



**Building Technology
Research Institute**
香港建築科技研究院

Wholly Owned by the Financial Secretary Incorporated



香港科技大學
THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY

Technical Specification for Remote Control Tower Crane System



© The Government of the Hong Kong Special Administrative Region

All rights reserved. No part of this publication may be reproduced or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, or stored in any retrieval system of any nature, without the written permission of the copyright holder and the publisher, application for which shall be made to the publisher.

First published, May 2026

Jointly Published by

Building Technology Research Institute and

The Hong Kong University of Science and Technology

Foreword

Tower cranes remain indispensable to Hong Kong's high-density vertical construction landscape, yet they present significant safety challenges. Traditional operations expose operators to harsh environmental conditions, including extreme heat, inclement weather, and prolonged isolation in elevated cabins, exacerbating fatigue and reducing situational awareness. Essentially, climbing tower cranes imposes significant physiological demands on operators, while falls from elevation present substantially elevated fatality risks compared to ground-level incidents.

The demographic challenges further compound these safety concerns in the construction industry. The lack of sufficient young entrants to replace skilled operators who are familiar with safety specifications and operating tower cranes threatens the sustainable development of the entire construction industry.

Remote Control Tower Crane System (RCTCS) emerged as a potential solution to safer lifting operations. The operators can perform lifting tasks from ground-based cabins, relying on remote monitoring and control technologies. The adoption of RCTCS can bring significant benefits to the construction industry.

However, proprietary technologies and products from various solution providers with varying features may lead to fragmented specifications, ambiguous scope and difficulties in system procurement.

In this document, specific requirements are proposed for RCTCS. By establishing common technical and safety specifications, vendors and contractors would be able to deploy systems that meet consistent safety benchmarks, setting a precedent for wider adoption of RCTCS.

Building Technology Research Institute and
The Hong Kong University of Science and Technology

Preface

This Technical Specification is developed following the promulgation of Development Bureau Technical Circular (Works) 09/2025 – Adoption of Construction Robots. This specification defines a comprehensive framework for the deployment and operation of for Remote Control Tower Crane System (RCTCS) in Hong Kong's construction sector.

This specification addresses a growing need for standardized, safe, and efficient lifting operations which is applicable to both public and private construction projects. Its primary purpose is to ensure that RCTCS operations consistently meet rigorous technical and safety specifications, thereby enhancing productivity, operator welfare and onsite safety in modern construction projects.

This specification is written with reference to existing safety regulations and emerging intelligent crane specifications. RCTCS may be considered as specialized applications of intelligent lifting systems, where operators control crane movements from ground-level cabins while sensors, cameras, and control systems facilitate precision operations.

To facilitate industry-wide adoption, this specification aligns with the Labour Department's Safety Requirements for RCTCS and establishes minimum technical requirements while allowing flexibility for technological innovation.

The drafting of this specification is the outcome of a collaborative effort between the Building Technology Research Institute and The Hong Kong University of Science and Technology. Contributions from the following organizations are gratefully acknowledged (in alphabetical order):

(a) Governmental Organizations / Industry Associations / Institutes

- Architectural Services Department, Government of the HKSAR
- Buildings Department, Government of the HKSAR
- Development Bureau, Government of the HKSAR
- Drainage Services Department, Government of the HKSAR
- Hong Kong Center for Construction Robotics
- Hong Kong Construction Association
- Hong Kong Construction Industry Council
- Hong Kong Construction Robotics Technology Society
- Hong Kong Construction Sub-Contractors Association

- Hong Kong General Building Contractors Association
- Hong Kong Institute of Construction
- Hong Kong Institution of Engineers
- Hong Kong Polytechnic University
- Hong Kong Tower Crane Association
- Hong Kong University of Science and Technology
- Housing Department, Government of the HKSAR
- Labour Department, Government of the HKSAR
- Occupational Safety and Health Council
- The Real Estate Developers Association of Hong Kong

(b) Corporates

- Glodon Company Limited
- Guangdong Tendfine Information Technology Development Co., Ltd
- Hip Hing Construction Co., Ltd
- Sanfield (Management) Limited
- Skyline Cockpit Technologies Ltd
- Xian Fosow Electronic Technology Development Co., Ltd

(c) Project Teams

- Project team of Design and Construction of a District Court Building at Caroline Hill Road
- Project team of Yuen Long Barrage and Nullah Improvement Schemes
- Project team of Yuen Long Effluent Polishing Plant – Main Works for Stage 1

The feedback from the aforementioned organizations is instrumental in shaping both the standards and the procedures outlined in this specification.

Building Technology Research Institute and
The Hong Kong University of Science and Technology

Contents

Foreword	ii
Preface.....	iii
1 Overview.....	6
2 Extent of Application.....	6
3 Effective Date	6
4 Effect on Existing Specifications.....	7
5 Introduction.....	8
6 Terms and Definitions.....	9
7 Technical Specification for Remote Control Tower Crane System.....	10
7.1 Operating Cabin	10
7.2 Network Architecture	12
7.3 Camera Systems	13
7.4 Sensing Systems	14
7.5 Operational Safety and Emergency Protocols	15
7.6 Remote-Control Interface	17
7.7 Data Security	19
7.8 System Design, Testing and Maintenance	20
7.9 Training and Qualification	22
8 Normative References	23

1 Overview

On top of the current statutory requirements on safety protocols generally applicable for all tower cranes, this specification lists out comprehensive technical requirements for Remote Control Tower Crane System (RCTCS) that contribute to the safe and effective operation of RCTCS. This specification establishes a two-tier compliance framework:

- (a) **Essential Requirements:** Mandatory requirements that shall be enforced through inspections, compliance checking and quality assurance.
- (b) **Best Practices:** Measures that are encouraged to be implemented, which can enhance system performance of RCTCS.

2 Extent of Application

This specification refers to the 6 classes of intelligence level for tower cranes in GB/T 45163.1-2024, published by the State Administration for Market Regulation and Standardization Administration of China. Human operator shall be involved in the control and monitoring for systems up to Level 3 (Conditional Intelligence) as defined in GB/T 45163.1-2024. Only for systems of Level 4 (High Intelligence) or Level 5 (Full Intelligence) can the direct participation of a human operator be excluded.

This specification establishes detailed functional requirements for tower crane operations in accordance with Level 3 (Conditional Intelligence). This specification can be updated in the future to establish the requirements based on Levels 4 or above.

3 Effective Date

This specification shall take immediate effect, and will be reviewed from time to time to incorporate technological advancements and industry feedback.

4 Effect on Existing Specifications

This specification shall be read in conjunction with other relevant safety regulations to be strictly complied with, including but not limited to:

1. Buildings Department of HKSAR Government – Code of Practice for the Structural Use of Steel 2011 (2023 Edition);
2. Buildings Department of HKSAR Government – Code of Practice for Site Supervision 2009 (2024 Edition);
3. Development Bureau of HKSAR Government – Technical Circular (Works) No. 3/2023: Smart Site Safety System;
4. Development Bureau of HKSAR Government – Technical Circular (Works) No. 9/2025: Adoption of Construction Robots;
5. Development Bureau of HKSAR Government and the Hong Kong Construction Industry Council – Lifting Safety Handbook (published in 2020);
6. Electrical and Mechanical Services Department of HKSAR Government – Code of Practice for the Electricity (Wiring) Regulations;
7. Electricity Ordinance (Cap. 406);
8. Electricity (Wiring) Regulations (Cap. 406E);
9. Factories and Industrial Undertakings (Electricity) Regulations (Cap. 59W);
10. Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations (Cap. 59J);
11. Factories and Industrial Undertakings Ordinance (Cap. 59);
12. International Organization for Standardization – EN ISO 9241-5:2024 Ergonomics of human-system interaction — Part 5: Workstation layout and postural requirements;
13. Labour Department of HKSAR Government – Code of Practice for Safe Use of Tower Cranes (2011 Edition);
14. Labour Department of HKSAR Government – Safety Requirements for the Use of Remote-control Tower Crane System;
15. Labour Department of HKSAR Government – A Health Guide on Working with Display Screen Equipment (9/2009-1b-OHB86);
16. Labour Department of HKSAR Government – Guidance Notes on Inspection, Thorough Examination and Testing of Lifting Appliances and Lifting Gear (2001 Edition) (6/2001-1-B103);
17. Occupational Safety and Health Ordinance (Cap. 509);
18. Telecommunications Ordinance (Cap. 106).

5 Introduction

Traditional operations expose operators to challenging working environment, including extreme heat, inclement weather, and prolonged isolation in elevated cabins, exacerbating fatigue and reducing situational awareness. Remote Control Tower Crane System (RCTCS) replicates the functionality of traditional tower cranes controlled in elevated cabins, enabling operators to safely perform tower crane operations from a cabin located on-ground. RCTCS reduces exposure to extreme weather, fatigue, and fall-related hazards, improving the lifting productivity, operator welfare and overall site safety in construction works.

To support the RCTCS development, this specification establishes a comprehensive framework for the deployment and operation of intelligent tower cranes in Hong Kong's construction sector. The primary purpose of this specification is to ensure that RCTCS operations, whether conducted in constrained urban sites or large-scale development areas, comply with rigorous technical and safety specifications, thereby enhancing productivity, operator welfare and overall site safety in modern construction projects.

This specification is written with reference to existing safety regulations and emerging intelligent crane specifications, clearly establishing minimum technical requirements as well as the best practices to facilitate industry-wide adoption. Key specifications cover system architecture, sensing capabilities, operating interfaces, safety protocols and certification requirements.

6 Terms and Definitions

6.1 Remote Control Tower Crane System (RCTCS)

A system for remote-control and monitoring of tower crane operations, allowing the operator to safely control the tower crane from a remote control cabin outside the crane tower onsite, replicating the tower crane control in the conventional on-board operating cabin attached to the structure of the tower crane.

6.2 System Latency

This denotes the end-to-end latency for control signal transmission, covering the time periods of input signal acquisition, signal processing, and control signal transmission.

6.3 Fail-Safe System

A control mechanism designed to bring the tower crane to a secure state when system failures are detected or when design operating conditions are exceeded.

7 Technical Specification for Remote Control Tower Crane System

7.1 Operating Cabin

Essential Requirements

- 7.1.1 The remote control cabin shall be installed within the site where the tower crane is being operated such that, in case of emergency, the operator can inspect the actual operations upon going outside the cabin.
- 7.1.2 The cabin shall be designed and constructed to protect the operator and controls from the weather (Regulation 10(1) of the LALGR).
- 7.1.3 The cabin shall be enclosed with adequate strength to protect the operator from external objects.
- 7.1.4 Suitable operating environment, lighting and ventilation shall be provided within the cabin to ensure physical comfort of the operator.
- 7.1.5 The cabin shall be well-protected acoustically to prevent operator distraction during operations.
- 7.1.6 Strict access control to the operating cabin and prohibition of unauthorized entry shall be fully implemented.
- 7.1.7 The cabin shall be fitted with a lockable door to prevent unauthorized entry into the operator cabin when unattended.
- 7.1.8 Identity-aware authentication methods, such as facial recognition and fingerprint scanning, shall be implemented at the operating console to prevent unauthorized operation of the RCTCS.
- 7.1.9 Voice communication shall be enabled between the remote operator, slingers, signalers and site supervision personnel, such as radio, walkie-talkie.
- 7.1.10 The cabin shall have appropriate quantities and types of fire extinguishers, such as carbon dioxide or powder type extinguishers to combat electrical fire.
- 7.1.11 At least one emergency exit from inside of cabin shall be provided without the use of key with clear signage.

7.1.12 The operating cabin shall be designed in accordance with ergonomic requirements, including but not limited to Clause 3.2 of A Health Guide on Working with Display Screen Equipment (9/2009-1b-OHB86) and Annex A of EN ISO 9241-5, ensuring safety and health of the operator.

Best Practices

7.1.13 Indicative devices, such as LED message display board, shall be put at a conspicuous place at the exterior side of the cabin to indicate that the RCTCS is in operation, preventing the operator from distraction.

7.2 Network Architecture

Essential Requirements

- 7.2.1 The network for the RCTCS shall operate stably and reliably on the construction site under all anticipated environmental conditions.
- 7.2.2 When operating in remote-control mode, the end-to-end latency of control signal transmission shall not exceed 100ms at all operating time, under safe working load and proof load.
- 7.2.3 The latency shall be continuously monitored and recorded during lifting operations.
- 7.2.4 At least two independent network channels shall be provided. Upon failure of the primary network channel, the RCTCS shall automatically switch to a backup network channel to prevent signal interruption.
- 7.2.5 For wired network, the cables shall have sufficient tensile strength and protection against physical damage and resistance to environmental hazards and electromagnetic interference.

Best Practices

- 7.2.6 For wired network, suitable types of cables such as armored cables shall be used to enhance the performance and durability of the cables.

7.3 Camera Systems

Essential Requirements

- 7.3.1 Adequate cameras shall be installed at different positions of the tower crane to provide comprehensive coverage of all critical operating zones, including but not limited to:
- (a) The jib end of luffing cranes;
 - (b) The trolley of flat top cranes;
 - (c) The crane cabin front view;
 - (d) The rear of the crane;
 - (e) The left of the crane;
 - (f) The right of the crane;
 - (g) Hook and load areas;
 - (h) Winches associated with the wire ropes.
- 7.3.2 The camera at the crane cabin front shall have a minimum resolution of 4K with IP66 rating or higher. All other cameras shall have a minimum resolution of 1080P with IP66 rating or higher.
- 7.3.3 The camera capturing the hook shall support zoom in/out function, such that the operator could adjust its camera view according to the movement of hook, and clearly see the loading/unloading areas under the hook throughout the lifting operations.
- 7.3.4 All the cameras shall possess night vision capabilities, such as infrared, providing clear views even in low-light environment.
- 7.3.5 Video footage recordings shall be retained for at least 30 days.

Best Practices

- 7.3.6 Protective coatings shall be applied onto the lens of the cameras to prevent the camera views from being blurred, such as by dust and water.
- 7.3.7 Auxiliary sensing devices such as LiDAR shall be employed to enhance environmental scanning and obstacle avoidance.

7.4 Sensing Systems

Essential Requirements

- 7.4.1 In addition to the sensors/indicators/limiting switches required in the Code of Practice for Safe Use of Tower Cranes, sensors shall be provided to monitor essential statuses of the tower crane, including but not limited to: load radius, lifting weight, lifting height, slewing angle, wind speed and wind direction.
- 7.4.2 Real-time visual and audio feedback of the winches associating with the wire ropes and the associated brakes, such as audio recording by cameras, shall be provided to inform the operator of their operational status of the winches.
- 7.4.3 The sensing measurements and warning logs shall be retained for at least 3 months, with logging interval of 1 second per measurement or more frequent.

Best Practices

- 7.4.4 Vibration sensors should be installed at appropriate locations to monitor the mechanical oscillation of the tower crane, with suitable mechanism to cease the crane operation when excessive or abnormal vibration is detected.

7.5 Operational Safety and Emergency Protocols

Essential Requirements

- 7.5.1 The tower crane operation shall be able to switch from the remote-control mode to the conventional on-board operation mode at any time, and these two modes cannot control and operate the crane simultaneously.
- 7.5.2 Anti-collision measures shall be implemented when two or more tower cranes operate within the same site, in accordance with the Code of Practice for Safe Use of Tower Cranes.
- 7.5.3 When onsite hazards are identified (such as those from tower crane alert systems, anti-collision systems and AI-based camera analytical systems), audible and visible warnings shall be automatically issued to alert tower crane operator and the site personnel around the danger zone.
- 7.5.4 The RCTCS shall be equipped with a fail-safe system: When the design limit of latency of signal transmission is exceeded or the power supply is interrupted, the tower crane shall at once cease its operation automatically, with the option to switch from remote-control mode to conventional on-board control mode. Audible and visual warnings shall be issued to the operator, and the tower crane shall be returned to a stationary state under safe conditions.
- 7.5.5 An uninterruptible power supply shall be automatically activated upon unexpected power outages, surges and voltage fluctuations, such that all RCTCS components can operate for at least 30 minutes under safe working load.
- 7.5.6 A dedicated power supply circuit, independent of other devices on the construction site, shall be provided for the RCTCS such that power interruption of other onsite devices shall not affect the RCTCS.
- 7.5.7 The warning records shall be kept for inspection for at least 3 months.
- 7.5.8 Appropriate rest breaks shall be implemented for the operator, in accordance with Clause 3.3 of A Health Guide on Working with Display Screen Equipment (9/2009-1b-OHB86).

Best Practices

- 7.5.9 Different alert thresholds shall be configured to issue various levels of audible/visual warnings before the signal transmission latency approaches the design limit.
- 7.5.10 Devices for monitoring the operator's health during lifting operations shall be adopted, such as smart wearables.

7.6 Remote-Control Interface

Essential Requirements

- 7.6.1 Each operating console shall be exclusively connected to one tower crane at all time, with the unique identifier of that particular tower crane indicated on the display screen. If the operating console is re-configured to connect another tower crane, a full inspection in accordance with Clause 7.8.7 of this specification shall be conducted prior to any actual operations.
- 7.6.2 The control devices and functions of the operating console shall be consistent with those of the conventional on-board control, including control levers and joysticks designed in accordance with the Code of Practice for Safe Use of Tower Cranes and BS EN 13557-2024.
- 7.6.3 The operating interface shall be equipped with adequate displays to provide unobstructed, smooth and real-time images, monitoring data and alerts of the lifting operations. The operating interface shall have a total display area at least equivalent to 3 x 43-inch monitors. Such display monitors shall provide at least 4K resolution.
- 7.6.4 The displays shall be able to split into multiple sub-views to display such information simultaneously. The optimal number and layout of the sub-views shall be determined and implemented, such that the operator can immediately see particular information without extra actions, and easily interpret the tower crane's status.
- 7.6.5 The operating interface shall continuously display information that assist the operator in performing lifting operations, including but not limited to:
- (a) live video streams of the camera system specified in Section 7.3 of this specification;
 - (b) real-time measurements of the sensing system specified in Section 7.4 of this specification;
 - (c) any audible and visual warnings specified in Sections 7.4 and 7.5 of this specification.

7.6.6 The data processing server shall provide a standardized application programming interface (API) to enable data sharing with other management systems onsite, including but not limited to video feeds and alerts/warnings generated.

Best Practices

7.6.7 The synchronization of camera videos to the display screens shall be optimized, such as adopting efficient video encoding, transmission and rendering pipelines, to ensure seamless perception and precise control operations by the operator.

7.7 Data Security

Essential Requirements

- 7.7.1 All the remote-control lifting images, monitoring data and alert information shall be stored properly in a data recorder for inspection. Video footage recordings shall be retained for at least 30 days.
- 7.7.2 Other data, including but not limited to the sensor data and warning records respectively in Section 7.4 and Section 7.5 of this specification, shall be retained for at least 3 months.
- 7.7.3 Storage backups shall be provided to prevent data loss due to single point of failure.
- 7.7.4 Security measures shall be implemented to prevent unauthorized access or modification of the data, such as data encryption upon transmission and storage.
- 7.7.5 Access to the data stored in the RCTCS shall be restricted to authorized personnel only.

Best Practices

- 7.7.6 Regular training shall be provided to site personnel to enhance their awareness of data security and relevant measures that shall be followed.

7.8 System Design, Testing and Maintenance

Essential Requirements

- 7.8.1 The design, production, installation and acceptance of the RCTCS shall not affect the operational conditions of the conventional tower crane.
- 7.8.2 The appointed RCTCS provider must have obtained approval from the relevant tower crane manufacturer or its duly authorized agent before making any modifications to the existing operating system.
- 7.8.3 Documentation of all modifications shall be maintained and made available for inspection.
- 7.8.4 All the RCTCS components shall be checked by the RCTCS provider before delivering onto a workplace, with documentation of the checking results.
- 7.8.5 Prior to any actual operations, onsite user acceptance test shall be conducted under remote control mode on the workplace, by the RCTCS provider and the site contractor.
- 7.8.6 Routine checks shall be conducted by a competent person at the beginning of each shift or working day, in accordance with the Code of Practice for Safe Use of Tower Cranes. The site contractor shall devise a checklist that cover the items per the recommendations of the RCTCS provider, including but not limited to:
 - (a) The signal transmission latency shall not exceed the design threshold (at most 100ms);
 - (b) The network for the RCTCS shall be stable;
 - (c) The fail-safe system shall be functioning properly;
 - (d) The switching from remote-control mode to conventional on-board operation mode shall be functioning properly;
 - (e) The access control measures shall be functioning properly to prevent unauthorized entry into the cabin;
 - (f) The working conditions inside the cabin shall be normal;
 - (g) The certificate of the operator for the particular RCTCS shall be valid.

7.8.7 A full inspection shall be carried out by a competent person at least once a week, in accordance with the Code of Practice for Safe Use of Tower Cranes. The site contractor shall devise a checklist that cover the items per the recommendations of the RCTCS provider, including but not limited to:

- (a) Check if the RCTCS cabin has any damage;
- (b) Check if the control joystick is positioned in a stable state before turning on the RCTCS;
- (c) Check if the power lines and connection parts have any damage;
- (d) Check if the RCTCS can be powered on and off normally;
- (e) Check if the network connection has any abnormal interruptions;
- (f) Check if the parameter settings are correct;
- (g) Check if there are any abnormal alarm messages;
- (h) Check if the RCTCS response and tower crane movement are normal, by performing simple operations such as lifting/lowering and rotating.

The competent person engaged in such inspection shall have received training on relevant aspects including but not limited to: operation of the remote-control system, network architecture and system stability, emergency procedures for handling crane malfunctions or system errors, inspection and maintenance protocols for both the remote-control interface and the networking hardware.

7.8.8 The RCTCS and its related equipment shall be regularly and comprehensively tested, inspected and properly maintained and repaired to ensure their safety and reliability. Test and examination of the tower crane shall be conducted by a competent examiner, in accordance with the Code of Practice for Safe Use of Tower Cranes, to verify that the tower crane can operate safely in both remote-control mode and conventional on-board control mode.

7.9 Training and Qualification

Essential Requirements

- 7.9.1 The RCTCS operators shall meet the requirements of tower crane operator as described in the Code of Practice for Safe Use of Tower Cranes.
- 7.9.2 The RCTCS operators shall possess valid Certificate of Crane Operator (Type of Crane: Tower Crane) issued under the Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations issued by the Hong Kong Construction Industry Council or by any other person specified by the Commissioner for Labour. For particular RCTCS, the operators shall also possess valid certificate in accordance with Clause 7.9.3 below.
- 7.9.3 The RCTCS operators shall have received adequate and specific training for the particular RCTCS provided by the RCTCS provider or its duly authorized agent, including:
- (a) At least 24 hours of offsite training, including:
 - i) Theoretical learning courses;
 - ii) Practical trial operations in training grounds;
 - iii) Competency assessment, with written test and practical test;
 - (b) Satisfactory completion of at least 16 hours of onsite training, including trial operations of the particular RCTCS on the construction site under supervision by another experienced operator of the particular RCTCS.

For (a) - offsite training, it can alternatively be provided by the Hong Kong Institute of Construction. A valid certificate shall be issued by the training party upon completion of offsite training.

- 7.9.4 The operators shall complete the refresher training by the particular RCTCS provider at appropriate intervals, pursuant to the recommendation of the particular RCTCS provider or its duly authorised agent.

8 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited shall apply. For undated references, the latest edition of the referenced document, including any amendments, shall apply.

1. Alliance of Industrial Internet – AII/010-2023 Application scenarios and technical requirements of 5G+ industrial internet for port;
2. British Standards Institution – BS EN 13557:2024 Cranes - Control devices and control stations;
3. British Standards Institution – BS EN 14439:2006 Cranes: Safety: Tower Cranes;
4. Buildings Department of HKSAR Government – Code of Practice for the Structural Use of Steel 2011 (2023 Edition);
5. Buildings Department of HKSAR Government – Code of Practice for Site Supervision 2009 (2024 Edition);
6. Development Bureau of HKSAR Government – Technical Circular (Works) No. 3/2023: Smart Site Safety System;
7. Development Bureau of HKSAR Government – Technical Circular (Works) No. 9/2025: Adoption of Construction Robots;
8. Development Bureau of HKSAR Government and the Hong Kong Construction Industry Council – Lifting Safety Handbook (published in 2020);
9. Electrical and Mechanical Services Department of HKSAR Government – Code of Practice for the Electricity (Wiring) Regulations;
10. Electricity Ordinance (Cap. 406);
11. Electricity (Wiring) Regulations (Cap. 406E);
12. Factories and Industrial Undertakings (Electricity) Regulations (Cap. 59W);
13. Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations (Cap. 59J);
14. Factories and Industrial Undertakings Ordinance (Cap. 59);
15. GB/T 45163.1-2024 Lifting appliances—Intelligent systems—Part 1: Vocabulary and classification;
16. GB/T 28181-2022 Technical requirements for information transmission, switch and control in video surveillance networking system for public security;
17. GB/T 28264-2017 Lifting appliances—Safety monitoring system;
18. GB/T 37366-2019 Tower crane safety monitor system and data transmission specifications;

19. International Organization for Standardization – EN ISO 9241-5:2024 Ergonomics of human-system interaction — Part 5: Workstation layout and postural requirements;
20. Labour Department of HKSAR Government – Code of Practice for Safe Use of Tower Cranes (2011 Edition);
21. Labour Department of HKSAR Government – Safety Requirements for the Use of Remote-control Tower Crane System;
22. Labour Department of HKSAR Government – A Health Guide on Working with Display Screen Equipment (9/2009-1b-OHB86);
23. Labour Department of HKSAR Government – Guidance Notes on Inspection, Thorough Examination and Testing of Lifting Appliances and Lifting Gear (2001 Edition) (6/2001-1-B103);
24. Ministry of Industry and Information Technology – YD/T 4778-2024 Overall technical requirements for 5G-based remote control driving information interaction system;
25. Ministry of Industry and Information Technology – YD/T 4783-2024 Technical requirements for audio and video transmission of remote control driving information interaction system based on 5G;
26. Occupational Safety and Health Ordinance (Cap. 509);
27. Telecommunications Ordinance (Cap. 106).