

# **Safety Check List & Guideline**

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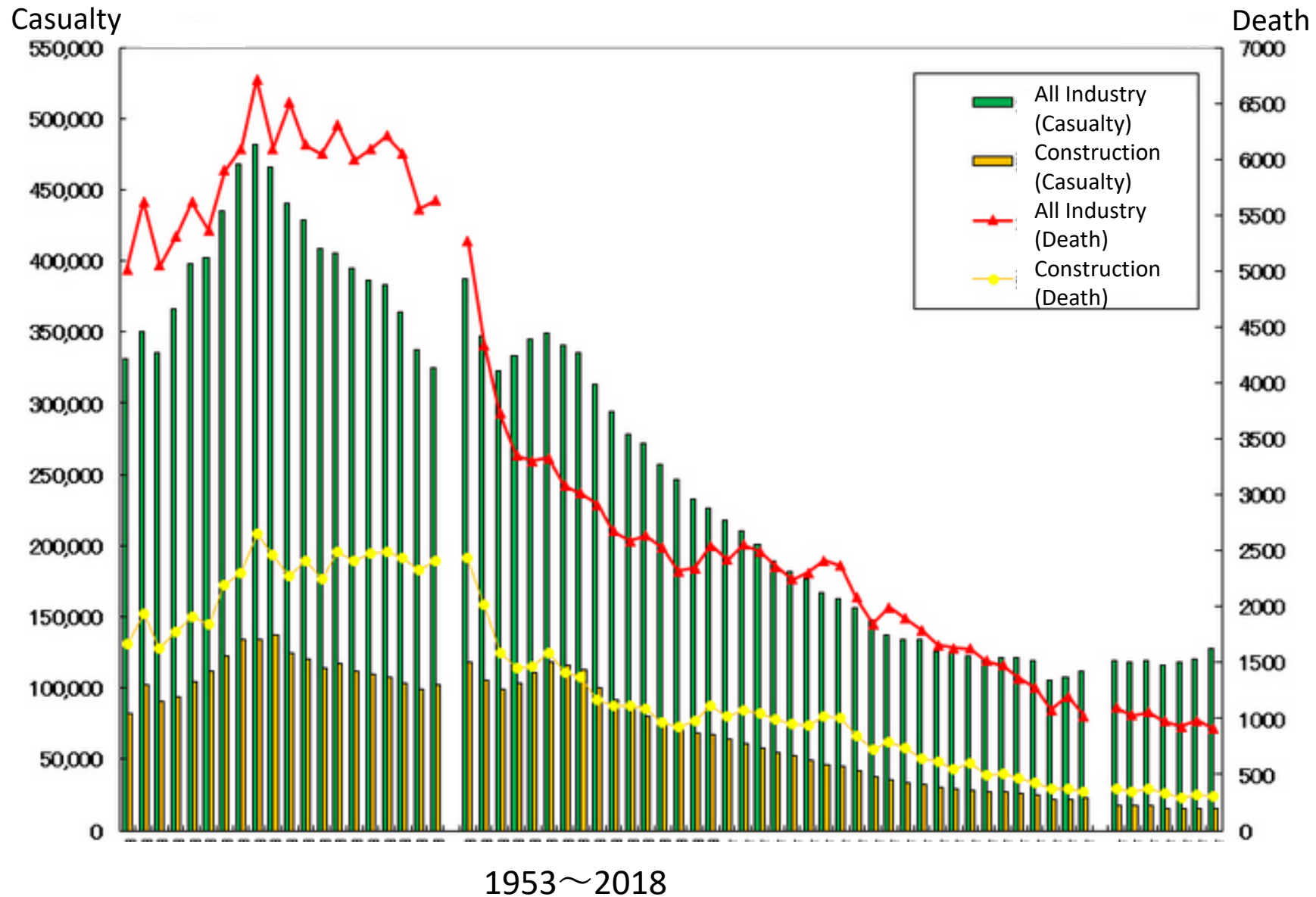
Project : CAMBRIDGE

(Technical Corporation Project for Capacity Development in Construction and Maintenance of Bridges in Kingdom Bhutan)

# **Table of Contents**

- 1. Preface**
- 2. Laws and Regulations in Bhutan**
- 3. Accident Type**
- 4. Check List and Guideline**
- 5. Check List and Guideline (OJT)**
- 6. Recommendations**

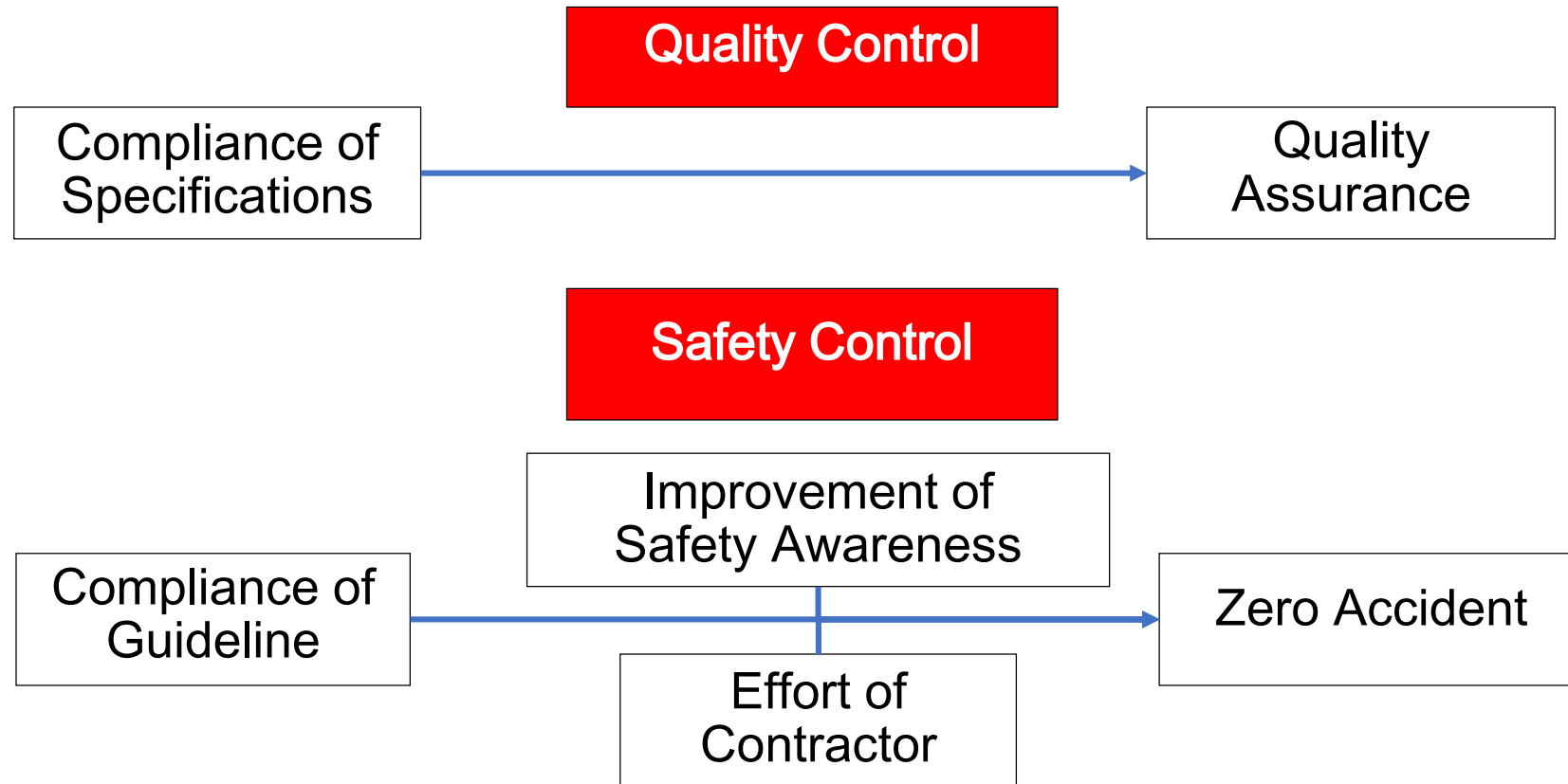
# 1. Preface / Casualty of Occupational accident in Japan



Source : Japan Construction Occupational Safety and Health Association (JOSHA)

# 1. Preface / Safety and Quality

## Difference of the concept between Quality Control and Safety Control



# 1. Preface / roles of ministries

## Comparison on Roles of Ministries on Safety

	Law	Guideline /Manual	Inspection	Penalty
Japan	MOL & MOE	MLIT /MOL	LSSO / MOL	Criminal, Civil Liability Administrative punishment
Bhutan (Before)	-	-	MoWHS	-
Bhutan (From now)	MoLHR MoAF?	MoWHS /MoLHR	MoLHR / MoWHS	Criminal, Civil Liability Administrative punishment

MOL : Ministry of Labor / Japan

MOE : Ministry of Environment

MLIT : Ministry of Land, Infrastructure, Transport and Tourism / Japan

LSSO : Labor Standards Supervision Office under MOL / Japan

MoWHS : Ministry of Works and Human Settlement

MoLHR : Ministry of Labour and Human Resources

# 1. Preface / Check List


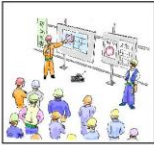

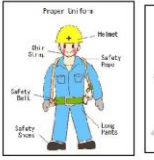
A field checklist  
on the basic items on safety control  
for Bridge Construction  
(DRAFT)




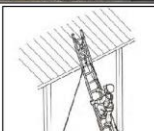
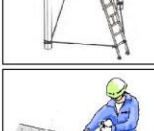
Oct 2019



JAPAN INTERNATIONAL COOPERATION AGENCY  
Capacity Development in Construction and Maintenance of Bridges in the Kingdom of Bhutan

CAMBRIDGE

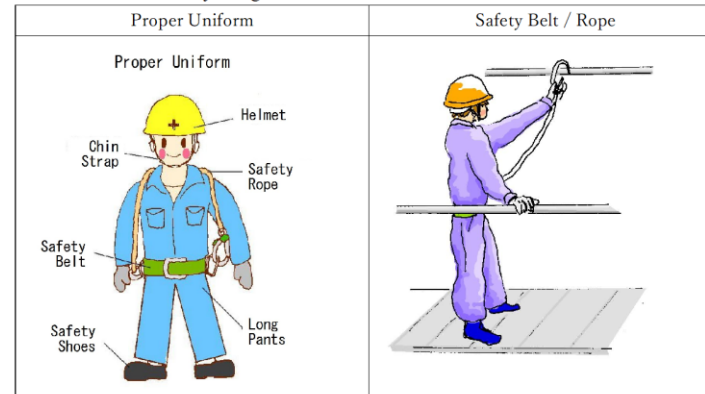
Work Item	Check Points	Plan /Site	Answer
Preparatory Item			
	Is Construction Work notified to MoLHR	Plan	Yes / No / NA
	Is the Safety Plan submitted?	Plan	Yes / No / NA
Daily Works			
Accident Cases	Are there any accidents happened in the project sits?	Records	Yes / No / NA
 (Regulation of MoLHR)	Did you report the cases to Client/Police/MoLHR?	Records	Yes / No / NA
	Are there any accidents reports if there were accidents?	Records	Yes / No / NA
	Morning Meeting	Is the morning meeting being conducted every day?	Site
 Morning Meeting	Is the status of the attendance of the workers being confirmed in the meeting?	Site	Yes / No / NA
	Is the presence of the drunken, child and aged labors being confirmed for exclusion?	Site	Yes / No / NA
 THP	Is the health condition of the workers being confirmed?	Site	Yes / No / NA
	Is the work schedule on the day being confirmed among the workers?	Site	Yes / No / NA
	Is the potential hazardous works being identified? Is its measures being explained to all the workers?	Site	Yes / No / NA
	Is THP (Training for Hazard Prediction) being conducted regularly?	Site	Yes / No / NA
	Safety Goal and Sign Board	Is Safety Goal for the project prepared?	Site
	Is the sign board minimum 30cm×100cm indicating "Safety First" prepared and being placed at the arrestive place?	Site	Yes / No / NA
Clothes and Safety Gadget of Workers	Do the workers wear helmets during working time in construction site?	Site	Yes / No / NA
 Proper Uniform	Do the workers wear the proper shoes?	Site	Yes / No / NA
	Do the workers wear the proper uniform?	Site	Yes / No / NA
	Do the workers use the proper safety gadgets such as safety belt, goggles, gloves, etc?	Site	Yes / No / NA

Work Item			
Common Works			
Scaffolding			
 Railings	Is the scaffolding prepared as per the safety plan?	Site	Yes / No / NA
	Is the sufficient work space with proper staging prepared?	Site	Yes / No / NA
	Is strong railings whose heights are 85cm properly placed at high places? High place means the place where the workers may drop 2m in height?	Site	Yes / No / NA
 stairs for access	Is the strong railings properly provided on the stairs?	Site	Yes / No / NA
	Are the proper stairs or ladders provided for the access to the working areas?	Site	Yes / No / NA
 Ladder fixed	Are the ladders fixed at the bottom and top?	Site	Yes / No / NA
	Both end Fixed	Are the foot boards staging fixed to the strong parts at the both end?	Site
 Scaffolding Material	Are the sound and proper materials used for the scaffoldings?	Site	Yes / No / NA
	Slip Stopper	Are the slip stoppers properly provided?	Site
			

# 1. Preface / Guideline

- The sign board minimum 30cm × 100cm indicating "Safety First" shall be prepared and placed at the arrestive place.

## 3.4. Clothes and Safety Gadget of Workers



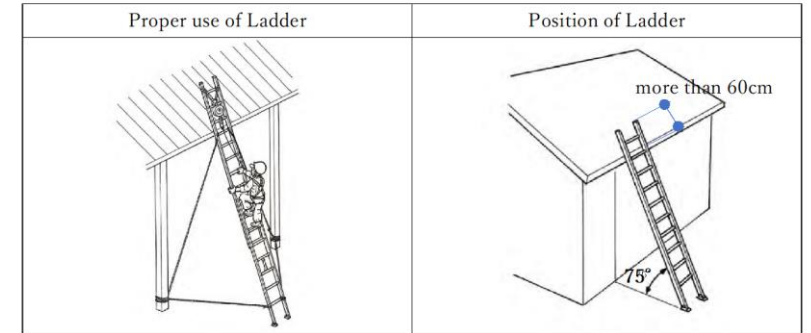
- The workers shall wear helmets during working time in construction site.
- The workers shall wear the proper shoes.
- The workers shall not wear national costume Gho but the proper uniform.
- The workers shall use the proper safety gadgets such as safety belt, goggles, gloves, etc.

## 4. Work Item

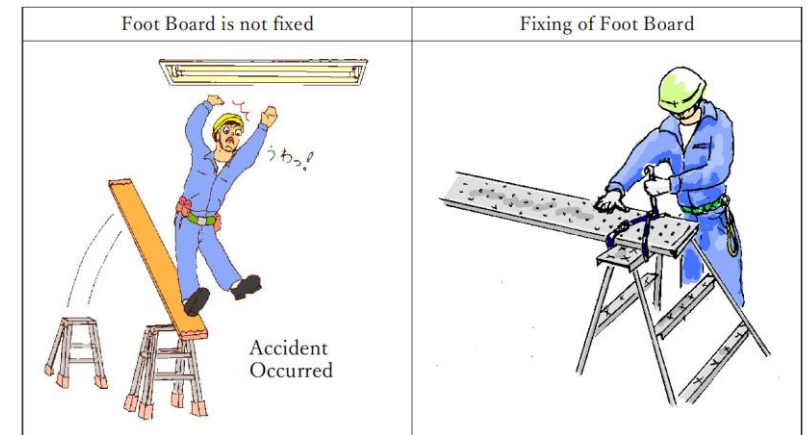
### 4.1. Common Works

#### 4.1.1. Scaffolding

- The scaffolding shall be prepared as per the safety plan.
- The sufficient work space with proper staging shall be prepared.
- Strong railings whose heights are 85cm shall be properly placed at high places. High place means the place where the workers may drop 2m in height.



- Foot boards staging shall be fixed to the strong part at the both end.



- Sound and proper materials shall be used for the scaffolding.
- Slip stoppers shall be properly provided.
- All the openings shall be properly covered.

Guideline for a field checklist  
on the basic items on safety control  
for Bridge Construction

Oct 2019

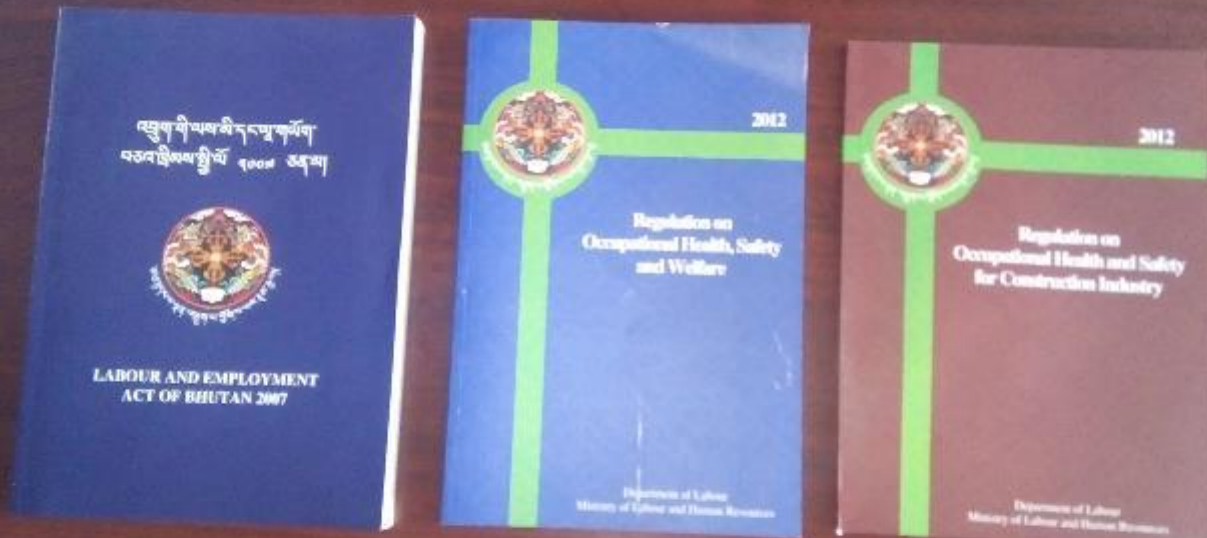


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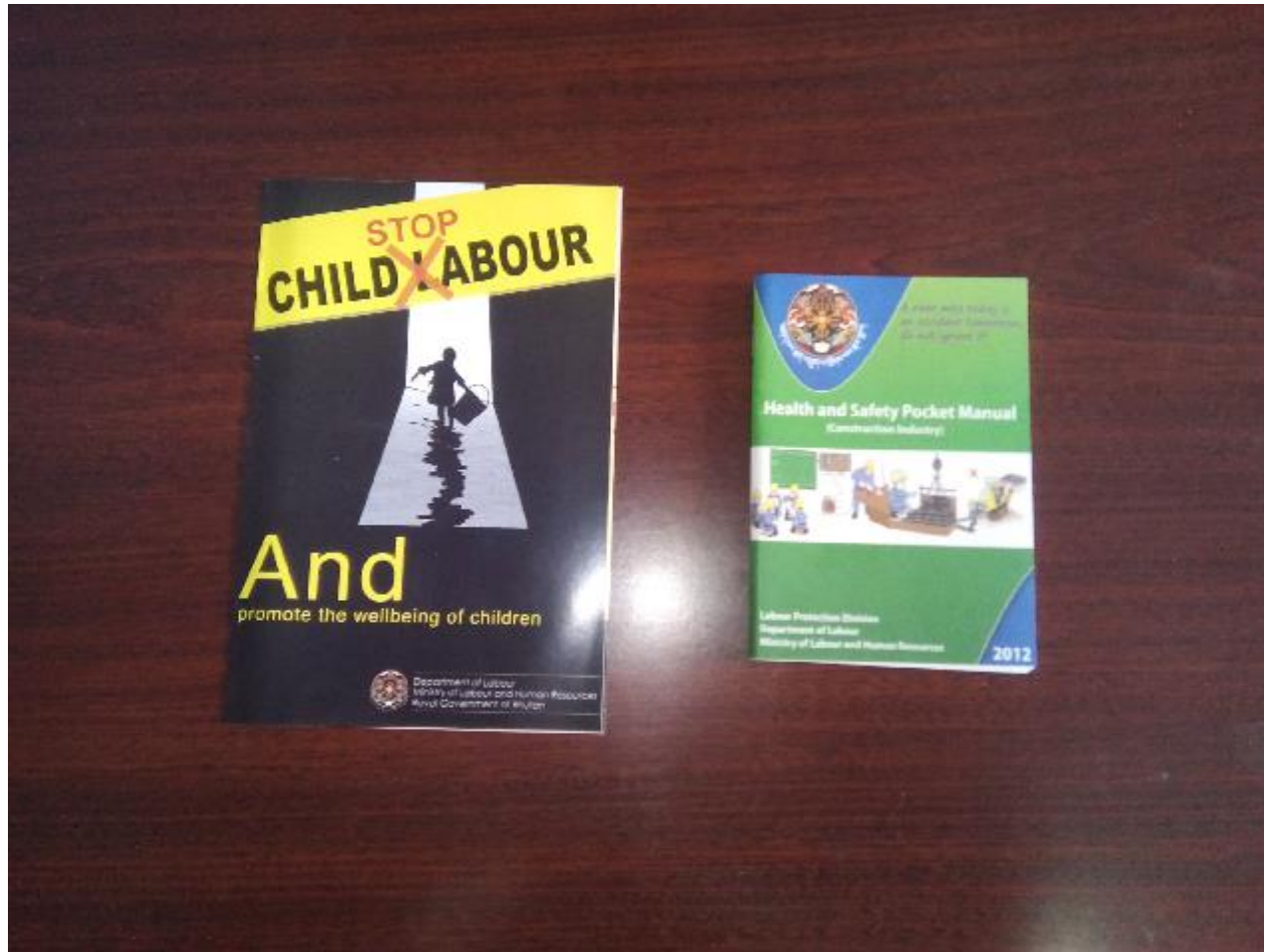
## 2. Laws and Regulations in Bhutan



- Labour and Employment Act of Bhutan 2007
- Regulation on Occupational Health, Safety and Welfare 2012
- Regulation on Occupational Health and Safety for Construction Industry 2012



## 2. Laws and Regulations in Bhutan



### Flyer & Handbook Of MoLHR

# 2. Laws and Regulations in Bhutan



**Posters of MoLHR**

## 2. Laws and Regulations in Bhutan

### / Contents of regulations

Regulation on Occupational Health, Safety and Welfare, 2012

- General Requirement of the Construction Site
- Power of Labour Inspector
- Duty to notify and report accidents (Chapter 6)
- Workplace Hazards (Opening, Railing, First Aid, Fire fighting facilities, etc)

Regulation on Occupational Health and Safety for Construction Industry, 2012

- Notification of Construction Work (Chapter 2) / Both Government and Private
- Excavation and Tunneling Works
- Scaffoldings
- Transport and Earth Moving Equipment
- Plant Equipment, Demolition and Explosive

# 3. Accident Type

Accident Type	Causes	Measures
Fall Accident	Structure and materials of <b>Scaffolding</b> Assembly and dismantling procedure of <b>scaffolding</b>	Proper materials and structure Proper procedure
Flying or Falling Objects	Fall from lifting objects by crane Works at different height at same location Openings of stage and scaffolding	Proper lifting wire, slinging Prohibiting of works at different heights, Covering of openings
Collapse of Structures	Land Sliding, <b>Shoring</b> , Scaffolding, Cofferdam, Earth Retaining(Timbering), Forms	Proper materials and structure
Construction Machinery	Turnover, Operation mistake	License, Maintenance, Signal man, Barricade, etc
Public Accident	Collision at detour, Falling in the river	Proper sign board, flag man, proper width and alignment

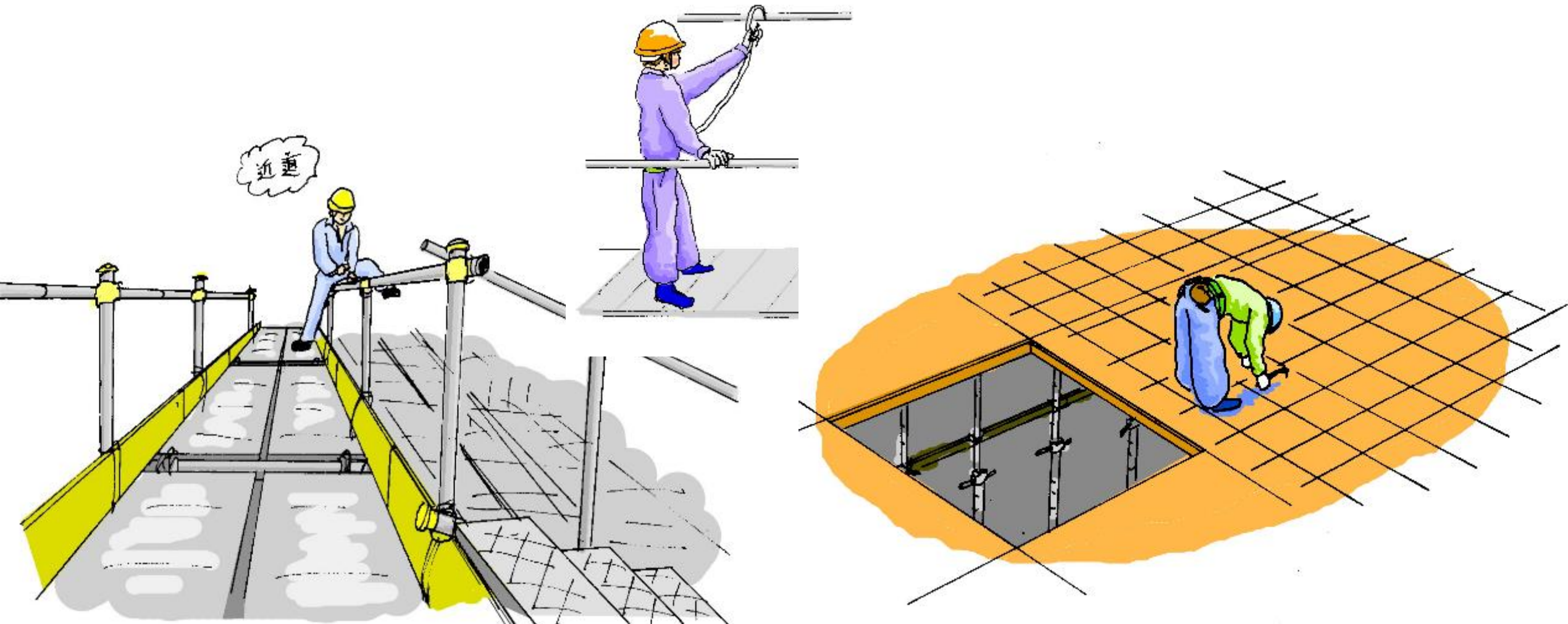
# 3. Accident Type

## Accident Type in Japan (Statistics of Death Accident in Construction Work)

Type of the accident	Bridge Project				Road Project			
	2014	2013	2012	Total	2014	2013	2012	Total
Fall / from Scaffolding	4	3	6	13	5	10	11	26
Flying or Falling Objects	0	0	1	1	5	5	3	13
Collapse of scaffolding/shoring	1	2	0	3	0	0	0	0
Collapse of soil cofferdam	0	0	0	0	3	8	1	12
Crane	2	0	0	2	1	1	1	3
Vehicles	1	2	0	3	7	8	4	19
Construction Equipment	1	0	3	4	7	4	10	21

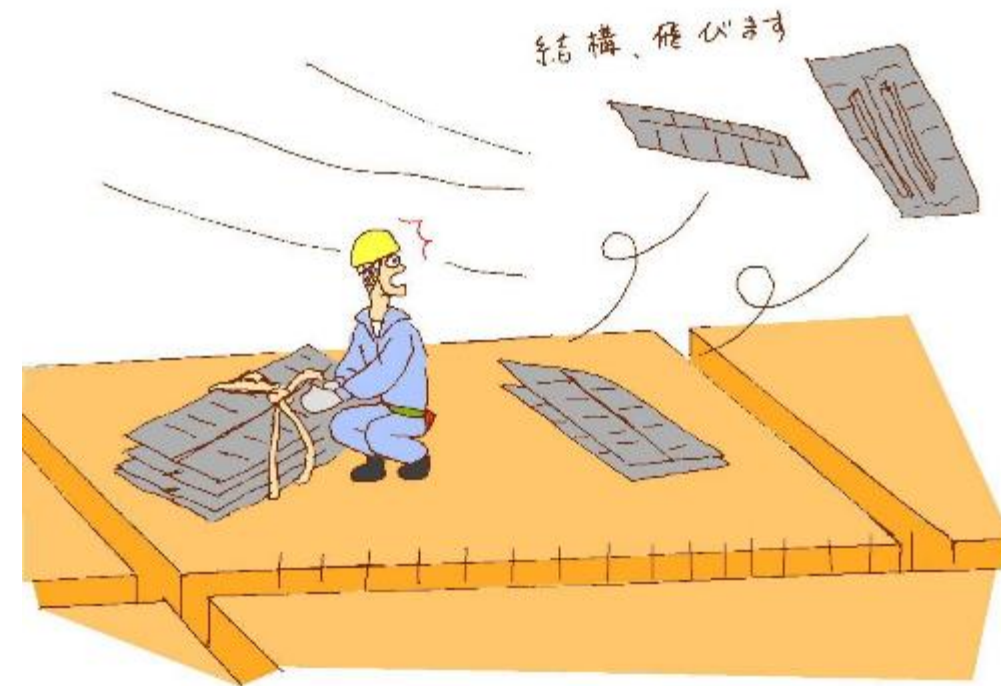
# 3. Accident Type

## Accident Type and Measures (Fall Accident)



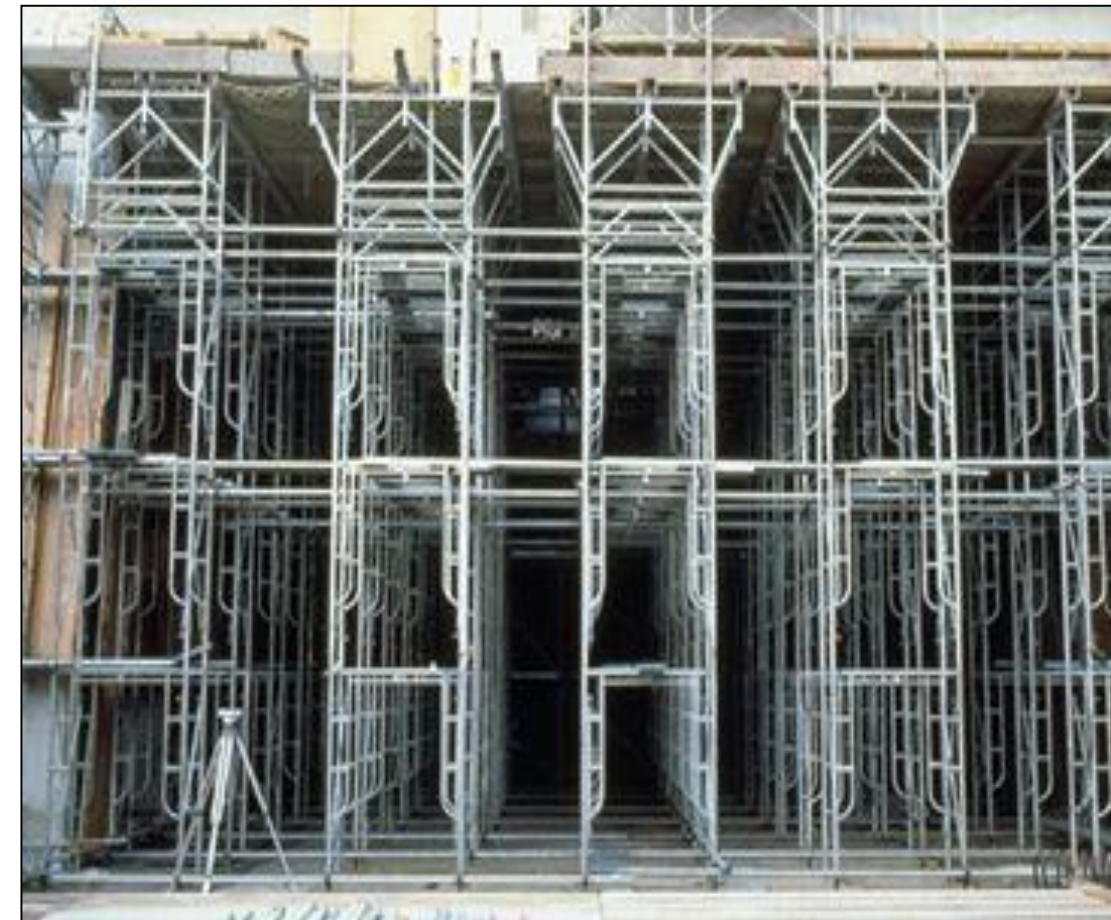
# 4. Accident Type

## Accident Type and Measures (Flying or Falling Objects)



# 4. Accident Type

## Accident Type and Measures (Collapse of Structure)





# 3. Accident Type

## Accident Type and Measures (Construction Machinery)



CAMBRIDGE PROJECT

# 3. Accident Type

## Accident Type and Measures (Public Accident)



## 4. Checklist & Guideline

Basic Policy of this guideline

- ◆ Safety First
- ◆ Elimination of Causes
- ◆ Thorough Precaution
- ◆ Thorough prevention of public accidents

# 4. Checklist & Guideline

## Table of Contents of Check List and Guideline

Items	Contents	Details
Preparatory Item	Notification to MoLHR Safety Plan	
Daily Works	Meeting, Goal, Clothes, Safety Gadgets, Notification of Accident	
Work Items	Common Works	Scaffolding, Shoring, Crane, Lifting method, etc
	Preparatory	Temporary Facility, Detour Road, Dewatering
	Earth Works	Cutting(including timbering) , Embankment
	Foundation Works	Precast pile, Bored pile, Spread footing
	Concrete Structure	Reinforcing Bar, Forms, Concreting
	Girder Fabrication and assembly	PC girder, Steel girder
	Girder erection	Crane, Erection girder, Launching method

# 4. Checklist & Guideline

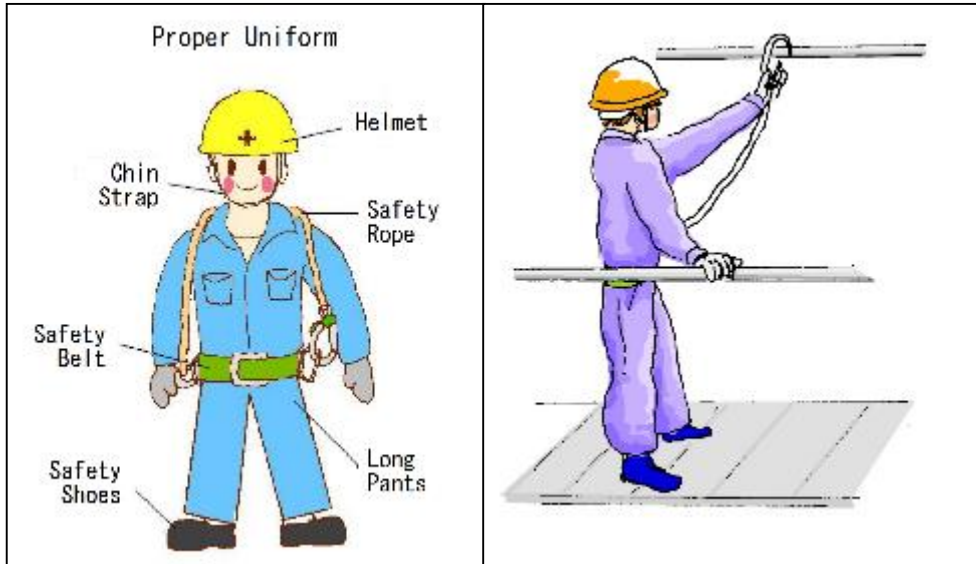
## Accident Cases / Abstract from Guideline

- The contractors shall notify and report accidents to the Client, Police and MoLHR in compliance with chapter 6 of Regulation on Occupational Health, Safety and Welfare.
- The records of any accidents happened on site describing the details such as the location, situation, causes and taken prevention measures shall be prepared in compliance with chapter 6 of Regulation on Occupational Health, Safety and Welfare.

# 4. Checklist & Guideline

## Clothes and Safety Gadget of Workers

### Proper Uniform



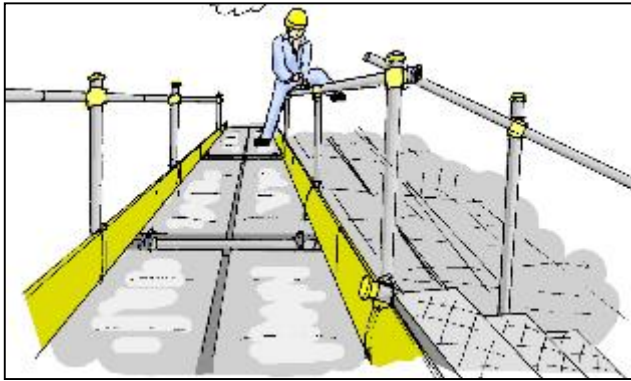
### Proper Safety Gears

- ◆ The workers shall wear helmets during working time in construction site.
- ◆ The workers shall wear the proper shoes.
- ◆ The workers shall not wear national costume Gho but the proper uniform.
- ◆ The workers shall use the proper safety gadgets such as safety belt, goggles, gloves, etc.

# 4. Checklist & Guideline

## Scaffolding (1)

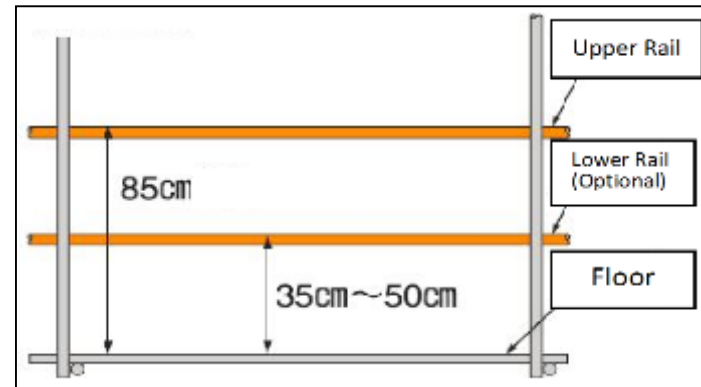
### Scaffolding with railing



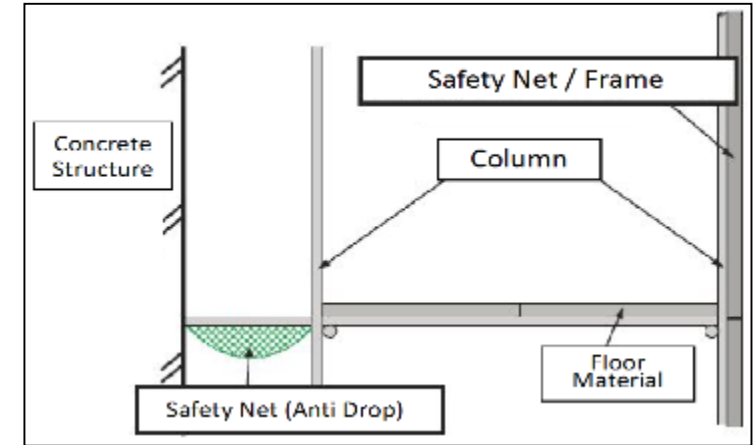
### High Place Work



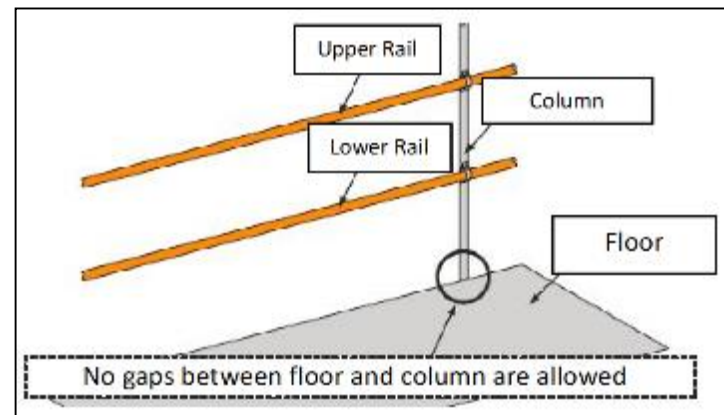
### Railing Location (1)/ Side View



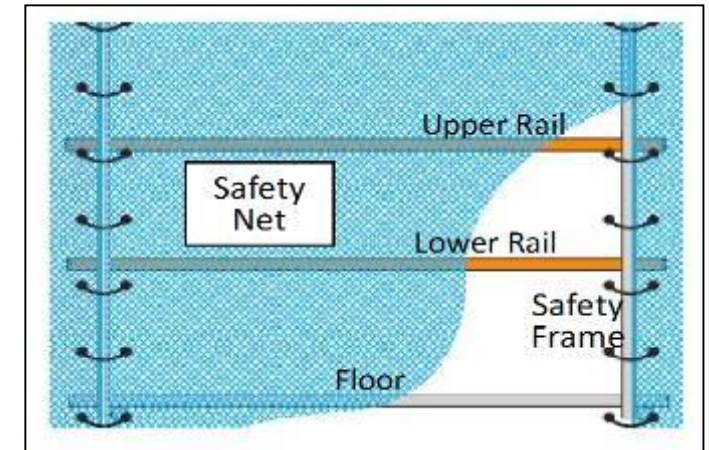
### Safety Net Location (1)



### Railing Location(2) / Perspective View



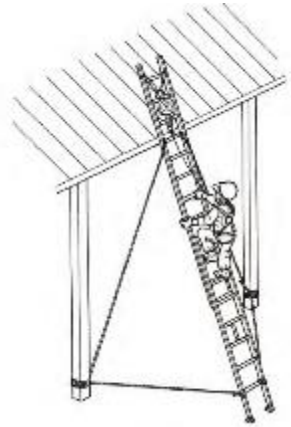
### Safety Net Location (2)



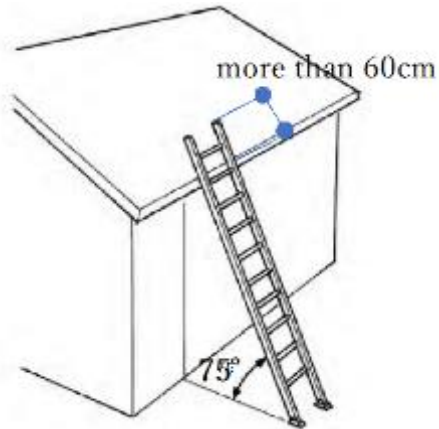
# 4. Checklist & Guideline

## Scaffolding(2)

### Proper use of Ladder



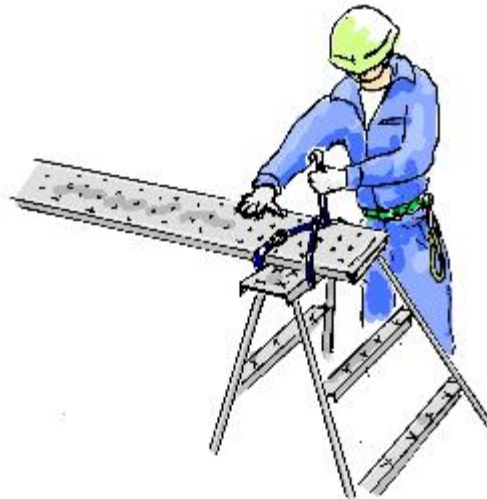
### Position of Ladder



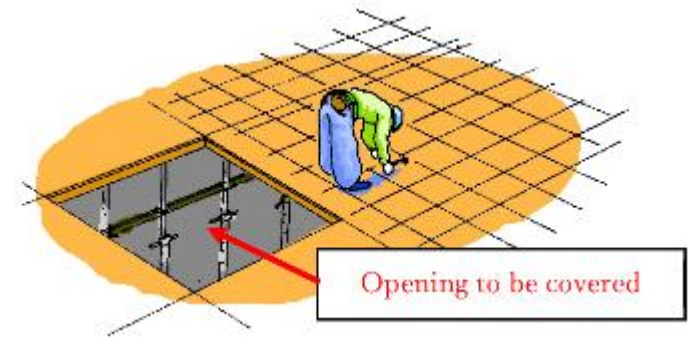
### Foot Board is not fixed



### Fixing of Foot Board



### Opening of scaffolding




### Obstruction on Scaffolding





# 5. Checklist & Guideline / OJT

## OJT at WANGCHHU Bridge (CDCL) at DANDUNG Bridge (Lamnekha)

Preparatory Item		/ Site	
	Is Construction Work notified to MoLHR	Plan	Yes / No / NA
	Is the Safety Plan submitted?	Plan	Yes / No / NA
Daily Works			
Accident Cases   (Regulation of MoLHR)	Are there any accidents happened in the project sits?	Records	Yes / No / NA
	Did you report the cases to Client/Police/MoLHR?	Records	Yes / No / NA
	Are there any accidents reports if there were accidents?	Records	Yes / No / NA

# 5. Checklist & Guideline / OJT

**CDCL**

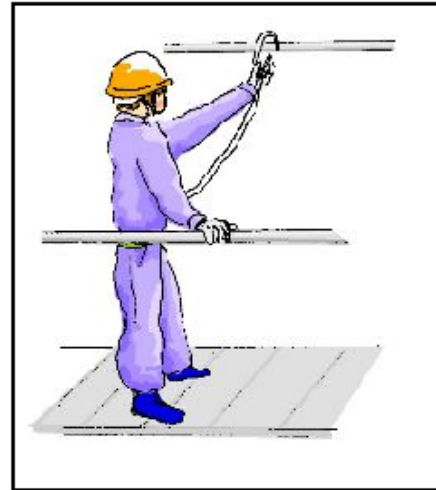
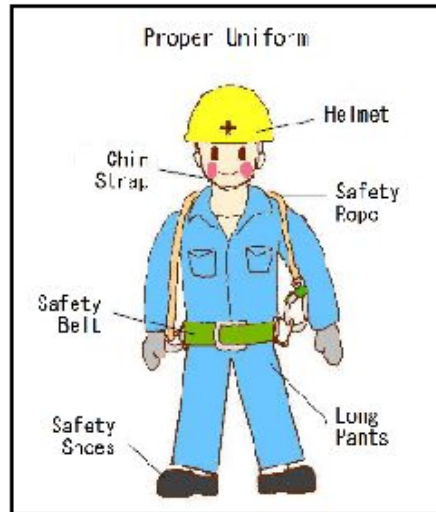
**Yes (CDCL notified the work to MOLHR)**

**Lamnekha**

**No / Most of the Contractors do not notified the work to MOLHR)**

# 5. Checklist & Guideline / OJT

## Clothes and Safety Gadget of Workers



being placed at the arrestive place?

Do the workers wear helmets during working time in construction site?

Site

Yes /  
No / NA

Do the workers wear the proper shoes?

Site

Yes /  
No / NA

Do the workers wear the proper uniform?

Site

Yes /  
No / NA

Do the workers use the proper safety gadgets such as safety belt, goggles, gloves, etc?

Site

Yes /  
No / NA

# 5. Checklist & Guideline / OJT

**CDCL**



**Yes**

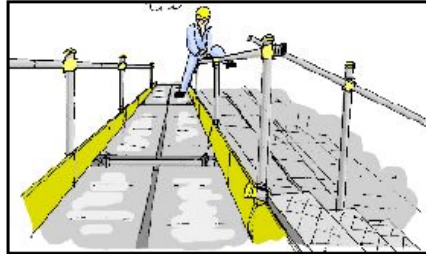
**Lamnekha**



**Yes, but Safety Belts are not used**

# 5. Checklist & Guideline / OJT

Common Works  
Scaffolding



Railings



stairs for access



Is the scaffolding prepared as per the safety plan?	Site	Yes / No / NA
Is the sufficient work space with proper staging prepared?	Site	Yes / No / NA
Is strong railings whose heights are 85cm properly placed at high places? High place means the place where the workers may drop 2m in height?	Site	Yes / No / NA
Is the strong railings properly provided on the stairs?	Site	Yes / No / NA
Are the proper stairs or ladders provided for the access to the working areas?	Site	Yes / No / NA

# 5. Checklist & Guideline / OJT

## CDCL



**Yes (wide enough)**  
**No (height not enough)**

## Lamnekha



**No (No Scaffolding)**

# 5. Checklist & Guideline / OJT

**CDCL**



**Yes**  
**Strong Railing**

**Lamnekha**



**No**  
**No Railings**

# 5. Checklist & Guideline / OJT

**CDCL**



**Yes  
But, not fixed**

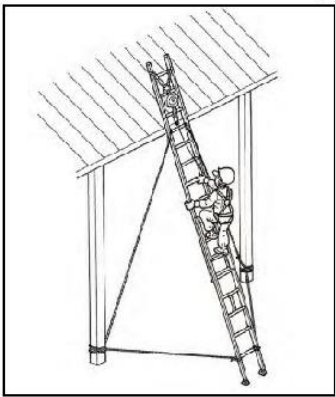
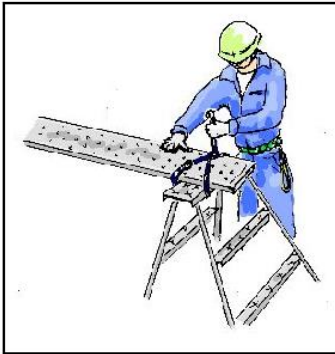


**Lamnekha**



**No  
No Access**



# 5. Checklist & Guideline / OJT

	Ladder fixed	Are the ladders fixed at the bottom and top?	Site	Yes / No / NA
	Both end Fixed	Are the foot boards staging fixed to the strong parts at the both end?	Site	Yes / No / NA
	Scaffolding Material	Are the sound and proper materials used for the scaffoldings?	Site	Yes / No / NA
	Slip Stopper	Are the slip stoppers properly provided?	Site	Yes / No / NA

# 5. Checklist & Guideline / OJT

## CDCL



**Yes**



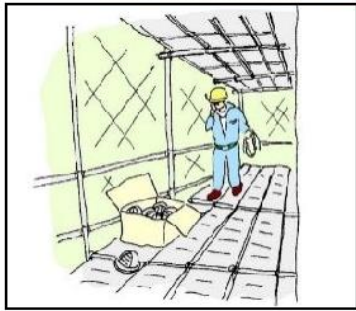

# 5. Checklist & Guideline / OJT

## CDCL



**Yes**

# 5. Checklist & Guideline / OJT

	<p>Protection of Opening</p>	<p>Are all the openings properly covered?</p>	<p>Site</p>	<p>Yes / No / NA</p>
	<p>Safety Net</p>	<p>Are the fall prevention measures such as safety net properly provided at hazardous points?</p>	<p>Site</p>	<p>Yes / No / NA</p>
	<p>Obstructions on the access</p>	<p>Are unnecessary things to hinder the access placed on the walkway of the scaffolding?</p>	<p>Site</p>	<p>Yes / No / NA</p>
	<p>Assembling of Scaffolding</p>	<p>Are the assembly and dismantling done safely?</p>	<p>Site</p>	<p>Yes / No / NA</p>

# 5. Checklist & Guideline / OJT

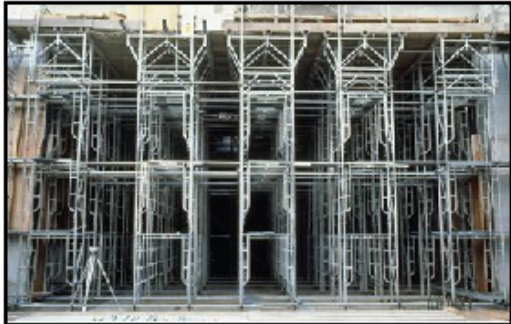
## CDCL



**No**

# 5. Checklist & Guideline / OJT

## Shoring Works



## Shoring

Is the shoring prepared as per the safety plan?	Site	Yes / No / NA
Is the shoring dismantled after the required strength of concrete is achieved?	Site	Yes / No / NA
Are the assembly and dismantling of the shoring done safely?	Site	Yes / No / NA

# 5. Checklist & Guideline / OJT

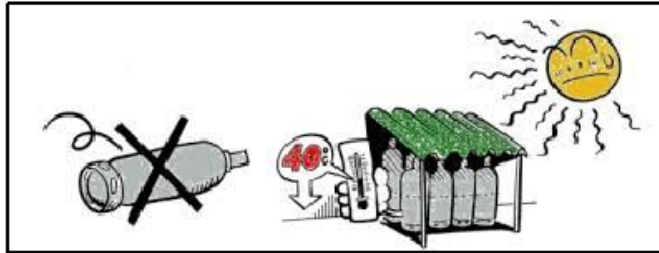
## CDCL



**Yes, Good Shoring**

# 5. Checklist & Guideline / OJT

## Acetylene and Oxygen Gas Cylinder



standing & fall prevention measure

Are the Acetylene and Oxygen Gas cylinders being kept standing in the storage?	Site	Yes / No / NA
Are the fall preventive measures for the standing acetylene gas cylinders being provided?	Site	Yes / No / NA
Are the Acetylene and Oxygen Gas cylinders being kept in shade and less than 40°in temperature?	Site	Yes / No / NA
Are the Acetylene gas cylinder being kept standing in use?	Site	Yes / No / NA
Is the firearm being used 5m away from acetylene and oxygen gas cylinder?	Site	Yes / No / NA



# 5. Checklist & Guideline / OJT

## CDCL



**Yes, Fixed**

# 5. Checklist & Guideline / OJT

## WANGCHHU Bridge

- **Notification to DOLHR was done (Good)**
- **Good scaffolding but there many locations can be improved.**
- **Concrete temporary shoring for flood measurement is working well and very good**

## DANDUNG Bridge

- **No notification to MOLHR (Most of the contractors)**
- **Absence of scaffolding and railings**
- **Safety Belt is not properly used**
- **Improvement of the safety awareness is needed. (They may be thinking the death accident can be compensated by insurance.)**

## **6. Recommendations**

### **Recommendation for Zero Accident**

- **Collaboration between MoWHS, MoLHR, Police and (Hospital)**
- **Setting and implementing strict penalties to the contractors for non-compliance with safety measures and accidents happened**
- **Adoption of Check list and Guideline**
- **Improvement of Safety Awareness of Contractors**