Logo	Tower Crane Erection & Installation – Hazard Identification & Risk Assessment	Doc Ref #: XYZ/IMS/HSE/F/00 Issue Date: DD-MM-YYYY Rev #: 00
	QHSE Forms	
	Organization Name	

Assessment #		**Project Name**			
Project Site		**Assessed By**			
Activity	Tower Crane Erection & Installation	**Assessed On**		**Re-Assessment**	

S/ #	Activity	Corresponding Risks/ Hazard Effects	Risk Level			Control Measures	Residual Risk	Responsible Person
			L	S	R.L			
1. Pre-Work Start								
1.1	Foundation Design and development	- Structure collapse due to poor- or low-quality foundation.	3	3	9	- Development of foundation drawings for construction by a competent person. - Construct the foundation with quality material. - Ensure the foundation is deep enough and constructed on firm ground. - Properly trained workforce uses to ensure work is done as per requirements. - Ensure electrical supply is isolated when electrical work is under process.	2x1 = 2	HSE Manager HSE Officer Civil Engineer
1.2	Relevant documentation acquisition e.g., JSA, Risk Assessment, Inspection Forms	N/a	n/a	n/a	n/a	- The documentation should be prepared and approved by the competent person with periodic review on regular basis. - Due to change in the work activity, location, or any accident, review the documents immediately.	n/a	HSE Manager HSE Officer Project Manger

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1.3	Site Preparation before start of routine activities	- Workers hit by moving vehicles. - Manual handling leading to body injuries and WRULD. - Exposure to dangerous substances during work.	3	3	9	- The workplace should be safe for use of vehicles and workforce together. Onsite traffic management to ensure there is a safe distance between workers and vehicles. - Heavy objects should be moved with mechanical aid instead of manual handling to avoid body injuries and Work-Related Upper Limb Disorder. - Dangerous substances should be removed carefully. - The roads for vehicle movement should be of good quality. - Speed brakers should be used where pedestrians passage cross the road. - At corners mirrors should be used to alert one about approaching vehicle and pedestrian. - Lighting arrangements should be appropriate.	2x1 = 2	HSE Manager HSE Officer Project Manager Civil Engineer Site Supervisor
2. Crane Material Transportation								
2.1	Crane Parts transportation	- Falling objects onto works during loading - Material damage leading to financial damage - Road accident during transportation - Vehicle lift up	3	3	9	- The material and crane components should be loaded safely and secured appropriately. - Manifest/list of loaded items should be prepared for tally. - Competent driver should drive the vehicle. - The unloading area should be free and used for intended purpose only.	2x1 = 2	HSE Manager HSE Officer Project Manager

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		- Oversize objects hitting nearby property				- Heavy objects should be handled with care using crane and forklift. - Each equipment should be wrapped during transportation. - Labelling should be done to identify parts. - Storage area should be guarded & locked 24/7. - Don't exceed the transporting carrier's SWL. - Use counter weights on truck to ensure the vehicle doesn't lift up due to heavy load. - Place reflecting tapes on carrying vehicle to ensure it is visible in night. - Oversize object should be transported safely.		
2.2	Receiving material onsite and unloading	- Fall of load - People hit by moving vehicle when entering site - Injuries and death	3	3	9	- The vehicle should enter the worksite for offloading through the designated gate. - The gateman/ security guard will guide the vehicle to the parking and unloading area. - Reverse parking should be done with the help of banksman. - The surrounding area should be barricaded to prevent entry or irrelevant people. - Good communication between driver and banksman/helper through wireless & hand signs. - Warning beacon and claxon warning light should be functional during whole activity.	2x1 = 2	HSE Manager HSE Officer Project Manager

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						- Parking brakes should be engaged, & wheels should be chocked when parking is done. - Heavy objects should be unloaded with the mechanical aid. - Unloading must be done systematically. - Each item/component should be labelled. - Component's list should be reviewed for tally. - Unloaded material should be stored at designated location. - Manual handling should be avoided when dealing with the heavy objects. - All of the unloaded objects should be secured against the environmental factors. Rain, mist etc. - Inspect the unloaded objects for any kind of damage and defect. If anything is damaged, notify the project manager immediately for replacement.		
3. Tower Crane Structure & Climbing Cage Erection and Installation								
3.1	Mobile Crane Use for lifting & installation of the climbing cage.	- Crane collapse due to excess load leading to damage to property, people. - Falling material/load leading to Injuries and death as well. - Damage to the environment	3	4	12	- Crane should be used for relevant job after proper inspection. - Site supervisor should be available onsite to monitor the activities. - Use base plates to spread the load over a larger area equally.	2 x 2 = 6	HSE Manager HSE Officer Project Manager Lifting Supervisor

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		- Electric shock due to contact with overhead power lines leading to the fire, explosion, as well as injuries.				- Lifting plan should be available prepared by the competent person. - Safe working load shouldn't be exceeded at all. - The crane should be placed on the firm ground. - Crane should be placed 10ft away at least from the overhead power lines. - Crane lifting activity should be performed safely to avoid any damage to the surrounding structure. - Workplace should be inspected for any kind of hazard. - Training, information and guidelines should be delivered to the whole workforce. - STARRT should be delivered to the workforce. - Certified, and well inspected slings should be used. - Emergency response plan and arrangements should be in place. - Worker's training and certification evidences e.g., certificates and attendance forms should be available.		Site Supervisor
3.2	Tower Crane Railing Bolting Process	- Bolting the tower crane railing can lead to hand injuries e.g., laceration due	3	2	6	- Work should be done carefully with the help of the experienced, trained and authorized worker.	2 x 1 = 2	HSE Manager HSE Officer Project Manager

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		to sharp edges, crushing between two parts of the railing structure, or tightening bolt etc. - Equipment can be damaged during bolting activity.				- Workers should maintain distance from the moving parts during the bolting activity. - Worker should be provided with the gloves to keep the hands safe during activity. - Authorized and relevant tool shall be used, use of defective and irrelevant tool should be discouraged. - The tool being used should be inspected and certified before use to prevent the equipment damage.		Site Supervisor
3.3	Mast Erection with the help of the mobile crane.	- Mast erection can lead to collapse during lifting it with the help of the mobile crane, that can lead to the structural collapse, falling material, death, injuries, equipment damage as well as severe environmental impact.	3	4	12	- Mast should be erected with the help of crane. - Lifting crane should be placed at correct and concrete place instead of fragile. - Develop and implement Lifting Plan, Method statement. - Carry out hazard inspection and risk management. - Trained workforce should be used. - Use baseplates to spread the weight over large area. - Area around crane and lifting place should be barricaded. - Site supervisor should be available. - Toolbox talk should be performed.	2 x 3 = 6	HSE Manager HSE Officer Project Manager Site Supervisor

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						- Structure should be divided into parts for easy lifting, and installation. - Stop the job if situation goes out of control.		
3.4	Climbing Cage assembling & installation	- Injuries - Fractures - Collapse of structure, cage, can lead to damage, surrounding structure damage, environmental impact, financial loss.	3	3	9	- The cage should be assembled at ground. - Work should be divided into parts for easy and safe execution. - Work area should be inspected for any kind of hazard and remedial action in regards. - Trained workforce should be used for work. - Certified, inspected, equipment should be used. - HSE Plan, method statement, JSA should be available. - Workers should be provided with the information, guidance, and training.	2 x 1 = 2	HSE Manager HSE Officer Project Manager Site Supervisor
3.5	Work At height	- Work at height can lead to fall resulting in injuries due to fall, death as well as falling objects from height.	3	3	9	- Work at height should be avoided if possible. - Trained and experienced workforce should be used for work at height. - Provide proper work platform for work at height. - Provision of the harness, and lifeline for work at height working force. - Active safety measures for falling material and objects safety during work at height. - Use of double lanyard, & training the workers how to use it with 100% tie-off.	2 x 1 = 2	HSE Manager HSE officer Project Manager Site Supervisor

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						- Work at height should be done after PTW. - Supervisor should be available onsite. - Don't carry any equipment in hand when climbing for work at height. - Use tool pocket to transport tools from ground to height for work execution. - PPEs should be provided for work.		
4. Assembly, Erection & Installation of Jib, Counter Jib, & Counter Weight, Hoist Gear Assembly								
4.1	Assembly of jib, counter jib, counter weight, counter weight and gear assembly	- Hand injuries during jointing and assembling the structure.	3	2	6	- Use proper equipment for the jointing and bolting process. - Divide the activity in parts to perform it safely and easily. - Use hand protection during work execution. - Use proper tools and equipment to perform the task. - Don't attempt the bolting with bare hands or without tool. - Keep body parts away from the tightening bolts. - Experienced and trained workers should be used for work execution.	2 x 1 = 2	HSE Manager HSE Officer Site Supervisor
4.2	Mobile Crane use for lifting assembled	- Collapse of structure - Falling material - Load falling	3	4	12	- Perform Safety Task Analysis and Risk Reduction Talk (STARRT) to discuss the risk factors.	2 x 3 = 6	HSE Manager HSE Officer

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	structure for installation	- Injuries and death - Property damage - Financial loss				- Use inspected and certified crane for lifting activity. - Use inspected and certified slings for lifting activity. - HSE Lift Plan should be available onsite. - Secure the load properly before lifting. - Barricade the area around crane rotation & work activity. - Experienced and trained workforce should be available for the job execution - Prevent the entry under the suspended load. - Place the crane at least 10ft away from overhead lines and surrounding structure. - Place the load on desired location properly.		Project Manager Lifting Supervisor Site Supervisor
4.3	Counter weight placement using mobile crane.	- Falling objects - Collapse of structure - Injuries and death	3	3	9	- The area around the work place should be barricaded. - STARRT & Lifting Plan should be available. - Counter weight load should be secured and attached to the lifting equipment properly. - Certified and inspected lifting equipment and vehicle should be used. - Trained workers should be used for the work execution. - Breakdown the task into parts for safe execution.	2 x 1 = 2	HSE Manager HSE Officer Project Manager Lifting Supervisor Site Supervisor

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						- Crane should be placed away from the overhead power lines during lifting activity.		
4.4	Operator's cabin installation	- The cabin installation can lead to various injuries e.g., hand injuries, injuries on ground due to falling material, objects, as well as death can be experienced. - The cabin can fell down and get damaged leading to the property damage, as well as financial loss. - The equipment lifting the cabin to the height can collapse and damage the surrounding structure, as well as delivering the injuries to the nearby workers.	3	3	9	- The cabin should be attached to the lifting equipment properly. - Lifting equipment and accessories should be inspected and certified before use. - The people working at height to install the cabin should be provided with the harness and lifelines to prevent the fall. - The cabin should be secured and lifted and correctly installed at desired location. - Once placed and security pints with screws have been installed, then remove the lifting attachments. - The screws and pins should be installed and tightened with proper tools and equipment. - Maintain safe distance from tightening screws, and heavy load areas to avoid hand injuries. - For manual work, wear gloves to protect hands. - The crane should be placed on firm, even ground away from the surrounding structure. - The baseplates should be used to spread the load over a large area.	2 x 1 = 2	HSE Manager HSE Officer Project Manager Lifting Supervisor Site Supervisor

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5. Installation of Electrical Cables and Hydraulics								
5.1	Electrical Cables installation	- Fire & Explosion - Electrocution resulting in injuries and death.	3	4	12	- Fire resistant electrical cables should be used. - When working at height for joining the cables, harness should be used or worker safety. - The joints should be made properly and secured to avoid exposure. - Wires should be labelled and secured properly. - Defective or broken insulation wires should be avoided. - Technicians with experience and abilities should be used for this purpose. - Circuit brakers should be provided and installed. - When joining the cables, ensure the power source is isolated and locked. - PPEs should be used by the workers when handling the electrical cables. - Firefighting equipment should be available. Water fire extinguisher shouldn't be used.	2 x 1 = 2	HSE Manager HSE Officer Project Manager Site Supervisor
5.2	Hydraulic System Installation	- Catastrophic incident due to sudden release of the energy leading to injures, fractures, inhalation of hydraulic fluids leading to death.	3	3	9	- Experienced and trained workers should be used for this job. - Use harness during work at height. - Hydraulics Fluid should be introduced properly. - Ensure all hoses and caps are properly tied off.	2 x 1 = 2	HSE Manager HSE Officer Project Manager Site Supervisor

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						- Brakes are fully functional.		

Likelihood	Severity				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Rare (1)	1	2	3	4	5
Possible (2)	2	4	6	8	10
Likely (3)	3	6	9	12	15
Often (4)	4	8	12	16	20
Frequent/ Certain (5)	5	10	15	20	25

Risk	Risk Level	Required Actions
15-25	Extreme Risk	Activity or industry must no proceed forward in this case.
8-12	High Risk	Activity or industry should be modified to include remedial planning and collection and be subject to detailed EHS Risk Assessment.
4-6	Moderate Risk	Activity or industry can operate subject management and/ or modification.
1-3	Low Risk	**No Action** required, unless risk level escalation is possible.

Likelihood	Frequency		Likelihood
	Environment	Health and Safety	
Certain/ Frequent	Continuous or will happen frequently	Occurs frequently	5
Very Likely/Often	5-12 times per year	Occurs several times a year	4
Likely/Probable	1-5 times a year	Has occurred more than once	3

Possible	Once every 5 years	Has occurred	2
Impossible/Rare	Less than once every 5 years	Never occurred	1

Prepared By	Approved By