

# STANDARD AND GUIDE ON LIFTING OPERATION



# Introduction

## Section 1

### 1.1 // Objective

This standard and guide aims to provide a quick reference of industry good practices on the lifting operation for the industry stakeholders to enhance safety. This standard and guide should be taken reference following with the updated requirements of legislation and codes of practice.

### 1.2 // Structure of Standard and Guide

In this standard and guide, it provides information of the roles and responsibilities of key personnel, major risks associated with the relevant operation, industry good practices, innovative technologies, and relevant references.

### 1.3 // Usage of Standard and Guide

Industry stakeholders can make use of the content mentioned in this standard and guide to plan ahead the specific operation, develop the operational procedure or review the existing operation.

### 1.4 // Limitations

It is important to note that compliance with this publication does not itself confer immunity from legal obligations in Hong Kong. Readers are reminded to observe and comply with statutory provisions, relevant codes of practice and other government departments' requirements so as to discharge their legal and other pertinent duties related to the relevant operation mentioned in the standard and guide.

# Lifting Operation

## Section 2

### 2.1 // Major Hazards of Crane Lifting Operations

#### 2.1.1 Collapse or collision of cranes

Collapse or collision of cranes due to insufficient lifting planning, inadequate lifting monitoring, inappropriate selection of crane, instability of crane, hazards from the surrounding of crane, improper maintenance, unsafe lifting operation, improper fixing of crane anchorage and bypassing of anti-collision devices, etc.

#### 2.1.2 Falling of the load

Falling of load due to various reasons, for example, overloading, incorrect methods of slinging, lack of inspection, testing, or thorough examination of lifting gear, etc.

#### 2.1.3 Being struck by moving loads or cranes

Being struck by moving loads or cranes due to insufficient planning and arrangement of the lifting routes, lack of management for lifting zone, etc.

### 2.2 // Roles and Responsibilities of Key Personnel

#### 2.2.1 Competent Examiner

- The competent examiner is responsible for carrying out regular examinations and tests of the lifting appliances or lifting gear.
- The competent examiner should be appointed by the owner, and be competent to carry out the test and examination by reason of his qualifications and training.
- The competent examiner should be a registered professional engineer under the Engineers Registration Ordinance (Cap. 409) within a relevant discipline specified by the Commissioner for Labour.

## 2.2.2 Competent Person

- The competent person is responsible for carrying out regular inspections of lifting appliances or lifting gear. He should be appointed by the owner, and is competent to perform the duty by reason of training and practical experience.
- The competent person should be responsible for supervision of crane erecting, dismantling, altering and multiple lifting appliances operation.

## 2.2.3 Slinger

- The slinger should receive appropriate training on general safe lifting operations.
- The slinger should be capable of selecting lifting gear suitable for the loads and liaising with the signaller for directing the movement of the crane safely.
- The slinger should be capable of selecting rigging method, and he is fit (regard to eyesight, hearing and reflexes) and be agile and have the physique to enable him to handle lifting tackle.

## 2.2.4 Signaller (Banksman)

- The signaller should receive appropriate training on general safe lifting operations.
- The signaller should be able to direct the movement of the crane and loads. He should also be fit with particular regard to eyesight, hearing and reflexes.

## 2.2.5 Crane Operator

- The crane operator should receive appropriate training on the crane operation. He should hold a valid certificate of the type of crane being used and is competent to operate the crane by virtue of his experience.
- The crane operator should understand the lifting operation thoroughly and communicate well with the signaller during the operation, and ensure at all times the safe operation of the crane under his control.

## 2.2.6 Lifting Supervisor

- The lifting supervisor is responsible for supervising the whole lifting operation and should be appointed and trained with practical experience.
- The lifting supervisor should brief the lifting team of the lifting plan and operation, supervise the implementation of the plan and have the authority to stop the lifting operation in case of the abnormalities of the operation.

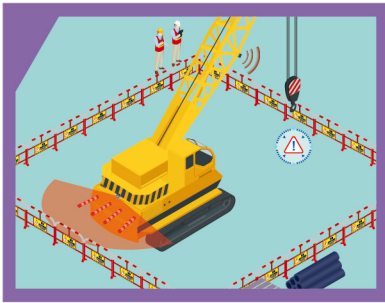
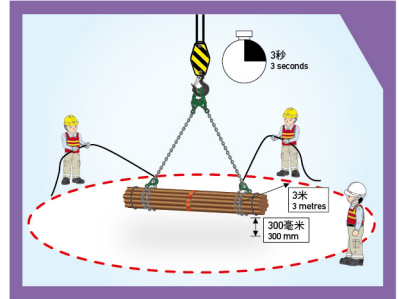


## 2.3 // Industry Good Practice

### 2.3.1 Safe Lifting 3,3,3

Safe lifting “3,3,3” is a hold point of lifting procedures before lifting, which can effectively improve the safety of lifting operation:

- Keep 3m away from materials being lifted;
- Lift up the materials 300mm from ground; and
- Wait for 3 seconds for stabilising the lifting object before lifting operation.

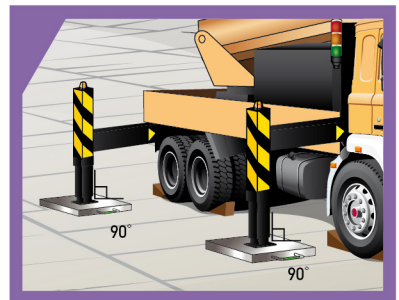


### 2.3.2 Barricade the Lifting Zone

- Lifting zone (including loading / unloading area) should be properly fenced off with barriers.
- Prominent notices should be displayed and physical measures should be implemented to ensure no unauthorised entry into the zone.
- No one should stay in the lifting path and lifting zone during lifting operation.
- Smart Site Safety System with visual and audio alarms could be set up to alert workers when lifting operation is in progress.

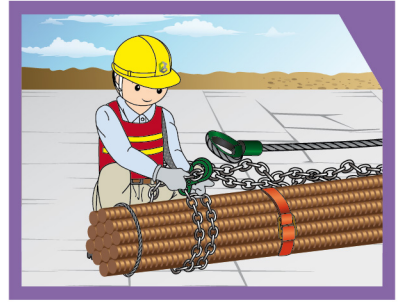
### 2.3.3 Outriggers of Crane

- Mat / pad for the outriggers of crane should be at least 3 times larger than the area of the float unless otherwise specified by the operation manual. Steel plates of adequate strength, suitable mat / pad or timber block should be used.
- Cylinder of the outriggers of crane should be perpendicular to the float.
- Ensure that the outriggers are fully extended, securely held in the extended position, and properly leveled.
- Manufacturers' recommendations and instructions should be followed and proper setup of outriggers should be checked before lifting operation.



### 2.3.4 Double Wrap Choker Hitch

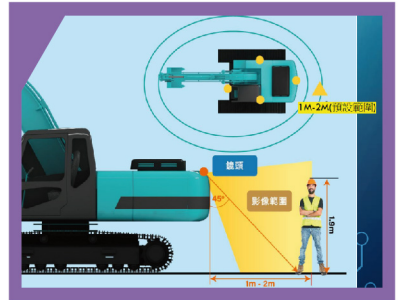
The double wrap choker hitch is a recommended lifting method, especially in situations where standard lifting eyes or attachment points are unavailable. It ensures materials such as steel bars, wooden blocks, etc., are secure and tightly held during lifting operations.



## 2.4 Innovative Technology

### 2.4.1 Safety Monitoring System

- PA Code: PA20-073 (List of CITF Pre-approved Technologies (Smart Site Safety System (SSSS)))  
A safety monitoring system could be installed on heavy construction plant for obstacles detection and real-time acquisition of surrounding environment. It provides synthesised image with 360° bird's-eye view, panoramic detection of obstacle within 1 metre, and siren and signal light when there are obstacles in the detection range, thus improving workers' safety when plant is in the operation.



- PA Code: PA20-020 (List of CITF Pre-approved Technologies (Smart Site Safety System (SSSS)))

The technology, Machinery Anti-collision Camera, allows users to set detection zone and provides audible alarm and flashing signals on the driver's screen if there are pedestrians or objects within the set zone. A monitor installed in the cabin provides continuous footage captured by the sensor head. It can ensure the safety of the pedestrians nearby the work site.

- PA Code: PA20-055 (List of CITF Pre-approved Technologies (Smart Site Safety System (SSSS)))  
Another technology, Collision warning system could provide real-time safety alert for workers and plant operators. The plant with a detector sets a virtual working perimeter and any worker with a tag entering the perimeter will trigger the alarm to warn workers and the operator to stop the plant so as to prevent collision accidents.



## 2.5 // Reference Materials

### **Code of Practice for Safe Use of Tower Cranes (Labour Department)**

[www.labour.gov.hk/eng/public/os/B/crane.pdf](http://www.labour.gov.hk/eng/public/os/B/crane.pdf)

### **Code of Practice for Safe Use of Mobile Cranes (Labour Department)**

[www.labour.gov.hk/eng/public/os/B/CoP\\_for\\_Mobile\\_Cranes\\_ENG.pdf](http://www.labour.gov.hk/eng/public/os/B/CoP_for_Mobile_Cranes_ENG.pdf)

### **A Guide to the Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations (Labour Department)**

[www.labour.gov.hk/eng/public/os/A/FIU\\_LALG\\_ENG.pdf](http://www.labour.gov.hk/eng/public/os/A/FIU_LALG_ENG.pdf)

### **Guidance Notes on Inspection, Thorough Examination and Testing of Lifting Appliances and Lifting Gear (Labour Department)**

[www.labour.gov.hk/eng/public/os/C/gear.pdf](http://www.labour.gov.hk/eng/public/os/C/gear.pdf)

### **Guidelines on Safety of Tower Cranes (Construction Industry Council)**

[www.cic.hk/files/page/50/Guidelines%20on%20Safety%20of%20Tower%20Cranes%20%28Version%202%29%20July%202010%20-%20e.pdf](http://www.cic.hk/files/page/50/Guidelines%20on%20Safety%20of%20Tower%20Cranes%20%28Version%202%29%20July%202010%20-%20e.pdf)

### **Reference Material on Safety Roles and Responsibilities of Key Stakeholders in the Hong Kong Construction Industry (Practical Reference Guidance On Lifting Operation)**

[www.cic.hk/files/page/51/RM%20PRG%20Lifting%20Operation%20\(Eng\).pdf](http://www.cic.hk/files/page/51/RM%20PRG%20Lifting%20Operation%20(Eng).pdf)

### **Lifting Safety Handbook**

[www.cic.hk/files/page/51/Lifting%20Safety%20Handbook%20%E5%90%8A%E9%81%8B%E5%AE%89%E5%85%A8%E6%89%8B%E5%86%8A.pdf](http://www.cic.hk/files/page/51/Lifting%20Safety%20Handbook%20%E5%90%8A%E9%81%8B%E5%AE%89%E5%85%A8%E6%89%8B%E5%86%8A.pdf)