohama City Government - Visit of Minato Mirai 21 - Exchange opinions Introduction of Yokohama City History of urban development The cooperation project between Yokohama City and private investors - Courtesy call to mayor 16:30-17:30: Visit of Solar Technology Park 19:00-21:00: Dinner invited by Ambassador Hattori
2 (Thu)	AM・PM	Visit of National Institute in Tsukuba	Tsukuba	9:30-11:00:Visit of Kashinoha Campus Project (Urban Development) on the way to Tsukuba 11:00-12:00: Lunch invited by Mitsui Fudosan 13:00-17:00: Visit of National Institute for Land and Infrastructure Management, Public Works Research Institute and Building Research Institute
3 (Fri)	AM	Tokyo - Osaka	Osaka	8:00: Leave hotel for Tokyo station 9:00: Tokyo - 1133 Shin-Osaka (Sinkansen Nozomi 215) Explanation about Sinkansen by Central Japan Railway Company at the top of Sinkansen
	PM	Visit of Kinki Regional Development Bureau		14:30-17:00: Visit of Kinki Regional Development Bureau - Introduction of role and responsibility of Regional Bureau in regional development - Site Visit （Osaka castle) 18:00-20:00: Dinner invited by Kinki Regional Development Bureau
4 (Sat)		Visit of City	Osaka Kyoto	09:00: Osaka, Kyoto 19:00: Fireworks Display (Mr. Nghi with a companion)
5 (Sun)		Kansai - Hanoi (JAL 5007)	Osaka	10:30: Departure from Kansai 14:20: Arrival to Hanoi

2) List of Members of the Delegation

(1) Mr. Nguyen Thanh Nghi, Deputy Minister, Head of the delegation

(2) Mr. Nguyen Trung Hoa, Director General, Department of Science, Technology and Environment

(3) Mr. Pham Khanh Toan, Director General, International Cooperation Department

(4) Mr. Le Quang Hung, Director General, State Authority of Construction Quality Inspection

(5) Mr. Do Duc Duy, Deputy Director General, Department of Organization and Personnel

(6) Mr. Hoang Tho Vinh, Deputy Director General, Department of Construction Activity Management

(7) Mrs. Do Tu Lan, Deputy Director General, Urban Development Agency

(8) Mr. Tran Anh Tuan, Deputy Director General, Administration of Technical Infrastructure

(9) Mrs. Phan Thi Lien, Deputy Head of Ministry's Office

(10) Mr. Truong Quy Ky, Head of MOC representative office in HCMC

(11) Mrs. Do Nguyet Anh, Official, International Cooperation Department

(12) Mr. Hoang Hai Van, Assistant to Deputy Minister

3) Institutes and companies accompanying deputy minister

(1) Mr. Trinh Viet Cuong, Director, Institute of Building Science and Technology (IBST).

(2) Mr. Truong Van Quang, Deputy Director, Vietnam Institute of Architecture, Urban and Rural Planning (VIAP)

(3) Mr. Nguyen Van Huynh, Deputy Director, Vietnam Institute of Building Materials (VIBM)

(4) Mr. Thai Son, Director, Urban Railway Management Unit, Song Da Group

(5) Mr. Tran Dinh Dai, Vice General Director, Vietnam Machinery Installation Corporation (LILAMA)

(6) Mr. Nguyen Van Cong, General Director, CONINCO JSC

(7) Mr. Ha Minh, Deputy General Director, CONINCO JSC

(8) Mr. Dang Tien Phong, General Director, Song Hong Corporation

(9) Mr. Nguyen Tran Phuong, Director, Song Hong consulting JSC

(10) Mr. Than Hong Linh, Deputy General Director, Vietnam National Construction Consultants Corporation (VNCC)

(11) Mr. Giang, Representative of Vietnam Office, Nikken Sekkei Civil Engineering)

13.4 EQUIPMENT AND MACHINERY PROVISION

(1) Inspection Vehicles

In the first year of the project, two units of 4-wheel Drive vehicles (TOYOTA Land Cruiser Prado TX-L 4.0 7 A/T) were provided by JICA to CQM/SACQI in order to facilitate the project activities.

Table 13.4.1 List of Delivered Vehicles

Vehicle Type		Units	Date of Delivery
TOYOTA Land Cruiser	Prado TX-L4.0 7A/T 4 wheel drive	2	June 2011

(2) Inspection Equipment

In the second year, the MOC requested provision of inspection equipment to strengthen the training and testing / inspection capabilities of CQM/SACQI. The equipment was delivered to CQM/MOC in July 2012.

The list of the delivered equipment is as shown in **Table 13.4.2**

Table 13.4.2 List of Delivered Equipment

NO	ITEMS	APPLICATION OF THE EQUIPMENT
I. EQUIPMENT FOR METAL		
1	Ultrasonic Flaw Detector	Provides capabilities for locating discontinuities and other flaws.
2	Coating Thickness Measurement Equipment	Can be used in applications ranging from wall thinning measurements of internally corroded pipes with dual element probes to very precise thickness measurements of thin or multilayer materials with single element transducers.
3	Contour Probe	Quickly locate surface cracks in ferrous materials that can be brought between the pole pieces. Find cracks from metal fatigue, heat treating, stress over load, welds, heat-treating, etc.
4	Eddy Current Flaw Detector	Conductivity measurement, coating thickness measurement, , fastener hole inspection, conductivity measurement, heat damage assessment, multi-layer testing, corrosion testing
II. EQUIPMENT FOR CONCRETE		
5	Concrete Test Hammer	It is used to find out compressive strength of concrete by using rebound hammer
6	Ultrasonic Pulse Velocity Test Instrument	Used for non-destructive determination of the quality of concrete, crack depth measure, detection of areas with cavities and voids, estimate mechanical properties of concrete strength.
7	Corrosion Analyzing Instrument	Measures the electrical resistivity of concrete.
8	Rebar Detection System	Non-destructive detection of rebars and for the measurement of concrete cover and bar diameters.
9	Structure scan System	For locating the position and depth of rebar, conduits, post-tension cables, and voids in up to 16" of concrete.
10	Core Drilling Machine	Drill to take specimen from structure.
11	Crack detection microscope	Used to measure crack width in concrete structures by operating via an adjustable light source.
12	Permeability Tester	Non-destructive measurement of the permeability of concrete structures.
13	Pull-off Tester	Determination of the adhesive strength of concrete structure and tension strength of concrete.

NO	ITEMS	APPLICATION OF THE EQUIPMENT
III. GEODETIC INSTRUMENT		
14	Total station	Survey total system
15	Automatic level	Automated level instrument
16	Laser Distance Meter	Laser distance and tilt measurement instrument

(3) Servers and Computers

Servers for the registration systems and package database system and construction performance evaluation system were provided to MOC. They were installed in the server room and under control of information center.

Meanwhile, two sets of computers were provided to MOC addressed to SACQI and CAMD.

Table 13.4.3 List of Delivered Servers and Computers

NO	ITEMS	APPLICATION OF THE EQUIPMENT	AMOUNT (US$)
I. EQUIPMENT FOR REGISTRATION SYSTEMS AND PACKAGE DATABASE SYSTEM AND CONSTRUCTION PERFORMANCE EVALUATION SYSTEM			
1	Application Server (IBM System x3650 M4, 300GB x2)	The application server creates dynamic content by mixing data with templates, running programs, or by accessing databases, as a correspondence of the user operation of the systems.	2,590
2	Database Server (IBM System x3650 M4, 300GB x3)	The database server is the storage of all registered data in the database of the systems.	2,920
3	Peripheral Equipment	Switch (CISCO 2960-24TC-L), UPS (APC SUA2200I), Firewall (ASA5510-BUN-K9), Multiple PC control unit (KVM Switch 8P)	4,240
II. DESKTOP COMPUTERS			
4	HP Pavilion P6317L, 18" LCD Monitor, Key Board, UPS and Microsoft Windows 7 and Microsoft Office 2007	A set of computer for developing the contractor registration and evaluation systems, which is delivered to SACQI.	1,040
5	FPT ELEAD T6li, 23" LCD Monitor, Key Board, UPS and Microsoft Windows 7	A set of computer for controlling the application server and database server, which is delivered to CAMD.	1,610

CHAPTER 14 SUMMARY

14.1 PROJECT OUTCOMES

Reporting formats of this Project fall into the following formats.

(a) MAIN REPORT

(b) GUIDELINES & MANUALS

(c) CD-ROM

(d) APPENDIX

In principle, the main reports includes recommendations and the framework of guidelines and manuals. The guidelines and manuals include the following products;

(a) Guidelines for developing project owners' manual (Activity-1)

(b) Operation guidelines for construction company/consultant registration, construction package database and construction work performance evaluation (Activity-3)

(c) Sample standard specifications for public works (Activity-5)

(d) Sample construction quality management for public works (Activity-5)

(e) Manual guiding building facility maintenance procedures (Activity-5)

(f) Safety and health manual in construction (Activity-6)

(g) Case studies on accidents and near misses in construction (Activity-6)

Also, CD-ROM accommodates computer software for the following systems;

(a) Computer software for contractor/consultant registration (Activity-3)

(b) Computer software for construction package information database (Activity-3)

(c) Computer software for construction work performance evaluation (Activity-3)

In addition, computer software systems were already installed in the MOC Web-site network system. Of these systems, the contractor/consultant registration system becomes operable now and companies and consultants can access to the MOC web-site through computer internet and register company information from any places in Viet Nam. However, remaining two systems, including a construction package information system and a construction work performance evaluation system, are not operable now until legalization. **Table 14.1.1** summarized final products of this Project and their reporting formats.

Table 14.1.1 Final Product and Reporting Formats

Activity	Title	Final Products	Reporting Formats
Activity-1	Improve project management methods and clarify responsibilities between stakeholders		
	(1) Clarify responsibility assignment between stakeholders	・Recommendations	・MAIN REPORT
	(2) Improve construction work management		
	(3) Enhance design change		
	(4) Enhance construction permits		
	(5) Enhance inspection before putting facilities into operation		
	(6) Encourage state authorities to standardize quality management technologies for their specialized sectors		
	(7) Improve construction work contract management		
	(8) Enhance interim payment		
	(9) Enhance construction contracts		
	(10) Reinforce institutions for construction facility maintenance		
	(11) Develop guidelines for project owner's manual	・Framework ・Guideline	・MAIN REPORT ・GUIDELINES & MANUALS
Activity-2	Improve state agency's inspection system		
	(1) Enhance construction Audit System by MOC and DOCs	・Recommendations	・MAIN REPORTS
	(2) Enhance technical intra-organization audit system		
	(3) Enhance functions of Construction Inspection Centers (CICs)		
	(4) Enhance sanctions		
Activity-3	Improve company registration system and contractor performance evaluation system		
	(1) Improve construction company registration system	・System Configuration ・Computer software ・Guidelines for; ✓ System administrator, ✓ CAMD leader, ✓ DOC staff, ✓ Consultants ✓ Contractors, ✓ Project Owners	・MAIN REPORT Report ・Installation in the MOC Website ・CD-ROM ・GUIDELINES & MANUALS
	(2) Improve consultant registration system		
	(3) Develop construction package information database	・System Configuration ・Computer software ・Operation Guideline	・MAIN REPORT ・Installation in the MOC Website ・CD-ROM ・GUIDELINES & MANUALS
	(4) Develop construction work performance evaluation system	・System configuration ・Computer software ・Operation Guideline	・MAIN REPORT ・Installation in the MOC Website ・CD-ROM ・GUIDELINES & MANUALS
Activity-4	Improve engineer qualification system		
	(1) Develop comprehensive plan for developing engineer qualifications in Vietnam	・Recommendation	・MAIN REPORT
	(2) Improve supervisor qualification		
	(3) Improve site manager qualification		

Activity	Title	Final Products	Reporting Formats
	(4) Develop examination system for engineer qualifications		
Activity-5.1	Develop construction project management technologies		
	(1) Develop framework for standard technical specifications and sample specifications for public works	· Framework · Sample standard	· MAIN REPORT · GUIDELINES & MANUALS
	(2) Develop framework for construction quality manuals and sample manuals for public works	· Framework · Sample manual	· MAIN REPORT · GUIDELINES & MANUALS
Activity-5.2	Develop consultant manuals guiding maintenance procedures for building facilities		
	(1) Develop consultant manuals guiding maintenance procedures for building works	· Framework · Guidelines	· MAIN REPORT · GUIDELINES & MANUALS
Activity-6	Develop construction work safety manuals		
	(1) Safety and health manual in construction	· Framework · Manual	· MAIN REPORT · GUIDELINES & MANUALS
	(2) Case studies on accidents and near misses in construction	· Manual	· GUIDELINES & MANUALS
Activity-7	Improve and implement training programs		
	(1) Develop capacity enhancement plans for MOC training programs	· Recommendation	· MAIN REPORT
	(2) Develop and implement during-project training programs		
	(3) Develop post-project training plans		
	(4) Develop CQM training functions		
	(5) Recommend human capacity development programs for regional governments		

14.2 SEMINARS AND WORKSHOPS

(1) Japan-Vietnam Senior Official's Seminar in Construction Projects

Japan-Vietnam Senior Official's Seminar in Construction Projects is a collaboration seminars between MOC in Vietnam and MLIT & JICA in Japan. Three (3) times of seminars were held in 2011 and 2012.

Table 14.2.1 Japan-Vietnam Senior Official's Seminar

Seminar/Workshop	Theme	Venue	Date	Participants
1st Seminar	Construction project	Tokyo, Japan	28/Feb - 4/Mar/2011	6 people, from Vietnam
2nd Seminar	Construction Quality assurance	HCMC, Vietnam	13/Oct - 14/Oct/2011	200 people
3rd Seminar	Facility maintenance	Da Nang, Vietnam	21/Sep – 22/Sep/2012	200 people

(2) Japan-Vietnam Exchange Program Between Government Officers and Construction Industry Executives.

Special seminar aiming at exchanging views in construction projects between Japan and Vietnam and between government officials and construction industry executives.

Table 14.2.2 Japan-Vietnam Exchange Program

Seminar/ Workshop	Theme	Venue	Date	Participants
Special Seminar	Construction project	Tokyo, Japan	30/Jul - 5/Aug/2012	23 people, MOC senior officials & construction industries executives.

(3) MOC-JICA Joint Coordination Workshop

MOC-JICA Joint Coordination Workshop was held twice to disseminate project outputs

Table 14.2.3 MOC-JICA Joint Coordination Workshop

No.	Date	Venue	Participants
1.	9 Feb. 2012	MOC, Ha Noi	200
2.	1 Nov. 2013	Kim Lien Hotel, Haoi	200

14.3 TRAINING IN JAPAN

Five (5) times of training courses have been conducted in Japan with 50 participants from Viet Nam.

Table 14.3.1 Training Courses in Japan

Training	Period	No. of participants
1st Training	28 Nov. – 11 Dec. 2010	11 Persons
2nd Training	28 Nov. – 9 Dec. 2011	11 Persons
3rd Training	12 Nov. – 23 Nov. 2012	12 Persons
4th Training	1 Oct. – 12 Oct. 2013	4 Persons
5th Training	21 Oct. – 1 Nov. 2013	12 Persons

14.4 CQM TRAINING (TRAINING IN VIET NAM)

Six (6) CQM training courses were implemented in 2012 with MOC funds in order to disseminate project outputs. In 2013, three (3) CQM training courses are planned and now under implementation..

Table 14.4.1 CQM Training Courses

No.	Date	Venue	Participants
1	2 Nov. 2012	Ha Noi	120
2	23 Nov. 2012	Can Tho	90
3	28 Nov. 2012	HCMC	130
4	15 Dec. 2012	Da Nang	110

No.	Date	Venue	Participants
5	19 Dec. 2012	Hai Phong	100
6	24 Dec. 2012	Nha Trang	90
7	25 Oct.. 2013	Hue City	240
8	15 Nov. 2013	Dong Thap	
9	22 Nov. 2013	Da Lat city	

14.5 VEHICLES AND EQUIPMENT SUPPLY

(1) Vehicles

Table 14.5.1 Vehicle Supply

Vehicle Type		Unit	Delivery
TOYOTA Land Cruiser	Prado TX-L4.0 7A/T 4 wheel drive	2	June 2011

(2) Computer hardware

Table 14.5.2 Computer Hardware Supply

Computer		Unit	Delivery
Personal desktop computer	HP (1set) FPT (1set)	1 unit each	Jul/2010 Dec/2012
Database server Application server	IBM X3650M4, 300 GB (3) IBM X3650M4, 300 GB (2)	1 unit each	Dec/2012

(3) Inspection Equipment Supply

Table 14.5.3 Inspection Equipment Supply

No.	Category	Equipment	Delivery
1	Equipment for Steel Structure	Ultrasonic Flaw Detector	To CQM/SACQI, MOC In July 2012
2		Coating Thickness Measurement Equipment	
3	Equipment for Concrete Structure	Contour Probe	
4		Eddy Current Flaw Detector	
5		Concrete Test Hammer	
6		Ultrasonic Pulse Velocity Test Instrument	
7		Corrosion Analyzing Instrument	
8		Rebar Detection System	
9		Structure scan System	
10		Core Drilling Machine	
11		Crack detection microscope	
12		Permeability Tester	
13		Pull-off Tester	
14	Geodetic Instrument	Total station	
15		Automatic level	
16		Laser Distance Meter	

14.6 LEGALIZATION OF PROJECT OUTCOMES

It is in general very difficult to bring project outcomes, shown in the table above, into legalization in a limited short project period. Regulations which are more or less concerned with construction project management and quality assurance and promulgated during the Project term (from May 2011 to December 2013) are listed in **Table 14.6.1.**

Table 14.6.1 Regulations Promulgated during Project Term

	Regulations	Title	Date of Issue
1.	Decree 15	On quality management of construction infrastructure	6 Feb. 2013
2.	Circular 10	Guiding some articles of the Decree on the quality management of construction works	23 Jul. 2013
3.	Circular 12	Promulgating regulation on rewarding on construction quality	31 Jul. 2013
4.	Circular 13	Stipulating the verification, appraisal and approval of designs of construction projects	15 Aug. 2013
5.	Circular	On publicized management of information on capacities of entities, individuals operating in construction sector.	Not decided

Of these regulations, Decree 15 is a key decree revised in 2013. The following are the points of revision closely related to project outcomes.

(1) Technical Specifications is introduced.

- In Decree 209, Technical Specifications were not required in construction projects, except for ODA projects or some other large-scale private projects. The Project recommended the incorporation of Technical Specifications into construction projects and introduced the standardization methods of this document.
- Decree 15, Article 7, has incorporated the concept of technical specifications, stipulating that POs shall prepare and approve Technical specifications in line with technical designs or other designs which are prepared after basic designs. Preparation of technical specifications is compulsory for the facilities of special grade, grade I and grade II. For other facilities, technical specifications may be prepared particularly or stipulated in design statement (explaination on the design).

(2) Publicity of information on capabilities of entities and individuals in construction sector

- In order to facilitate Project Owners to find out reliable information on construction and consultant companies, the Project has upgraded the existing company information registration system and in addition developed a construction package database system and a contractor's work performance evaluation system together with operation software systems. The company registration software systems, including those for construction companies and consultants, were already incorporated into MOC website and became operable now. End users including construction companies, consultants and Project

Owners can access to the MOC website and get information through computer internet. (Relevant information is seen in Article 8, Decree 15)

- As a future plan, CAMD-MOC is intended to bring the construction package database system and the work performance evaluation system into legalization when revising Law on Construction.

(3) Design verification:

- The Project recommended strict implementation of design check, focusing on private-sector building works, in the examination of Construction Permits.
- Decree 15 has incorporated the concept of this design check as design verification and applied it to various kinds of projects (Article 20 and 21).

(4) Design changes:

- Decree 209, Article 22, stipulated the design change should be submitted to Decision Makers if it changes basic design. Due to this unclear definition of design change and limited power given to Project Owner, design change needed a long time for approval, causing delay in construction project management.
- The Project recommended that prompt actions be taken to design changes in order not cause delay. With this, it is necessary to clarify responsibilities of who should make decision and the ranges of decisions. Decree 15 has stipulated that Project Owners can make decisions on the design changes other than those relevant to basic elements including location, planning, scale and excess of total investment capital, which shall be managed by Decision Makers.

(5) Chief Supervisor

- The Project has introduced the Comprehensive study on Engineer qualifications, Improvement of qualifications for Construction Supervisors, and Site Manager including grading system. In Decree 209, Chief Supervisor was not required in consultant's construction supervision.
- Decree 15, Article 27, has stipulated that construction supervision consultants should assign eligible persons as chief supervisors and other positions of supervision.
- In introducing the concept of Chief Supervisor, the grading system of engineer qualifications based on the Project recommendation can be incorporated.

(6) Inspections over PO's acceptance procedures

- Decree 209 stipulated that construction facilities could be put into use after a final acceptance was made between POs and Contractors.
- The Project recommended that facility final inspection (acceptance) be made between Project Owners and contractors, and then Decision Maker should implement a final safety check before putting facilities into use.
- Decree 15, Article 32, has adopted the concept of Decision Maker's (State Authority's) inspection and applied to the Project Owners acceptance procedures, saying that state authorities in construction management conduct inspections over PO's acceptance procedures during construction and at the completion of construction works.

(7) Stage acceptance is just in case of necessity.

- Decree 209 required 3 kinds of Construction Acceptance between Project Owner and Contractors. One for job acceptance, another for stage acceptance and anther for final acceptance. Job acceptance is equivalent to daily inspection. Final acceptance is equivalent to completion certificate. Stage acceptance, which is used for interim payment, requires contractor to prepare repetitive documents.
- The Project recommended the simplification of acceptance procedures, timely payment and reduction of document requirement for interim payment.
- Decree 15 has stipulated that POs shall take responsibility for organizing the acceptance of construction facilities, including acceptance of construction jobs during construction and at the completion of construction jobs before putting facilities into use.
- In case of necessity, POs shall stipulate the acceptance of important construction stages of facilities.

(8) Certification on quality conformity is eliminated.

- Decree 209 required the Certification on quality conformity and Force bearing safety for construction projects that may be harmful in case of incidents.
- The Project recommended the final inspection be implemented at completion which makes sure the safety of constructed facilities. And Decree 15 substantially eliminated the service of Certification in Article 47.

14.7 RECOMMENDATIONS ON THE REVISION OF CONSTRUCTION LAW

MOC is planning to steadily strengthen the legal frameworks relevant to Construction Law. Study on the revision of Construction Law has already started. The law will be revised in 2014, followed by the revision of decrees and then circulars.

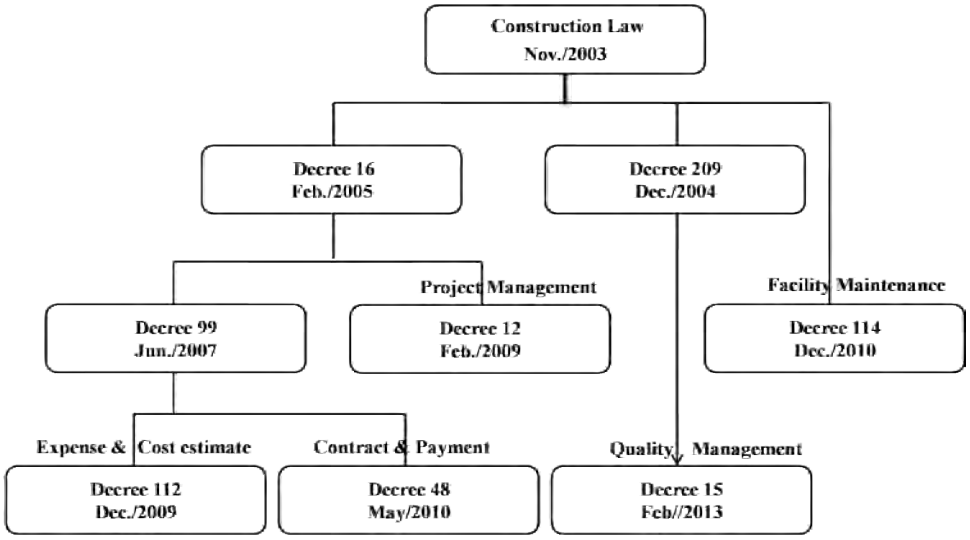


Figure 14.7.1 Construction Law Legal Framework

The following are the recommendations presented in the MOC-JICA Cooperative Workshop on the Quality Assurance and Safety Management in Construction held at the last end of this Project on November 1st, 2013. The Project selected six (6) subjects deemed key elements in the revision of Construction Law. Recommendations were made for each subject at the end of the following sections. The outline of recommendations are briefly shown as follows;

14.7.1 Enhancement of Construction Investment Management for Private-sector and Public-sector Projects

(1) Construction investment management in Japan

There is no comprehensive law governing all procedures of construction projects in Japan, including public and private projects. However, individual laws needed for construction investment procedures have been promulgated subject by subject. In principle, laws fall into the following three classifications;

1) Law which stipulates responsibilities of the construction companies who first enter construction businesses (Construction Business Law).

Construction Business Law stipulates responsibilities of the construction companies which enter construction businesses.

- For companies which first enter construction businesses: Companies should get construction business permits from MLIT Minister or regional Governors. Companies should make fair construction work contracts and carry out the contracts. Companies should assign a technical advisor or a chief engineer to their projects, who are eligible to management construction works.
- For companies wishing to participate in public construction projects (state-budget projects): All companies should undergo third-party evaluation on their financial and technical capacities for executing construction works and receive their capacity ranking
- For Government organization: Government organizations should set up dispute committees for arbitration/reconciliation, a central committee in MLIT and regional committees in prefectural governments
- For companies violating the law provisions: Construction business licenses will be revoked (If it is the worst)

2) Laws and regulations governing public-sector construction projects

For public projects, Laws stipulating project procedures needed for government staff have been promulgated subject by subject in Japan as follows;

- Public account law stipulates tendering, payments etc.
- Act on the promotion of proper contract and bidding for public works stipulates tendering, contract, construction project management, etc.
- Act on the promotion of quality assurance of public works stipulates quality assurance, inspection, etc.
- Labor Standard Act / Industrial Safety and Health Law (Common to private projects)

In addition to the above regulations, MLIT has published many ministerial standards and guidelines which elaborate details of procedures for construction project management and quality assurance. The followings are some of the examples.

- Ex1. Construction work supervision, inspection and testing standards and guidelines
- Ex2. Construction work standard technical specifications (sector-by-sector specifications)

Laws in Japan in general stipulate only the principles of construction project management and quality assurance, so that they don't need to be frequently revised. MLIT standards and guidelines are frequently updated. Local Governments also apply MLIT standards and guidelines.

3) Laws which stipulate procedures for private-sector project implementation

For private projects, detailed regulations except for those on public safety have never been applied to the projects unlike public projects in order to ensure flexibility in project management.

Building facility construction is a dominant private-sector project in Japan. Building Standards Act specialized for building facility construction and maintenance stipulates facilities owner's responsibilities in detail for project management in order to ensure public safety.

- Design check and verification
- Construction permit
- Midterm and final inspection
- Facility maintenance

(2) Recommendations on the enhancement of construction investment management

It is recommended to clearly demarcate legal framework between public projects and private projects due to differences in construction project management.

1) Common regulations to all projects

- Responsibility of contractors and consultants to assign qualified engineers to their construction projects.
- Responsibility of contractors to make contracts and to implement construction works following contracts.

2) Regulations for public projects

Focuses should be placed on the responsibility assignment between stakeholders and procedures.

3) Regulations for private-sector projects

Focuses should be placed on the enhancement of quality of construction permits.

14.7.2 Enhancement of Private-Sector Construction Project Management - Building Facility Project

(1) Building Facility Construction in Japan

1) Construction Permits (CP)

Government enforces strict examinations on construction permits rather than stipulating details of project management or construction quality management. Facility owner should

propose construction permits to local autonomies before starting construction. Professional architects in local autonomies examine the law conformity of technical designs with Building Standards Act and issue permits.

Design checks for CP include:

- Design check
- Structural safety check by computer software which is applied for large-scale projects

Application: Construction permits are applied to all construction projects, not only to private projects, but also to state-budget projects.

Facility maintenance: The Law stipulates details of facility maintenance procedures.

- Facility owners responsibilities
- Facilities to be inspected
- Inspection frequencies
- Inspector's eligibility
- Points of inspection and data records

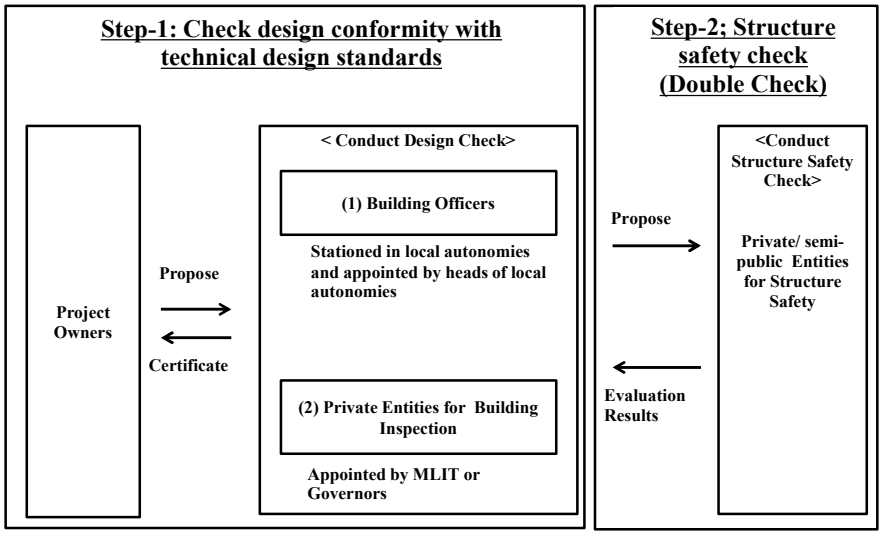


Figure 14.7.2 Building Facility Construction Permit

(2) Recommendations on the enhancement of private-sector's construction management:

Many of private building facilities are for public use, so that much attention should be directed to public safety.

It is recommended to enhance the quality and the examination methods of construction permits.

- Design check by professional engineer
- Check project implementation in conformity with approved conditions

- Implement mid-term and final inspection
- Enhance facility maintenance procedures

MOC is recommended to develop engineer qualifications for design check and building facility inspection.

MOC is also recommended to develop guidelines for building facility maintenance showing points of inspection and diagnosis of building conditions.

14.7.3 Enhancement of Contractor Selection for Public-sector Projects

(1) Construction Company Ranking System in Japan

It is important to select contractors whose construction work execution capacity is fit for project requirements. Construction companies participating in state-budget projects are required to take third-party evaluation on their financial and technical capacities (Construction Business Law). After the evaluation, grades showing company's construction work execution capacity are then given to all companies. Construction companies are allowed to participate in the state budget projects fit for their given grades. Currently, company ranking system is applied to all state budget projects in Japan.

- Evaluation points include;
  - Company financial capacity
  - Company technical capacity
- Key points for company grading system:
  - Company registration data (Financial and Technical status data)
  - Construction package information prepared by project owners (contract amount / term / package type)
  - Contractor work performance evaluation data prepared by project owners (construction Resource / Management / Quality).

(2) Recommendations on the enhancement of contractor Selection

It is recommended to enhance legal framework including operation guidelines and database systems for contractor selection step by step in line with roadmap to the future.

- First, MOC is recommended to develop construction company registration system to be a compulsory system.
- Second, It is recommended to develop construction work performance evaluation system and data feedback system to Preliminary Qualification (PQ) in the tendering procedure.

- Third, MOC is recommended to study on the future use of contractor grading system which makes it possible to select a contractor whose project execution capacity is matched with project requirements.

14.7.4 Enhancement of Public Project Construction Project Management

In Japan, MLIT assigns professional project owners to its own state-budget projects, who belong to MLIT regional bureaus.

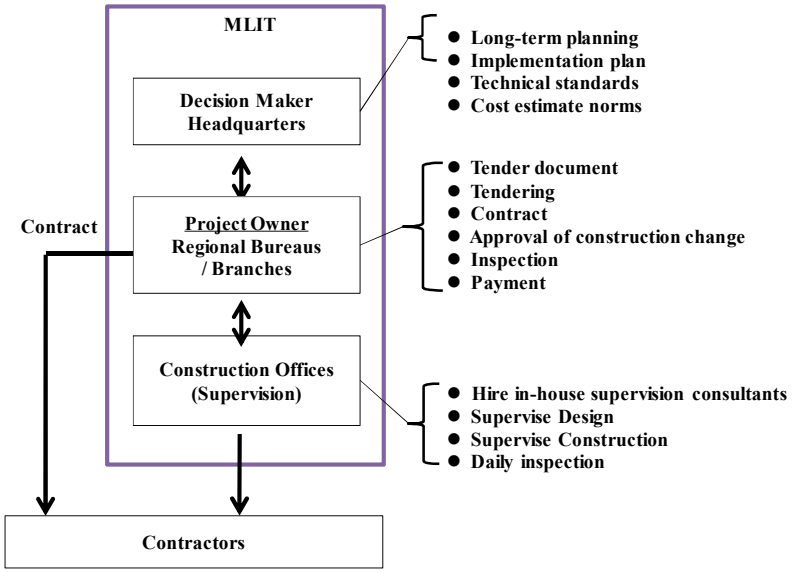


Figure 14.7.3 MLIT Project Management in Japan

(1) For public-projects (Roads, Bridges, Ports, etc.)

1) Project Owners

MLIT including ministerial agencies and local governments in principle assign professional Project Owners (POs) who belong to their organizations.

2) Project Supervision and Management

MLIT including ministerial agencies and local governments in general assign their subordinate organizations under POs to carry out construction supervision, which are capable of project supervision and management.

3) Supervision Consultants

POs in general hire in-house supervision consultants to supplement staff in short.

4) Contractors

Following the Construction Business Law, contractors should assign resident Technical Advisor or Chief engineer to their construction projects.

(2) Recommendations on the enhancement of engineer qualifications

Construction project management and construction quality assurance often need professional knowledge and experience in making judgment while executing supervision, in particular for large-scale construction projects.

It is recommended to assign professionals, in particular to large-scale state budget projects.

- To assign professional project owners including supervisors who belong to the project owners. Accumulation of managerial technologies and knowledge in state authorities is very important.
- To assign qualified engineers for construction supervision consultants
- To assign qualifies engineers for contractor's project management.

MOC is recommended to enhance engineer qualifications;

- Enhancement existing engineer qualifications by applying examination systems and grade qualifications.
- Study on the Professional Engineers for Viet Nam

14.7.5 Enhancement of Construction Contracts

(1) Construction Contracts

In Japan, Construction Business Law stipulates that all companies performing construction business should establish contracts and follow them.

There is clear demarcation in contents between legal frameworks and construction contract conditions.

In principle, regulations stipulate only the principles of construction project management and quality assurance, and contract conditions stipulates details, thereby avoid overlapping of information.

Technical specifications have been standardized sector by sector and widely incorporated in the tendering of construction projects.

(2) Recommendations on the enhancement of construction contracts

It is recommended to clearly obligate project owners and contractors to establish contracts and to observe contracts during construction works.

It is recommended to simplify legal frameworks, but enhance qualities of contracts, making clear demarcation between regulations and construction contracts to avoid overlapping of information.

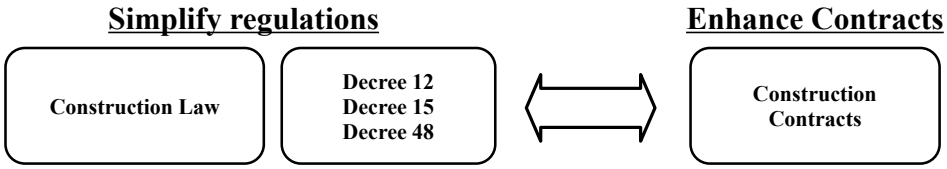


Figure 14.7.4 Demarcation between regulations and Contracts

It is recommended to develop construction contracts to the international level in order that construction industry can improve competitiveness and meet requirements of domestic construction and international bidding.

14.7.6 Enhancement of Construction Work Supervision, Testing and Inspection

(1) Guidelines

The following guidelines have been standardized and disseminated to stakeholders in Japan.

- Construction work supervision guidelines
- Laboratory test and field test guidelines
- Inspection guidelines
- Measurement guidelines of final products

Guidelines have been developed sector by sector by sector management ministries.

Central ministries, in particular MLIT, have been playing a leading role in developing technical standards, technical specifications, construction supervision manuals and distributing information to local governments.

(2) Recommendations on Enhancement of construction work supervision, testing and inspection

In conducting construction project management in the construction sites, guidelines with more detailed information than regulations are needed between project stakeholders.

Guidelines would reduce misinterpretation of regulations and contracts, thereby reduce conflicts between stakeholders.

MOC is recommended to encourage sector management ministries to develop the following guidelines for their own infrastructure sectors;

- Construction supervision manual
- Test and inspection manuals
- Standard technical specifications

14.8 RECOMMENDATION AND DEVELOPMENT OF GUIDELINES AND MANUALS

(1) Background

The study was conducted in response to the Minutes of Meeting (MM) for Joint Coordination Committee (JCC) held on November 6th, 2013. The MM requests us to recommend the list of guidelines to be hereafter developed in Vietnam. Upon this request, the Project analyzed the current practices in Vietnam and in Japan and made recommendations on the guidelines.

(2) Objective

The study is to find out and to recommend guidelines and manuals to be hereafter developed in Vietnam, which can translate regulations and provide practical and concrete procedures rather than those stipulated in the regulations.

(3) Current status of the development of guidelines in Vietnam

In Vietnam, Decrees under Construction Law stipulate principles of construction project management and quality assurance, and Circulars relevant to the Decrees stipulate implementation procedures, supplementing information to the Decrees, so that many of the provisions in the Decrees and Circulars are treated as compulsory rules to the users.

However, current regulations, in particular the Circulars stipulating implementation processes of Decrees, are not so detailed enough in contents for users to implement the regulations, thereby causing a little confusion to users. The current status survey conducted in the Project have clarified that users in the construction fields are wishing to have more practical and more concrete procedure guidelines and manuals rather than the Circulars.

(4) Foreign Practices (MLIT practices in japan)

MLIT[1] in Japan has so far disseminated many guidelines and manuals to the MLIT staff and ministerial agency staff who are implementing construction project management and quality assurance for MLIT public work projects. Local Governments also tries to make best use of these guidelines and manuals to their construction projects, though they are allowed to make own guidelines and manuals. In the MLIT practices, regional bureaus, which are eight (8) under the headquarters of MLIT, are obliged to develop practical guidelines and manuals fitted to their regional environment, receiving instructions from the MLIT headquarters.

Some of the MLIT guidelines and manuals are compulsory in application, but some voluntary. If contract dossiers specify compulsory application of these guidelines and manuals to

[1] MLIT: Ministry of Land, Infrastructure, transport and tourism in Japan.

specific construction projects in the documents, in particular in technical specifications, they will come to compulsory in application which stakeholders in construction projects should follow.

The following are the samples of MLIT guidelines and manuals;

1) Tendering and contract

- Guideline on the use of comprehensive evaluation contract method
- Guideline on contractor work performance evaluation
- Guideline on the operation of e-bidding system
- Standard technical specifications for public works; General, river work edition, road work edition, coastal work edition, dam work edition and disaster and landslide work edition.
- Others

2) Survey and design

- Standard technical specification for survey and design; General, river work edition, road work edition, coastal work edition, dam work edition and disaster and landslide work edition.

3) Construction project management and quality assurance

- Guideline on construction work quality assurance
- Manual for construction machine work safety
- Report of labor accidents during construction works
- Report of labor accident case studies
- Guideline on design verification
- Guideline on document preparation for public works
- Guideline on design change
- Guideline on design verification for detailed design (technical design)
- Guideline on construction work supervision, testing and inspection.
- Guideline on the management standards for construction supervision
- Technical guideline for safe construction works
- Guideline on photo record management
- Guideline on the implementation of inspection

- Guideline on inspection standards
- Awarding to superior contractors and subcontractors
- Manual for the measurement of concrete strength by non-destructive testing.
- Manual for the measurement of steel bar arrangement and covers in concrete structure

(5) Recommendation

1) Status of guidelines and manuals

Most important elements for the successful implementation construction work management and construction quality assurance are not only to prepare regulations (Laws, Decrees, and Circulars) and construction contracts, but also to prepare implementation guidelines and Manuals and operation systems. In addition, information management also needs operation systems as is the case of construction company and consultants registration systems.

- Regulations (Laws, Decrees, Circulars)
- Construction contracts
- Implementation guidelines (Guidelines, Manuals etc.)
- Implementation systems (Operation systems, etc.)

In general, regulations disseminate basic information on construction project management and quality assurance, focusing more on the principles, so that they are not detailed enough for users to implement construction project management and quality assurance. The guidelines and manuals are to supplement regulations with detailed procedures and to show more practical and concrete information for the implementation of construction project management and quality assurance. It is important to define its status including judgment on whether compulsory or not in the contract dossiers.

2) Requirements

Functional requirements for guidelines and manuals are summarized as follows;

- High development priority should be placed on those to be used in the construction fields by project owners, supervision consultants and contractors, since many of the project owners are likely nonprofessional and positive effects can be expected including the reduction of dispute between project owners and contractors. Second priority is placed on those to be used by state authority staff.
- Guidelines and manuals to be developed should include two types of information; first, explanation of regulations, provisions and technical standards to be applied and second, detailed information on management procedures and criteria.

- It is important to encourage sector management ministries to get involved in the development of guidelines and manuals for their own sectors.

3) Recommendation

The following are the potential guidelines and manuals recommended to be developed in Vietnam hereafter. MOC is recommended to conduct further study on the potentials of their development.

- Guideline on construction work supervision, testing and inspection
- Guideline on design verification for technical designs
- Guideline on construction work acceptance
- Guideline on design change during construction works
- Guideline on building facility inspection