



Salient Points of SS 559:2022

Code of Practice for Tower Cranes

Er. Teng Chin Seng
Convenor
Working Group on Tower Crane

1st Workgroup Meeting: 08 Sep 2017

SS 559:2022 Launched in May 2022

Co-Convenors : Er. Teng Chin Seng
: Mr. Jason Oh Boon Chye

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: Mr. Kareemkhan Mahaboob Khan
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: Mr. Tan Wei Chiat
: Mr. Tay Kok Hien Mike
: Mr. Daniel Woo



The organizations in which the experts of the Working Group are involved:



Access System Technology Pte Ltd
Association of Singapore Marine Industries
Building and Construction Authority
Crane World Asia Pte Ltd
Ho Lee Machinery Pte Ltd
Housing & Development Board
Institution of Occupational Safety and Health (Singapore Branch)
IQS Services Pte Ltd
KSK Consultants
Liebherr-Singapore Pte Ltd
Manitowoc Crane Group Asia Pte Ltd
Ministry of Manpower
Singapore Contractors Association Limited
Singapore Cranes Association
The Institute of Engineers, Singapore
Yongmao Machinery Pte Ltd

SS 559:2022 Code of Practice for Tower Cranes



Part 1: General

Modified adoption of ISO 12480-1:1997

Part 2: Safe use

Modified adoption of ISO 12480-3:2020

Part 3: Inspection

SS 559-1:2022
ISO 12480-1:1997, MOD
(ICS 53.020.20)

SINGAPORE STANDARD
Code of practice for tower cranes
– Part 1 : General
[ISO title: Cranes – Safe use – Part 1: General]



SS 559-2:2022
ISO 12480-3:2020, MOD
(ICS 53.020.20)

SINGAPORE STANDARD
Code of practice for tower cranes
– Part 2 : Safe use
[ISO title: Cranes – Safe use – Part 3: Tower cranes]



SS 559-3:2022
(ICS 53.020.20)

SINGAPORE STANDARD
Code of practice for tower cranes
– Part 3 : Inspection



Part 1: General

Modified adoption of ISO 12480-1:1997



1. Scope

- Safe systems of work
 - Management
 - Planning
 - Selection
 - Erection
 - Dismantling
 - Operation and maintenance
 - Crane operators, riggers and signalman
- ➔ General practices for safe use of cranes

SS 559-1:2022
ISO 12480-1:1997, MOD
(ICS 53.020.20)

SINGAPORE STANDARD
Code of practice for tower cranes

– Part 1 : General

[ISO title: Cranes – Safe use – Part 1: General]



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3.1. Appointed person

:- A person appointed in writing by the occupier, employer or responsible person for one or more project sites to carry out the functions or duties stipulated in SS 559-2, clause 9.9.3.

:- The appointed person should be aware of the limits of their knowledge and experience concerning lifting operations, and when conditions exceeded their limits, further advice should be sought.



5.4. Rigger

5.4.1 Duties

:- The rigger shall be responsible for attaching and detaching the load to and from the crane load-lifting attachment and for the use of the correct lifting gear and equipment in accordance with the planning of the operation for proper positioning of loads.

:- The rigger is responsible for initiating the planned movement of the crane load.

:- If there is more than one rigger, only one of them shall have this responsibility at any one time, depending on their positions relative to the crane.



:- To ensure continuity of signalling where this rigger is not visible to the crane operator, a signalman is necessary to relay the signals to the crane operator.

:- Alternatively, other audio or visual methods may be used.

:- If, during the crane operation, responsibility of initiating the planned movement of the crane and load is to be transferred to another nominated person, the rigger shall clearly indicate to the crane operator that this responsibility is being transferred and to whom.

:- Furthermore, the crane operator and the new nominated person shall clearly indicate that they accept the transfer of responsibility.

11.3 Handling of loads near persons

- : - When loads have to be handled in the vicinity of persons, extreme care shall be exercised and adequate clearance allowed.
- : - Crane operator and signalman shall pay particular attention to possible danger to persons working out of sight.
- : - All persons shall stand clear of the load being lifted.
- : - When lifting from a stack, all persons shall stand away from the stack in case adjacent materials or objects are displaced.
- : - Lifting of loads over highways, railways, rivers or other places to which the public have access shall be avoided.
- : - If this is not possible, permission should be obtained from the local authority and the area should be kept clear of traffic and persons.

home.

Falling mast section kills engineer

300kg metal structure crashes into container office; co-worker injured

By TEH JOO LIN

AN ENGINEER was killed and another worker seriously injured after a 500kg metal structure plummeted 30m and crashed into a container office that they were in yesterday.

This happened when the wire rope of a tower crane, hoisting the 6m-long structure, snapped.

Mr Lim Boon Tiong, a 40-year-old engineering consultant with Meinhardt Singapore, was trapped in the container office. He suffered serious head injuries and was pronounced dead at the scene.

His co-worker, a 41-year-old quality control consultant, was found seated nearby. His right forearm was crushed by debris and he had two deep cuts to his head. He was taken to Tan Tock Seng Hospital, where he is believed to be in a stable condition.

The incident happened at about 11.30am at the construction site of an upcoming condominium, the Sui Generis, in Balmoral Road off Bukit Timah Road.

Both were part of a group of nine attending a meeting inside the container office. The seven others emerged from the container shocked but otherwise unscathed.

A spokesman for the project said the site is under investigation following the incident. "We are not in a position to release any information," she said.

The Straits Times understands that

the accident happened while work was being done to elevate a mast erected alongside one of the half-built blocks.

This mast allows a temporary workers' lift to go up and down the block.

The structure that fell about eight storeys onto the container office was an additional section to make the mast taller.

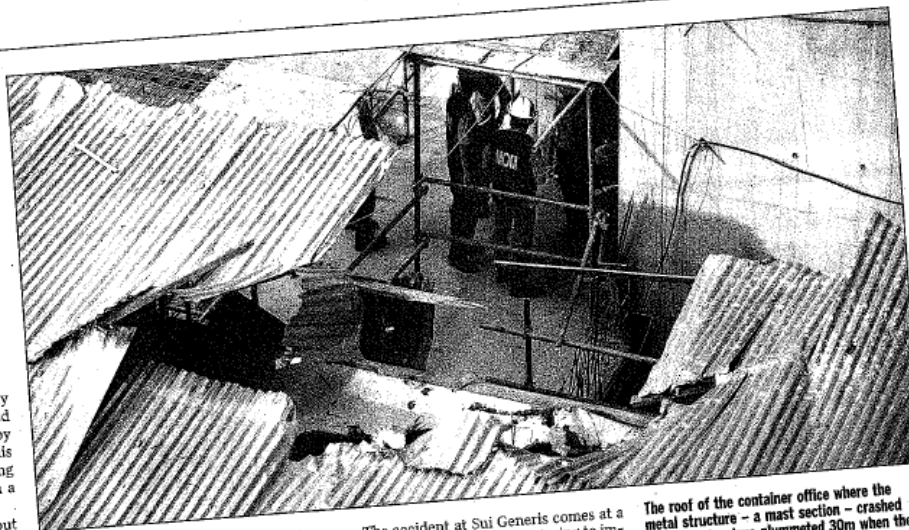
Safety experts said a crane's hoisting wires can snap for reasons that include overloading or the corrosion of the rope's inner core.

The accident at Sui Generis comes at a time when the authorities are trying to improve crane safety at construction sites.

Last year, there were 162 crane-related accidents, which resulted in the deaths of five people and left 139 injured. In 2007, four men died and 107 were injured.

Following yesterday's incident, the Manpower Ministry issued a stop work order to Chiu Teng Enterprise, the main contractor at the site.

joolin@sph.com.sg



The roof of the container office where the metal structure - a mast section - crashed into. The structure plummeted 30m when the wire rope of a tower crane hoisting it snapped. The incident happened at the construction site of an upcoming condominium, the Sui Generis, in Balmoral Road off Bukit Timah Road.
ST PHOTO: CAROLINE CHIA

Married man jailed

...ing lover





Part 2: Safe use

Modified adoption of ISO 12480-3:2020



1. Scope:

- :- Safe systems of work
- :- Management
- :- Planning
- :- Selection
- :- Erection
- :- Dismantling
- :- Crane foundation
- :- Operation and maintenance
- :- crane operators, riggers and signalman

➔ Specific to tower cranes

SS 559-2:2022
ISO 12480-3:2020, MOD
(ICS 53.020.20)

SINGAPORE STANDARD
Code of practice for tower cranes
– Part 2 : Safe use

[ISO title: Cranes – Safe use – Part 3: Tower cranes]



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3.2 Crane coordinator

A person appointed by the **occupier** to coordinate the sequence of operations of tower cranes and other cranes (such as crawler cranes, gantry cranes etc.) on sites, when an anti-collision devices was not installed, to prevent collision of the cranes, components and/or loads.

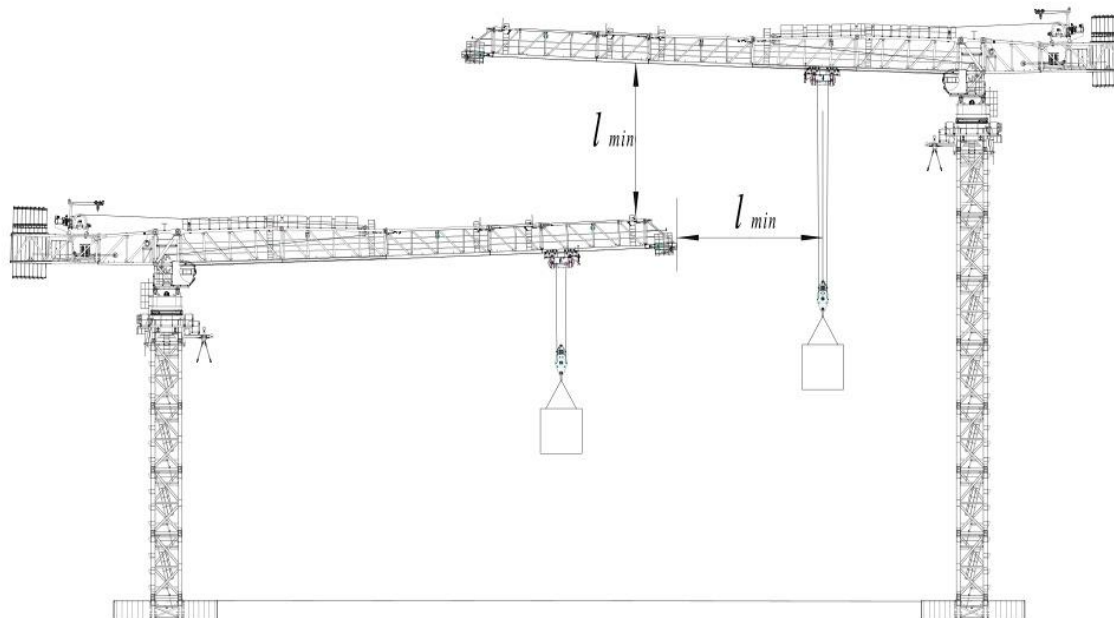


4.1 Safe system of work

- :- On sites with multiple tower cranes and a possibility of collision between cranes, anti-collision devices shall be equipped.
- :- On site where there is a possibility of collision between tower cranes and other types of cranes, such as mobile crane, crawler crane, gantry crane etc., a person, designated as the crane coordinator and the crane operator shall coordinate the sequence of the crane movements to prevent collisions.
- :- Any corresponding instructions from the crane coordinator to the crane operators shall be via the respective signalman.
- :- In such circumstances, the signalman shall obtain the agreement of the crane coordinator before carrying out any operation.

:- During planning of operation, if any tower cranes are required to overlap where a collision between components can occur, a clearance shall be maintained to prevent collision.

:- This distance shall be a minimum clearance of 3m.



6.5.2 Boarding and leaving the crane

Where the crane cabin level is in **excess of 30m** from the ground and there is no access from supporting building, it is recommended to have a crane lift.

:- A ruling introduced in France as of **1 January 2017**, tower cranes over 30m should be fitted with operator lift.

:- Similar ruling in Sweden, Denmark and Netherlands.

:- Improve health and safety, save time, increase operator comfort, facilitate maintenance and inspection....

:- Design available from Liebherr, Manitowoc, Jaso...

:- Other 3rd party crane lift suppliers



6.6 Fire extinguisher

:- Tower cranes shall be equipped with appropriate types and quantity of fire extinguishers, which shall be easily accessible to the crane operator.

:- The crane operator and other personnel likely to be in the cabin should be adequately trained in the use of such fire extinguishers.

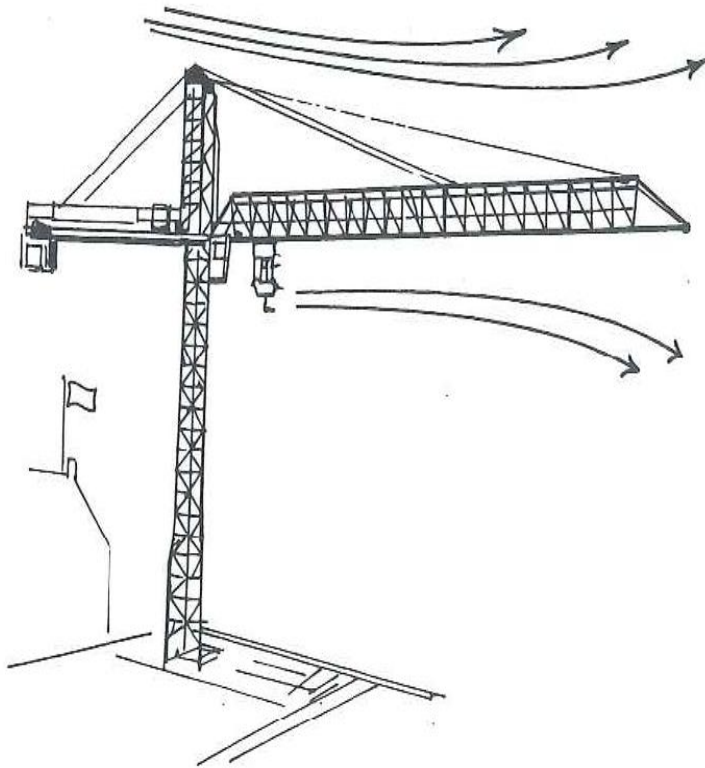


6.9.1 Crane earthing

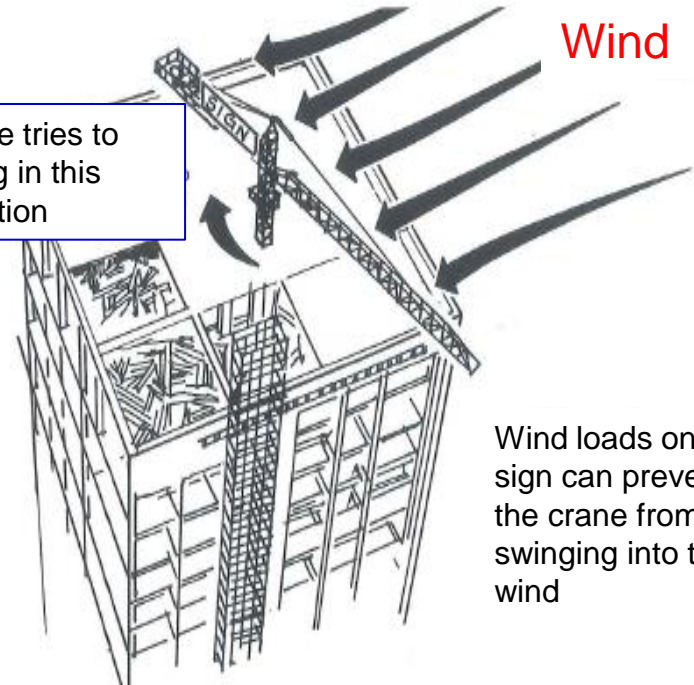
- :- Tower cranes should be effectively earthed in accordance with manufacturer requirements.
- :- The resistance between the base of the tower crane and earthing point shall not exceed 10 Ω . SS 551:2009, Code of practice for earthing shall apply.
- :- Earthing does not provide lightning protection.
- :- Lightning protection is a separate issue which is very technical in nature.

6.9.4 Signboards

:- Signboards, decorations, outline lights, etc. can impose additional loading on the crane and shall not be fitted unless approved by the crane manufacturer.



Crane tries to swing in this direction



Wind loads on the sign can prevent the crane from swinging into the wind

10.4 Leaving the crane

When a tower crane is to be **left unattended** for even a short period, it is essential that the following precautions are carried out:

- a) No load shall be on the hook, and all chains, slings, etc. shall be removed.
- b) The crane shall be put out-of-service in accordance with the manufacturer's instructions.

NOTE 1. Only when possible and safe, this involve turning the jib downwind and taking some action to ensure that the slew brake is off, so that the crane is free to slew in the wind.

NOTE 2. In the case of saddle jib cranes, it is usual practice to bring the trolley or carriage to a minimum radius position.

NOTE 3. Refer to local authority's requirements for crane over-sail outside site boundary.

- c) In the case of luffing jib and similar cranes, the manufacturer's instructions concerning the angle of the jib for out-of-service purpose shall be observed.

11.6.4 Rain, thunder or lightning

- :- Consideration shall be given to not starting work with the crane until the rain stops and risk of lightning reduced.
- :- During thunderstorm, the crane shall be shut down and personnel in the vicinity shall be warned to seek shelter away from the crane.
- :- When there has been a lightning strike, the crane shall be thoroughly inspected before putting the crane into service.



Part 3: Inspection

1. Scope:

- :- Specified requirements for the checking and inspection to be carried out on tower crane.
- :- Covers checking and inspection in all aspects of tower crane usage:
 - :- from the initial planning stage
 - :- pre-delivery check at workshop
 - :- pre and post erection check at site
 - :- periodic inspection
 - :- pre-operational check
 - :- end-of day check
 - :- inspection before and after tieback and/or jacking
 - :- inspection in exceptional cases
 - :- inspection before dismantling

SS 559-3:2022
(ICS 53.020.20)

SINGAPORE STANDARD
Code of practice for tower cranes
– Part 3 : Inspection



Focus on: **when** to inspect, **who** should inspect, **what** to inspect, **how** to inspect, explain **why** need to inspect.

15. Inspection after tieback and/or jacking, changing of wire ropes or changing of part lines

- :- Tieback COS (*Certificate of Supervision*)
- :- AE inspection
- :- Limit switches of all motions. Ensuring that the hoist down limit switches is activated before the hook reaches the lowest position.
- :- Test to confirm moment cut at the correct radius
- :- Perform a load test at 100% of the rated capacity
- :-



16. Inspection after lightning strike

- :- Whenever there is a lightning alert, the boom of the tower crane should be lowered, all crane operation should stop and electrical power supply to the crane switched off.
- :- A simple way you know if the tower crane is in danger of lightning strike, is when you hear thunder or notice lightning nearby.
- :- Lightning information can also be obtained from the meteorological service.
- :- When the lightning has ceased, the crane operator shall not resume operation of the crane immediately.
- :- Instead, the operator shall visually inspect the crane and report any damage or anomaly to the occupier.
- :- Operation can only resume if there is no damage to the crane.

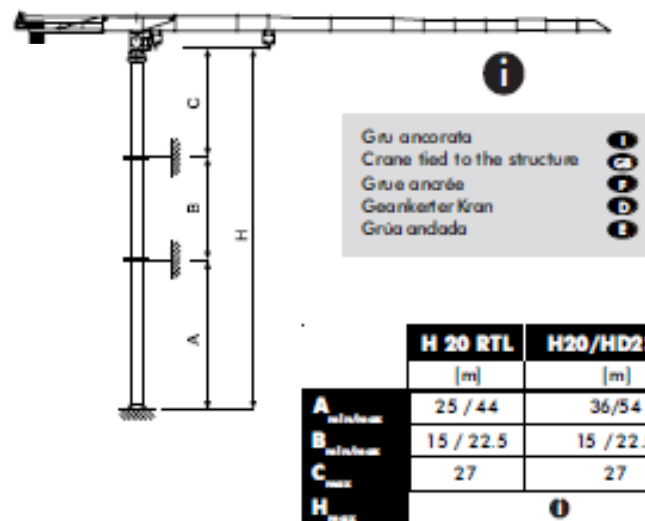
Annex A. Checks during planning stage of deployment of tower crane

A.9: Tieback design

:- Check the spacing of the tiebacks.

:- The manufacturer shall be consulted on the spacing of the tiebacks if they are too narrow.

:- NOTE – Narrow tieback spacing may result in excessive loading on the tower crane mast.



Annex B. Pre-delivery check

B.4: Load bearing components

- :- List all load bearing components to be tracked and monitored.
- :- Maintain identification markings on all load-bearing components with distinctive numbers.
- :- The use of bar coding or radio-frequency identification (RFID) can be considered to track these components.
- :- The year of manufacture and country of origin of the load bearing components shall be traceable from the distinctive number.
- :- To ensure that all load-bearing components are approved by the original equipment manufacturer (non-counterfeit part) and the age of the load-bearing components are tracked and monitored.

Annex C. Pre-installation check



C.7: Wire ropes

- Check the condition of the wire ropes. SS 595-3 shall apply.

SS 595: Part 3:2014. Steel wire ropes for hoisting

Part 3: Code of practice for the care, inspection and maintenance of steel wire ropes for hoisting.



SS 595 : Part 3 : 2014
(ICS 53.020.30)

SINGAPORE STANDARD

Steel wire ropes for hoisting

– Part 3 : Code of practice for the care, inspection
and maintenance of steel wire ropes for hoisting



Published by
Enterprise
Singapore

4.2 Rope replacement

Unless an alternative rope has been approved by the crane manufacturer, rope manufacturer or other competent person, only one of the correct length, diameter, construction, type and direction of lay and strength (i.e. minimum breaking force), as specified by the crane manufacturer, shall be installed on the crane. A record of the rope change shall be placed on file.

:- Ensure that the mill certificates of the wire ropes are made available upon request.

:- The availability of the wire rope mill certificates and the manufacturer's rope specification shall facilitate the inspection to ensure that the wire ropes used comply with the manufacturer's requirement.

:- This shall also help to monitor the age of wire ropes, in order to plan for rope replacement before failure.

Annex E. Post-installation check

E.11: Lightning protection system

:- Check that the tower crane is protected against lightning in accordance with the manufacturer's recommendation.

:- Other proprietary lightning protection system can be used if acceptable by the manufacturer.

:- It is recommended to install surge protection to prevent damage to electrical equipment.

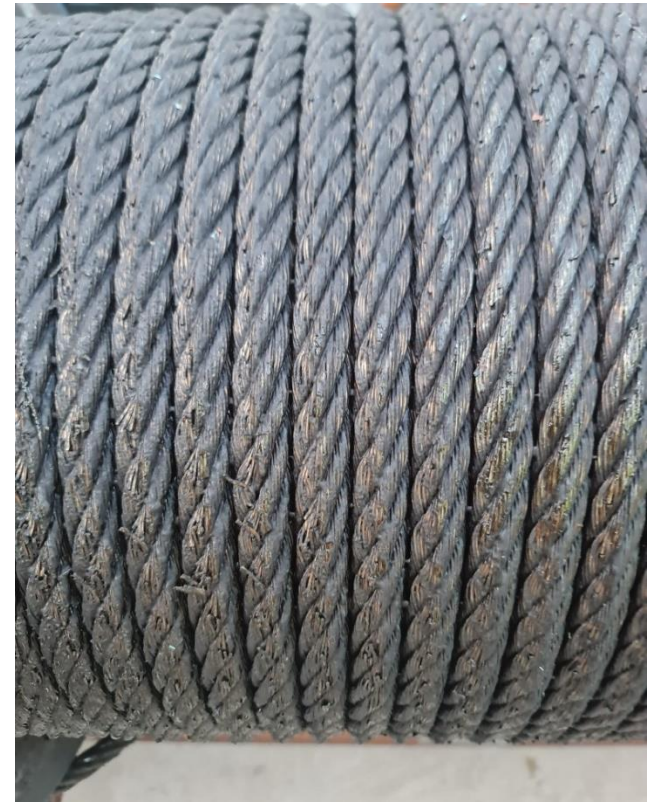
Annex G. Daily inspection check by tower crane operator



4.h: Visual check

:- Check that the wire ropes have been lubricated

:- Check that there are no sign of damage or broken wires along the length of the wire ropes.



Annex S. Types of NDT and recommended NDT points for load-bearing components

S.12: In consultation with the manufacturer, the authorized examiner shall identify the points and location for UTG (*ultrasonic thickness gauging*) testing or other equivalent NDT (*Non-destructive test*) method to confirm that there is no significant thinning of the structure of the any of the load-bearing components.

S.13: The authorized examiner shall compare the UTG readings with the specification provided by the manufacturer for the specific load-bearing components.

Annex T: Acceptance criteria for slewing ring bolts

T.1: Bolts used to secure slew rings shall be replaced with new ones whenever they are removed, unless a letter of confirmation is obtained from the manufacturer that these bolts can be re-used.

What is a Code of Practice issued by the WSH Council?

Codes of Practice (CPs) issued by WSH Council set the preferred WSH standards or practices that employers/ principals/ occupiers/ persons at work are expected to adopt when managing workplace risks.

What is an Approved Code of Practice (ACOP)?

Approved Codes of Practice (ACOPs) comprise gazetted WSH Council –issued CPs and Singapore Standards deemed relevant to WSH. The WSH (Approved Codes of Practice) Notification is issued in accordance to Section 40B of the WSH Act (Cap.345A)

ACOPs set the preferred work standards or practices that Industry practitioners are **expected to adopt** when managing workplace risks, **unless** an alternative course of action can achieve the same or better WSH outcome.

Although ACOPs are not legislation but may be cited as a reference in a court of law to determine whether a WSH measure is considered **reasonably practicable**.

SS 559:2022 Code of Practice for Tower Cranes is one of the 94 ACOPs under WSH (Approved Codes of Practice) Notification 2022

FRIDAY, OCTOBER 14, 2022

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First published in the Government Gazette, Electronic Edition, on 14 October 2022 at 5 pm.

No. 2861 — WORKPLACE SAFETY AND HEALTH ACT 2006

WORKPLACE SAFETY AND HEALTH (APPROVED CODES OF PRACTICE) NOTIFICATION 2022

In accordance with section 40B(3) of the Workplace Safety and Health Act 2006, the Workplace Safety and Health Council hereby notifies that the Council has approved the Codes of Practice set out in the Schedule, with effect from 31 October 2022.

2. The approved Codes of Practice may be inspected at the place and time and on such days as follows:

Place: Workplace Safety and Health Council
1500 Bendemeer Road, #04-01
Ministry of Manpower Services Centre
Singapore 339946

Day: Mondays to Fridays
(public holidays excepted)

Time: 9.00 a.m. to 1.00 p.m.
2.00 p.m. to 5.00 p.m.

THE SCHEDULE

<i>Approved Codes of Practice</i>	<i>Year Published</i>
1. Code of Practice for Working Safely at Heights	2013
2. Code of Practice on Workplace Safety and Health (WSH) Risk Management	2021
3. Code of Practice on Safe Lifting Operations in the Workplaces	2014
4. Code of Practice on Chief Executives' and Board of Directors' Workplace Safety and Health (WSH) Duties	2022
5. SS 98: Specification for industrial safety helmets	2013
6. SS 280: Specification for metal scaffoldings Part 1: Frame scaffoldings	2006
7. SS 280: Specification for metal scaffoldings Part 2: Modular scaffoldings Incorporating Corrigendum No. 1, May 2011	2009
8. SS 311: Specification for steel tubes and fittings used in tubular scaffolding	2005
9. SS 343: Specification for lifting gear Part 1: Wire rope slings	2014

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REPUBLIC OF SINGAPORE GOVERNMENT GAZETTE

THE SCHEDULE — *continued*

<i>Approved Codes of Practice</i>	<i>Year Published</i>
44. SS 553: Code of Practice for air-conditioning and mechanical ventilation in buildings Incorporating Amendment No. 1, August 2017 Incorporating Amendment No. 2, May 2021	2016
45. SS 554: Code of Practice for indoor air quality for air-conditioned buildings Incorporating Amendment No. 1, September 2021	2016
46. SS 557: Code of Practice for demolition	2010
47. SS 559: Code of practice for tower cranes Part 1: General	2022
48. SS 559: Code of practice for tower cranes Part 2: Safe use	2022
49. SS 559: Code of practice for tower cranes Part 3: Inspection	2022
50. SS 562: Code of Practice for safety in trenches, pits and other excavated areas	2010
51. SS 567: Code of Practice for factory layout – Safety, health and welfare considerations	2011
52. SS 568: Code of Practice for confined spaces	2011
53. SS 569: Code of Practice for manual handling	2011
54. SS 570: Specification for personal protective equipment for protection against falls from a height – Single point anchor devices and flexible horizontal lifeline systems	2011
55. SS 571: Code of Practice for energy lockout and tagout	2011
56. SS 573: Code of Practice for the safe use of powered counterbalanced forklifts Incorporating Corrigendum No. 1, July 2012	2012
57. SS 580: Code of practice for formwork	2020
58. SS 586: Specification for hazard communication for hazardous chemicals and dangerous goods Part 1: Transport and storage of dangerous goods	2021
59. SS 586: Specification for hazard communication for hazardous chemicals and dangerous goods Part 2: Globally harmonised system of classification and labelling of chemicals – Singapore's adaptations	2014
60. SS 586: Specification for hazard communication for hazardous chemicals and dangerous goods Part 3: Preparation of safety data sheets (SDS) Incorporating Amendment No. 1, February 2014	2008 (2014)



5-Day Course for Appointed Person – Lifting Operations, (26th Run)

Introduction

As the Singapore Government pushes for higher productivity in various sectors, more and more cranes will be deployed at various work places. Use of cranes at site involves many people from various organisations, such as the crane manufacturer, site occupier, crane contractor, and various sub-contractors that use the cranes. According to the latest SS 559:2022 Code of practice for tower cranes, it is crucial that one person be appointed to have overall control of the cranes.

This appointed person shall be notified formally in writing of their appointment. This course is aimed at anyone who is required to plan safe systems of work, using lifting equipment and intends to take up this position as an appointed person. It is recommended that prior to attending this course, individuals should have some experience of working with lifting equipment, especially mobile cranes and tower cranes.

Objectives

The objective of this course is to equip candidate with an in-depth understanding of the roles and responsibility of the Appointed Person. Successful completion of the course will enable the candidate to prepare and implement safety system of work for lifting operation.

Target Audience

Managers, Engineers and Workplace Safety and Health Professional Officers (WSHO) involve in site planning of safe systems of work, crane selection, project management, installation, commissioning, specification and consultancy of cranes at various jobsite, such as construction, shipyard, ship repairing, A&A, oil & gas etc.

Minimum Entry Requirements

1. An Engineering Degree **OR** At least an (Local) Engineering Diploma holder with 1 - 3 years of relevant experience.
- And
2. Assumed knowledge of rigging, signaling and lifting experience.

It is compulsory to send all soft-copy of documents (certificates, transcript and updated CV for verification purposes)

PROGRAMME DETAILS

Date	: 9, 10, 11, 13, 15, 17 March 2023 17 March 2023 (Written Exam)
Duration	: 5 Days
Time	: Please refer to schedule
Venue	: IES Academy @ Jurong East & BCA Academy @ Braddell
CPD Programme	: 30 PDUs (TBC)
Fees	: \$2,808.00 (IES Members) \$3,024.00 (Non-Members)
Organizer	: IES Academy

Day 1 (9 March 2023, Thursday): IES Academy

Timing	Description	Trainer
0815 – 0830	Registration	
0830 – 0900	WSH Act 2006	Jason Oh
0900 – 0945	WSH (General Provisions) 2006 WSH (Risk Management) Regulations 2006	Jason Oh
0945 – 1000	WSH (Work at Heights) Regulations 2013	Jason Oh
1000 – 1015	Coffee/ Tea-Break	
1015 – 1045	WSH (Construction) Regulations 2007 WSH (Shipbuilding and Ship-repairing) Regulations 2008	Jason Oh
1045 – 1115	WSH (Operation of Cranes) Regulations 2011	Jason Oh
1115 – 1200	Case Studies	Jason Oh
1200 – 1230	Quiz	Jason Oh
1230 – 1330	Lunch	
1330 – 1400	WSH (Approved Codes of Practice) Notification 2022	Jason Oh
1400 – 1430	Code of Practice on WSH Risk Management 2021	Jason Oh
1430 – 1530	Rapid Transit Systems Act/ Regulations Code of practice for Railway Protection	Jason Oh
1530 – 1545	Coffee/ Tea-Break	
1545 – 1645	Case Studies (Tower cranes) Case Studies (Mobile cranes)	Jason Oh
1645 – 1800	Quiz	Jason Oh

Day 2 (10 March 2023, Friday): IES Academy

Timing	Description	Trainer
0815 – 0830	Registration	
0830 – 1000	Code of Practice on Safe lifting operations in the workplaces	Jason Oh
1000 – 1015	Coffee/ Tea-Break	
1015 – 1100	Introduction to DfMA/ PPVC	Jason Oh
1100 – 1230	Case Study on "Crane Location" Risk Assessment	Jason Oh
1230 – 1330	Lunch	
1330 – 1400	Lifting Plan (LP) preparation	Sam Ko
1400 – 1430	Lifting Plan exercise (Use BCA LP for practice)	Sam Ko
1430 – 1530	Specialist Designer (QP/PE) for -Tower crane foundation (use of fixed anchor base), forces, pile cap and pile foundation	Sam Ko
1530 – 1545	Coffee/ Tea-Break	
1545 – 1645	Mobile crane and crawler access and working platform design. Outrigger load, crawler crane track pressure and soil bearing capacity.	Sam Ko
1645 – 1745	Tower crane tie-back design; forces, member, connection and checking proposed structure that tie-back mount onto. Type of structure that tie-back can mount onto.	Sam Ko
1800 – 1830	Quiz	Sam Ko

Day 3 (11 March 2023, Saturday): IES Academy

Timing	Description	Trainer
0815 – 0830	Registration	
0830 – 0900	SS 559:2022 Code of practice for tower cranes , Part 1: General, Part 2: Safe use, Part 3: Inspection	Teng Chin Seng
0900 – 1000	SS 536: 2008, Code of Practice for the Safe use of Mobile Cranes	Teng Chin Seng
1000 – 1015	Coffee/ Tea-Break	
1015 – 1100	SS 595: 2014, Singapore Standard for steel wire ropes for hoisting - Part 1: Specification for steel wire ropes - Part 2: Specification for selection of wore ropes - Part 3: Code of practice for the care, inspection and maintenance of steel wire rope for hoisting	Teng Chin Seng
1100 – 1130	SS 497: 2011 Code of Practice for design, safe use and maintenance of gantry cranes, overhead traveling Cranes and Mono hoists	Teng Chin Seng
1130 – 1200	SS 617:2016, Code of Practice for the Lifting of Persons in Work Platforms Suspended from Cranes	Teng Chin Seng
1200 – 1230	Case Studies (Cranes recovery)	Teng Chin Seng
1230 – 1330	Lunch	
1330 – 1500	Tandem lifting (Equal and Unequal Lifting)	Teng Chin Seng
1500 – 1530	Quiz	Teng Chin Seng
1530 – 1545	Coffee Tea-Break	
1545 – 1615	Selection of cranes, i.e. mobile cranes, crawler cranes, all terrain cranes, truck cranes, gantry cranes, etc.	Frankie Tan
1615 – 1645	Interpretation of various cranes Load chart	Frankie Tan
1645 – 1730	Planning of lifting operation, i.e. preparation works, mobilisation, actual lift and demobilisation	Frankie Tan
1730 – 1800	Quiz	Frankie Tan

Day 4 (13 March 2023, Monday): IES Academy

Timing	Description	Trainer
0815 – 0830	Registration	
0830 – 1000	Virtual classroom -Theory lesson	Chew Poh Eng
1000 – 1015	Coffee/ Tea-Break	
1015 – 1230	Virtual classroom -Theory lesson	Chew Poh Eng
1230 – 1330	Lunch	
1330 – 1430	Introduction to Rigging Terminology	Alan Ong
1430 – 1530	SS 343: 2014, Specification for Lifting gear Part 1 (Wire rope slings), Part 2 (Hooks) and Part 3 (Shackles)	Alan Ong
1530 – 1545	Coffee/ Tea break	
1545 – 1615	Wire Sling Rope and Centre of Gravity (CG) Calculation (2, 3, 4-legged)	Alan Ong
1615 – 1715	Estimating load weight for various shape and size	Alan Ong
1715 – 1800	Choosing lifting equipment: Slings, Shackles, lifting Beam/ spreader beam	Alan Ong
1800 – 1830	Quiz	Alan Ong

Day 5 (15 March 2023, Wednesday): BCA Academy

Timing	Description	Trainer
Group 1 & 2: 0830 - 0900	Registration (Group 1 & 2) -- At Training Yard	
Group 1: 0900 - 1030	1. Role Play: Lifting Supervisor, Signalman & Rigger 2. Participants need to play difference roles such as lifting supervisor, signalman and rigger during practical assessment. 3. Perform briefing, hand signal and rigging. 4. Course de-brief, evaluation. (Estimated 15 minutes per participant)	Chew Poh Eng
1030 - 1100	Coffee/ Tea-Break	
Group 2: 1100 - 1230	1. Role Play: Lifting Supervisor, Signalman & Rigger 2. Participants need to play difference roles such as lifting supervisor, signalman and rigger during practical assessment. 3. Perform briefing, hand signal and rigging. 4. Course de-brief, evaluation. (Estimated 15 minutes per participant)	Chew Poh Eng
Group 3 & 4: 1300- 1330	Registration (Group 3 & 4) -- At Training Yard	
Group 3: 1330 - 1500	1. Role Play: Lifting Supervisor, Signalman & Rigger 2. Participants need to play difference roles such as lifting supervisor, signalman and rigger during practical assessment. 3. Perform briefing, hand signal and rigging. 4. Course de-brief, evaluation. (Estimated 15 minutes per participant)	Chew Poh Eng
1500 - 1530	Coffee/ Tea-Break	
Group 4: 1530 - 1700	1. Role Play: Lifting Supervisor, Signalman & Rigger 2. Participants need to play difference roles such as lifting supervisor, signalman and rigger during practical assessment. 3. Perform briefing, hand signal and rigging. 4. Course de-brief, evaluation. (Estimated 15 minutes per participant)	Chew Poh Eng

Day 6 (17 March 2023, Friday): IES Academy

Timing	Description	Trainer
0900 - 0930	Registration	
0930 - 1130	Written Assessment - 2 hours	

Trainers' Profile



Er. Teng Chin Seng had graduated with B. Eng, M. Eng, P. Eng (Mechanical), MBA, is the Managing Director of CST Engineering Services Pte Ltd. He is a professional engineer and authorised examiner for lifting equipment. Prior to his current position, he was the Chief Operating Officer of an international tower crane rental company. He also held several positions in an international crane manufacturing company. He has extensive experience in crane design and installation.



Mr Jason Oh has 25 years of project engineering Design, construction and management experience. He is the Principal Consultant of JOH Safety Consultancy Pte Ltd (www.johsafetyconsultancy.com). He obtained his B.Eng (Civil) (Hons) from the University of Glasgow (UK) and furthers his study at the National University of Singapore (NUS) for his Master of Science (Safety, Health and Environmental Technology). He ventures into construction industry starting from ground as Engineer, Safety Officer/ Manager, Project Manager, Civil & Structural Designer and DFS Professional. The projects ranged from infra-structures, schools, chemical plants, residential apartments and mixed development in Singapore, Malaysia, Thailand, China and United Arab Emirates (UAE). Jason is a Fellow member of IES (FIES). He was appointed as the Convenor for the CP 63:1996 (2005) review committee (Code of Practice for the Lifting of persons in work platforms suspended from cranes) (Replaced by SS 617:2016) and also as Co-Convenor for Singapore Standard, SS 559: 2010 (Safe use of Tower cranes) review committee (currently under review)



Er. Sam Ko had graduated with a Diploma in Civil Engineering from Singapore Polytechnic and B.Eng. (Hon) Civil Engineering from University of Glasgow. Sam is a Professional Engineer in Singapore and Chartered Professional Engineer in Australia. He is a certified mobile crane operator and an associate trainer in BCA Academy.

Sam is a Registered Workplace Safety & Health Officer and was trained as an auditor for Occupational Safety and Health. Since graduating from University, Sam has had about 30 years of working experience as an Engineer, Project Manager, Project Director and General Manager in the construction industry. He had vast experiences in project management, coordinate of site layout, selection of crane and deployment & usage of crane in construction project.



Mr Frankie Tan is presently the Secretary of the Singapore Cranes Association and represents the Association in the National Crane Safety Taskforce. He is also the Regional Director of STSY International Pte Ltd. His practical crane knowledge comes through many involvements in management and operational level of the companies he managed. With a BBA and professional certifications, Frankie Tan always gives a different insight to crane safety.



Mr Alan Ong has experience in planning and engineering complicated lifts using multiple cranes and alternative lifting method like strand jack and skidding and was involved in some of the largest projects in Singapore and Asia region. Alan is also experienced in modular construction and movement of large and oversized equipment using SPMT trailers and skidding method. He has worked with global EPC companies and consultancy companies as well as an international heavy lift company. He advised mega projects on the construction strategy and planning from initial concept and design phase to the construction stage.



Mr Chew Por Eng graduated with Diploma in Mechanical Engineering from Singapore Polytechnic and Specialist Diploma in Workplace Safety and Health from BCA Academy. He has also attended and passed the Appointed Person-Lifting Operations course jointly organized by IES and LEEA (Lifting Equipment Engineers Association, UK). Mr Chew is a certified crane operator and trainer for crane courses at BCA Academy. He has more than ten years of experiences in the training of crane courses. Prior to his present profession, he was an Engineer for the ST Engineering and the job scope involved project management, planning of site layout and implementing safe work procedures for manufacturing processes and this include of lifting operation as well.



Thank You



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