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Approvals			
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Reviewed By	[Name]	Click or tap to enter a date.	[Signature]
Reviewed By	[Name]	Click or tap to enter a date.	[Signature]
Approved By	[Name]	Click or tap to enter a date.	[Signature]

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2 PURPOSE

- 2.1.1.1 To detail the requirement for lifting throughout the organization
- 2.1.1.2 This document defines the minimum standard requirements for lifting. Additional client or authority requirements, if any, will be included in the task specific method statement and risk assessment for the activity

3 RESPONSIBILITY

- 3.1.1.1 Corporate QHSE Manager is responsible for ensuring that this procedure is suitable to be implemented across the organization
 - 3.1.1.2 Project Manager is responsible for ensuring the procedure is implemented on their project
 - 3.1.1.3 Project HSE Lead is responsible for supporting the Project Manager in ensuring this procedure is implemented
 - 3.1.1.4 Construction Manager, Project Engineer, Site Engineer, Foremen and Group Leaders are responsible for implementing this procedure
 - 3.1.1.5 All employees shall be empowered to STOP any unsafe or non-complying work activity
- 3.2 Project Manager
- 3.2.1.1 Accountable for the operational planning, and implementation of this procedure.
 - 3.2.1.2 Shall ensure that their project is assigned with the appropriate resources to fulfil this plan (number of Lifting Appointed Persons, Lifting Supervisors, Riggers, etc.)
 - 3.2.1.3 Shall establish and maintain a direct line of communication with the Project HSE Lead
 - 3.2.1.4 Shall monitor the site operation to ensure they are conducted in accordance with this procedure and take urgent and appropriate action to prevent unsafe working practices or other infringements



3.3 Construction Manager, Project Engineer & Site Engineer

- 3.3.1.1 Shall ensure that everyone, including subcontractors, comply with the requirements of this procedure
- 3.3.1.2 Shall ensure all-necessary work procedures, method statements and work instructions are prepared, reviewed, and issued
- 3.3.1.3 Shall monitor the site operation to ensure they are conducted in accordance with this procedure and take urgent and appropriate action to prevent unsafe working practices or other infringements.
- 3.3.1.4 Shall establish and maintain a direct line of communication with the HSE Lead
- 3.3.1.5 Provide the lifting crew with accurate information about the loads that are to be lifted
- 3.3.1.6 Shall not permit the operation of any plant unless both the plant and operator are suitably certified, confirm by HSE staff
- 3.3.1.7 Shall ensure that periodic test; inspections and maintenance on plant and machinery are carried out as per safety staff recommendations.

3.4 Foreman & Group Leader

- 3.4.1.1 Shall be familiar with the safety procedures stated in this procedure relating to the work to be carried out under their supervision.
- 3.4.1.2 Shall ensure that their crew receive clear instructions relating to the work that they are carrying out by conducting pre-task briefings for all work
- 3.4.1.3 Shall ensure that the workplace is maintained in a safe and tidy condition
- 3.4.1.4 Shall deliver toolbox talks
- 3.4.1.5 Shall take prompt action to rectify unsafe conditions.
- 3.4.1.6 Shall provide full co-operation to the HSE staff and comply with their recommendations
- 3.4.1.7 Notify the Lifting Supervisor of all the lifts they have planned for their work
- 3.4.1.8 Provide the lifting crew with accurate information about the loads that are to be lifted



3.5 Lifting Appointed Person

- 3.5.1.1 Ensure the appropriate planning of all lifting operations
- 3.5.1.2 Ensure that a lifting plan is prepared and regularly updated
- 3.5.1.3 Provide advice and guidance to riggers and lifting equipment operators on the identified safe system of work
- 3.5.1.4 Develop a schedule of common lifts detailing the means of lifting common loads on the site
- 3.5.1.5 Develop a procedure to ensure that where special lifts are undertaken, arrangements are in place to ensure that lifting operations can be carried out safely

3.6 Lifting Supervisor

- 3.6.1.1 Ensure the appropriate planning of all lifting operations
- 3.6.1.2 Provide advice and guidance to riggers and lifting equipment operators on the identified safe system of work
- 3.6.1.3 Report any incompetent or unsafe behaviour from the Rigger or Operator
- 3.6.1.4 Stop any condition or situation immediately that could affect lifting operations being undertaken safely
- 3.6.1.5 Visually inspect all lifting accessories to be used on a daily basis and dispose of any damaged items
- 3.6.1.6 Ensure that lifting accessories are used in accordance with the lifting plan and their individual Safe Working Load (SWL)
- 3.6.1.7 Take reasonable care to ensure that neither lifting equipment or lifting accessories are overloaded or used incorrectly
- 3.6.1.8 Conduct weekly detailed inspections of lifting equipment and accessories and recorded formally in the Lifting Equipment & Accessory Inspection Register



3.7 Rigger (Signaller / Slinger)

- 3.7.1.1 Report any condition or situation immediately that could affect lifting operations being undertaken safely
- 3.7.1.2 Visually inspect lifting accessories prior to each use and immediately report any damage or suspicion of damage to the employer
- 3.7.1.3 Not use any damaged or defected lifting equipment or undertake any lifting operations that are not safe
- 3.7.1.4 Ensure that lifting accessories are used in accordance with the lifting plan and their individual Safe Working Load (SWL)
- 3.7.1.5 Suspend immediately any lifting operation where there is a loss of and/or breakdown in communication with the operator of the lifting equipment
- 3.7.1.6 Set up exclusion zones where lifting operations are being carried out
- 3.7.1.7 Take reasonable care to ensure that neither lifting equipment or lifting accessories are overloaded or used incorrectly

3.8 Operator

- 3.8.1.1 Carry out the lift safely in coordination with the riggers
- 3.8.1.2 Daily visual inspections of lifting equipment
- 3.8.1.3 Ensure safety critical devices on lifting equipment are not bypassed



3.9 HSE Lead

- 3.9.1.1 Shall conduct site visits and inspections for monitoring of HSE compliance as per this procedure
- 3.9.1.2 Shall carry out audits to ensure the effective implementation of this procedure
- 3.9.1.3 Shall prepare and deliver training programs on the topic of safe lifting
- 3.9.1.4 Shall prepare and update the emergency response plans to include lifting operations
- 3.9.1.5 Shall conduct emergency response drills relevant to lifting
- 3.9.1.6 Shall check all work procedures and method statements before the activity is commenced to ensure that safety aspects (risks/hazards) of the operations are covered.
- 3.9.1.7 Shall issue non-conformance reports for serious irregularities observed on site
- 3.9.1.8 Shall red flag to the Project Manager any unsafe acts or conditions that may lead to incident

3.10 HSE Advisors

- 3.10.1.1 Report to the HSE Lead
- 3.10.1.2 Shall identify and record unsafe acts and conditions (hazards) and monitor their closeout
- 3.10.1.3 Shall deliver training programs on the topic of safe lifting
- 3.10.1.4 Shall carry out audits to ensure the effective implementation of this procedure
- 3.10.1.5 Shall conduct emergency response drills relevant to lifting
- 3.10.1.6 Shall check all work procedures and method statements before the activity is commenced to ensure that safety aspects (risks/hazards) of the operations are covered
- 3.10.1.7 Shall issue non-conformance reports for serious irregularities observed on site
- 3.10.1.8 Shall red flag to the HSE Lead any unsafe acts or conditions that may lead to incident



3.11 All Personnel / Workers

- 3.11.1.1 Every person employed on the project is legally required to take reasonable care for the health and safety of themselves and others that may be affected by their actions or omissions at work
- 3.11.1.2 Co-operate with their employer to enable them to comply with the requirements of the project
- 3.11.1.3 No person shall intentionally or recklessly interfere with or misuse anything provided for safety, health or welfare under the relevant statutory provisions
- 3.11.1.4 All personnel shall wear or use the appropriate safety equipment or clothing and use the appropriate safety devices
- 3.11.1.5 All personnel shall be familiarized with the relevant parts of this procedure that are relevant to their scope
- 3.11.1.6 All personnel shall report any accidents and damage to property or equipment to their immediate supervisor, irrespective of whether persons are injured
- 3.11.1.7 All personnel are encouraged to make suggestions to improve health and safety to their supervisor and the HSE staff

4 COMPETENCE & TRAINING

4.1 Lifting Appointed Person

- 4.1.1.1 Holder of an Engineering Qualification
- 4.1.1.2 Have minimum 5 years of experience with lifting equipment
- 4.1.1.3 Have previous experience in the use of similar types of cranes being used on the project
- 4.1.1.4 Must have a valid Lifting Appointed Person training from a third party
- 4.1.1.5 Appointment of the Lifting Appointed Person must be in writing



4.2 Lifting Supervisor

4.2.1.1 Must be able to read and write

4.2.1.2 Confidently read load charts

4.2.1.3 Have previous experience in the use of similar types of cranes being used on the project

4.2.1.4 Must have a valid Lifting Supervisor certificate from an approved third-party training provider

4.2.1.5 Passed the internal Lifting Supervisor assessment by the organization's Corporate HSE Department

4.3 Rigger (Signaller / Slinger)

4.3.1.1 Carry out rigging and signalling duties during lifting operations

4.3.1.2 Must have a valid Rigger (Signaller / Slinger) certificate from an approved third-party training provider

4.3.1.3 Passed the internal Rigger assessment by organization's Corporate HSE Department

4.3.1.4 Must be at least 18 years of age

4.3.1.5 Medically fit for the purpose, with particular emphasis on eyesight, hearing and speaking

4.3.1.6 Has an aptitude for judging distances and heights

4.3.1.7 Capable of selecting lifting gear slings suitable for the loads to be lifted

4.3.1.8 Capable of directing the safe movement of the crane and its load to maintain the safety of all personnel

4.3.1.9 Trained in hand-signalling and capable of giving clear and distinct instructions over the radio

4.3.1.10 Capable of determining the safe areas of storage



4.4 Operator

- 4.4.1.1 Must be at least 18 years of age
- 4.4.1.2 Possesses a valid license for operating cranes according to the authority requirements
- 4.4.1.3 Medically fit for the purpose, with particular emphasis on eyesight, hearing and speaking
- 4.4.1.4 Trained and physically capable of operating the crane controls
- 4.4.1.5 Trained in hand-signalling
- 4.4.1.6 Holds a qualifying and training certificate issued by recognized organization approved by the authority

5 LIFTING ESSENTIALS

5.1 Lift Planning & Supervision

- 5.1.1.1 All lifts shall be planned
- 5.1.1.2 Depending on the weight and complexity of the lift, different levels of planning and documentation are required as per below:

	Simple Lift Rigging Sheet	General Lifting Plan	Special Lifting Plan
Loads below 10 Ton	Yes	Yes	No
Loads greater than 10 Ton	No	No	Yes
Lifts that are greater than 75% of the Lifting Equipment's SWL	No	No	Yes
Tandem Lifts	No	No	Yes
Lifts using Luffer Configuration	No	No	Yes

- 5.1.1.3 Each work site will have a General Lifting Plan which includes a schedule of common lifts
- 5.1.1.4 Special Lifts are:
 - Lifts above 10 ton



- Lifts that use 75% or more of the lifting equipment's SWL
- Tandem Lifts
- Lifts using Luffer Configuration

5.1.1.5 Special Lifts shall require the preparation of a Special Lifting Plan for each type of lift

5.1.1.6 Any lift that is greater than 5 Ton requires a Lifting Supervisor to be physically present during the lifting operation

5.1.1.7 Any Special Lift requires a Lifting Supervisor to be physically present during the lifting operation

5.2 Risk Assessment

5.2.1.1 All work sites shall conduct risk assessments prior to any lifting operations

5.2.1.2 Risk assessments shall consider the following:

- Competency requirements of operators / riggers / signallers
- Lifting equipment and accessories testing and certification requirements
- Unauthorized use of lifting equipment
- Failure of lifting equipment or lifting accessories
- Load being dropped whilst suspended
- Unstable ground conditions
- Collision of lifting equipment where 2 or more devices are being used in proximity to each other
- Visibility
- Lifting of people
- Communication
- Fatigue
- Employees being struck by the load or lifting equipment
- Striking overhead power cables or other services
- Falls during the erection of cranes
- Manual handling risks associated with lifting and moving heavy equipment
- Health risks from oils, solvents, and greases
- Contact with moving machinery parts during maintenance



5.3 Lifting Plan Requirements

5.3.1.1 Lifting plans shall be prepared for any special lifts

5.3.1.2 A General Lift Plan shall be prepared for all the common lifts which do not meet the above conditions

5.3.1.3 General Lift Plans shall include a Schedule of Common Lifts which shall include the following information:

- Load Description
- Estimated Weight
- Sling Type
- Number of Legs
- Sling Capacity

5.3.1.4 Lifting plans shall include:

- Details of the person in overall charge of all lifting operations (the Appointed Person), including relevant experience of this person in planning lifting operations
- A list of responsibilities of those involved in lifting operations, including the person in overall control, crane operators and riggers
- Overview procedure detailing how lifting operations shall be planned, supervised, monitored, and reviewed
- Details of the crane(s) capacities at various radius
- Diagrammatic representation / Sketch of the lift – including equipment and personnel placement, distances, maximum weight capacity, radii and over relevant measurements
- Copies and a register of all crane operator competency certificates issued by an approved third-party training provider
- Copies and a register of all rigger competency certificates issued by an approved third-party training provider
- Copies of all test certificates for the lifting equipment and accessories to be issued by a third-party engineer
- A schedule of common lifts to be undertaken by the crane detailing what is to be lifted, weight of a load, and how connection between the load and the crane shall be made
- A written procedure detailing how special lifts shall be planned to ensure they can be carried out safely
- A written procedure detailing the planned maintenance requirements of each type of crane and the inspections and checks that shall be carried out
- Copies of all risk assessments undertaken for crane lifting operations

5.3.1.5 A Lifting Plan template has been prepared and can be used: *HSETB-XXX-XXXX Lifting Plan (template)*



5.4 Communication

- 5.4.1.1 The agreed means of communication shall be documented in the Lifting Plan
- 5.4.1.2 Where hand signals are used as the means of communication the rigger shall be within easy viewing distance of the crane operator. Where there is no clear line of site between the rigger and the crane operator, radio communication shall be used
- 5.4.1.3 On tower cranes where the driver cab is more than 35 meters from the ground level, radio communication shall be the mandatory means of communication between the crane operator and the rigger
- 5.4.1.4 Only the appointed rigger shall communicate with the crane operator
- 5.4.1.5 Crane operators shall be instructed not to accept signals from any person other than the appointed rigger

5.5 Wind Speed

- 5.5.1.1 Each worksite shall ensure that an anemometer is available to measure wind speed
- 5.5.1.2 Each worksite shall ensure that windsocks are available in the laydown area
- 5.5.1.3 HSE Advisors are required to obtain daily meteorological reports of the area where cranes are being used and this shall be communicated to the lifting crew
- 5.5.1.4 In all cases, lifting operations shall cease when the recorded wind speed reaches or gusts more than 38 km/h (20.5 knots)

5.6 Maintenance

- 5.6.1.1 The Plant department shall maintain all lifting equipment as per the planned preventive maintenance procedures which shall be based on the manufacturer recommendations
- 5.6.1.2 The Plant department shall maintain a log of maintenance that has been conducted on the lifting equipment
- 5.6.1.3 Maintenance records shall be maintained for 2 years



5.7 Documentation

- 5.7.1.1 Every crane shall have the following documentation available in the cab
- Manufacturer's operating manual
 - Load chart (the following shall be indicated on the load chart: crane make, model, year of manufacturing, serial number)
 - Crane operating speeds
 - Operating limits (wind)

6 THOROUGH EXAMINATION AND TESTING

6.1 Lifting Equipment

- 6.1.1.1 All lifting equipment shall be thoroughly examined and tested at least every 12 months by a third-party inspection body that employs approved engineers (approval by Ministry of Labour)
- 6.1.1.2 Lifting equipment that is used to carry persons shall be thoroughly examined every 6 months
- 6.1.1.3 Lifting Equipment with variable radius will have a maximum SWL test carried out at least once in every 4 years in line with the manufacturer's instructions
- 6.1.1.4 Lifting Equipment shall be thoroughly examined and tested before they are brought into service after being erected in a new location (e.g. Tower cranes) or after a modification is made to any structural component of the crane (e.g. Adding jib sections to a crawler crane)
- 6.1.1.5 Lifting Equipment that has exceeded 25 years of service must have a certificate confirming the quality and safety of the equipment from the manufacturing company in addition to a non-destructive test for the complete structure
- 6.1.1.6 Test certificates for cranes shall include a special item concerning the crane foundation, specifying that it has been erected according to the recommendation of the manufacturing company



6.2 Lifting Accessories

6.2.1.1 Lifting accessories must be thoroughly examined by an approved third-party engineer at least every 6 months

7 INSPECTION OF LIFTING EQUIPMENT AND LIFTING ACCESSORIES

7.1.1.1 All worksites shall maintain a QHSE-0409-02 Lifting Equipment & Accessory Inspection Register

7.1.1.2 Weekly inspections need to be recorded in the QHSE-0409-02 *Lifting Equipment & Accessory Inspection Register*

7.1.1.3 Inspections shall be carried out accordingly:

	Daily		Weekly	
	Lifting Equipment	Lifting Accessories	Lifting Equipment	Lifting Accessories
Rigger		X		X
Operator	X		X	
Lifting Supervisor	X		X	X
HSE Advisor			X	X



8 LIFTING EQUIPMENT SPECIFIC REQUIREMENTS

8.1 General Requirements

- 8.1.1.1 Every drum or pulley which the chain or wire rope of any lifting equipment is carried shall be of suitable diameter and construction for the chain or rope used. At least two full wraps shall remain on the drum when the boom point is at the ground level
- 8.1.1.2 All moving parts in cranes (belts, gears, pulleys) must be guarded from employee contact
- 8.1.1.3 Accessible areas within the swing radius of the crane swing radius area shall be barricaded
- 8.1.1.4 When working near excavation works (trenches), a safe distance of one and half the depth of the trench shall be maintained between the crane and edge of the trench to make sure that lateral pressure shall not occur on the trench walls
- 8.1.1.5 Control handles, levers, switches shall be marked to show what they are for and how they should be operated
- 8.1.1.6 All cranes shall be equipped with an automatic safe load indicator with a visual warning which shall provide a visual warning to the operator and an audible warning to those in the vicinity
- 8.1.1.7 Cranes must be operated on a stable and level base. If the ground is soft or not level, all precautionary measures shall be taken to ensure the stability of the crane, including the use of outrigger pads
- 8.1.1.8 When handling long or large loads, a tag line shall be used to direct the load into position and prevent it from spinning
- 8.1.1.9 No crane which has any timber structural member shall be used
- 8.1.1.10 Lifting Equipment shall follow the local aviation authority rules for warning lights. As a minimum, any lifting equipment that reaches over 30m in length must have a warning system installed
- 8.1.1.11 Walking under a suspended load is strictly prohibited and is considered a terminable offense
- 8.1.1.12 Cranes shall only be erected by specialized companies competent and authorized to do so in their respective regions
- 8.1.1.13 Lightning protection systems shall be installed and maintained for all types of cranes



8.1.1.14 Lifting equipment must have the windows free of broken or cracked glass, or any other means of obstructing vision.

8.2 Truck Mounted Mobile Cranes

8.2.1.1 Truck mounted mobile cranes shall be set up on ground that is level, stable and compacted

8.2.1.2 Where truck mounted mobile cranes are to be set up near excavations, culverts, made-up-ground or close-by to building foundations, a competent engineer shall be consulted for advice on crane location and control measures to be taken

8.2.1.3 Outrigger and base plates shall always be used with truck mounted mobile cranes in accordance with the manufacturers operating manual

8.2.1.4 The area around the truck mounted mobile crane shall be set up as an exclusion zone for all unnecessary personnel

8.2.1.5 Control measures shall be implemented to eliminate the risk of crushing persons between the counterweight and any other surface during slewing operations

8.2.1.6 Truck mounted mobile cranes shall never be used free-on-wheels to move loads around the site unless specifically permitted and detailed in the manufacturer's operating manual

8.2.1.7 When left unattended, truck mounted mobile cranes shall be switched off and the key shall be removed from the ignition to isolate the crane

8.2.1.8 Safe access for the truck mounted mobile crane operator shall be provided and the area around where the crane is used shall be kept clear of obstruction

8.2.1.9 Windows and windscreen shall be maintained in good condition, if glass is broken the crane shall be taken out of service until it can be repaired



8.3 Crawler Cranes

- 8.3.1.1 Whilst crawler cranes are tracking the jib shall be reduced to the minimum radius
- 8.3.1.2 Where work on the jib is carried out such as adding or removing sections and the jib is laid flat in the horizontal position, it shall be appropriately supported with props to prevent collapse
- 8.3.1.3 Crawler crane tracks shall be regularly maintained in accordance with the manufacturer's operating manual
- 8.3.1.4 Barriers and warning signs shall be set up around crawler cranes to prevent personnel accessing areas where lifting operations are being carried out



8.4 Mobile Elevating Work Platforms

- 8.4.1.1 Operators of MEWPs shall be trained and competent to use the equipment
- 8.4.1.2 The training given shall be specific to the type of equipment the person is operating and shall be in accordance with internationally recognized training such as The International Powered Access Federation (IPAF) or Powered Access License (PAL), or equivalent
- 8.4.1.3 MEWPS shall be subject to a 6-month thorough examination and testing
- 8.4.1.4 Safety harness shall be always worn by employees working from the platform of a MEWP
- 8.4.1.5 MEWPs shall only be used when the ground conditions are favorable for this type of device
- 8.4.1.6 Step ladders or hop-ups shall never be used from the working platform of a MEWP
- 8.4.1.7 Employees shall not be allowed to leave the working platform whilst in an elevated position, e.g., climbing off the platform to gain access to an elevated place of work
- 8.4.1.8 Wind speeds shall be monitored, and the wind-off speed shall be in accordance with the manufacturer's instructions
- 8.4.1.9 MEWPs shall have the safe working load of the platform clearly marked on the equipment
- 8.4.1.10 MEWPs shall be fitted with an emergency lowering device in the event of power failure or another malfunction
- 8.4.1.11 Risk assessment shall be prepared for worksites that use MEWPs
- 8.4.1.12 Actions to be taken during an emergency shall be included in the Emergency Response Plan



8.5 Excavators used as Cranes

- 8.5.1.1 Any excavator used as a crane with a safe working load greater than one ton shall have check valves fitted to the boom and outward reach of the excavator arm
- 8.5.1.2 If used as a crane with variable safe working load greater than one ton, the excavator shall be fitted with an automatic safe load indicator
- 8.5.1.3 Excavators used as cranes shall be subject to annual thorough examination and testing requirements
- 8.5.1.4 Lifting shall only be carried out with the excavator arm in the outward reach mode
- 8.5.1.5 Any excavator used as a crane shall have the safe working load clearly marked on the machine or displayed in the cab
- 8.5.1.6 Lifting operations shall be permitted only from the certified lifting point of the excavator boom, under no circumstance are the teeth of an excavator bucket to be used to lift loads



8.6 Tower Cranes

- 8.6.1.1 Crane bases shall be checked and signed off by a competent engineer before the erection of crane mast sections commences
- 8.6.1.2 Only competent tower crane erectors are to be employed in the erection of tower cranes
- 8.6.1.3 All electrical connections to the tower crane shall be made by a competent electrician
- 8.6.1.4 Tower crane erectors shall wear safety harnesses and clip on when working at height
- 8.6.1.5 All erection components such as temporary platforms shall be removed from the crane by the crane erector prior to handover in accordance with the manufacturer's instruction
- 8.6.1.6 A hand over certificate shall be provided by the tower crane erector when the erection work is complete
- 8.6.1.7 Prior to use and after the issuance of the hand over certificate from the crane erector, a full test of the crane shall be undertaken by an approved third-party engineer
- 8.6.1.8 The crane manufacturer's erection and operating manual shall be available on site
- 8.6.1.9 Where an anemometer is fitted to a tower crane, a repeater shall be fitted at the base of the crane or in the project site office
- 8.6.1.10 Rest platforms shall be provided throughout the mast at a frequency of at least every 9 meters. Rest platforms shall be provided with appropriate edge protection
- 8.6.1.11 Where self-climbing tower cranes are used, the climbing section shall be lowered after use in accordance with the manufacturer's instructions
- 8.6.1.12 All the necessary soil tests shall be carried out to ensure that it can support all the loads resulting from the base
- 8.6.1.13 The erection of the base of the crane shall be carried out according to the drawings of the approved consultant engineer and under their supervision. This shall be documented in writing
- 8.6.1.14 White color warning light shall be fitted at the highest point of the crane and another white color light shall be fitted on the crane jib at each end, and then every 4 meters along the jib length



- 8.6.1.15 When the height of a tower crane exceeds the free-standing height determined by the manufacturing company, the crane shall be fixed and anchored to nearby solid structures or buildings in accordance with the regulations of the manufacturing company. At any time the height of the tower crane is adjusted, a new safety certificate must be issued from a third-party company approved by the authority
- 8.6.1.16 The safe working load (SWL) shall be marked at various radii and an indicator shall be fitted which shows the safe working load at each operating radius
- 8.6.1.17 A safe means of access to the crane cabin shall be provided by using a permanent steel ladder fitted with proper cage for fall protection. Rest platforms fitted with proper guard rails shall be provided at every 9 meters vertical intervals
- 8.6.1.18 Gears of the slewing ring shall be protected and fitted in a way to prevent the interference of other elements such as wire ropes and hoisting ropes
- 8.6.1.19 The correct amount of ballast and counterweight must be properly fitted to the crane base as per the manufacturer specification
- 8.6.1.20 When the tower crane is not in use, the brakes shall be activated to prevent the movement of the crane jib by the effect of wind or any other means.

8.7 Gantry Cranes

- 8.7.1.1 Where gantry cranes are used in the same bay and there is the possibility of collision between cranes, an anti-collision system shall be installed
- 8.7.1.2 The rated load of all cranes shall be plainly marked on each side of the crane. If the crane has more than one hoisting unit, each hoist load block shall be marked with its rated load. This marking shall be clearly legible from the ground floor
- 8.7.1.3 Each overhead crane shall have the directions of its bridge and trolley movements displayed on the underside of the crane
- 8.7.1.4 Appropriate lock-out / tag-out system shall be established when equipment is not being used due to inspection discrepancies, on-going maintenance operations or other reasons
- 8.7.1.5 Remove emergency stops are installed for cranes used for critical lifts where the crane operator's view is restricted / obstructed
- 8.7.1.6 During periods of inactivity, the crane operating mechanisms shall be appropriately disabled by the operator (powered off, ignition key removed). Only licensed operators or appointed personal shall be able to power up and operate the crane





8.8 Goods and Passenger Hoists

- 8.8.1.1 Hoists used shall be appropriate for the purpose and erected in accordance with the manufacturers / supplier's recommendation
- 8.8.1.2 Persons involved with erecting hoists shall be competent and experienced in carrying out the work
- 8.8.1.3 Prior to the hoist being used for the first time, a handover certificate is to be provided by the hoist installer and a thorough examination and test of the hoist shall be carried out by an approved third-party engineer
- 8.8.1.4 Hoist mast sections are to be tied to the structure in accordance with the manufacturer's / supplier's recommendations
- 8.8.1.5 Safety devices are provided to prevent the over-run of the hoist at the top of the mast section
- 8.8.1.6 The hoist base is securely fenced to prevent persons being struck by the descending hoist
- 8.8.1.7 Material hoists are used only for the carriage of materials, it is strictly prohibited to carry persons on hoist designed only for material use
- 8.8.1.8 Landing points shall as far as reasonably practicable be provided with interlocking gates fitted at each level
- 8.8.1.9 The SWL of each hoist shall be clearly marked on the hoist and communicated to the hoist operator
- 8.8.1.10 Hoist operators shall be trained on safe working procedures for the hoists they are operating
- 8.8.1.11 Passenger hoist shall be thoroughly examined and tested every six months
- 8.8.1.12 The hatch in the roof of a passenger hoist shall be kept closed and where reasonably practicable be fitted with an interlock to prevent the hoist being used with the hatch in the open position
- 8.8.1.13 Under no circumstance shall materials be allowed to protrude through the open hatch in the roof of passenger hoists
- 8.8.1.14 Third-party certificate shall be posted inside the cabinet
- 8.8.1.15 Gates shall be fitted in the enclosure at all landing places and shall normally be at least 2 meters high, covered with proper mesh for clear viewing and these gates shall be opened only by the hoist operator from outside



- 8.8.1.16 A warning notice should be posted on the hoist gates requesting that the gates remain closed. No persons shall be carried by the hoist unless it is provided with a cage and the following conditions are met:
- Constructed with cage gate with interlocking arrangements to prevent the occupants falling out or from being trapped between any part of the cage and the fixed structure or moving part. The ceiling of the cage shall be constructed from materials that prevent being struck by falling material
 - Every hoist enclosure shall be fitted with interlocking gates at landing places
 - Every hoist used for carrying persons shall be provided with an over-run device (limit switch) at the bottom and top of the hoist way, which automatically stops the hoist if it exceeds the pre-determined travel limits



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- 8.8.1.17 Gates shall be provided with electrical or mechanical locking devices, so that the gates cannot be opened except when the cage is at the landing stage, and so that the hoist cannot be operated unless that gate is closed and the lock is in the shut position
- 8.8.1.18 Hoists must be fitted with an emergency brake to stop the fully loaded platform or cage in the event of failure of the hoist rope or driving gear. The hoist must be stopped completely within a fall distance not exceeding 3 meters or according to the manufacturer recommendations
- 8.8.1.19 Hoists shall only be operated from one position from inside the cage, if for any reason the cage stops between landing stages, it should be isolated electrically from outside to prevent any possibility of further movement and remove trapped persons from the cage safely
- 8.8.1.20 All hoists shall be provided with stoppers from the top and bottom to prevent the cage from exceeding the pre-set top position or the pre-set bottom position by more than 100-200 mm
- 8.8.1.21 Adequate lighting shall be provided inside the cage, outside the cage and at all the entrances and exits
- 8.8.1.22 An adequate space shall be maintained from the upper side of the cage when at its highest position to provide a free travel path if the cage over-runs the upper landing level. Also, adequate space shall be maintained from the underside of the cage for the same purpose
- 8.8.1.23 Overhead protective covering shall be provided above the overhead work of all hoists to prevent objects falling down the shaft way
- 8.8.1.24 Proper shock absorber (springs) shall be erected at the bottom of the hoist shaft to absorb any shock should the hoist falls
- 8.8.1.25 Personnel hoists used to carry material shall only be allowed to do so if the following conditions are met:
- No personnel shall be allowed to ride the cage with the material except the operator
 - Hazardous or flammable materials shall not be allowed inside the personnel hoist
 - The safe working load of the hoist must never be exceeded
 - The loads shall be distributed uniformly, and materials shall not be stacked to the extent that it will collapse



- 8.8.1.26 Speed limit of single speed hoists shall not exceed 0.5 m/second
- 8.8.1.27 Hoist main control panel shall be protected against dust, water and external tampering
- 8.8.1.28 Hoists shall be operated manually when descending and ascending
- 8.8.1.29 Hoist cages shall be provided with a fire extinguisher to be fixed near the door
- 8.8.1.30 When selecting the location of the hoist, if possible, it shall be located away from waste chutes and away from tower crane locations or any other locations that may present a hazard to the hoist users
- 8.8.1.31 The control panel shall be electrically isolated in such a way to prevent the occurrence of any electrical faults or short circuits in the cage or the hoist structure
- 8.8.1.32 Barricade shall be provided at the lowest level of the hoist so that employees do not stand in the travel of the cage
- 8.8.1.33 Signage and instructions shall be provided in Arabic, English and a language that is common to the workers
- 8.8.1.34 Personnel hoist cages shall be provided with proper means of communication to be used in case of emergencies or in case the hoist stops for any reason
- 8.8.1.35 The hoist shall not reverse its direction unless it has completely stopped
- 8.8.1.36 Material hoists shall have a sign that reads “No Riders Allowed” at the cage entrance



8.9 Personnel Platforms

- 8.9.1.1 Cranes carrying personnel platforms shall be fixed on firm footing ground with a uniformity level within 1%
- 8.9.1.2 The total weight of the loaded personnel platform and related rigging shall not exceed 50% of the rated capacity for the radius and configuration of the crane
- 8.9.1.3 The crane operator shall remain at the controls when the crane engine is running, and the platform is occupied
- 8.9.1.4 Personnel platform shall be designed by a third-party qualified engineer or a qualified person competent in structural design
- 8.9.1.5 The personnel platform itself, shall be capable of supporting without failure its own weight and at least 5 times the maximum intended load
- 8.9.1.6 Each personnel platform shall be equipped with standard guardrail system and shall be enclosed at least from the toe-board to mid-rail either solid construction or expanded metal having openings no greater than 13 mm to prevent falling of tools and materials from the platform
- 8.9.1.7 A hand grab shall be installed inside the entire perimeter of the personnel platform
- 8.9.1.8 The personnel platform shall have a permanent plate that indicates the weight of the platform, the rated load capacity or maximum intended load
- 8.9.1.9 Access gates shall be installed and shall not swing outward during hoisting. It shall be equipped with a restraining device to prevent accidental opening
- 8.9.1.10 Personnel platforms shall be inspected before employees use it as follows:
 - The personnel platform is lifted from the ground or to the same level where employees will enter to the platform and move the platform to all places the platform is expected to reach
 - All control and safety devices at the crane and the platform shall be inspected to ensure that they are working properly
 - The crane lifting the personnel platform will be downgraded to 50 percent of its actual capacity to ensure a safe lifting operation
 - All wire ropes shall be inspected to ensure that they are free of any damage or defects and they are wrapped in their correct place around the drum
 - Visual inspection to the crane and the platform shall be carried out by a competent person
 - The platform and rigging shall be proof tested to 125% of the platform's rated capacity in the following cases:
 - When the platform is used for the first time
 - After carrying out any repairs or modifications
 - Before using it to lift personnel



- The test is carried out by loading the platform uniformly by 125% of its capacity and raising it about one meter from the ground and holding it in a suspended position for 5 minutes with the test load evenly distributed on the platform

8.9.1.11 Personnel platform users shall be provided with full harness protection always tied off to the platform

9 LIFTING ACCESSORIES SPECIFIC REQUIREMENTS

9.1 Storage of Lifting Accessories

9.1.1.1 All wire ropes, chains and their attachments when not in use shall be stored on racks in a clean, dry and well-ventilated place, and by hanging them vertically

9.1.1.2 Lifting equipment shall be stored and grouped in accordance to their safe working load (SWL)

9.2 Alloy Steel Chain Slings

9.2.1.1 Alloy steel chain slings shall have permanently affixed identification stating size, grade, rated capacity and sling manufacturer

9.2.1.2 Hooks, rings, welded or mechanical coupling links and other attachments when used with alloy steel chains shall have a rated capacity at least equal to that of the chain

9.2.1.3 Only original components of shackles shall be used to avoid the occurrence of accidents

9.2.1.4 Whenever wear at any point of any chain link exceeds 10% reduction in diameter, the chain shall be removed from service immediately



9.3 Wire Rope Slings

9.3.1.1 Wire ropes shall not be secured by knots

9.3.1.2 When using U-shape clips to form eyes, the U-bolt of all wire rope clips must be applied on the dead end of the rope

9.3.1.3 Appropriately sized thimbles shall be fitted in the eye to protect it from friction

9.3.1.4 Recommended number of clips and spaces of wire clips, as well as the tightening torque is illustrated in below table. The first clip shall be fixed as close to the thimble as possible:

Rope Diameter (mm)	Number of Clips	Min. Spacing (mm)	Tightening Torque (N/m)
5	3	30 mm	2
6.5	3	39 mm	3.5
8	4	48 mm	6
10	4	60 mm	9
13	4	78 mm	33
16	4	96 mm	49
19	4	114 mm	68
22	5	132 mm	107
26	5	156 mm	147
30	6	180 mm	212
34	6	204 mm	296
40	6	240 mm	363



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- 9.3.1.5 Wire ropes shall be lubricated with suitable lubricants recommended by the manufacturer and free of acids and alkalis
 - 9.3.1.6 All wire ropes must be inspected before being used. Any rope showing excessive wear, corrosion, rust or any defect shall be taken out of service
 - 9.3.1.7 Wire ropes used for rigging operations shall have a safety factor of 5 times its safe working load
 - 9.3.1.8 Wire ropes used for hoisting, lowering, or pulling loads shall consist of one continuous piece without any knot or splice
 - 9.3.1.9 Wire rope shall be removed from service if the total number of visible broken wires is 3 in any strand or 6 in any lay
 - 9.3.1.10 Wire rope shall be removed from service if there is any kinking or bird caging
 - 9.3.1.11 Wire rope shall be removed from service if there is wear equal to 10% of the original outside diameter of the wire
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- 9.4 Pulley Blocks
 - 9.4.1.1 Pulley blocks shall be made of anti-impact metal
 - 9.4.1.2 Sheaves shall be made of suitable metal and shall be compatible with the size and diameter of the rope used
 - 9.4.1.3 Pulley blocks must be greased, lubricated and maintained frequently
 - 9.4.1.4 The load line shall be matched properly with the sheaves groove size to avoid the rope from being displaced
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- 9.5 Hooks
 - 9.5.1.1 Hooks must have a safety latch to prevent the displacement of the sling or the load from the hook
 - 9.5.1.2 Hooks used in lifting operations shall be made of formed steel or equivalent



9.6 Shackles

9.6.1.1 Shackles shall be 1.5 times the strength of the wire rope attached to it

9.6.1.2 Shackles used for suspended loads shall be provided with threaded pins to tightly secure it