Lusail Real Estate Development Company

Health, Safety, Security, Environment, Logistics & Quality Department

Lusail Construction Safety Procedural Forms/Checklists – Crane Specifications

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Amendment Record

This document is reviewed to ensure its continuing relevance to the systems and process that it describes. A record of contextual additions or omissions is given below:

Rev .No	Description / Comments	Prepared By	Checked By	Approved By	Issue Date
1	(Pg. 1) Company Propriety Information – Not controlled if printed has been added.	HSE Working Group	Michael Ford	Uwe Krueger	1st April 2015
1	(Pg. 2) Revised Amendment Table	HSE Working Group	Michael Ford Michael Ford	Uwe Krueger	1st April 2015

Crane Specifications

1. CRANE SELECTION AND SET -UP

The operator is responsible for selecting a Crane, Lift, Hoist of sufficient capacity and with appropriate design features to be suitable for the intended lift. The operator shall comply with the manufacturer's specifications and limitations applicable to the operation. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer competent in this field. Such determinations shall be appropriately documented and recorded and available at the job site.

A. *Crane Operator Responsibilities*

At the site, the operator will be responsible for the following:

- The proper placement of the Crane, Lift, Hoist in relationship to the load to be handled and the landing area as to obtain the best rated lift capacity.
- Leveling the Crane, Lift, Hoist to within one (1) degree of level and reassuring the level a minimum of three times during each work shift.
- The proper placement and usage of outriggers.
- The determination of stable or unstable ground or footing. Should additional floats, cribbing, timbers or other structural members be needed, they shall be of proper design and sufficient to uniformly distribute the load.
- The installation and maintenance of Crane, Lift, and Hoist swing radius protection.
- Completion of daily/ monthly inspections

B. *Load Ratings*

The operator will be responsible for making the following determinations

- The operator shall consider the weight of all auxiliary devices such as hoist blocks, headache balls, hooks and rigging as part of the total load. Additionally, the weight of all items added to the load at the site must be determined and added to the total weight.

C. *Operator Qualifications*

Only the following personnel will operate Cranes, Lifts, Hoists

- Designated operators having received training per Governments and manufacturer's requirements. Documentation verifying shall be retained on site and with the operator in equipment cab.
- Designated operators licensed by an approving agency (if required)
- Trainees under the direct supervision of the designated operator.
- Inspectors certified for Crane, Lift, and Hoist inspection.
- Test and Maintenance personnel when necessary.

No one other than the personnel listed above shall be in or on the Crane, Lift, Hoist during operations

D. ***Operating Procedures***

- The operator shall not engage in any practice that may divert attention while engaged in Crane, Lift, Hoist operations, operate the Crane, Lift, Hoist if physically or mentally unfit, taking prescription drugs that may affect judgment, and shall not respond to anyone other than appointed signalman. **EXCEPTION**: The operator shall respond to a stop signal given by anyone.
- The operator shall not permit trainees to make initial lifts. The operator shall perform the first lift to determine lift stability, Crane, Lift, Hoist function, and safety in general.
- The operator shall have final responsibility and control over Crane, Lift, Hoist operations. Whenever there is any doubt as to safety, the operator shall have the authority to stop and refuse to handle loads until safety has been assured.
- The operator shall be familiar with the Crane, Lift, Hoist and its care, the operator's manual and load charts. He shall be responsible for notifying his supervisor of any needed adjustments or repairs, and for documenting his findings on the daily inspection form.
- Upon request the operator shall demonstrate his ability to determine total weight and its relationship to Crane, Lift, Hoist load charts.
- No Crane, Lift, Hoist shall be loaded beyond its rated capacity, except for test purposes under controlled circumstances.
- When loads to be handled are limited by structural competence rather than by stability, the operator and supervisor shall determine concurrently that the weight of the load in known within plus or minus 5 percent before load is lifted.
- Loads shall be attached to the hook by means of slings or other approved devices. Hooks shall have hook safety latches to prevent slings from jumping off the hook.
- The operator shall not suddenly accelerate or decelerate a moving load.

- Neither the hoisting device, nor any part of the load, may contact any obstruction.
- The operator must not swing loads over personnel.
- The operator must not permit the side loading of booms. Lifts shall be limited to freely suspended loads. Crane, Lift, Hoist shall not be used to drag loads sideways.

2. PORTAL, TOWER AND PILLAR CRANES

- The operator's cab of a tower crane, either tower mounted or remote from the tower, must meet the following minimum requirements:
  - Vision: The cab must be designed and constructed to provide the operator a clear and unrestricted view of the load and boom point and as clear a view of the jobsite as possible.
  - Windows: The windows must be constructed of safety glass or equivalent and designed to provide ventilation. Paper, cardboard, or other material cannot be used as a sun block if it restricts the operator's vision in any way.
  - Lock: The cab must be equipped with a lock to prevent unauthorized entry, unless the control unit can be locked separately.
  - Access: The cab must be provided with a means of safe access for the operator. All walking surfaces to and from the cab will be of an anti-slip material and protected with guardrails.
  - Wiper and Defroster: The windshield must be equipped with a windshield wiper and, in cold climates, a heater and defroster must be installed in the cab.
- Luffing boom tower cranes must be equipped with a shock absorbing boom stop of a type that disengages the boom hoist motor and physically stops the boom at a predetermined maximum angle.
- Tower cranes of every configuration must be equipped with limit switches as follows:
  - A hook height limit switch that causes the hoist drum to stop when the load hook reaches a predetermined maximum height below the head block.
  - Trolley limit switches that stop the trolley motion when the trolley reaches a predetermined out or maximum in position.
  - An overload limit switch that causes the hoist drum to stop when the load being hoisted exceeds the maximum rated load for any radius or boom angle or whenever the overturning moment exceeds the rated load moment.
- Tower cranes must have an audible warning device controlled by the operator.
- Safety lines with runners to attach safety belt lanyards must be fitted to tower crane jibs and safety platforms must be installed on trolleys of saddle jibs for safe inspection and maintenance.
- Trolley radius markers clearly visible from the cab must be installed on the jib.
- Outriggers must be used at all times on rubber-tired cranes unless a load is secured for travel.
- All crane hooks must have safety latches and the safety latches must be used properly.
- Substantial mats must be laid down to support cranes being operated on soft ground.

3. OVERHEAD, GANTRY, MONORAIL, AND UNDERHUNG CRANES

- Rail-mounted cranes, trolleys and bridges must be equipped with both switches and rail stops or buffers at each end of the tracks.
- Track-mounted cranes, bridges, and trolleys must be equipped with rail sweeps extending below the top of the rail and effective in all directions of travel.
- Except for floor-operated cranes, a gong or other effective audible warning signal must be installed on cranes with power-traveling mechanisms.
- A height limit switch that causes the hoist drum to stop when the load hook reaches a predetermined maximum height below the headlock will be installed on overhead and gantry cranes.
- Cranes with cable-supported booms, except draglines, must have a device attached between the gantry or A-frame and boom cords to limit the elevation of the boom.

4. CRAWLER, LOCOMOTIVE, AND WHEEL-MOUNTED CRANES

- Crawler, locomotive, truck and wheel-mounted cranes must be equipped with a boom angle or radius indicator located within the operator's view.
- The operator must have the means to visually determine the levelness of the crane.
- In addition to boom stops, jibs must have a positive stop installed to prevent overtopping.
- Windows installed in crane cabs must be safety glass or equivalent to eliminate visibility distortion that could interfere with the safe operation of the crane.
- Power cranes must be equipped with an audible warning signal device that can be heard above construction noise levels.
- A backup alarm must be installed on all crawler, truck, and wheel-mounted cranes.
- The rear swing radius area of rotating superstructures of mobile cranes must be barricaded in a manner that physically prevents persons or equipment from being struck by the superstructure.
- When not in use, crane booms must be lowered to the ground or otherwise secured to prevent displacement by wind or other outside forces.
- Tag lines for controlling loads must be used whenever necessary for protection of personnel, equipment, and structures.