Tower Crane Erection, Installation & Inspection

Method Statement

[Company]
[Company Address]
[Company E-mail]
[Company Phone]

Doc Ref #	XYZ/IMS/HSE/MS/00
Issue Date	DD-MM-YYYY
Rev #:	00
Pages	14

Prepared By	Approved By
Name:	**Name**:
Designation:	**Designation**:
Signature:	**Signature**:

Revision Summary

S/#	Date	Rev	Revision Description	Revised By & Title
1				
2				
3				
4				
5				

Contents

Project Credentials	
Project Name	
Project Ref #	
Site Name	
Location	

Client Credentials			
Client Name			
Address			
Contact #			
Concerned Person		**Designation**	

Crane Contractor Details			
Contractor Name			
Contractor Ref #			
Address			
Contact #			
Concerned Person		**Designation**	
Operator Name		**Rigger Name**	

Other Details	
Project Manager	
Project Engineer	
Project Safety Officer	
Site Safety Officer	
Site Supervisor Name	
Onsite First Aider	
First Aid Kits Location	
Fire Extinguishers	
Emergency Contact #	
Hospital Contact #	

Rescue Service #	
Police Station #	

1. Introduction

The Tower Crane is used in construction industry to perform the construction activities at height where use of mobile crane is practically impossible. The crane is erected on safe location from where a maximum work area is covered and lifting activities are performed.

2. Scope

The scope of the method statement titled **Tower Crane Erection, Installation & Inspection** is applicable to the project, every worker and person involved in the work activity.

3. Purpose

The purpose of the method statement titled **Tower Crane Erection, Installation & Inspection** is to define the roles and responsibilities of the work force including top management of the organization, tower crane contractor, as well as field staff.

Not only this, the provision of the guidelines to transport the crane parts, storage, assembly, erection, installation, as well as inspection upon completion. All of the work activities shall be performed as per the agree work project standards, safety standards to ensure comprehensive compliance of the safety standards.

Not limited to safety, compliance of local legislation and standards is also mandatory, to comply with minimum standards so that any punitive action is avoided neither environment is impacted in anyway.

4. Roles and Responsibilities

4.1. CEO/MD

- Provision of the guidelines to the junior management.
- Assist the junior management in planning and scheduling the project activities.
- Management review on regular basis to evaluate the enhance work performance.
- Allocation of the resources for the work execution, training, information, instruction, PPEs.
- Consultation with the junior management.
- Ensure investigation of all kind of accidents, spillages, environmental impacts, etc.
- Ensure risk assessment (RA) is performed before start of activity, provide assistance & approve it.

4.2. Safety Manager (SM)

- Provision of the guidelines and information to plan and execute the work activities.
- Identification and controls of hazards and corresponding risks.
- Inspection, testing, maintenance (ITM) of the equipment & tools to ensure they are safe for use.
- Monitoring of the workplace, work activities and ensure workers are aware of their responsibilities.
- Incident investigations and reporting to the higher management.
- Emergency response planning and implementation.
- Training and development of the workforce to ensure they are competent enough to perform the job.
- Other tasks assigned by the top management.

4.3. Foreman

- Manage the workplace and work activities.
- Conduct inspection to ensure workplace is safe for use and free of hazards.
- Ensure the implementation of the work methods and organizational policies.
- Report all incidents, hazards to the top management, safety department & participate in investigations.
- Participate in toolbox talks, emergency drills, meetings, and trainings.
- Record management and daily work reporting to the higher management.
- Ensure the workplace is safe for use.
- Ensure emergency arrangements are up-to-requirement.

4.4. Project Engineer

- Plan the work activities, break them into sub-parts, and schedule.
- Provide guidance, information, and instructions to field workers to perform them.
- Assist in incident investigation & finding the root cause analysis.
- Perform the Risk Assessment, Job Safety Analysis, Inspections with help of safety department.
- Schedule the preventive maintenance of the equipment and tools.

4.5. Contractor

- The contractor is supposed to supply the safe and correct equipment for job activity.
- Provide thorough details of the assembly, erection, installation, and inspection of the equipment.
- Assist in erection, and installation of the tower crane.
- Provide all documents related to the crane operation, inspection, maintenance.
- Provide inspection certificates, and documents.

4.6. Operator

- Perform the job activity as per requirements, safely operating the crane.
- Report all kind of hazards, to the management for immediate elimination.
- Assist in planning lifting activity, lifting plan, inspection, maintenance and testing.
- Assist in incident investigation to identify the root cause of an accident.
- Other tasks allocated by the management.

4.7. Rigger

- Inspect the lifting accessories e.g., belts, hooks, slings etc.
- Attach the load with the crane hoist and secure properly.
- Report all kind of defective accessories to the management for replacement.
- Assist in the accident investigation and risk assessment.
- Other responsibilities allocated by the management.

5. Abbreviations

S/#	Abbreviation	Description
1	CEO	Chief Executive Officer
2	MD	Managing Director
3	SM	Safety Manager

4	ITM	Inspection, Testing and Maintenance
5	PPEs	Personal Protective Equipment
6	PTW	Permit To Work
7	RA	Risk Assessment
8	QA	Quality Assurance
9	QC	Quality Control

6. Specialized Tools & Equipment

S/#	Equipment Description	Quantity
1	Flatbed Lorry – Crane Parts transportation (40 ft Length)	
2	Safety Harness – (for erection team)	
3	Power tools	
4	Concrete Mixer for foundation preparation	
5	Excavator – for foundation preparation	
6	Power Generator	
7	Mobile crane – for crane parts loading/unloading & lifting purpose.	
8	Forklift	

7. Procedure

7.1. General Requirements

- Qualified Crane erector will be available onsite for dismantling and erection of the tower crane.
- Tower crane engineer will inspect the crane and give green signal once satisfied.
- Quality Control & Quality Assurance engineers will monitor the quality standards during the work.
- HSE Engineer and other staff members will provide the guidelines, information, training to the workers involved in the work activity.
- Site Safety Induction Training shall be provided to all of the workforce before start of the job.
- Work at height will be performed by the competent person, with authorization in form of Permit to Work issued by the competent person e.g., Safety Manager.

7.2. Tower Crane Transportation

- Tower crane parts will be labelled and prioritized for shifting as needed.
- All the crane parts will be transported on flatbed lorries from location to the location.
- All of the crane parts will be loaded and unloaded using the mobile crane and forklift.
- Crane parts will be stored on safe location under shed to prevent environmental & physical damage. The storage area should be even floor area, storage on uneven flooring should be avoided.
- Site Safety Officer, Crane Operator, Crane contractor will inspect the crane jointly, to ensure the crane is safe for use, before start of erection of tower crane.

- Any missing items will be reported to the concerned person immediately, before start of the job.

7.3. Tower Crane Foundation Preparation

- Engineers will visit the site area, and evaluate the correct appropriate location for the crane erection & installation.
- Foundation drawings will be prepared by the civil engineers and approved by the top management.
- Excavation will be done as per the drawings approved by the top management.
- Steel and concrete will be used for foundation preparation and building.
- Concrete will be poured in the surroundings of the foundation to give it rigidity and firmness.
- Consult the drawing for installing the fixing angles. They will be fixed in the correct location. Mobile crane shall be used to place one mast section on these fixing angles to ensure the correct alignment.
- Once fixing angles have been placed, pour the concrete and leave for 5-7 days at least to gain rigidity and firmness.

7.4. Basic Mast Erection, Slew Ring & Counter-Jib Assembly, Erection & Installation

- The basic mast will be erected using the mobile crane employing the competent workforce.
- The mast section will be raised in the air using crane and brough top of the fixing angles for alignment & installation.
- The bolts and pins shall be used to hold the basic mast in place once placed over fixing angles.
- Crane erection crew will assemble the slew ring with Cat Head followed by the counter-jib.
- The main jib shall be prepared for the installation.
- The assembly of these sections will be performed on the ground level, in a designated assembly area.
- To keep the whole section above the ground, wooden blocks should be used.
- When main jib is ready, install the trolley using mobile crane, and lock it in place to prevent independent movement.
- When all sections are attached together, and ready for installation, lift each section to the cabin height, and install on the desired location.
- After installing the counter-jib and the slew ring, lift the main jib with trolley and lift it for installation.
- After installing the both counter-jib and the main jib, place tie-bars and ensure it is accurately placed.
- Counter weights should be installed using the mobile cranes. One block should be lifted at a time, and placed in the counter-block in cage and secure properly.
- Mobile crane shall be used for this purpose, and work activity shall be performed in sections for easy execution to avoid any physical harm.
- Steel Rope supplied by the crane contractor will be used across the wheel drum, going through the end pulley, returning back to the trolley gear lock. Clips should be used to tight it and lock in place.
- Install the trolley wire for movement and lifting hoist wires and secure properly.
- Install the hook block, safety sensors for example, limit switches. Use a competent person to install these sensors and test for proper function.
- Install the safety warning light on the top of the crane, a competent person should install the light.

7.5. Electrical Cabling and Connections

- Fire-resistant cables should be used for the wiring across the whole crane and power sources.
- Open wiring should be covered to prevent environmental and physical damage.
- The joints should be properly secured and covered.

- All cables shall run through the tower crane assembly structure, while power lines should be connected to the counter jib and main jib.
- Power source should be placed on the safe location, and covered properly.
- Ensure the power source energizing the crane is sufficient enough for its supply.

7.6. Crane Inspection

- Once crane has been erected, a competent person will inspect the crane and ensure it is erected as per standard requirements.
- Crane Engineer should test the crane by operating its all features and components. Once satisfied, give a green signal. A 3rd party inspector should be hired for a proper certification who will inspect the crane, associate accessories, and issue a certificate after testing it.
- All kind of defects, issues, and deficiencies identified during the internal inspection as well as by the 3rd party should be rectified on immediate basis before putting the tower crane into operation.

8. Health and Safety Guidelines

- All of the work activities should be authorized by the competent person.
- Work at height, excavation, confined space or any electrical work is subject to the permit to work.
- Workers will be provided with the relevant and effective PPEs.
- Workers will be given the induction training, information and guidelines before job commencement.
- Specific job activities will be performed only after proper training, e.g., work at height.
- Specific job activities will be executed by the competent person only.
- Work at height requires the specific PPEs provision, e.g., full body harness.
- Workplace should be inspected before start of job.
- Lifting accessories and mobile cranes should be inspected before use.
- Lifting Plan should be prepared by the competent lifting supervisor and implemented.
- Toolbox talk should be provided to all of the workforce.
- Emergency response plan should be available onsite.
- Credentials of the mobile crane operators and riggers should be available onsite.
- Emergency contact numbers e.g., ambulance should be available.
- Safety signs should be placed onsite, irrelevant signs should be removed from site.
- Emergency arrangements should be made, provision of firefighting & first aid arrangements is mandatory.
- Workers should be informed and trained about how to act during emergency.

9. Manpower

S/#	Manpower	Quantity
1	Project Manager	
2	Assistant Project Manager	
3	Project HSE Officer	
4	Site HSE Officer	
5	Site Foreman	
6	Crane Lifting Supervisor	

7	Mobile Crane Operator	
8	Mobile Crane Rigger	
9	Crane Erection Engineer	
10	Quality Assurance Technician	
11	Quality Control Technician	
12	Electrical Technician	
13	Civil Engineer	
	Total	

10. Work Permit

S/#	Permit Detail	Permit Duration		Issued By	Status
		Issue Date	End Date		
1	Permit 1				
2	Permit 2				
3	Permit 3				
4	Permit 4				
5	Permit 5				

11. Training Requirements

S/#	Training Requirements	Training Date & Location	Trainer	Status
1	Training Topic 1			
2	Training Topic 2			
3	Training Topic 3			
4	Training Topic 4			
5	Training Topic 5			

12. PPE Requirements

S/#	PPEs	Qty.
1	Helmets	
2	Goggles/ Face Shields	
3	Ear Muffs/ Ear Plugs	

4	Coveralls	
5	Gloves	
6	Safety shoes	
7	Personal Fall Arrest System – Full Body Harness	
	Total Quantity	

13. Material, Tools & Equipment

S/#	Material, Tools & Equipment	Qty.
1	Material, Tools & Equipment 1	
2	Material, Tools & Equipment 2	
3	Material, Tools & Equipment 3	
4	Material, Tools & Equipment 4	
	Total Quantity	

14. Emergency Procedure

The Organization's Emergency Response Plan shall be used to ensure the workers are aware of their responsibilities in case of emergency, the arrangements made to counter emergency are relevant, implemented, and reviewed on regular basis.

15. Relevant Documents

1. Worksite Layout
2. Tower crane Inspection Checklist
3. Mobile Crane Inspection Checklist
4. Lifting Plan
5. Risk Assessment
6. Project HSE Plan
7. Contract Drawings

16. Tower Crane Inspection Checklist

Inspection	Pre-Use ☐	Weekly ☐	Monthly ☐	Bi-Annually ☐	Annually ☐
Crane ID #	Tower Crane		**Checklist Sr. #**		
Model #			**Manufacturer**		
Inspected By			**Approved By**		
Inspected On			**Next Inspection**		

Tick (✔) the correct answer.

S/#	Criteria	Yes	No	Comment
1	The tower crane is registered with the relevant authority?			
2	Bolts and pins used for connection are of approved standard as recommended by the manufacturer?			
3	Mast sections are made of sound material, and properly labelled?			
4	All parts and mast sections are free of corrosion and defects?			
5	Slew ring bolts are inspected for any kind of defect and labelled?			
6	Joints and bolts are inspected through the NDT process?			
Operator's Cabin				
7	Operator cabin is properly installed on the top?			
8	Safety bar is installed across around the operator's cabin?			
9	Operator cabin is installed with door and locks for operator safety?			
10	Operator cabin has seat and seat blet in good functional condition?			
11	Operator cabin has appropriate load chart, firefighting equipment?			
12	Operator cabin is provided with emergency stop button?			
13	Operator's controls are functional and working properly?			
Communication				
14	Operator is provided with relevant and appropriate communication means?			
15	Rigger is provided with communication means to contact with operator?			
16	Hand signal chart is provided to both operator and rigger?			
Electrical Safety & Hydraulic Controls				

S/#	Criteria	Yes	No	Comment
17	All electrical cables are in good condition?			
18	All joints are properly covered and secured?			
19	All switches and plugs are in good condition, free of defects?			
20	All wiring insulation are in good condition, not worn off?			
21	All controls are checked			
22	Emergency stop button is functional and tested?			
23	Lighting system are working properly?			
24	Hydraulic system is working properly? Hydraulic reservoir is ok?			
25	Brake system is working properly?			
26	Emergency load lowering system is working properly?			
27	Hoist ropes and trolley rope is working properly, fully greased?			
28	Hoist and hook both are in good condition?			
29	Counter-weight, attachment, trolley and trolley wheels are in functional condition?			
30	Jib section, counter-jib section, slew rings are free of defects?			
31	Sheaves, bearings, and bolts are free from any kind of defect?			
32	Hook, hook block, & associated attachments are in good condition?			
33	Climbing and self-erection equipment is in good condition?			
Foundation & Worksite				
34	The foundation is prepared as per site layout plan?			
35	The area around tower crane is barricaded properly?			
General Requirements				
36	Fixed ladder is provided to access all parts for maintenance?			
37	Competent person performed load test on both; - Maximum radius - Minimum radius			
38	Load radius indicator is installed to warn operator?			
39	Automatic Crane Trip system is installed if maximum load is exceeded?			
40	All Limit switches are tested by competent person;			

S/#	Criteria	Yes	No	Comment
	- Over hoist limit switch - Overload limit switch - Trolley limit switch - Slewing limit switch			
41	Wind anemometer and Anti-collision devices are installed and tested by competent person? Minimum distance between two cranes should be not less than 3m?			

Observations

Recommendations

S/#	Defect	Action Taken	Identified By	Status
1	Defect 1			
2	Defect 2			
3	Defect 3			
4	Defect 4			
5	Defect 5			

Inspected By	Operator	Approved By
Name:	**Name**:	**Name**:
Designation:	**Designation**:	**Designation**:
Signature:	**Signature**:	**Signature**: