# **APPENDIX 5**

# SOFT COMPONENT (TECHNICAL ASSISTANCE) PLAN

## The Project for

## **Improvement of Road Construction and Maintenance Equipment**

## in Kachin State and Chin State

## Soft Component (Technical Assistance) Plan

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#### 1. Background of the Soft Component

The Project for Improvement of Road Construction and Maintenance Equipment in Kachin State and Chin State (hereinafter referred to as "the Project") has the objective of improving the standard of living for the residents of Kachin State and Chin State, where development has been comparatively slow compared to the rest of Myanmar, and it intends to procure equipment for construction and maintenance, testing and training necessary for conducting works on roads that are targeted by state plans under the direct management of Department of Highways (hereinafter referred to as "DOH"), Ministry of Construction (hereinafter referred to as "MOC").

This soft component is designed to promote capacity of personnel in the government organizations with regard to i) usage and maintenance of construction equipment, ii) appropriate allocation and utilization of advanced equipment for road works, iii) technique for slope protection to mountain roads, iv) capacity of engineers and trainers working in training centers.

The existing road construction and maintenance equipment in Kachin State and Chin State is centrally controlled by Mechanical Equipment Compound (North) in Mandalay of DOH, MOC. From here, equipment is allocated to states including Kachin and Chin under the Compound's jurisdiction. Although the Compound conducts actual control, its ledgers are paper-based and there are numerous problems in the system. Under the circumstances, it is important to upgrade DOH's management system to an advanced one namely "the Ledger Control System".

In order to realize safe and high-quality roads, DOH personnel are required to learn method for appropriate allocation of equipment to suit type of works and proper operation technique under the Ledger Control System for the equipment. Pilot projects are prepared using part of target road in Kachin State and Chin State for DOH personnel to enhance capacity for construction management and operation technique. The pilot project are useful both for the practical training of construction technique to suit actual site conditions and for the practical training of equipment management system.

Slope cutting is required for the project in mountainous Chin State. Concrete sprayers are planned to be provided as they are very effective machine to stabilize slopes in the area where landslides and slope failures are common in rainy seasons. As there is little technical knowledge and experience for slope protection in DOH personnel, however, it is necessary to promote their capacity by teaching a series of fundamentals about investigation, design, construction and by carrying out a pilot work at a slope in the target road to learn efficient utilization of the project equipment.

In addition to provision of construction equipment for construction sites in Kachin State and Chin State, training equipment is planned to be provided to the Central Training Center (hereinafter referred to as "CTC") in Yangon. The equipment is used for training of civil engineers and skilled workers to enhance their capacity. It is important to carry out demonstration of training for each course of subject to promote efficiency of training. In the demonstration of training, safety training is included, as well. The

safety training will include introduction of accidents that can happen during road and bridge works aiming to transplant Japanese highly developed awareness on importance of safety.

#### 2. Soft Component Objectives

In light of the above background, the following objectives are set with a view to realizing the effects and sustainability of the Project.

#### Objective ①

Project equipment and spare parts are efficiently managed and maintained with existing equipment and spare parts.

#### Objective 2

Project equipment is allocated appropriately for road construction and their potential performance is fully utilized.

#### Objective ③

Slope protection is appropriately carried out at mountain roads as a result of learning technique for concrete sprayers.

#### Objective ④

As a result of learning efficient training method utilizing project equipment at CTC, even better personnel start to grow in Myanmar.

#### **3.** Soft Component Outputs

The direct outputs that will be achieved on completion of the Soft Component are as stated below.

- Output 1: A system that enables employees of Mechanical Equipment Compound (North) in Mandalay to administer the operating conditions of the Project equipment and stock conditions of spare parts is developed. (Objective ①)
- Output 2: Employees of Kachin State and Chin State can grasp the operating conditions of equipment assigned to the stock yard and work sites as well as the need and urgency of maintenance, and through establishment of a systematic control setup with the Mechanical Equipment Compound in Mandalay, they can promptly respond to equipment failures. (Objective ①)
- Output 3: The capability of road construction management of DOH site engineers in Kachin State and Chin State is improved, and technique to fully utilize performance of project equipment is achieved by engineers. (Objective ②)
- Output 4: DOH engineers master techniques of topographic survey, investigation, design, construction supervision and maintenance for slope stability and master the techniques to utilize project equipment. (Objective ③)
- Output 5 Personnel at CTC gain effective method of training using project equipment and learn to be able to provide safety training. (Objective ④)

#### 4. Method for confirming Achievement of Outputs

In order to confirm the level of achievement of the Soft Component outputs in the Project, confirmation items will be set for each output as follows. Level of achievement will be evaluated by addressing questionnaires before and after the training to the personnel targeted by the Soft Component.

Output		Items for Confirming Level of Achievement
Output 1:	1.	Can the operating conditions and stock conditions of the Project
A system that enables employees of		equipment and spare parts be grasped?
Mechanical Equipment Compound (North) in Mandalay to administer the operating	2.	Are ledger control methods and procedures that utilize a database
conditions of the Project equipment and stock		understood, and can accurate data control be implemented?
conditions of the Project equipment and stock conditions of spare parts is developed.	3.	Can procurement plans for storing the appropriate quantity of spare
		parts be understood?
	4.	Based on the Project equipment control methods, can the conditions of allocation and operation be controlled through listing the existing
		equipment owned by Kachin State and Chin State?
	5.	Have personnel learned the ability to expand the scope of control to
		existing owned equipment under their jurisdiction?
Output 2:	1.	Can the operating conditions and stock conditions of the Project
Employees of Kachin State and Chin State		equipment and spare parts be grasped?
can grasp the operating conditions of equipment assigned to the stock yard and	2.	Are ledger control methods and procedures that utilize a database
work sites as well as the need and urgency of		understood, and can accurate data control be implemented?
maintenance, and through establishment of a	3.	Do personnel understand the importance of and implement regular
systematic control setup with the Mechanical		reporting on equipment control conditions to the Mechanical Equipment Compound?
Equipment Compound in Mandalay, they can	4	
promptly respond to equipment failures.	4.	Based on the Project equipment control methods, can the conditions of allocation and operation be controlled through listing the existing
		equipment owned by Kachin State and Chin State?
	-	
	5.	Can ledger control system be utilized to identify timing of maintenance and replacement of spare parts, which would prolong
		the life of equipment?
Output 3:	1.	Can the Project equipment be safely and appropriately operated on
The capability of road construction	1.	works sites?
management of DOH site engineers in	2.	Can works that fully realize the functions and performance of the
Kachin State and Chin State is improved, and		Project equipment to achieve compaction and flatness required for
technique to fully utilize performance of		earthwork and paving work?
project equipment is achieved by engineers.	3.	Can works materials be procured according to the design
		documents and specifications, and can works be executed according to the execution plans?
Output 4:	1.	Have DOH engineers understood purpose, effect and application
DOH engineers master techniques of		condition for each method of slope protection?
topographic survey, investigation, design,	2.	Have DOH engineers understood and can they carry out land
construction supervision and maintenance for		survey, investigation, design (stability calculation), construction and
slope stability and master the techniques to		maintenance which are necessary for slope stability?
utilize project equipment.	3.	Can DOH engineers use properly concrete sprayer and testing
Output 5:	1.	equipment to achieve required results? Can the instructors of CTC provide practical trainings and safety
Personnel at CTC gain effective method of	1.	trainings utilizing the project equipment?
training using project equipment and learn to	2.	Have the trainees of CTC acquired technical knowledge and skills
be able to provide safety training.		to achieve assigned job utilizing the project equipment?
	3.	Have the relevant officials review and discuss the current training
		program and propose updated programs that incorporate use of the
	I	project equipment?

#### 5. Soft Component Activities (Plan of Inputs)

#### (1) Contents of Activities

Activities set for each soft component is summarized as shown below.

Activities	Target Organization	Relevant Output
(1) Equipment Management System	Mechanical Department in Upper	
	Myanmar, Mechanical teams at	Output 1, 2
	Director's Offices in Kachin State and	Output 1, 2
	Chin State	
(2) Pilot Road Construction	Road construction teams at Director's	Outrout 2
	Office in Kachin State and Chin State	Output 3
(3) Slope Stability and Protection	Road Section, Road Research	
	Laboratory, Director's Office in Chin	Output 4
	State	
(4) Training at Central Training Center	Central Training Center (CTC)	Output 5

The Soft Component will be implemented under direct support by the contracted consultant, and the contents of activities for realizing the outputs of the Soft Component are as indicated below.

- 1) Activities regarding Output 1
- (a) Necessary technology and line of work

Equipment ledger system controllers and mechanics

#### (b) Technical level

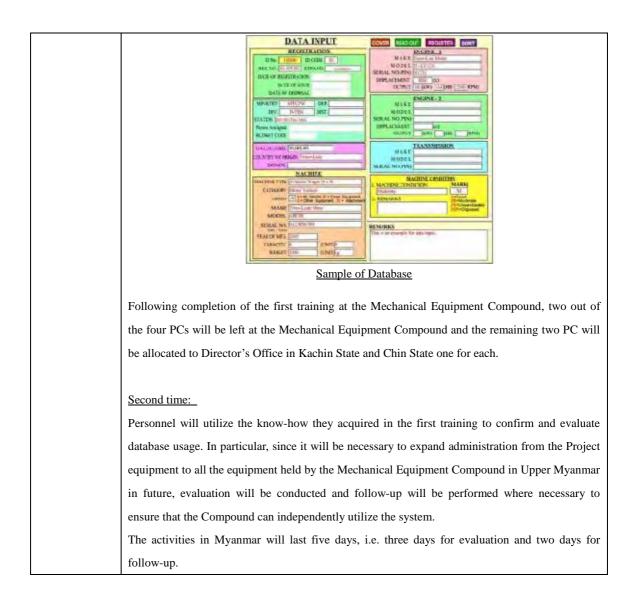
Current technical level	Required technical level
Since stock control of owned equipment and	Through effectively utilizing the database via PC,
spare parts is based on paper, it is difficult to	easily manage the store entry and issue conditions of
acquire necessary information, and the	equipment and spare parts, and efficiently plan the
system isn't efficient.	maintenance cycles of equipment and procurement
	periods of spare parts, etc.

#### (c) Target personnel

Responsible personnel at the Mandalay Mechanical Compound, and responsible employees of Kachin State and Chin State (approximately 30 persons in total)

%Although the training is targeted to staff in Upper Myanmar, staff of Mayangone Mechanical Compound, will be invited to join. This arrangement is to aim horizontal development of technology over whole Myanmar. Training on equipment management system has once been provided to Mayangone Mechanical Compound through the past project for equipment in Kayin State.

Venue	Mandalay Mechanical Compound, Kachin State and Chin State Office
Implementation	No activities in Japan
period	Local Activities: 1.16 months ( twice)
	First time: Practical guidance 0.83 months (16 activity days, 5 travel days( oversea travel 3 days,
	domestic 2 days), 4 rest days)
	Second time: Evaluation and follow-up 0.33 months (5 activity days, 3 travel days, 2 rest days)
Utilized	- Construction and maintenance equipment operating record manual (operating log)
training	- Construction and maintenance equipment operation and maintenance manual (spare parts
materials	control ledger)
Practical	- Desktop Computer: 4 units
training	- Database Software (general-purpose software)
equipment	
Contents of	The training consists of two stages; first time for practical training and 2 <sup>nd</sup> time for evaluation and
activities	follow-up. The composition is to assure trainees' mastering know-how so that effective utilization
	will last for long time.
	First time:
	Introduce the Ledger Control System which is database for the Project equipment and spare parts,
	and conduct training according to the above two manuals in order to impart know-how for
	operating the control system.
	Training will be implemented before delivering the Project equipment, and the main training
	contents will be as follows:
	- Outline explanation of database software and orientation: 1 day
	- Data inputting of equipment specifications (makers, models, suppliers, registration
	numbers, etc.) : 3days
	- Equipment operating conditions and stock entry/exit control: 2 days
	- Stock control of spare parts and expendable items: 3 days
	- Periodic inspection and maintenance implementation planning: 2 days
	(Compile implementation plans based on operating hours or running distance, etc.)
	- Periodic inspection and maintenance implementation recording: 2 days
	- Reflection of periodic reports from local offices under jurisdiction in the system, and
	centralized control of the allocation and operation of equipment under jurisdiction (in this
	Soft Component, targeting equipment procured for Kachin State and Chin State in the
	Project) : 1 day
	- Follow-up of the above activities by the target personnel themselves: 2 days



## 2) Activities regarding Output 2

(a) Necessary technology and line of work

Equipment ledger system controllers and mechanics

#### (b) Technical level

Current technical level	Required technical level
Some of the allocated equipment isn't operating due to breakdown or deterioration, however, basic maintenance equipment is inadequate, and provision of spare parts from the Mechanical Equipment Compound tends to be delayed. As a result, it is difficult to implement appropriate maintenance or conduct prompt repairs when failures occur.	Appropriately implement routine basic maintenance through making use of the mobile workshop procured in the Project. Also, utilize the PC database to control the operating conditions of allocated equipment and make periodic reports to the Mandalay Mechanical Compound.

#### (c) Target personnel

Personnel responsible for equipment in Kachin State and Chin State (approximately 20 persons from each State)

Venue	Kachin State and Chin State Office
Implementation	No activities in Japan
period	Local activities: 2.54 months (twice)
	First time: Practical guidance 1.67 months (18 activity days $\times$ 2 places, 6 travel days,
	8 rest days)
	Second time: Evaluation and follow-up 0.87 months (6 activity days $\times 2$ places, 6
	travel days, 8 rest day)
Utilized	- Construction and maintenance equipment operating record manual (operating log)
training	- Construction and maintenance equipment operation and maintenance manual (spare
materials	parts control ledger)
Practical	- Desktop PC: 1 unit
training	- Control database (general-purpose software): 1 set
equipment	% Equipment that has been transferred from Mandalay Mechanical Compound will
	be utilized for the above.
Contents of	The training consists of two stages; first time for practical training and 2nd time for
activities	evaluation and follow-up. The composition is to assure trainees' mastering know-how
	so that effective utilization will last for long time.
	First time:
	Introduce the Project equipment and spare parts ledger control database and conduct
	training according to the above two manuals in order to impart know-how on

operating the control system.
In the Soft Component, since pilot works will be implemented on a section of the
targeted roads in Kachin State and Chin State, the allocation of Project equipment to
this site will be treated as a case study.
Training will be implemented before delivering the Project equipment, and the main
training contents will be as follows:
- Outline explanation of database software and orientation: 1 day
- Data inputting of equipment specifications (makers, models, suppliers,
registration numbers, etc.) : 2days
- Equipment operating conditions and stock entry/exit control: 2 days
- Stock control of spare parts and expendable items: 3 days
- Observation of operation time, consumption of fuel and oil: 2 days
- Periodic inspection and maintenance implementation planning: 3 days
- (Compile implementation plans based on operating hours or running distance,
etc.)
- Periodic inspection and maintenance implementation recording: 2 days
- Periodic reporting on Project equipment allocation conditions, operating
conditions and maintenance recording, etc. to the Mechanical Equipment
Compound in Mandalay: 1 day
- Follow-up of the above activities by the target personnel themselves: 2 days
Second time
Personnel will utilize the know-how they acquired in the first training to confirm and
evaluate database usage.
Also, support will be offered for listing the equipment allocated to Kachin State and
Chin State in the control system. This support will target not only the Project
equipment but also all equipment in the state that is controlled by the system.
Evaluation and, where necessary, follow-up will be conducted with a view to enabling
Kachin State and Chin State Office to independently utilize the system.
The activities will last six days, i.e. four days for evaluation and two days for fallow up in each of Kachin State and Chin State
follow-up in each of Kachin State and Chin State.

## 3) Activities regarding Output 3

(a) Necessary technology and line of work

Road engineers, equipment operators

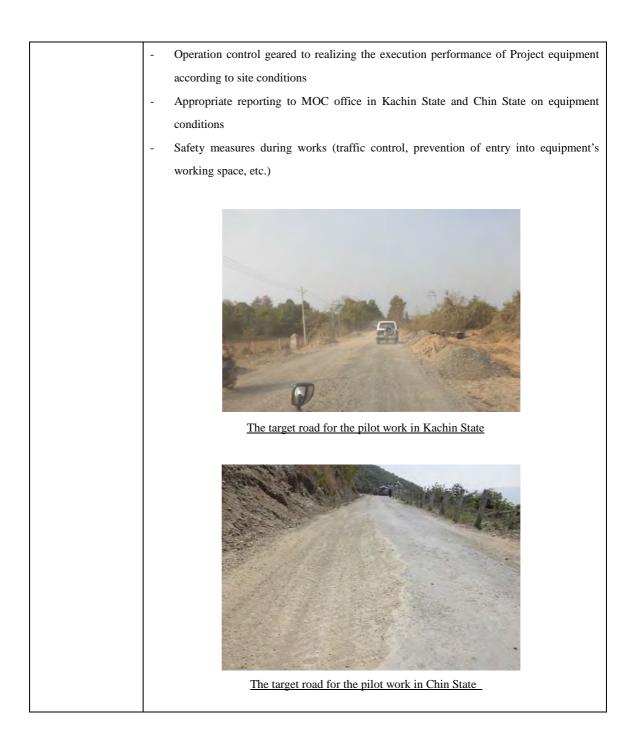
#### (b) Technical level

Current technical level	Required technical level
Existing equipment can be utilized to implement road paving works.	Through efficiently utilizing the latest equipment procured in the Project, it will be possible to construct and maintain high-quality roads.

#### (c) Target personnel

Road engineers and equipment operators in Kachin State and Chin State

Implementation site	Out of the roads targeted in Kachin State and Chin State, a section of approximately 200 km
	around their state's capital.
Implementation	No activities in Japan
period	Local activities: 5.17 months (twice)
	First time: 1.17 months (pilot work preparation: 10 activity days×2 places, 9 travel
	days(international 3 days, domestic 6 days), 6 rest days)
	Second time: 4.0 months (guidance on pilot work: 2 months in each of Kachin State and
	Chin State)
Utilized training	- Paving manual
materials	
Practical training	- Project procured equipment
equipment	
Contents of	Before the guidance at pilot works on site, preliminary discussion and confirmation with
activities	engineers in Kachin State and Chin State are necessary regarding budget, execution planning
	and works materials procurement. Thus the local activities comprise two stages.
	Followings are details of activities.
	First time:
	In order to smoothly start the pilot work, hold discussions with engineers (implementing
	agency) and confirm conditions regarding budget, execution planning and works materials
	procurement.
	Second time:
	Conduct the following technical guidance via the pilot work:
	- Efficient introduction of equipment according to work processes and site conditions



- 4) Activities regarding Output 4
- (a) Necessary technology and line of work

Slope engineers, equipment operators

(b) Technical level

Required technical level
To have knowledge about slope stability and be able to plan necessary countermeasures

(c) Target personnel

Road engineers and equipment operators at Road Section of Naypyitaw head office, Road Research Laboratory and Director's Office in Chin State

Implementation site	Road Section (Naypyitaw), Road Research Laboratory(Yangon), and Director's Office in
	Chin State
Implementation	Japan: 1.0 month (10 day $\times$ 2 persons) for preparatory work
period	Myanmar: 5.7 months
	First time: 2.7 months
	Technical lecture $0.7$ months $\times 2$ persons + 0.4 month $\times 1$ person
	(at Road Section in Naypyitaw, and Road Research Laboratory in Yangon)
	Site investigation $0.3$ months $\times 3$ persons
	Second time: 3.0 months
	Topographic survey, Excavation and trimming $1.5 \text{ months} \times 1 \text{ person}$
	Pilot works of slope protection $1.5 \text{ months} \times 1 \text{ person}$
Utilized training	- Fundamental materials for topographic survey, investigation, stability analysis, design and
materials	construction of slopes in road works
	- Guideline for slope protection works for road
Practical training	- Project procured equipment : Concrete sprayer, Survey equipment and Boring machine
equipment	
Contents of	On the First time in Myanmar, lectures on technical fundamentals of slope stabilization will
activities	be given at two venues, Naypyitaw and Yangon. Then preparatory training for the pilot
	project will be provided in Chin State to two groups, one group for design and construction
	and the other for site investigation by boring.
	On the Second time, the pilot project will be carried out.
	Details of each activity are as shown below.

Activities in Japan
Drawing up teaching materials:
• Fundamental materials for land survey, investigation, stability analysis, design and
construction of slopes in road works
Guideline for slope protection works for road
Activities in Myanmar
<u>First time:</u>
Technical lectures: Road Section at Naypyitaw 5 days
Road Research Laboratory at Yangon 5 days
- Overview of Methods for Slope Stabilization
- Land survey and Geological Investigation
- Evaluation of Slope Stability
- Design and Construction Methods
- Maintenance of Slopes to Road
On-site Training on Evaluation of Slopes: at the actual slopes in Chin State 7days
- Land survey, Evaluation of slopes, Method for slope stabilization
( Design/Construction Group)
- Investigation by Boring
(Investigation Group)
Second time:
Conduct the following technical guidance via the pilot project:
Topographic survey, Excavation & trimming
• Pilot works of slope protection by spraying mortar
the second s
All the second s
Target road for the pilot works of slope protection in Chin State

#### 5) Activities regarding Output 5

#### (a) Necessary technology and line of work

Civil Engineers and Trainers for skilled workers (30 -50 people for each training course)

#### (b)Technical level

Current technical level	Required technical level
Existing training equipment is simple one for manual works. No training for bringing on engineers and skilled workers for efficient and safe execution of works is provided.	

## (c) Target personnel

## Lecturers of Central Training Center, civil engineers and skilled workers

Implementation site	Central Training Center (CTC)
Implementation	Activities in Japan: 1.5 months (twice)
period	First time: 0.5 months $\times 2$ persons
	Second time:0.5 month $\times$ 1person
	Local activities: 18.4 months (5 times)
	<u>First time</u> : 1.0 months (0.5 months $\times$ 2 persons )
	Preliminary discussions with DOH head office at Naypyitaw and CTC at Yangon
	(6 activity days, 5 travel days(international 3 days , domestic 2 days ), 4 rest
	days)
	Second time: 6.3 months
	Implementation plan and monitoring: 0.3 month (1person)
	Training management and safety management: 2.0 months (1 person)
	Planning Training Program: 2 months (1 person)
	Guidance at practical training: 2.0 months 1.0 month $\times$ 1 person $\times$ 2 courses
	Third time: 2.2 months
	Monitoring: 0.2 month (1 person)
	Planning mock work, guidance on safety management: 1.0 month (1 person)
	Training plan, Intermediate follow-up 1.0 month (1 person)
	Forth time: 8.0 months
	Implementation plan and monitoring: 0.3 month (1person)
	Management of training and planning safety management: 2.5 months (1person)
	Planning Training Program: 1.0 month (1person)
	Guidance for practical training: 4.2 months (0.7 month $\times$ 1 person $\times$ 6 courses)
	Fifth time: 0.9 month
	Monitoring: 0.2 month (1 person)

		Planning Training Program: 0.7 month (1person)
Utilized	training	- Guideline for basic skills in civil works (Formwork, Concrete Work, Road Work, Re-bar
materials		Work, Scaffolding Work)
		- Guideline for safety measures in road works
Practical	training	- Project equipment for Central Training Center
equipment		
Contents	of	The Activities include 6 training courses for CTC: Topographic survey, Formwork, Concrete
activities		Work, Road Work, Rebar Work and Scaffolding. Each course provides practical training with
		guidance on safety measures. Another activity included here is to compile improvement plar
		of existing training programs exercised at CTC and its affiliated body Mechanical Training
		Center in Insein, Yangon.
		Activities in Japan
		Drawing up "Guideline for basic skills in civil works (Formwork, Concrete Work, Road
		Work, Re-bar Work, Scaffolding Work)" and "Guideline for safety measures in road works"
		work, Re-bai work, Scanolding work) and Guideline for safety measures in road works
		Activities in Myanmar
		<u>First time:</u>
		At Head Office in Naypyitaw and CTC in Yangon.
		Orientation to explain activity plan, preliminary discussion and preparation for training
		Second time:
		Conduct the following activities at Central Training Center:
		- Summarization at the end of training and monitoring
		- Guidance on Safety Measures
		- Analysis and discussion on improvement of training programs
		- Training on formwork
		Lecture: Fundamentals of formwork, Function of each component
		Practice: Handling equipment and parts, Assembling and disassembling formwork
		- Training on Scaffolding
		Lecture: Fundamentals of scaffolding, Function of each component
		Practice: Erecting and dismantling of scaffolding with preventative measures
		against fall.
		Third Time
		Conduct the following activities at CTC:
		<ul> <li>Summarization at the end of training and monitoring</li> </ul>
		<ul> <li>Planning mock work (actual structure), guidance on safety management</li> </ul>
		<ul> <li>Mock work (actual structure), garance on succey management</li> <li>Mock work training plan, analysis and discussion on improvement of training programs</li> </ul>

[]	- Intermediate follow-up
	Note: The above mentioned "mock work training plan" is to draw up a training plan to be
	conducted in the fourth activity for survey, steelwork, formwork, concrete work and
	scaffolding using mock structure built in the Training Center.
	Fourth Time
	Conduct the following activities at CTC:
	- Summarization at the end of training and monitoring
	- Guidance on model construction and safety measures
	- Analysis and discussion on improvement of training programs
	- Training on topographic survey
	Lecture: Fundamentals of field survey
	Practice: Exercise of surveying using mock work
	- Training on rebar work
	Lecture: Fundamentals of steel work, Function of each reinforcement bars
	Practice: Use of bending machine • cutting machine, exercise at mock work
	- Training on formwork
	Lecture: Review fundamentals of formwork and function of each component.
	Practice: Guidance on handling equipment, exercise at mock work
	- Training on concrete work
	Lecture: Characters of material, purpose of compaction notes on placing concrete
	Practice: guidance on usage of vibrators, exercise at mock work
	- Training on road work
	Lecture: Illustration of damage to pavement, repair method, material for repair
	Practice: Guidance on handling equipment, exercise of repair work
	- Training on scaffolding
	Lecture: Review fundamentals of scaffolding and function of each component
	Practice: Exercise of erection, dismantling, preventative measure against fall at
	mock work
	Fifth time
	Conduct the following activities at CTC and Mechanical Training Center in Insein.
	- Summarization at the end of training and monitoring
	<ul> <li>Analysis of training program for operators and discussion on improvement</li> </ul>

## (2) Implementation Resources

#### 1) Japanese side

Japanese Experts to be dispatched for the Soft Component, field, number, period and major contents of activities are described below.

[Japanese Engineers]

Responsible field	Number of member	Period (M/M)	Major contents of activities
Experts for Output 1 & 2	member		
Equipment Planning (Japanese engineer)	1	1 <sup>st</sup> : 2.5M/M 2 <sup>nd</sup> : 1.2M/M Total: 3.7M/M	First time: Guidance on ledger control system training Second time: Confirmation and evaluation of conditions of system utilization
Experts for Output 3			
Road Planning (Japanese engineer)	1 2	1 <sup>st</sup> : 1.17M/M 2 <sup>nd</sup> : 4.0M/M Total: 5.17M/M	First time: Pilot work preparation Second time: Technical guidance on pilot work
Experts for Output 4			
Slope Stabilization (Japanese Engineer)	3	$\begin{array}{c} 1^{\text{st}}: 2.7\text{M/M} \\ (1.0\text{M/M} \times 2 + \\ 0.7\text{M/M} \times 1) \\ 2^{\text{nd}}: 3.0\text{M/M} \\ (1.5\text{M/M} \times 2) \end{array}$	<ul><li>1st: Lectures on technical fundamentals of slope stabilization and preparatory training for the pilot project</li><li>2nd: Provide technical guidance via execution of pilot project</li></ul>
	2	In Japan 1.0M/M (0.5M/M×2) Total: 6.7M/M	Drawing up teaching materials
Experts for Output 5		100001007102102	
Planning/Monitoring (Japanese engineer)	1	1 <sup>st</sup> : 0.3M/M 2nd: 0.2M/M 3 <sup>rd</sup> : 0.3M/M 4 <sup>th</sup> : 0.2M/M Total: 1.0M/M	1st:       Evaluation at the end of         2nd:       training and monitoring         3rd:       4th:
Training Planning/Safety Management (Japanese engineer)	1	1 <sup>st</sup> : 0.3M/M 2nd: 0.2M/M 3 <sup>rd</sup> : 0.3M/M 4 <sup>th</sup> : 0.2M/M In Japan 1.0MM (0.5M/M×2) Total: 7.0M/M	<ul> <li>1<sup>st</sup>: Preparatory discussion and preparation for training</li> <li>2<sup>nd</sup>: Guidance on safety measures</li> <li>3<sup>rd</sup>: Planning mock work, guidance on safety measures</li> <li>4<sup>th</sup>: Guidance at mock work and safety measures</li> <li>In Japan: Drawing up teaching materials, preparation for training</li> </ul>
Training Program Planning (Japanese engineer)	1	1 <sup>st</sup> : 0.5M/M 2nd: 2.0M/M 3 <sup>rd</sup> : 1.0M/M 4 <sup>th</sup> : 1.0M/M 5 <sup>th</sup> : 0.7M/M In Japan 0.5MM (0.5M/M×2) Total: 5.7M/M	<ul> <li>1<sup>st</sup>: Preparatory discussion and preparation for training</li> <li>2<sup>nd</sup>: Analysis of training program and discussion</li> <li>3<sup>rd</sup>: Planning training and intermediate follow-up</li> <li>4<sup>th</sup>: Summarize improvement plan of training program for Engineers and skilled workers</li> <li>5<sup>th</sup>: Summarize improvement plan of training program for operators</li> <li>In Japan Drawing up teaching materials, preparation for training</li> </ul>
Trainers for Skilled Workers (Japanese engineer)	2 6	1 <sup>st</sup> : 2.0M/M (1.0M/M×2) 2nd: 4.2M/M (0.7M/M×6) Total: 6.2M/M	1 <sup>st</sup> : Guidance at practical training 2 <sup>nd</sup> : Guidance at practical training
			I

## [Local Staff]

Responsible field	Number of staff	Period (M/M)	Major contents of activities
Local Staff for Output 1	&2		
Interpreter (English/Burmese) (Local Staff)	1	1 <sup>st</sup> : 2.4 M/M 2 <sup>nd</sup> : 1.1 M/M Total : 3.5 M/M	For Japanese engineer in charge of planning equipment - At training - Translation of teaching material
Local Staff for Output 3			
Interpreter (English/Burmese) (Local Staff)	1 2	1 <sup>st</sup> : 1.07M/M 2 <sup>nd</sup> : 3.8M/M (1.9M/M×2) Total: 4.87M/M	For Japanese engineer in charge of planning road work - At pilot work - Translation of teaching material
Local Staff for Output 4	•	•	ž
Interpreter (Japanese/Burmese) (Local Staff)	1	1 <sup>st</sup> : 0.9M/M 2 <sup>nd</sup> : 2.4M/M Total: 3.3M/M	<ul> <li>For Japanese engineer in charge of slopes</li> <li>At lectures and execution of pilot project</li> <li>Translation of teaching materials</li> </ul>
Interpreter (Japanese/Burmese) (Local staff)	1	1 <sup>st</sup> : 0.6M/M Total: 0.6M/M	For Japanese engineer in charge of slopes - At survey and investigation by boring
Technical assistant (Local staff)	1	1 <sup>st</sup> : 0.9M/M 2 <sup>nd</sup> : 2.4M/M Total: 3.3M/M	<ul> <li>For Japanese engineer in charge of slopes</li> <li>At survey</li> <li>At pilot work</li> </ul>
Local Staff for Output 5			
Interpreter (English/Burmese) (Local Staff)	1	1 <sup>st</sup> : 0.4M/M 2nd: 1.9M/M 3 <sup>rd</sup> : 0.9M/M 4 <sup>th</sup> : 2.4M/M 5 <sup>th</sup> : 0.6M/M Total: 6.2M/M	<ul> <li>For Japanese engineer in charge of safety management plan and safety training program</li> <li>At training and follow-up</li> <li>Translation of teaching material</li> </ul>
Interpreter (Japanese/Burmese) (Local staff)	2	1 <sup>st</sup> : 1.8M/M (0.9M/M×2) 2 <sup>nd</sup> : 3.6M/M	For Japanese engineers in charge of training skilled workers - At training
		(0.6M/M×6) Total: 5.4M/M	- Translation of teaching material
Technical assistant (Local staff)	1	1 <sup>st</sup> : 1.9M/M 2 <sup>nd</sup> : 2.4M/M Total: 4.3M/M	Assist Japanese trainers in charge of safety management plan and safety training program - At safety guidance - At mock work

#### 2) Myanmar side

The human resources to be recruited on Myanmar side for the Soft Component are described below.

Responsible field	Number of trainees	Period
Equipment control and	Around 20 trainees	1 <sup>st</sup> : 2.5 months
management		$2^{nd}$ : 1.2 month
		Total: 3.7 months
Works supervisors, road	Appropriately	1 : 0.5 month (except operators)
engineers, operators	recruit according to	2 : 1.5months
	the type of pilot	Total: 2.0 months
	works	ot
Investigation, design and	Around 20 trainees	$1^{st}$ : 1.0 month
construction of slope		2 <sup>nd</sup> : 2.5 months
		Total: 3.5 months
Trainers and trainees at	30 – 50 trainees	1st: 0.5 months
Central Training Center		2nd: 2.0 months
		3rd: 1.0 month
		4th: 2.5 months
		5th: 0.7 months
		Total: 6.7 months

#### (3) Types of Outputs

- 1) Japanese side
  - > Construction and maintenance equipment operating record manual (operating log)
  - Construction and maintenance equipment operation and maintenance manual (spare parts control ledger)
  - Fundamental materials for land survey (topographic survey), investigation, stability analysis, design and construction of slopes in road works
  - Guideline for slope protection works for road
  - Guideline for basic skills in civil works (Formwork, Concrete Work, Road Work, Rebar Work, Scaffolding)
  - Guideline for safety measures in road works
- 2) Japanese side and Myanmar side
  - > Operation flow of the Ledger Control System prepared in the training

(The operating flow including the periodic reporting setup between the central and local levels will be jointly created).

Proposed improvement on training programs for CTC (including Mechanical Training Center in Insein)

#### 6. Procurement Method for Soft Component Implementation Resources

It is considered that the activities in the soft component are better carried out by Japanese engineers than by local resources for the reasons summarized below

Activities	Reason for Introduction of Japanese Engineers
(1) Equipment	The system to manage various construction equipment using ledger is not
Management System	common in Myanmar. In addition, manufacturers of the most equipment are
	Japanese. So it is difficult for local resources to cope with it and Japanese
	engineers would best suit.
(2) Pilot Road	In connection with the above (1), improvement of quality of road works
Construction	using the project equipment can be achieved by guidance on site by Japanese
	engineers who are well informed of equipment and ledger system.
(3) Slope Stability and	There is no technical know-how for slope stabilization in Myanmar.
Protection	Guidance by experienced Japanese engineers is indispensable.
(4) Training at Central	It is planned that the training equipment will be procured from Japanese
Training Center	manufacturers. Japanese experienced engineers who are familiar with those
	equipment and safety measures would enable effective trainings using the
	equipment.

As such, it is appropriate that the contracted consultant directly conduct the Soft Component.

#### 7. Implementation Schedule of Soft Component

	Year	201	5	201	6											201	7			
	Month	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
	Procurement Schedule						Contra	ct		I	Delivery	▼		I	elivery	2▼	Deliv	very3		etion ▼
	(1) Equipment Management System															Out	put 1,3	2		
Sof	(2) Pilot Road Construction													Output	2					
Soft Component	(3) Slope Stability and Protection											Out (in J	put 3 apan)							
onent	(4) Training at Central Training Center		Output	4 apan)																
	Submission of Reports					(To	ogress F DOH) Progres		(To D t				Progres (To D Progre	OH)					(To	eport ♥ DOH) Report ♥
*	May to October is a rainy se	eason	in N	Iyann	nar.	. (	То ЛСА	A)	(To J	i <del>tess Re</del> ICA)	port		(10 J	ICA)					(To	JICA)

The implementation schedule of Soft Component is as follows.

#### 8. Types of Outputs

The outputs to be created in the Soft Component are as follows:

- > Construction and maintenance equipment operating record manual (operating log)
- Construction and maintenance equipment operation and maintenance manual (spare parts control ledger)
- Fundamental materials for land survey, investigation, stability analysis, design and construction of slopes in road works
- Guideline for slope protection works for road
- Guideline for basic skills in civil works (Formwork, Concrete Work, Road Work, Steel Work, Scaffolding)
- Guideline for safety measures in road works
- Proposed improvement on training programs for Central Training Center (including Mechanical Training Center in Insein)
- Soft Component completion report

to includes:

- Record of activities, for example, photographs of works, etc.
- The above-mentioned manuals and system operation flow
- Results of the before and after questionnaire implemented with respect to employees of the Myanmar implementing agency
- Final Report to be submitted to the client

#### 9. Soft Component Cost Estimation

The cost for the Soft Component is not disclosed.

#### 10. Obligations of Myanmar Side

In order to achieve the objectives of the Soft Component, in addition to the outputs of implementation, the following items will need to be implemented as the obligations of Myanmar side:

- To ensure the ongoing operation of the Ledger Control System established under the Soft Component, disseminate and horizontally extend within the organization the technologies and control methods that have been learned.
- Utilizing the project equipment, advance construction and maintenance of the target roads without delay, and utilize the control system in order to efficiently operate and maintain the roads.
- In order to appropriately conduct operation and maintenance utilizing the control system, secure the necessary budget to maintain the Project equipment and procure additional spare parts.
- > Allocate appropriate budget and continue slope protection using the project equipment in the

target road in Chin State so that the learnt techniques and skills are sustained and further developed.

- Shared with other districts the techniques and skills for slopes transplanted to Chin State so that the effect spread widely over mountainous areas in Myanmar.
- Conduct the learnt training method continuously using procured training equipment at Central Training Center

# **APPENDIX 6**

# OTHER RELEVANT DATA

## Safety Management Seminar

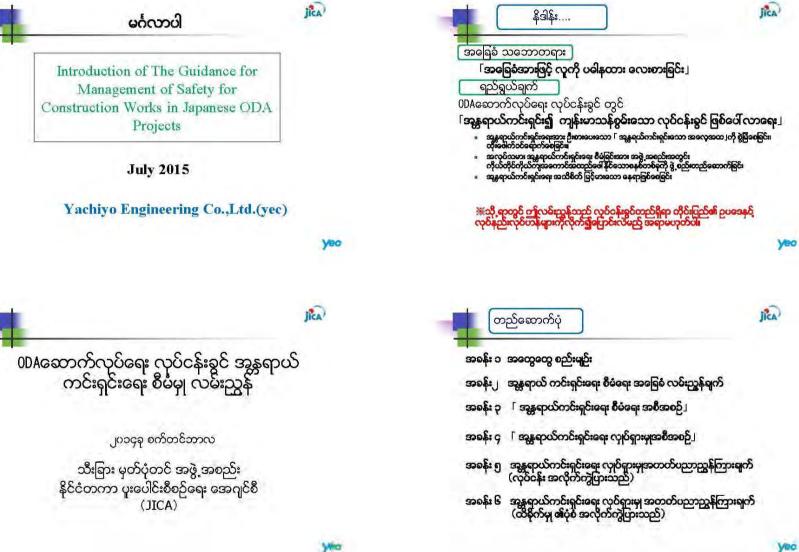
Seminal Program in Mandalay





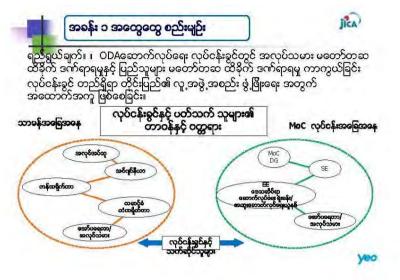
Seminal Program at Central Training Center in Yangon

Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 1/12"



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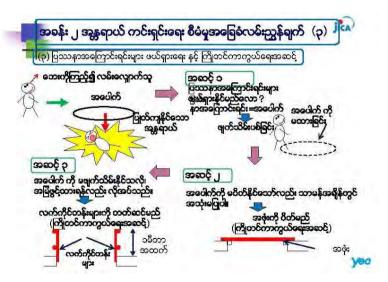
Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 2/12"



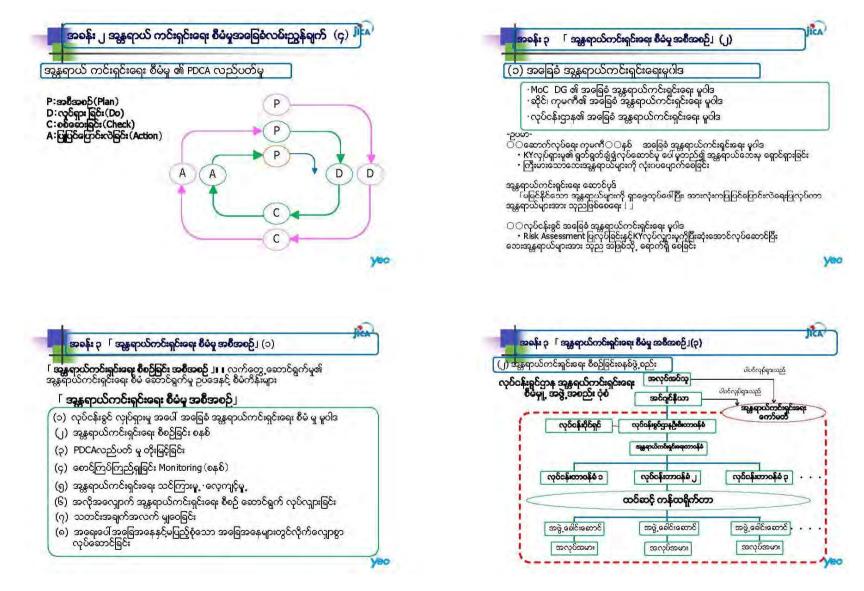


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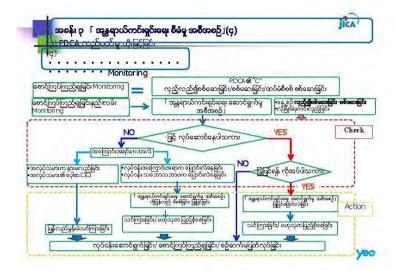




Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 3/12"

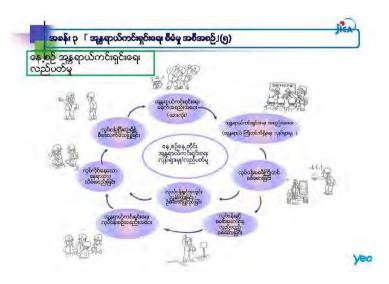


Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 4/12"



	) အန္တရာယ်ကင်းရှင်းရေး သင်ကြားခြ	မင်း/ လေ့တျင့်မှ
	အဓိတတျသောအန္တရာယ်တင်းရှင်းရေး သင်ကြားခြင်း/ လေ့ကျင့်မှု အမျိုးအစားများ	အကြောင်းအရာ
o	တိုင်းပြည်မှ ချမှတ်ထားသော အန္တရာယ် ကင်းရှင်းရေး အခြေခံဥပဒေနှင့် ပတ်သက်သော သင်ကြားခြင်း	•လုဝ်ငန်းခွင်ဆိုင်ရာ အန္တရာယ် တင်းရှင်းရေး အခြေခံဥပဒေ
J	အလုပ်သမားအသစ် သင်ကြားခြင်း	•လုပ်ငန်းအတွေထွေအကျဉ်းချစ် (နေရာရထားမှုပြပုံစံ) •လုပ်ငန်းခွင် စည်းကမ်း •နေ,စဉ် အန္တရာယ် ကင်းနှင်းရေး လည်ပတ် လျှမ်ရှားမှု
5	အုန္စရာယ် ကင်းရှင်းရေး လုဝ်ငန်းအဆင့်ဆင့် သင်ကြားခြင်း	•၊အန္တရာယ်ကင်းရှင်းရေး လုပ်လျားမူ့ အစီအစဉ် ၊ထင်ရှားသီသာစေသည့် အန္တရာယ် ကင်းရှင်းရေး လုပ်ငန်း အဆင့်ဆင့် ကို ပတ်သက်ရာသို့ အကြောင်းကြားရြှင်း
9	အပြောင်းအလဲရှိစဉ် အသိပေး သင်ကြားခြင်း	•လုပ်ငန်းနှင် အဆင့်ဆင့်နှင့် အကြောင်းအရာ ပြောင်းလဲသည့်အခါ ဟာသတ်ရာသို့ အကြောင်းကြားခြင်း
9	ပုံမှန် အန္တရာယ် ကင်းရှင်းရေး သင်ကြားခြင်း / လေ့ကျင့်မှု	•အန္တရာယ်ကင်းရှင်းရေး ညီလာခံ •အုန္တရာယ်ကင်းရှင်းရေး တင်းလှည် မူအဖြေ





Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 5/12"





JICA အန္တရာယ်ကင်းရှင်းရေး မနက်ခင်းအစည်းအဝေး yeo JICA အန္တရာယ်တားဆီးရေး ပစ္စည်းများ တတ်ဆင်ရေး နှံထူသော လုပ်ငန်းစွင် အတွက် ဘာကပ်စာအာက်ပန် အလင်းစာသော လုပ်ငန်းနှင့် အတွက် ကာကွယ်ရရဲ့မျက်မှုန თიზიათნჭიდნ S. OP Par J , ဆူဘံသော လုပ်ငန်းစွင်အတွက် နားဆို အဝိဂဟေးစာာသော အစါသုံးသည့် မျက်နှာဖုံး Se အဆိပ်သင့် လုပ်ငန်းနှင် အတွက် အသုံးဖြစ်သာ နားစစ်င်းစွတ် မျက်နားစုံ ခေါက်လာတွေ ချောင်းသည်

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Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 6/12"

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 အဝန်း ၃ 「အမ္တနာယ်ကင်းရှင်းရေး စိပ်မှ အစီအဝဉ်၂(၈)

 55 (35) လှုပ်ရှားမှ ခွဲခြားထုပ်ပယ်ခြင်း (Seiri)

 ခွဲခြားထုပ်ပယ်ခြင်း (Seiri)
 လိုအပ်သည်များကို ဖယ်ထုပ်ခြင်း

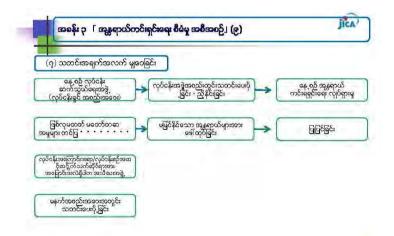
 နေရာတကျထားခြင်း (Seiton)
 လိုအပ်သည်များကို စနစ်တကျ ရှိသင့်သည့်နေရာတွင် ထားခြင်း

 သန့် ရှင်းခြင်း (Seisou)
 အလုပ်ပြီးပါက လုပ်ငန်းခွင် သန့် ရှင်းရေးပြုလုပ်ခြင်း

 သင့်ရပ်ခြင်း (Seiketsu)
 စိပ်ပတ်ဝန်းကျင်အား သပ်သပ်ရပ်ဖြစ်စေခြင်း

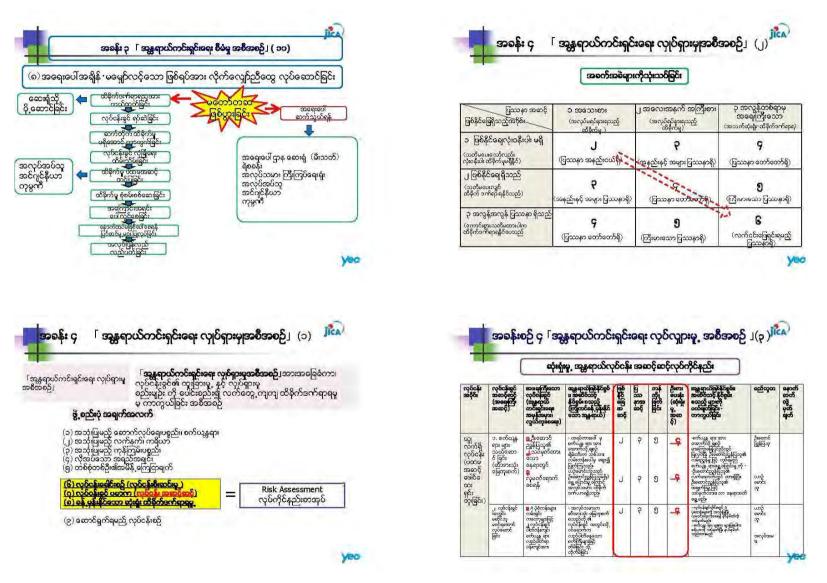
 စောင့်ထိမ်းခြင်း (Shitsuke)
 သတ်မှတ်ထားသော စည်းကမ်းချက်ကို လိုက်နာခြင်း

<u> </u>	KYသင်ပုန်း	
လုပ်ငန်းအဆင့်ဆင့်	ဖြစ်ပွားနိုင်သော မတော်တဆ ထိနိုက်မှု	ကျွန်ပ်တို့သည် ဤသို့ တားဆီးမည်
ာ ပစ္စည်းကိုသယ်ယူခြင်း	ပစ္စည်းများပြတ်ကျပြီးလူကိုထိမှန်ခြင်း	•အချက်ပြရင်းဖြင့်သေချာစေခြင်း
		•သယ်ယူရွေ့လျားနေသောပစ္စည်း များအောက်သို့ မပင်ရန်
-	ခန္ဓာကိုယ်အရှိန်လွန်ရှိအမြင့်မှပြတ်ကျခြင်း	•အနေရာယ်တင်းခါးပတ်ကိုဂတ်ဆင် အသုံးပြုခြင်း
၂ ပစ္စည်းများကိုဖယ်ရှားခြင်း	ပစ္စည်းဖွားပြုတ်ကျပြီးလူကိုထိမှန်ခြင်း	•ပစ္စည်းများတတ်ဆင်သည့်နေရာ အောက်သို့ မပင်ရ
		•ပစ္စည်းများတတ်ဆင်သည့်နေရာသို့ မပင်ရ
-	ခန္ဓာကိုယ်အရှိန်လွန်၍အမြင့်မှပြတ်ကျခြင်း	•အန္တရာယ်ကင်းခါးပတ်ကိုပတ်ဆင် အသုံးပြုခြင်း



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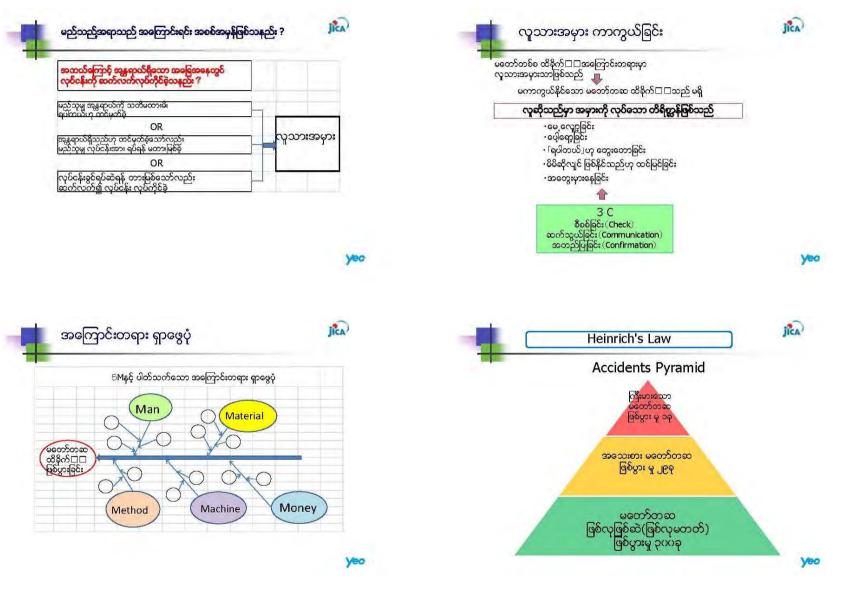
Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 7/12"



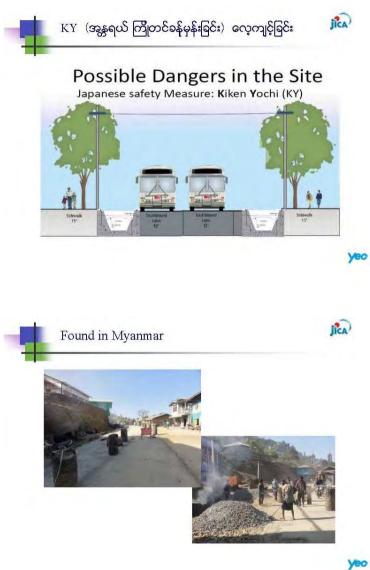
Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 8/12"

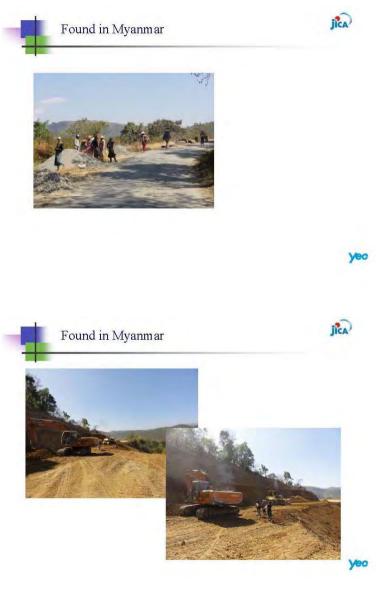


Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 9/12"



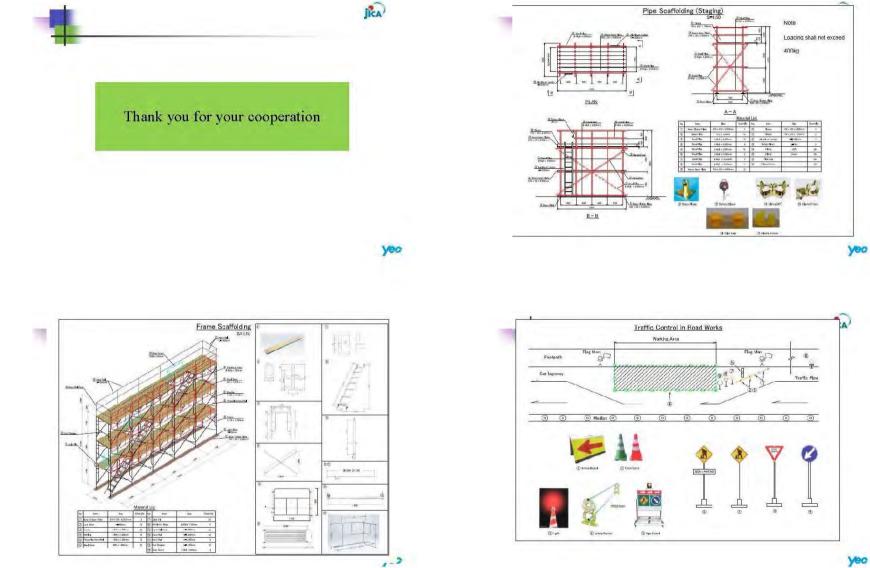
Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 10/12"





Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 11/12"





Handouts "Guidance for the Management of Safety for Construction Works in Japanese ODA Project 12/12"

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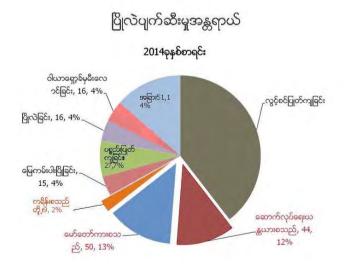
Handouts "Accident Prevention in Earth Work Site 1/10"





## Yamazaki Construction Co., Ltd

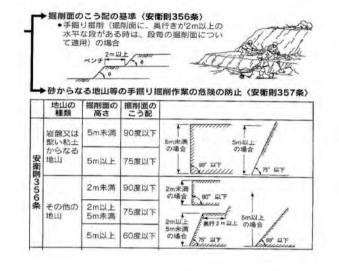






Handouts "Accident Prevention in Earth Work Site 2/10"

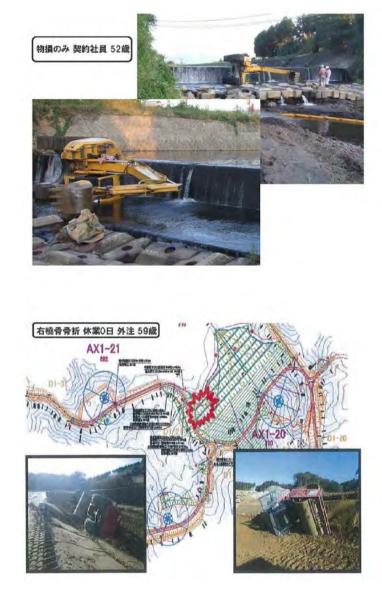








Handouts "Accident Prevention in Earth Work Site 3/10"







Handouts "Accident Prevention in Earth Work Site 4/10"



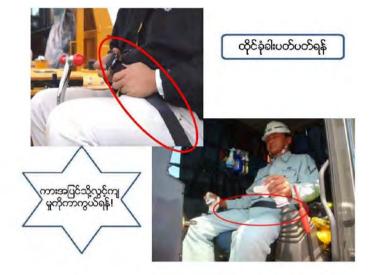


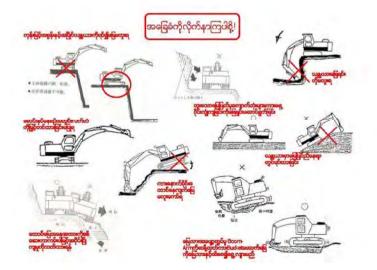




Handouts "Accident Prevention in Earth Work Site 5/10"









Handouts "Accident Prevention in Earth Work Site 6/10" ຝົວນພິກາກເຕີສະ(Heavy Dump)ເປີະເພຣິະວຽໂນວອີດຍະລຸຽໂະລຸວອີເຕັສະພຸກະດອອີລະໂຊິໂະແ



စတင်ထွက်ရွှါရှိန်တွင်ဟွန်းအချက်ပြရင်း



စတေကာဖြင့်သတိပေးခြင်း



နောက်ပြန်ဆုတ် ချိန်အန္တရာယ်ရှိသည်။ **အနားမကာပ်ရ** 

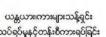
ကားစာထင်ထွက်ရှိရှိန်တွင်ဟွန်းအရက်ဖြစ်း သန္တယားခရွှ.လျားရှိန်တွင်တွန်းအရက်ဖြစ်း ကို ဂို ဂို ဂို ဂို ဂို ကို ဂို ဂို ဂို ဂို ဂို



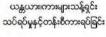
Handouts "Accident Prevention in Earth Work Site 7/10"

ယန္တယားများ၏မမြင်ရသောရှုထောင့်ကိုသိပါသလား? からは 見えない恐怖 か 2 ---死角 💈 山崎建設株式会社 💈 山崎建設株式会社

ဥမင်လိုက်ခေါင်းအတွင်းတွင်စက်၏ချိန်းပတ်၄နေရာတွင် အချက်ပြColour Coneတတ်ဆင်ရန်နှင့် မောင်းနှင်ချိန်တွင်ပတ်ဝန်းကျင်ကိုစစ်ဆေးရင်းပြန်လည်သိမ်းဆည်းရန်











Handouts "Accident Prevention in Earth Work Site 8/10"

လွင့်စင်ပြုတ်ကျခြင်းအန္တရာယ်



စက်ယန္တယားပြင်ဆင်နေစဉ်လုပ်ငန်းခွင်ဇရိယာညွှန်ပြခြင်း







အမြင့်ဂိုင်းနေရာပြုပြင်ထိန်းသိမ်းမှုပြုစဉ်၊ချော်မကျစေရန်အကာအကွယ်



Handouts "Accident Prevention in Earth Work Site 9/10"

အမြင့်ပိုင်းနေရာပြုပြင်ထိန်းသိမ်းမှုပြုစဉ်၊ချော်မကျစေရန် အကာအကွယ်(လုံခြုံရေးခါးပတ်အသုံးပြုခြင်း)



စက်ခန်းတွင်းကိရိယာနှင့်အမှိုက်များရှိနေခြင်း



သန့်ရှင်းသောလုံခြံစိတ်ရ၊ရသည်လူသွားလမ်း (လမ်းလျှောက်ရလွယ်ကူခြင်း၊သိသာထင်ရှားသောဆိုင်းဘုတ်)



မနက်ခင်းအစည်းအဝေးတွင်လုံခြံရေးညွှန်ကြား မှု၊ အန္တရာယ်ရှိမှုအချက်ပြ မှု၊KYလှုပ်ရှားမှု





ကာယလေ့ကျင့်ခန်းဖြင့်ကိုယ်ခန္ဓာ အကြောလျှော့ပါ။ Handouts "Accident Prevention in Earth Work Site 10/10"

အလွန်အေးသောအရှိန်တွင် လုပ်သောကာယလေ့ကျင့်ခန်း



လုံခြုံရေးညီလာခံကျင်းပ(လစဉ်) လုံခြုံမှုအသိစိတ်မြင့်တက်ခြင်း

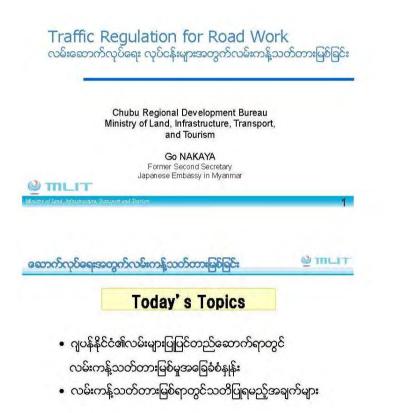


မတော်တဆမှုဖြစ်ပွါးပြီးနောက် အားလုံးပါဝင်သော ဆွေးနွေးသုံးသဝ်ပွဲ၊ဖြေရှင်းဆောင်ရွက်ပုံဆွေးနွေးပွဲကိုကျင်းပခြင်း



# အနှစ်ချုပ်

- လုံခြုံမှုထိန်းသိမ်းရန်အထူးကောင်းမွန်သည် ဆေးမရှိပါ။
- လုဝ်သားများကိုပညာပေးမှုစဉ်ဆက်မပြတ်လုပ်ဆောင်ပါ။
- ကြီးကြပ်သူမှအတတ်ပညာ၊အရည်အသွေးတို့ကိုလေ့လာသင်ယူပြီးလုပ် သားများကိုသင့်လျော်သောညွှန်ကြားမှုပြုပါ။
- သတ်မှတ်ထားသောစည်းကမ်းကိုမပျက်မကွက်လိုက်နာပါ။
- ဒက်ရာမရစေရန်တီထွင်ကြံဆလုပ်ဆောင်မှုကိုအားလုံးနှင့်ပြောဆို
   ဆွေးနွေးကြပါ။



2



O TILIT

မြန်မာနိုင်ငံ၏လမ်းကန့်သတ်တားမြစ်မှုဥပမာ (YGN-Mandalay Express way)



Handouts "Traffic Regulation for Road Work 2/8"





@ TILIT

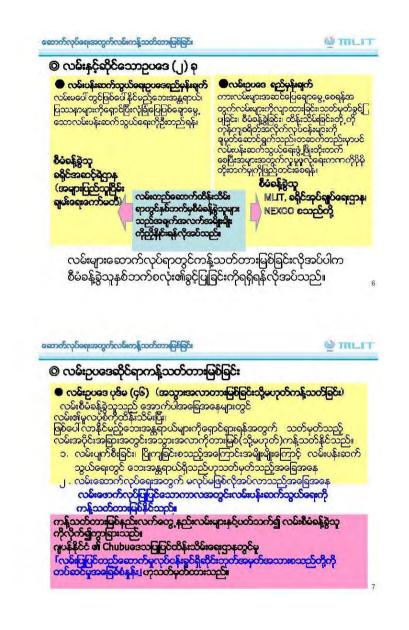


ကန့်သတ်ချက်ရှိသောဘတ်ဂျက်(Budget)ကိုအကိျုံးရှိစွာဖြင့်ဆောင်ရွက်နေ သည်မှာလေးစားဘွယ်ဖြစ်ပါသည်။



မြန်မာနိုင်ငံ၏ လမ်းကန့်သတ် တားမြစ်မှုဥပမာ (ရန်ကုန်မြို့ :YCDC)

5



Handouts "Traffic Regulation for Road Work 3/8"

#### လမ်းကန့်သတ်တားမြစ်မှု

OTT

9

<b>@လစ်းပြပြာ်တည်ဆောက်မှုလုပ်ဝန်းစွင်ရှိဆိုင်းဘုတ်အမှတ်အသားစသည်</b> တို့တ <b>င်ဆ</b> င်မှုအခြေစံစံနှန်း
ကရှိသတ်ပူနှင့်နောက်ခံ
• ရမန်နိုင်ငံစန်အရှိန်ခြင့်စီဖွဲ့စရေဖွဲ့ ဖြီးမှုတာလ
•လစ်မြှုပြာတည်ဆောက်နေစဉ်တွင်ခြစ်သောအချားပြည်သူဆိုင်ရာဘေးအန္တရာယ်
တိုးခွါးလာမှုကိုဖြေရှင်းဆောင်ရွက်မှု
•လမ်းပြုပ်တည်တောက်ခြင်းအတွက်လမ်းပိတ်ဆို့မှုတိုးခွဲကာခြင်ကန်းခြေးက်ဆောင်ရွက်မှု
• 1962စုနှစ်လမ်းဌာနမှလမ်းစိမ်စန့်ခွဲသူသို့အကြောင်းကြားခြင်း
တပ်လင်မှုအဖြစ်စစ်ရည်မှန်းရက်
• ကမ်းမန်းဆက်သွယ်နေနှင့်နောက်ခြည့်နောမွှေ့သောသယ်ယူနောက်နှ
ະກັ <u>ດ</u> ວິຊີກິຈແຫຍ່ນີ້ ເພື່ອ
ထိုနောက်····
• နောက်ဆုံးပြင်ဆင်မှုမှာ 2006ခုနှစ် (H1B.3.31)
•ပြောင်းလဲမှုအကျဉ်းချင်မှာအများပြည်သူအပေါ် ဘောက်လုပ်ရေးဆိုင်ရာသတင်းအချက်အလက်
များမှာလည်လွယ်စေခြင်ဖြင့်မှုလချည်ရွယ်ရက်ကိုဖို၍သေရာမိုင်မာစေမည်။
အများပြည်သူဆိုင်ရာဘေးအန္တရာယ်ကိုကာကွယ်ခြင်းမှာလုပ်ရမည့်တာဝန်ဖြစ်သည်။
တောက်လုပ်ရေးသတင်အာရှက်အလက်များ ပေးခြင်းဖြင့်
ဖြားသုံးပြံသူများကိုပေးသောသန်ဆောသ်မှုတိုးတက်စေရေးကိုအရေးထားရှိြားသို့မြောင်းလဲလာလျက်ရှိသည်



#### အောက်လုပ်ရေးအတွက်လမ်းကန့်သတ်တားဖြစ်ခြင်း

@ mLIT

တရာက်တည်းပြောလိုသည်မှာ

#### နေအေရာစာမသိမာလန်ပြီးနေထူကြီးဌာနနှင့်ဖြန်မာလမ်းဖားစေရာ

အထူးသဖြင့် မြို့ကြီးများ၏လမ်းဆောက်လုပ်ရေးမှာ

· ရန်ကုန်မြို့တွင်YCDC မန္တလေးမြို့တွင်MCDC နေပြည်တော်မြို့တွင်NCDCတို့မှ ဆောက်လုပ်သည်။

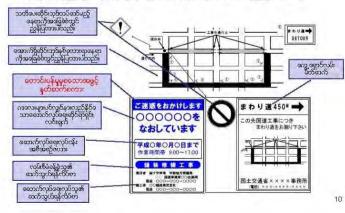
ဆောက်လုပ်ရေးဝန်ကြီးဌာနမှကြီးကြပ်ဆောက်လုပ်သည်မှာ •နယ်မြို့များကိုချိတ်ဆက်သောအဝေးပြေးလမ်း •အမြန်လမ်းမ(ရန်ကုန်~မန္တလေး)

ထို့ကြောင့်၊ဤဟောပြောပိုချမှတွင်အမြန်လမ်းအဝေးပြေးလမ်းမများရှိဆောက်လုပ်ရေးကို ရည်ရွယ်သောလမ်းကန့်သတ်တားမြစ်မှုနှင့်စပ်လျဉ်း၍ပြောကြားလိုပါသည်။ (ယာဉ်ကြောဝိတ်ဆိုမှုသက်သာလျော့ပါးစေရေးဗျဟာ၊လမ်းအသုံးပြသူထံသို့ပေး သောဝန်စဆောင်မှုတိုးတက်စေခြင်းစသောအမြင်နှင့်ပတ်သက်သောအရာများအား နောင်တွင်ထပ်မံတင်ပြမည် )



#### @ MLIT ဆောက်လုပ်ရေးအတွက်လမ်းကန့်သတ်တားမြစ်ခြင်း

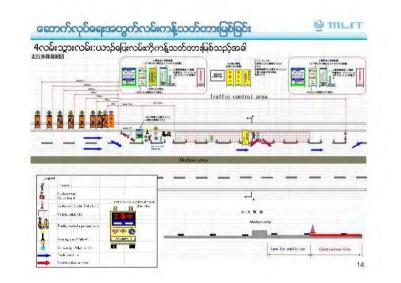
တပ်ဆင်မှုအခြေခံအကြောင်းအရာမိတ်ဆက် •ယာဉ်ဝိတ်ဆိုမှုဖြစ်ခြင်းကိုထိန်းချပ်နိုင်ရန်ဆောက်လုပ်ရေးသတင်းဖေးနည်းဥပမာတစ်ခု

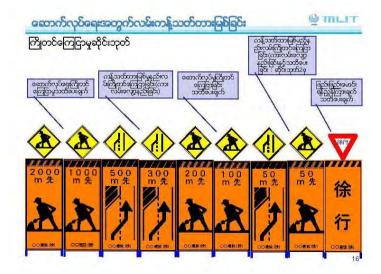


Handouts "Traffic Regulation for Road Work 4/8"







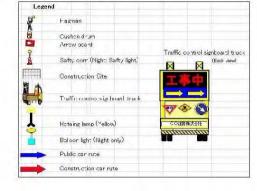


#### Handouts "Traffic Regulation for Road Work 5/8"



0∼30m
on signboard
V VI
C T
thin 5m





19



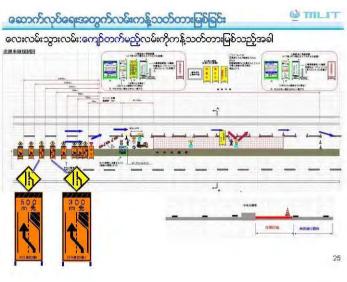
Handouts "Traffic Regulation for Road Work 6/8"



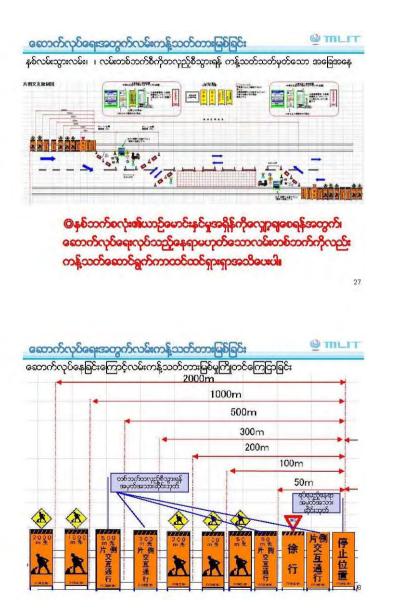


common control (Balloon light)

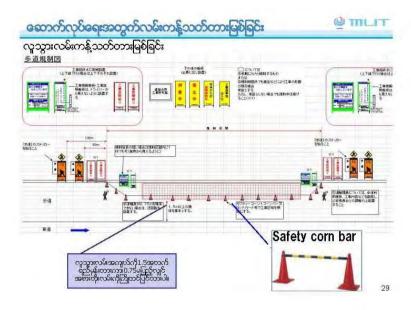
Handouts "Traffic Regulation for Road Work 7/8"







Handouts "Traffic Regulation for Road Work 8/8"



ဆောက်လုပ်ရေအတွက်လမ်းကန့်သတ်တားဖြစ်ခြင်း 🔮 🎹 💷

## အကျဉ်းချုပ်

မြန်မာနိုင်ငံ၏စီးပွါးရေးဖွံ့ဖြီးမှုတိုးတက်ခြင်းနှင့်အတူမော်တာလိုက်ဇေးရှင်းဖြစ်ရန် မဖြစ်မနေ လိုအပ်လာပါသည်။

- လူထို ့၏အသိစိတ်ခာတ်မြင်မှားလာခြင်း၊ အသက်တစ်ရောင်းကိုပိုမိတန်ဘိုးထားလာကြခြင်းတို့ နှင့်အလားတူစွ ကျွန်ုပ်တို့ရင်ဆိုင်ရမည့် မတော်တစာမှုများလည်းပိုမိုများပြားလာပါသည်။
- သို့ဖြစ်ပါ၍
- အလျင်အဖြန် လမ်းပန်းဆက်သွယ်ရေးဥပဒေအခြေခံစံနှုန်းများထားရှိရန်လိုအပ်လာသည်ဟု ထင်မြင်ပါသည်။
- ပာခုအကြိမ်မိတ်ဆက်ပြောကြားခွင့်ရှုသော ဂျပန်နိုင်ငံ၏ဥပမာအချက်အလက်များသည် အားလုံးအတွက်အသုံးဝင်ပါလိမ့်မည်ဟုမျှော်လင့်မိပါသည်။



### Photographs in Seminar

















# **APPENDIX 7**

# REFERENCES

		# of	# of		Dist	tribution of	populatior	h by Ethn	ic Groups			Foreign	# of	# of	Av. Annual Income per	Major
Ref	Township	Villages	Population	Kachin	Burma	Shan	Naga	Karen	Rakain	Chin	Others	-ers	Household	family	Houshold (USD)	Product
1	Myitkyina	29	229,823	113,086	68,560	22,422	0	927	764	848	588	22,628	36,122	6.4	2,500	
2	Waimaw	45	105,032	65,459	6,644	24,086	0	75	84	73	24	8,587	17,417	6.0	1,500	Rice
3	Tanai	11	34,784	20,593	5,590	1,298	6,295	76	524	150	0	258	5,859	5.9	1,800	Amber
4	Chi Hpwi	40	19,190	18,847	280	21	0	5	1	13	0	23	3,205	6.0	1,400	
5	Saw Law	25	6,886	6,857	23	6	0	0	0	0	0	0	1,034	6.7	1,400	
6	N-jan Yang	17	8,035	4,744	1,896	1,216	0	78	67	22	12	0	1,596	5.0	1,000	
7	Mohnyin	37	200,807	14,047	107,089	69,333	0	203	383	177	2,958	6,617	34,804	5.8	1,600	
8	Mogaung	37	128,418	31,482	54,196	34,209	0	158	161	163	6,022	2,027	21,830	5.9	1,200	Water -melon
9	Pha Kant	15	116,718	44,954	24,530	40,517	0	1,627	924	1,237	2,792	137	16,628	7.0	3,600	Jade
10	Bamaw	45	108,865	15,863	53,745	33,582	0	486	108	168	23	4,890	18,746	5.8	1,900	Peanuts
11	Moe Mauk	53	82,147	33,205	3,234	40,898	0	1	37	23	5	4,744	13,792	6.0	1,600	Gold
12	Mansi	40	76,844	37,925	12,866	24,349	0	66	106	11	11	1,510	13,570	5.7	1,400	Teak
13	Shwe Gu	31	77,444	3,544	71,825	790	0	56	0	33	1,120	76	10,303	7.5	1,500	
14	Putao	14	58,818	53,263	1,254	4,127	0	53	10	23	0	88	10,467	5.6	1,500	Grapefruit
15	Ma Shan Baw	13	8,830	8,371	46	410	0	0	0	2	0	1	1,662	5.3	1,000	
16	Naung Mon	13	7,537	7,145	4	8	0	8	10	0	0	362	1,192	6.3	1,000	
17	Khaung Lan Phu	24	12,503	12,354	48	8	0	0	0	0	0	93	1,826	6.8	800	
18	Sumpra Bum	11	10,322	10,252	50	20	0	0	0	0	0	0	929	11.1	1,000	
	Total	500	1,293,003	501,991	411,880	297,300	6,295	3,819	3,179	2,943	13,555	52,041	210,982			

Def	Taunahin	# c	of Teache	ers	# 0	of Students	;		# of Sc	hools		# of	# of	# of	# of	Health ce	nter
Ref		Primary	Middle	High	Primary	Middle	High	Primary	Middle	High	UVS	Doctors	Nurses	Mid wives	Hospital	RHC	<i>SHC</i>
1	Myitkyina	1,316	600	123	32,675	25,646	9,582	82	60	21	3	104	312	40	2	0	3
2	Waimaw	612	234	98	15,095	9,154	2,362	93	30	11	0	6	46	41	0	1	4
3	Tanai	211	70	34	6,866	3,722	973	20	11	3	0	3	32	14	0	1	1
4	Chi Hpwi	231	34	20	2,925	865	151	52	9	3	0	1	24	24	0	1	2
5	Saw Law	102	11	7	1,152	430	41	19	5	1	0	0	16	5	0	1	0
6	N-jan Yang	13	6	5	300	98	41	2	0	1	0	0	9	4	0	1	0
7	Mohnyin	1,141	495	246	24,170	17,707	6,359	124	49	23	3	20	113	36	1	0	5
8	Mogaung	610	314	145	15,272	12,051	3,837	87	26	13	0	7	44	28	0	1	3
9	Pha Kant	815	302	103	22,310	12,968	3,006	49	45	11	0	11	49	29	0	1	4
10	Bamaw	511	274	136	3,294	10,248	14,546	47	33	11	3	74	142	32	1	0	1
11	Moe Mauk	461	132	60	8,170	5,255	1,235	65	18	9	0	6	35	27	0	1	4
12	Mansi	402	89	38	7,720	3,450	636	54	14	5	0	2	20	37	0	1	0
13	Shwe Gu	506	187	72	11,143	7,483	2,235	58	32	7	0	3	33	23	0	1	2
14	Putao	444	149	62	8,746	5,369	1,818	66	20	7	0	6	31	19	1	1	2
15	Ma Shan Baw	156	30	15	1,332	742	197	30	5	2	0	2	8	10	0	1	1
16	Naung Mon	193	25	16	1,108	578	181	33	5	3	0	0	8	10	0	1	1
17	Khaung Lan Phu	303	25	8	2,736	842	88	39	7	2	0	0	6	5	0	1	0
18	Sumpra Bum	62	11	6	465	222	71	15	1	1	0	0	8	7	0	1	0
	Total	8,089	2,988	1,194	165,479	116,830	47,359	935	370	134	9	245	936	391	5	15	33

											(1/2)										
Ref	Town, Village	Township	Kilopost (km)	# of Population	# of Household	Av.# of Family	Av. Annual Income per Houshold (USD)	Way of Earning Money	Major Product	Water Supply	Electricy Supply										
1	Nansiaung village		268.8	706	200	3.5	1,400	Agriculture	Rice	well	O National Grid										
2	Mawhan village		276.8	6,149	1,537	4.0	1,400	Agriculture	Rice	well	O National Grid										
3	Mohnyin town		300.8	151,242	30,248	5.0	1,825	General	—	well	O National Grid										
4	Belu village	Mohnyin	308.8	12,356	2,471	5.0	1,825	Agriculture	Rice	well	×										
5	Minnkone village		309.6	1,164	232	5.0	1,825	Agriculture	Rice	well	×										
6	Hopin town		334.4	58,127	11,625	5.0	1,825	General	_	well	Hdrogeneration										
7	Nankwin village		345.6	2,928	585	5.0	1,825	Agriculture	Rice	well	Hdrogeneration										
8	Pwintphyu village		348.8	1,800	360	5.0	1,825	Agriculture	Rice	well	Hdrogeneration										
9	Kone tankyi village		350.4	1,200	240	5.0	1,825	Agriculture	Rice	well	Hdrogeneration										
10	Pinbaw village		353.6	8,797	1,759	5.0	1,825	Agriculture		well	Hdrogeneration										
11	Ingyin kone village				355.2	1,461	292	5.0	1,825	Agriculture	Rice	well	Hdrogeneration								
12	Htikewar kone village		358.4	1,902	380	5.0	1,825	Agriculture	Rice	well	Hdrogeneration										
13	Taungni village	Mogaung	368	5,120	1,024	5.0	1,825	Agriculture	Rice	well	Hdrogeneration										
14	Kanyin mying village			373.6	1,200	240	5.0	1,825	Agriculture	Rice	well	Hdrogeneration									
15	Manyoute village												385	1,450	290	5.0	1,825	Agriculture	Rice	well	Hdrogeneration
16	Mogaung town										395.2	128,284	25,656	5.0	1,825	General	Rice	well	Hdrogeneration		
17	Nanmati Village		409.8	32,533	6,506	5.0	1,825	Agriculture	Rice	well	Hdrogeneration										
18	Mayang village		417.6	3,143	628	5.0	1,825	Agriculture	Rice	well	Hdrogeneration										
19	Shatau village		444.8	7,440	1,488	5.0	1,825	Agriculture	Rice	well	Hdrogeneration										
20	Mawphaung village	Myitkyina	448	8,969	1,793	5.0	1,825	Agriculture	Rice	well	Hdrogeneration										
21	Myitkyina town		462.4	212,530	42,506	5.0	1,825	General	Rice	well	Hdrogeneration										
	Total			648,501	130,060																

																	(2/2)
0.6	Tauna Millana	# 0	of Teache	ers	# (	of Studer	nts		# of So	chools		# of	# of	# of	# of	Health ce	enter
Ref	Town, Village	Primary	Middle	High	Primary	Middle	High	Primary	Middle	High	UVS	Doctors	Nurses	Mid wives	Hospital	RHC	SHC
1	Nansiaung village	15	0	20	300	0	660	3	0	1	0	1	3	2	1	0	0
2	Mawhan village	10	0	0	100	0	0	2	0	0	0	0	0	1	0	1	0
3	Mohnyin town	35	15	20	700	400	1,000	7	1	1	1	10	20	5	1	0	0
4	Belu village	0	0	20	0	0	300	0	0	1	0	0	0	1	0	0	0
5	Minnkone village	4	0	0	50	0	0	1	0	0	0	0	0	0	0	0	0
6	Hopin town	25	0	20	500	0	700	5	0	1	0	2	2	1	1	0	0
7	Nankwin village	10	0	0	100	0	0	2	0	0	0	0	0	0	0	0	0
8	Pwintphyu vi <b>ll</b> age	5	0	0	50	0	0	1	0	0	0	0	0	0	0	0	0
9	Kone tankyi vi <b>ll</b> age	5	0	0	50	0	0	1	0	0	0	0	0	1	0	0	0
10	Pinbaw village	10	0	15	100	0	300	2	0	1	0	2	2	1	1	0	0
11	Ingyin kone village	5	0	0	50	0	0	1	0	0	0	0	0	0	0	0	0
12	Htikewar kone village	5	0	0	50	0	0	1	0	0	0	0	0	0	0	0	0
13	Taungni village	5	0	0	50	0	0	1	0	0	0	0	0	1	0	0	0
14	Kanyin mying vi <b>ll</b> age	5	0	0	50	0	0	1	0	0	0	0	0	0	0	0	0
15	Manyoute village	10	0	0	100	0	0	2	0	0	0	0	0	0	0	0	0
16	Mogaung town	30	30	20	720	800	1,000	6	2	1	0	2	22	1	1	0	0
17	Nanmati Village	25	30	20	500	800	660	5	2	1	0	1	0	0	1	0	0
18	Mayang village	5	15	0	50	250	0	1	1	0	0	1	1	1	1	1	1
19	Shatau village	5	0	0	50	0	0	1	0	0	0	0	0	0	0	0	0
20	Mawphaung village	5	0	0	50	0	0	1	0	0	0	0	0	0	0	0	0
21	Myitkyina town	500	600	323	15,000	18,000	9,582	50	35	7	3	50	200	20	1	3	0
	Total	719	690	458	18,620	20,250	14,202	94	41	14	4	69	250	35	8	5	1

						-	-				(1/2)
		# of		Distributi	on of popula	tion by Ethni	c Groups	# of	Av.# of	Av. Annual Income per	
Ref	Township	Villages	# of Population	Chin	Burma	Rachain	Others	Household	Family	Houshold (USD)	Major Product
1	Hakha	62	48,266	47,420	724	11	111	10,033	4.8	1,798	Rice, Maize
2	Than Tlang	76	50,363	50,310	47	2	4	9,848	5.1	1,911	Rice, Maize
3	Falam	177	41,695	40,716	793	21	165	8,514	4.9	1,283	Rice, Maize
4	Rih		6,622	6,543	79	-	0	1,212	5.5	1,442	Rice, Maize
5	Teddim	108	87,389	86,654	633	22	80	14,736	5.9	1,566	Rice, Maize
6	Tonzang	90	21,361	21,212	124	23	2	3,552	6.0	1,579	Rice, Maize
7	Chika (Cikkha)		11,139	11,095	44	-	0	1,548	7.2	1,899	Rice, Maize
8	Mindat	197	42,540	41,635	876	2	27	8,637	4.9	1,599	Rice, Maize
9	Matupi	128	39,355	38,933	410	6	6	7,761	5.1	1,648	Rice, Maize
10	Rezua		12,202	12,145	55	2	0	2,546	4.8	1,557	Rice, Maize
11	Kampalat	113	21,259	20,849	390	6	14	4,051	5.2	1,703	Rice, Maize
12	Paletwa	395	64,806	47,847	312	16,513	134	13,398	4.8	1,570	Rice, Maize
13	Sami		32,093	28,804	21	3,268	0	6,337	5.1	1,645	
	StateTotal		479,090	454,163	4,508	19,876	543	92,173			

### Social Data in Chin State

		# of Teachers			#	of Studor		-	# of \$	haala				# of	#	Haalth aa	(2/2)
Ref	Township	#0	or reache	ers	#0	of Studen	its		# of So	noois		# of	# of	Mid	# 01	Health ce	
		Primary	Middle	High	Primary	Middle	High	Primary	Middle	High	UVS	Doctors	Nurses	wives	Hospital	RHC	SHC
1	Hakha	384	229	71	6,432	4,070	1,724	72	13	6	1	48	136	23	3	3	18
2	Than Tlang	480	249	55	7,971	3,968	690	77	21	12		2	19	36	5	7	36
3	Falam	588	256	81	6,502	4,003	1,144	141	23	12		21	97	40	6	7	36
4	Rih	53	33	7	853	500	47	8	7	1		1	3	1			
5	Teddim	594	380	108	12,768	6,981	2,064	105	26	13		10	83	72	7	13	62
6	Tonzang	237	104	22	5,116	2,156	557	74	6	8		1	12	25	3	5	24
7	Chika (Cikkha)	104	33	19	1,693	994	367	23	1	3			3	1			
8	Mindat	545	199	49	7,601	3,156	1,089	134	17	6		14	76	43	5	5	32
9	Matupi	474	188	68	7,981	4,162	1,210	126	21	10		1	24	43	5	7	36
10	Rezua	118	47	12	1,992	814	121	25	3	3			3	1			
11	Kampalat	371	114	34	4,014	1,594	426	95	12	4		2	14	27	3	4	20
12	Paletwa	640	160	67	18,338	6,635	1,522	256	22	10		3	15	35	3	8	34
13	Sami	375	72	33	5,358	1,863	638	93	9	4			6	1			
	StateTotal	4,963	2,064	626	86,619	40,896	11,599	1,229	181	92	1	103	491	348	40	59	298

(2/2)

											(1/2)								
Ref	Town, Village	Township	Kilopost (km)	# of Population	# of Household	Av.# of Family	Av. Annual Income per Houshold (USD)	Way of Earning Money	Major Product	Piped Water	Public Electricy								
1	Khai kam		14.2	1,299	289	4.5	1,244			х	0								
2	Mualpi	_	27.4	272	57	4.8	1,062	Agriculture	Rice and Maize	Х	x								
3	Theizang	_	30.4	467	114	4.1	1,046	Agriculture	Rice and Maize	Х	х								
4	Hriangzing	Teddim	42.2	207	41	5.0	1,050	Agriculture	Rice and Maize	Х	x								
5	Taingen	_	49.4	175	32	5.5	1,048	Agriculture	Rice and Maize	Х	х								
6	Suahlim	_	50.2	186	30	6.2	1,003	Agriculture	Rice and Maize	Х	x								
7	Bekan		54.8	204	39	5.2	1,016	Agriculture	Rice and Maize	Х	х								
8	Varung	Falam	Falam	66.6	611	148	4.1	1,136	Agriculture	Rice and Maize	х	х							
9	Lumbang - parte					-	-	95.4	470	123	3.8	1,107	Agriculture	Rice and Maize	Х	0			
10	Vaar			109.8	136	25	5.4	1,001	Agriculture	Rice and Maize	Х	0							
11	Zamual			Falam	122.6	200	34	5.9	1,000	Agriculture	Rice and Maize	Х	0						
12	Falam				Falam	Falam	Falam	Falam	Falam	Falam	129	9,359	1,512	6.2	1,283	Agriculture	Rice and Maize	0	0
13	Rih									134.4	3,326	573	5.8	1,043	Agriculture	Rice and Maize	Х	0	
14	Taal									151.4	166	69	2.4	1,024	Agriculture	Rice and Maize	Х	x	
15	Ramthlo		164.2	788	273	2.9	1,036	Agriculture	Rice and Maize	Х	0								
18	Chuncung	- Hakha	173.8	1,655	343	4.8	1,013	Agriculture	Rice and Maize	Х	0								
19	Hakha Town	- Takita	198.4	44,726	4,226	10.6	1,798	Agriculture	Rice and Maize	0	0								
	Total			64,247	7,928														

(1/2)

·	8							1					1	1			(2/2)
Dof	Town Villago	#	of Teache	rs	# c	of Studen	ts		# of So	chools		# of	# of	# of Mid	# of	Health ce	nter
Ref	Town, Village	Primary	Middle	High	Primary	Middle	High	Primary	Middle	High	UVS	Doctors	Nurses	wives	Hospital	RHC	SHC
1	Khai kam	6	9		206	138			1								
2	Mualpi	5			51			1									
3	Theizang	4	3		97	62			1					2			1
4	Hriangzing	4			25			1									
5	Taingen	4	5		17	38			1								
6	Suahlim	4			42			1									
7	Bekan	4			21			1									
8	Varung	4			21					1							
9	Lumbang - parte	25	16	13	247	312	120	1		1		2		2	1	1	
10	Vaar	3			14			1									
11	Zamual	9			28	8			1								
12	Falam	41	61	37	879	1,254	663	5		3		14	82	40	6	7	36
13	Rih							1	1								
14	Taal	18	5		285	103		1									
15	Ramthlo	10	8	5	121	95	52			1		1		2			
18	Chuncung	13	7	4	255	138	11			1		1		2			
19	Hakha Town	76	94	56	2,872	2,543	1,596	4	8	3	1	24	131	23	3	3	18
	Total	230	208	115	5,181	4,691	2,442	17	13	10	1	42	213	71	10	11	55

(2/2)