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Infrastructure works for Riyadh

SEDRA 3 & 4 Project

00103-CHE-PLN-HSE-000012

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LIFTING OPERATION AND MANAGEMENT
(Phase -3)

فرع شركة شاينا هاربور إنجينيرنج كمبني ليمتد
BRANCH OF CHINA HARBOUR ENGINEERING CO., LTD.
中国港湾工程有限责任公司沙特分公司

Document No.	Lifting Operation and Management (Phase -3)	Revision	00
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Infrastructure works for Riyadh

SEDRA 3 & 4 Project

Lifting Operation and Management (Phase -3)

00	25 July, 2024				Issued For Approval
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1. Purpose

CHEC shall ensure that all its workers, operators and management staff who are performing safe lifting activities follow Its procedure.

2. Scope

This plan applies to all CHEC, Subcontractor, site workers at the project site who performed or involve in lifting operation. Each subcontractor shall ensure that its employ follow this procedure.
The Mandatory Recommendation and requirements for the safe utilization of all lifting equipment operating in the project. The experience, qualification and training requirements for lifting equipment personnel, maintenance, inspection, testing, critical lift operation, organizational setup and quality systems for safe use of lifting equipment. It is a requirement that the safety and wellbeing of project personnel is maintained as the primary object of this plan.

CHEC team shall review the plan internally with all required personnel through internal meetings in the start of project and then, ensure that effective communication shall be established with consultant/client for review of the lifting plan. The project Manager shall notify the Consultant/client of any changes in the lifting plan. Any update in a change of activity shall be notified& reviewed by Consultant/Client.

3. Responsibilities

3.1 Project Manager

The project manager will be responsible for allocating sufficient resource, appointing inwriting the Lifting Appointed Person.

Should arrange the Lifting Equipment (Mobile Crane, Boom Truck, Telehandler etc.)

Should arrange the Competent Lifting Team and Any resources required to make a Lift Safe.

3.2 Construction Manager

The construction Manager holds the overall responsibility for the Site HSE management system and its responsibilities for the Site includes but not limited to:

- Planning, logistics and safe work procedures are implemented.
- Communicate all concerns to the HSE Manager and report to him in case of emergency during lifting work.
- Ensure all workers are competent in the tasks they are assigned.
- Ensure all the employees have been given the appropriate training, and understand the safe procedures of work conducted.
- Ensure that the Lifting Work Permit procedure is fully implemented at Site.
- Adequate barriers are provided around areas where hazards may exist.
- Adequate medical coverage is in place during work activities.
- All lifting equipment assigned has been checked and certified in accordance with the Client Sop's.
- Constantly monitor work activities & ensure unsafe acts/unsafe conditions does not remain.
- Disseminate the work force about the hazards and precautionary measures of the

Activity through toolbox discussions, prior to the commencement of any work activity and that they are all fully conversant of the work to be done. All TBTs to be signed by employees to confirm attendance.

3.3 HSE Manager

The HSE Manager will assist the CHEC in the implementation of its procedure and provide the necessary OSH advice to ensure compliance with CHEC HSE Plan and Roshan Standards.

HSE Manager Should:

- Ensure that a risk assessment is carried out and a lift plan is prepared and approved.
- To constantly monitor the approved risk assessment and identify improvement for future work.
- All risks arising from operations involving lifting equipment are suitably and

Sufficiently assessed by a competent person and appropriate control measures implemented.

- All lifting operations are suitably planned, supervised and carried out in a safe manner.
- HSE Manager/Safety Officer will check the Competency and Certification of the Rigger and Lifting Crew

3.4 Lifting Supervisor

Lifting Supervisor:

Responsibilities:

- Supervises and coordinates the actual lifting operations on-site.
- Ensures that the lifting plan is followed correctly.
- Monitors the lifting crew to ensure they adhere to safety protocols and procedures.
- Conducts pre-lift safety briefings and tool-box talks with the lifting team.
- Ensures that lifting equipment is in good working condition and that any necessary inspections and maintenance are up-to-date.
- Stops the lifting operation if any unsafe conditions arise and takes corrective action.

3.5 Signaler/Slinger (Rigger)

Contractors must ensure that competent numbers of slingers / signalers are appointed to safely conduct all lifting operations. Slingers / Signalers (Riggers) must be easily identifiable by a red hard hat and 'Slinger / Signaler', or 'Rigger' marked on the rear of an orange high visibility vest.

Slingers / Signalers must:

- Be in attendance at all times the crane or lift is in operation.
- Have a recognized qualification for lifting and slinging or other approved training. Their competency must be checked via physical on-site demonstration to the Crane Supervisor.
- Sling all loads in line with lift plans and industry best practice, within the safe working limits of the equipment, using hooks with safety catches, netting loose loads, and attaching tag lines.
- Follow directions of the Crane Supervisor and rigger.
- Give relevant signals to crane operators using the approved system of visual and radio signals.

3.6 Emergency Response Team

Their primary function is to assist the egress of people from the work areas and

perform a head count of them, once evacuated in case of emergency.

4. General Requirement

4.1 General

- Lifting must be overseen by a competent team of trained and experienced personnel.
- Where a project site consists of several Contractors, the main Contractor must appoint a person to oversee all lifting operations.
- CHEC shall appoint a competent person who will supervise all the lifting work
- Lifts must be planned and documented by Rigger.

- Before commencing any lift CHEC Safety must be inspect and notify by lifting supervisor.
- Lifting equipment and accessories must be color-coded on a monthly basis to ensure that only certified equipment is in use on-site. Colored tags must only be attached to equipment or accessories that have a valid test or inspection certificate.
- Exclusion zones must be implemented in loading / unloading zones and lifting areas and must be clearly signed and demarked with warning tape or hard barriers to prevent inadvertent access. All slingers and signalers will be issued a whistle for warning general workers of lifting operations in progress.
- Ensure zoning and anti-collision systems are left in in the 'on' position with the keys removed and held in a key safe controlled by an appropriate senior manager.
- A third party will issue a certificate of safety after due examination and test, and only after any repairs have been carried out, specify the serial number, technical details, tests done, safe working load, etc. for each equipment / appliance.
- Lifting equipment and accessories register shall be maintained and available onsite
- A copy of 3rd party inspection and test certificates must be available on-site for all lifting equipment and lifting accessories With the crane
- Safe working loads must be displayed on the equipment.

4.2 Selection and Duties of Personnel

CHEC shall ensure when selecting any personnel for duties within the lifting team, the type of equipment, types and diversity of lifting and hazards, are taken into account.

Personnel must be trained and certified by third party.

Legislation. Proof of competency must be verified on-site ahead of any lifts. All appointments must be formalized in writing and regularly reviewed. All members of the lift team are empowered to stop any work they believe to be unsafe.

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4.3 Crane Supervisor

CHEC shall be ensure that all lifting operations are supervised by a Crane Supervisor. The Crane Supervisor must direct and supervise the lifting operation, ensuring that it is carried out in accordance with the lift plan. The Crane Supervisor must be competent and
Suitably trained and must have sufficient experience to carry out the relevant duties. Crane Supervisors must have completed an internationally recognized crane Supervisor training course and have the relevant experience.
CHEC Crane Supervisor must:
Ensure lifting operations only commence after the task lifting plan has been approved by the project team and has been coordinated with other lifting operations. Supervise lifting operations to ensure they are carried out in a safe manner fully in line with the agreed lifting plan including supervision of crane drivers and slingers/signalers under their control.
Crane supervisor will interact with the with the rigger before the commence of the lift and shall ensure that all the requirement are fulfilled
Supervise lifts in accordance with the complexity of the lifting operation. Some lifts may require continual presence by the Crane Supervisor, other repeated lifts of less

complexity or risk may only require the Crane Supervisor to ensure the operation is set up correctly with all relevant parties understanding the safe system of work / lifting plan and action to take if conditions / circumstance change that may affect the
Lift. The Crane Supervisor role may be combined with other roles. However, they must have sufficient time to supervise lifting and slinger / signalers under their control and personally supervise at all times non-generic lifts standard and complex lifts.

4.4 Slinger/Signaler (Rigger)

- CHEC shall ensure that competent numbers of slingers / signalers are appointed to
- Safely conduct all lifting operations. Slingers / Signalers (Riggers) must be easily identifiable by a red hard hat and orange high visibility vest. Slingers /
- Signalers must:
- Be in attendance at all times the crane or lift is in operation.
- Have a recognized qualification for lifting and slinging or other approved training. Their competency must be checked via physical on-site demonstration to the Crane Supervisor / Appointed Person.
- Sling all loads in line with lift plans and industry best practice, within the safe working limits of the equipment, using hooks with safety catches, netting loose loads, and attaching tag lines.
- Follow directions of the Crane Supervisor and Rigger.
- Give relevant signals to crane operators using the approved system of visual and radio signals

4.5 Operators

CHEC shall be ensure crane (or lifting equipment) operators hold a valid license TPC for the type of crane they are operating and are responsible for the correct operation of equipment in accordance with the manufacturer's instructions, and within the bounds of the lifting plan and task briefing. The operator must only respond to the signals of one signaler.

4.6 Planning of Lifting Operations

CHEC shall be ensure all lifting operations are planned to ensure that they are carried out safely.
Planning must consider the following:
Ensure that the ground conditions are structural sound and ensure crane stability at all times.
The type of load to be lifted, its characteristics and method of lifting (Note: It may be necessary to make allowance for any adhesion between the load and its support).
The selection of a suitable crane appropriate to the operation, ensuring that adequate clearances are maintained between the load(s) and the crane structure. Special consideration must be given to travelling with loads.
The selection of lifting gear, the weight of which must be considered when assessing the load on the crane.

The position of the crane and load before, during, and after the operation.

The site of the operations, considering proximity hazards, space availability and suitability of the ground or foundations. These environmental conditions may necessitate stopping the operation when conditions are unsuitable.
Any necessary erection and dismantling of the crane.
Any interface with other operations on-site that may present a hazard and means of controlling these issues.
The proximity of the crane and load to the public and third parties.
The amount and detail of planning required for a lifting operation will depend on the complexity and risk involved. Lifting operations can be divided into the three categories as detailed in the sections below.
In each case, a risk assessment must be carried out as part of the planning process and the results of the assessment and planning must be recorded in a method statement, which may take the form of the Lifting Plan.
The detail required in the Method Statement / Plan will vary with the complexity of the lift.
For commonly lifted items such as pallets of blocks, several generic solutions are to be
Provided in the Project Lifting Plan. At the other end of the spectrum, a single lift of a large, prefabricated roof will require a more comprehensive method statement.
Before any lift takes place, one of the following must be produced and communicated to all relevant parties:
Schedule of common lifts covering the lift to be carried out.
A specific lift plan covering the task.
The lift plan must consist of as a minimum the following information:
Risk Assessment, Method Statement and Lift Plan to be written by a competent person.
Supervisor to sign M/S R/A L/P
Crane Supervisor, Slinger Banksman and Operator certificates to be attached.
Load Details (weights and radius)
Load Analysis (weights and size)
SWL Analysis (% of crane capacity)
Mobile Crane, Tower Crane location and drawing
Lifting Accessories (Chains, slings, wire ropes, shackles, pulleys. etc.)
Laydown Area for transport (loading and unloading)
Barricading of area
Services Locations
Surrounding Environment
Valid third-party Crane Certificates.

4.7 Basic Lifts

Where the load to be lifted is of established weight and there are no hazards or obstructions

Within the area of operation. Typical examples of the type of load are pallets of bricks or blocks,

bundles of rebar or scaffold tubes.

4.8 Intermediate Lifts

Where the load to be lifted is of established weight and there are hazards to be considered, either within the working area of the crane, or on the access route to the working area, but multiple crane lifting is not involved. Typical examples of hazards are pick and carry duties, over sailing other cranes, lifting persons or landing or lifting a load without full visibility of the path throughout the lift.

4.9 Complex Lifts

Where the lifting operation requires more than one crane to lift the load, a crane with load enhancement attachments such as Super lift must be used.

Rigger 1 should be use for all complex lift such as.

I. Load more than 40 ton or above,
II. Lift near high voltage overhead line,
III. Any load using two cranes,
IV. When any part of a crane whose boom or boom attachment is to be within 10 m (33 ft.) of any populated/traffic areas. This includes cranes having to suspend a load over pedestrians, vehicle traffic, occupied construction equipment or occupied buildings.
V. When any load that exceeds 85% of the crane's rated load capacity or manufacturer's specifications for that Specific lift.
VI. Crane suspended personal Platform (Man Basket). Man, basket must have valid TPC. Man, basket Operation cannot be performed if the wind speed is greater than 24kph.

4.10 Weather

CHEC shall be ensure the following measures are implemented for the operations of cranes during adverse weather:

- Cranes must not lift when the wind speed exceeds manufacturer's threshold or gusts of 32 kph at jib level whichever is the lower limit. Lifting in gusty weather may only continue in accordance with the manufacturers recommendations which will normally state a reduced average wind speed and a maximum gust wind speed.
- Where wind speeds exceed manufacturer's recommendations or gusts of 32 kph and over, whichever is the lower limit, the crane must be placed in the out of service mode. In all events, the final decision on the safety and advisability of a lift rests with the crane operator. In the event of a disagreement between the appointed person and the crane operator the more cautious view will prevail.
- Crane operators must be able to see either the load or the slinger/signaler. If environmental conditions prevent this, then lifting must be suspended. Visibility maybe adversely affected by glare, fog, sandstorm, or heavy rain.
- The crane manufacturer's operating handbook must be consulted to determine when it is safe to lift in windy conditions and these must be strictly observed.
- Contractors must always have a dedicated wind speed
- Monitoring means and arrangements in place that crane operations are taking place. The same requirements apply to all cranes.

4.11 Crane Erection and Dismantling

CHEC shall be ensure compliance with the following crane erection and dismantling measures:

- Checks on the verticality of the mast to confirm that it is erected within the manufacturer's tolerances must be conducted. Life of mast sections of any crane must be known with appropriate examination undertaken prior to use or reuse.

- The location of the test and the path through which the test loads will be maneuvered, particularly, where, and how the test load will need to be dismantled, moved, and reconstructed around any obstructions in the test path must be conducted.
- Crane Supervisor will ensure the crane is assembled or dismantled correctly
- The sequence of work including pre-test thorough examination, test sequencing, lifting schedules, personnel involved, and general methodology must be planned.
- Trolley motor brake setting must be verified as correct.
- Proof has been provided that jib clamps are approved by the manufacturer have been fitted to the jib in the correct positions.
- The test sledge being used must not allow weights to be dislodged during the test and the sledge must have the appropriate test and certification paperwork.
- A Risk Assessment / Method Statement must be developed for the erection, climbing, dismantling, and testing of tower cranes. The statement/assessment must include the following elements:

- Specific reference to manufacturer's safety guidelines for activities including a step-by-step process description.
- Methods of compliance with all relevant legal and contractual requirements.
- Safety checklists provided for all safety critical operations (e.g., ensuring check made before any securing bolts or pins are released, bolts are torqued to
    - Correct tension, etc.).
- Safe access to and fall protection measures for all work at height.
- Identification of adequate exclusion zones and methods for implementation.
- Arrangements for lifting equipment / gear examinations (certificates on-site).
- Specification of crew roles, responsibilities, competencies, and supervisory arrangements.
- Inclusion of the working hours, wind speeds and other weather conditions including the most suitable day/ date/ time for the works to be carried out to mitigate risk from collapse.
- Emergency procedures including the rescue of incapacitated persons from a height.
- Methods of pre-start briefings and toolbox talks for the crew.
- Methods and arrangements for crew communications.
- Arrangements for 3rd party crane examinations (certification on-site).

- Competent engineers must check the designs and installation of all permanent and temporary works including crane bases, ties, hard standings and imposed loads on the permanent structure, floor slabs or ground.
    - Cranes assembled on-site (typically, tower and crawler cranes) must be erected and dismantled by specially trained persons. Cranes must be erected in accordance with the manufacturer's instructions using only manufacturer-approved parts and fittings. Rigging of hoisting and trolley cables must be carried out in accordance with the specific instructions set out in the manufacturer's

- Instructions.

- The impact of the operation on other activities both on the site and adjacent to the site must be adequately assessed and controlled, i.e., other cranes, other site activities, activities on neighboring premises, public activities such as transportation, electrical services, and members of the public must be adequately assessed and controlled.
- Potential risks from / to installations and services in the area must be assessed and precautions put in place (i.e., services overhead and below ground).
- Other site-specific items must be completed prior to starting on-site (e.g., testing tower crane base unit welds using the magnetic or dye methods before crane erection).
- Unless specified, tower crane hoisting cables will be terminated on the jib using a wedge socket. Live and dead ends of the hoisting cable must not be clipped together.

4.12 Lifting Communications

CHEC shall ensure that a clear and efficient system of communication is established between crane operators and signalers.

Projects must ensure that radio communication exists between crane operators and signalers to ensure verbal communication is supplement by a visual signaling system. Aki-Taki shall be provided for the better communication

Hands-free communication is the preferred radio communication method to allow signalers to visually and verbally communicate requirements simultaneously.

In instances where radio communication does not exist, Contractors must ensure that the

Crane operator has an uninterrupted line of sight to the signalers at all times. All hand / arm signals used must conform to the universal signaling system to ensure consistency.

4.13 General Crane Requirements

CHEC shall be must ensure that any cranes used are structurally sound and fitted with appropriate safety devices, including compliance with the following measures:

- Before operating a crane, operators must ensure the crane test and maintenance certificates are current.
- All crane cabs must have a suitable fire extinguisher.
- Working hours for crane drivers must be controlled to minimize the risk of errors \Caused by fatigue. As a guide, single tower cranes will have two drivers, two towers 'cranes will have three drivers; three tower cranes will have five drivers.
- The manufacturer's manual supplied with the crane should provide details of the regular inspection requirements and must be followed. A visual inspection of the entire machine must be made before the crane is put to work.
- The crane must be put through all motions by the driver and any defects must be reported immediately. All brakes and clutches must be checked for correct operation.
- A competent person must be appointed to carry out a weekly inspection which must be recorded. The inspection must include the crane structure and mechanical components together with any structural ties, track, etc. and the correct functioning of the safe load indicator

- The crane logbook must be completed by the operator to detail any faults or issues with the crane and record their use.
- Sufficient clear space for the length of the jib involved must always be provided to prevent overlapping of jibs from other cranes on the site.
- Proximity of other structures and Contractors' works must be considered.
- Pre-operational checks to be carried out include the following:

– Crane is free of visual defects.

– Controls are in good condition and operational with legible markings.

– Ropes are not damaged, and hooks are in good condition.

– Runways are clear of obstacles.

– Safety switches and interlocks are operational.

– Warning signs are in good condition.

– Lifting gear has current certification and shows no signs of damage.

– All brakes, stops, and motion limits including zoning (where applicable) are checked before any load is lifted.

- If any lifting gear or accessories are out of certification or showing signs of damage, they must be withdrawn from service.
- No person must operate or allow the operation of a crane that is either faulty or out of certification.
- Crane operators must not exceed the crane capacity and must immediately cease operations if the automatic warning devices activate.
- Grillages (crane mats) must be used on mobile crane outriggers to spread the load.
- All mobile cranes must extend outriggers before commencing lifting operations. All crane warning devices or lights must be in full working condition prior to commencing lifting operations.
- A permit-to-work system is required for the use of mobile cranes managed by the Contractor. Further lifting permits may be required as documented within each Stakeholder's own arrangements.

- Cranes must have the ability to isolate the controls when the crane is not in use, the crane cab is still powered (e.g., air conditioning is on), and the operator is within the cab to prevent accidental use of controls.
- To ensure no slippage occurs, recheck the brakes after the lifting load is just clear of the ground or the landing.

4.14 Vehicle Loading & Unloading

CHEC shall be implement the following measures in relation to vehicle loading and unloading:

- Review risk assessments and method statements for lifting operations, including material loading and unloading.
- Ensure an approved lifting plan in be in place for all lifting operations, with lifting equipment and accessories subject to appropriate inspection and maintenance.
- Check all individuals involved in lifting operations are competent and have completed relevant training.
- Maintain levels of supervision during lifting operations, including activities undertaken at night.
- Before unloading any material, ensure the lay down area is inspected and prepared. The area must be free of debris or objects which could obstruct the unloading process, damage the material, or cause slips, trips, and falls.
- The vehicle trailer must be positioned on level, stable ground and chocking of wheels to prevent any inadvertent movement during unloading. The straps must be utilized to keep the remaining load secure, as well as to prevent pipe / cylindrical stock from rolling.
- Keep all additional load straps in place during unloading until the section of the uppermost tier of a stacked material has been completed. At no time should truck drivers be allowed to unstrap loads unless they have been provided specific training and are following all precautions in the lifting plan.
- No person should place themselves between the load and the truck/trailer/lifting equipment, or any other pinch points, which may arise during loading or unloading.

4.15 Lifting Accessories Requirements

CHEC shall be ensure the following requirements are implemented in relation to the use of lifting equipment accessories:

- Lifting accessories must display the safe working load.
- Wire ropes must not be used for lifting operations if kinked, significantly rusted, the core is visible, or more than five percent of the individual wire strands are broken on any section. The competent Supervisor must determine when to withdraw a wire rope from use.
- Web slings must not be used for lifting operations if there are significant cuts, snags,

- Or holes. The competent Supervisor must determine when to withdraw a web sling from use.
- Slings provided on pre-slung materials and canvas bags must only be used once.
- Lifting Equipment and Accessories register is to be maintained and available on site
- Each lifting accessory must have a unique number on the lifting accessory. The number must relate to the test certificate for the accessory. In addition, when web slings are used, softeners must be used to ensure no damage is caused to web slings.

4.16 Lifting of Persons Requirements

- Contractors must ensure that all lifting equipment used for lifting of persons is subject to a3rd party examination every six months. This includes both the lifting equipment and the lifting gear. Note that an annual examination that is not yet six months old is acceptable. Secondary fall protection must be provided during man lifting operations using MEWP's. Such protection includes the use of a harness and lanyard on a designated anchor point. Cranes with the 'traditional' manually operated slipping friction clutch will not be used.
- Cranes with hydraulically driven permanently engaged clutches are required.
- Cranes must be used in a power load lowering mode. Cranes which have a free-fall mode must be 'locked out' of free fall using a key-operated selector; indications of this must be shown externally on the crane and within the cab, by light or sound. The keys must be secured by the project or site manager or other appointed persons whilst the crane is engaged in man-riding duties.
- Cranes must have automatic brakes which will be automatically applied if the hoisting lever is not in the operating position. In addition to the automatic brake, there must be other means of arresting the load, that is, by the hydraulic winch motor and a foot- operated brake.
- Cranes with latch-able controls must have the latching mechanisms removed, to enable controls to automatically return to the neutral position when released.
- Each crane must be individually assessed and a technical statement, with appropriate information, obtained from the owner as to its suitability for lifting persons. This statement must be appraised by a technically competent person and agreed on prior to commencement of man- riding.
- A MS/RA will be required from Contractors for planned man lifts. Emergency arrangements must include detailed rescue procedures for workers at height.
- Man riding in a crane basket will be agreed with the EPM prior to commencement. Man riding in cranes will be a last resort and not a first use situation. All other MEWPs etc. shall be considered first.

4.17 Thorough Examination, Including Testing & Inspection

Inspection of Lifting Equipment and Lifting Accessories

CHEC and its sub-contractors will ensure that a register of all lifting equipment and lifting accessories in use is maintained at each work site.

CHEC and its sub-contractors will ensure the following inspections are carried out:

- Daily inspections of lifting equipment and completion of daily checklist carried out by the lifting equipment operator in accordance with the manufacturer's recommendations

- Weekly detailed inspections of lifting equipment carried out by the lifting equipment operator recorded formally in the lifting equipment inspection register
- Daily visual inspections of lifting accessories carried out by the signaler/slinger or other competent employee.

- Weekly detailed inspections of lifting accessories carried out by the appointed person or signaler/slinger or other competent employee and recorded formally in the lifting accessory inspection register.
- CHEC and its sub-contractors will ensure that periodic inspections by the lifting equipment supplier / owner
- Are undertaken in accordance with the lifting equipment manufacturer's recommendations. All lifting accessories must be:
- Stored in a safe manner when not in use, away from chemicals and adverse weather conditions.
- Inspected periodically and employers must develop a color-coding system for the periodic inspection
- Maintenance of Lifting Equipment and Lifting Accessories
- In order to reduce the risks associated with wear and/or deterioration CHEC lifting team will ensure
- A planned and preventative maintenance program is developed for lifting equipment and lifting accessories based on the manufacturer's recommendations /manual; and
- The maintenance schedule is reviewed frequently based on maintenance and failure findings.
- Record Keeping
- CHEC and its sub-contractors will maintain records
- Appropriate records for the following activities shall be maintained by the CHEC lifting team: Licenses of operators.
- Fitting equipment and accessories third party testing and certification evidence. Records of repairs / servicing / maintenance.
- Logbooks and inspection check sheet.

5. Working on or Near Live Roads

5.1 Critical Controls

Contractors must ensure robust controls are implemented when undertaking work on or near live roads, including adequate engineering controls or technical measures which ensure effective segregation of workforce and vehicles. Contractors must ensure that an assessment of the risks associated with work on or near live roads is undertaken, and safe systems of work are established which protect all parties, including the public. When planning roadworks, Contractors must consider the following:

- Pedestrian access and properties requiring vehicular access where these must always be maintained.
- If any underground services are present.
- Where work is planned which involves breaking up or opening any road, sewer, drain or tunnel under it. Relevant approvals must be provided by all statutory authorities before commencing works.
- Any part of the road to be obstructed by plant or materials must be appropriately signed and guarded.
- Works must be supervised by a competent person and there must always be at least one trained Supervisor on site.
- Workers must be provided with appropriate induction training before beginning road works.

- Visitors must always be given appropriate instruction on relevant hazards before entering the works area and be accompanied at all times.
- Assessing the competency of workers working near the live road:
- Define Competency Requirements: Specify the necessary knowledge, skills, experience, and certifications for working near live roads.
- Conduct Induction Training: Provide initial training on site-specific hazards, safety protocols, and emergency procedures.
- Offer Formal Training: Ensure operatives complete format training in road safety, traffic management, and first aid.
- Implement On-the-Job Training: Facilitate practical training under the supervision of a competent person.
- Theoretical Assessments: Administer written tests to evaluate operatives' understanding of safety protocols.
- Practical Assessments: Observe and evaluate operatives performing tasks in controlled or supervised settings.
- Conduct Performance Reviews: Regularly evaluate operatives' ongoing competency and
- Performance.

5.2 Traffic Management

Contractors must develop a Traffic Management and Logistics Plan to ensure the safe movement of traffic in and around the site. The plan must identify the precautions and rules for all Contractors' plant and vehicles delivering to and operating on the site and must be issued to the Project Management Consultant or Delivery Partner for review and approval.

5.3 Segregation from Live Roads

Contractors working in proximity to live roads must ensure controls are put in place to provide adequate segregation of pedestrians and vehicles. Consideration must be given to barrier types, times of working and road or land closures as agreed with the appropriate authorities, including the Ministry of Transport.

5.4 Parking

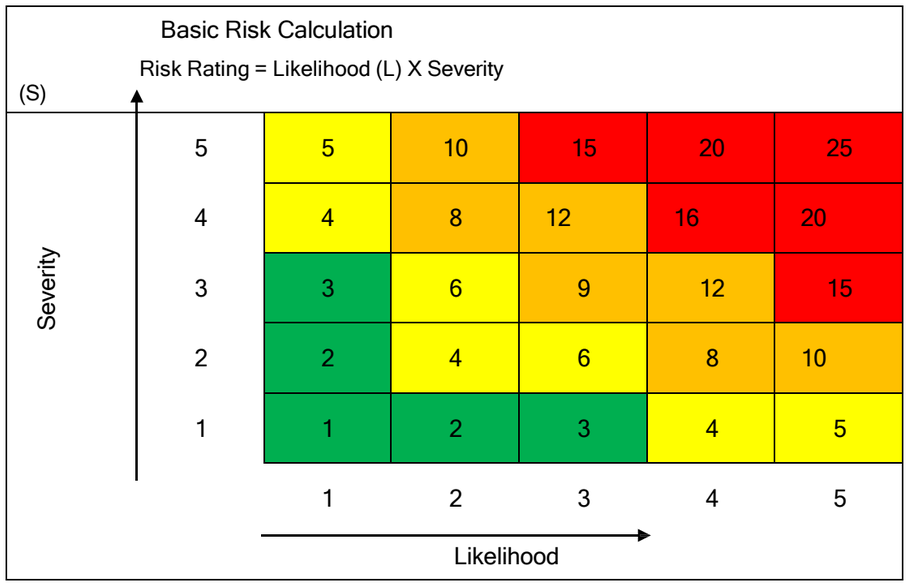
Contractors must ensure parking areas for different types of vehicles are in place. Delivery trucks and commercial vehicles must be parked separately from private vehicles. The following requirements apply to car parks:

- Must be established within the project site, or in an area agreed with Construction Management. Logistics team.
- No vehicles, private or commercial, will be allowed to park on the construction site access roads. Any vehicle parked on site access roads will be towed away.
- Segregated pedestrian walkways must be installed.
- Any car park shading structures must be subject to a temporary works design by the Contractor. The design must be submitted to the Project Management Consultant or Delivery Partner.
- Reverse parking is mandatory at all Project sites and offices.

6. Risk Assessment

RA #		LOCATION	Infrastructure work for Riyadh Sedra 3,4,5		
TASK	Risk assessment for Lifting, Loading and Unloading Operations				
DATE	25/07/2024	☒ New	☐ Revised	Revision Date	0

1.0	**Permit(s) Required:**	☐ Cold Work	☐ Hot Work	☐ Excavation	☐ Confined Space	☐ Work at Height
		☐ LOTO Permit	☐ Night Work	☐ Radiography	☒ Lifting Permit	☐ Road Closure Permit
2.0	**PPE Required:**	☒ Hard Hat ☒ Clear Safety Glasses ☒ Dark Safety Glasses ☒ Coverall ☒ Cotton Gloves ☒ Safety Shoes ☐ Dielectric footwear	☒ Fluorescent Reflective Vest ☒ Dust Mask ☐ Cartridge Respirator Mask Air supplied ☐ respirator SCBA ☐ Ear Plugs ☐ Earmuffs	☐ Rain Suit Disposable Coverall ☐ Fire resistant coverall Chemical Goggles ☐ Cutting Goggles ☐ Face Shield ☐ Welding Hood	☐ Cut resistant gloves. Leather Gloves ☐ Rubber Gloves Nitrile gloves ☐ Elect Insulated gloves. ☐ Welding Aprons Welding Leggings ☐	
3.0	**Special Tools and Equipment Required:**	☐ Gas tester Dosimeter ☐ Multi-Gas Monitor	☐ Anemometer with TWL Lux Meter ☐ Noise Meter	☐ Lifeline Retrieval Line ☐ Full body Harness	☐ Fire Extinguisher Ventilation Fans ☐ Lighting	
4.0	**Additional Instructions**	Approved HSE Plan & procedure will be followed at the site. Foreman / Supervisors to secure work permit before commencing activity and conduct brief safety talk. Wear mandatory PPE's (hard hats, safety glass, coverall, safety shoes, visibility vest). Ensure availability of welfare facilities Maintain adequate supervision. Dangerous occurrence, near miss and another related incident shall be reported accordingly.				



R	Unacceptable risk, plan out or add additional controls
O	Acceptable only if no other method viable and with high level control in place
Y	Acceptable with suitable control measures
G	Acceptable, no further action required

Calculation of Risk

A method is shown below for calculating the Risk, given the estimate Likelihood of occurrence (L), Severity (S). Risk Level (RL) = Likelihood (L) X Severity (S)

Where:

a - S = The Severity (Outcome) are ranked on a scale from catastrophe to minor interruption. (1, 2, 3, 4, 5)

b - L = Likelihood of fire occurrence i.e., probability of the event occurring because of the risk is measured on the likelihood of happening. (1, 2, 3, 4, 5)

Residual Risk RR = is the amount of risk associated with an activity remaining after risks have been reduced by control measures.

SN	Activity	Potential Hazard	Possible Risk	Employees Exposed	L	S	RL	Control Measures	RR			Responsible Personal
									L	S	RR	
1	Work Permit, Activity Briefing	Secure necessary permit	Working without valid work permit	Operators Site Engineer/ Supervisor/ Foreman/ HSE Team	3	4	12	➢ A work permit will be obtained before Starting the activity. ➢ Activity briefing must be done by the activity supervisor to communicate the hazard Associated with the specific task and control measure. ➢ Verify the job competency training before Starting the activity. ➢ Arrange all the required resources before Starting the activity.	2	2	4	Site engineer/ Work Permit Receiver/ Work Permit Issuer Supervisor/ Foreman/ Safety Officer
2	Preparation of site, tools, and equipment	Fall of Material Improper manual handling could result in minor bodily injury. Ergonomic (Manual Handling)	Personal Injury, Property damage to equipment or materials	Operators Site Engineer/ Supervisor/ Foreman/ HSE Team	3	3	9	➢ Assign inducted employee and must possess Induction sticker. ➢ Skilled workmen to be deployed at the job. ➢ Material stacking should not be more than 1.5 m. ➢ Toolbox talk/instructions must be provided to employees prior to starting the work. ➢ When assistive devices are not available, two or more staff must be used for lifting or awkward loads. ➢ All workers attending the toolbox meeting shall sign on the attendance sheet attached to the specific Permit to Work ➢ Continuous orientation and training to all regarding manual handling ➢ PPE acceptance pledge of the workers good stocks and availability of PPEs	2	2	4	Site engineer/ Work Permit Receiver/ Work Permit Issuer Supervisor/ Foreman/ Safety Officer
3	Manual Handling	Repeated sustained Load unstable Repetitive movement	Back pain Hand foot injury Hand foot twist Strains and sprains Slip, fall crush Cuts,	Workers,	3	3	9	➢ Engage only trained personnel. ➢ Use a hard hat wherever required, safety boots, eye protection, and hand gloves ➢ Engage two or more persons where ever required	2	2	4	Site engineer/ Supervisor/ Foreman/ Safety Officer

SN	Activity	Potential Hazard	Possible Risk	Employees Exposed	L	S	RL	Control Measures	RR			Responsible Personal
									L	S	RR	
3			bruises and broken bones Hernia					➢ As a guideline alone person not allow to lift the load. ➢ Ask for help and use the proper method of handling ➢ Avoid manual handling ➢ Utilize mechanical lifting method or equipment ➢ Reorganize the activity				
4	Inspection Heavy Equipment' s	Plant/ Equipment Failure	Property damage to equipment or materials Injuries to other personnel involved to the activity	Employees	3	4	12	➢ Operators of the equipment should have a daily inspection checklist for their equipment. ➢ Operators of the equipment shall be certified and licensed to operate pieces of equipment, TPC ➢ All plants shall be operated as per the Manufacturer's instruction manual. ➢ All equipment to be checked upon arrival on site. ➢ Awareness training should be provided regarding equipment. ➢ First aid box and first aider to be available on site. ➢ A safe work practice shall be implemented to Reduce the possibilities of accident / incident.se PPE appropriate to the job.	2	3	6	Equipment inspector/ Site engineer/ Supervisor/ Foreman/ Safety Officer
5	Heavy Equipment Operation	Collision of equipment	Injury, Property damage	Employees	3	4	12	➢ Equipment driver operator must be certified by third party with valid TPC. ➢ Equipment is in good condition and free from fault. ➢ Body cover is in place. ➢ Driver operator always inspects the equipment asper checklist ➢ Maintenance is done as per equipment schedule ➢ Always operate the equipment in the safe zone	2	2	4	Construction Manager/ Site engineer/ Supervisor/ Foreman/ Safety Officer
		Poor access Abrasions, strains Back strain	Getting injured from protruding object	Employees	3	3	9	➢ Daily check the tool before starting the activity. ➢ Excess & egress must be cleared. ➢ Proper access to be provided for carrying and placing the material.	2	1	2	Construction Manger Site Engineer Foreman/Supervisors

SN	Activity	Potential Hazard	Possible Risk	Employees Exposed	L	S	RL	Control Measures	RR L	RR S	RR RR	Responsible Personal
6	Carrying and placing of materials	Falling objects Obstruction	Injuries to other personnel involved to the activity					➢ Inspection and corrective action to follow correct handling procedure. ➢ Use adequate PPE's (face shield, goggles, Gloves etc.) ➢ Procurement of proper quality tools ➢ Use of appropriate Work permit system where required. ➢ Mechanical aid to be provided. ➢ Use PPE appropriate to the job.				
7	Delivery of items to work location by trailer truck	Falling of materials Overloading. Collision, Injury / fatality Rain, sandstorm & fog	Property damage to equipment or materials Injuries to other personnel involved to the activity	Operators Site Engineer/Supervisor/Foreman/HSE Team	3	3	9	➢ Competent and valid document holder drive/operates the heavy equipment and trucks, ➢ Equipment/Trucks should be inspected to Ensure that heavy equipment is in good working condition. ➢ Flagman/banksman should be assigned to guide operators/ drivers. ➢ Mandatory PPE must use Operators and driver At work site. ➢ Supervision and monitoring are required to ensure ➢ workers are not seated and sleep under Heavy equipment. ➢ Job supervisors should conduct pre- start briefing for the working crews; all the involved hazards/ risks, control measures And responsibilities should be briefed. ➢ Dedicated routes for vehicles. ➢ Information, instruction, and training for the Working crews. ➢ Use of job specific PPEs.	2	2	4	Construction Manger Site Engineer Logistic Engineer Foreman/Supervisor
		Untrained/Incompetent Riggers. Improper rigging	Major accident, serious injuries,	Operators Site Engineer	4	4	16	➢ Lifting Supervisor should verify the documents and knowledge of riggers prior to work start.	2	3	6	Lifting, supervisor Rigger HSE officer

SN	Activity	Potential Hazard	Possible Risk	Employees Exposed	L	S	RL	Control Measures	RR L	RR S	RR RR	Responsible Personal
8	Lifting Work - Loading & Unloading of materials by Mobile crane /Boom Truck	Lifting equipment failure Incorrect position (toppling) of mobile crane during unloading/ installation Falling Hazards Weather condition sandstorm, High winds, Fog etc.	fatality, property damage, for unauthorized operation Injuries to other personnel involved to the activity. Environmental complaint	supervisor/Fore man/HSE Team				➢ Only trained and certified riggers shall rig the load and monitoring will be required from the lifting supervisor. ➢ Check the capacity of each lifting gear to ensure that the weight of element doesn't exceed the SWL of rigging gear. ➢ Tag Line shall be utilized to control the load swing while shifting. ➢ Premobilization check carried out as per lifting regulation. ➢ Mobile Crane inspected and certified by third party as fit for use and third-party documents are valid. ➢ All lifting equipment must have third party certificate and be checked by the rigger daily. All damaged slings, chains and Shackles are removed from the workplace immediately. ➢ Barricade the work area and different type of signage posted. ➢ Check and ensure wind speed does not exceed from the crane manufacture's recommendation. ➢ Lifting operation suspended until weather conditions improve and visibility is clear. ➢ Only authorized personnel shall be involved and present in a direct work location. ➢ All working platforms and cranes were positioned on compacted, and ground levelled prior to work start. The Rigger/supervisor shall determine the size of the outrigger mats based on the load the ground compaction and radius etc. included in mitigation. ➢ Ensure the area is free from underground utilities and overhead cranes away from the edges of excavation. ➢ Ensure to obtain permit as applicable to lifting as Client/consultant PTW procedure.				

SN	Activity	Potential Hazard	Possible Risk	Employees Exposed	L	S	RL	Control Measures	RR			Responsible Personal
									L	S	RR	
								➢ PPE acceptance pledge of the workers ➢ Good stocks and availability of PPE's ➢ The appointed person available on site for the selection of crane(s) and lifting accessories, instruction and supervision, and consultation with other responsible bodies to ensure effective collaboration as is necessary for the Work to be undertaken safely. ➢ Lift operation will be supervised by The crane supervisor available all the time with lifting activities.				
9	Adjacent works	Other work in the vicinity People accessing. Effected by the noise Injury/major injury due to falling of cut piece on personal.	Personnel Equipment Major accident, serious injuries, fatality, property damage for unauthorized operation Injuries to other personnel involved to the activity	Operators Site Engineer/Supervisor/Foreman/HSE Team	3	3	9	➢ Barricade the area to prevent others passing Through and signage must be posted. ➢ One person to be allocated as watchman. ➢ Create separate access away from work area. ➢ Conduct Task briefing prior to start work. ➢ Only authorized personnel shall be involved and present in a direct work location. ➢ Ensure to obtain permit as applicable to lifting as client PTW procedure. ➢ Coordination with the other workers/ party to be ensured by the work supervisor	1	2	2	Construction Manger Site Engineer Logistic Coordinator
10	Work in Heat	Exposure to Direct Sun light, Extreme temperatures, Humidity & Radiant Heat during Extended hours for Excavation and Haulage Activity.	Heat Stress Dehydration Unconsciousness Fatigue Heat Exhaustion Heat Stroke Sunburns, Heat Rash and other skin-related issues Risk of accidents and	Operators Site Engineer/Supervisor/Foreman/HSE Team	4	3	12	➢ No activity shall be performed during extended hours (12:00-3:00 PM) without approval client. ➢ All vehicle/Equipment/Machine must equip with enclosed cabin with an operational air condition system. ➢ Medical team, ambulance and first aid provision shall be present at all times site to attend any medical emergency that may occur due to heat stress during working hours. ➢ No workers allow to sit and stay under equipment.	2	2	4	Construction Manager/ Site engineer/ Supervisor/ Foreman/ Safety Officer

SN	Activity	Potential Hazard	Possible Risk	Employees Exposed	L	S	RL	Control Measures	RR			Responsible Personal
									L	S	RR	
			injuries due to fatigue and discomfort Reduce cognitive function and impaired judgment					➢ No working shall be allowed at site and ensure proper supervision of work force. ➢ All Workers and Staff are encouraged to have a balanced diet and get adequate sleep. ➢ Provision of Cold drinking Water and Oral Dehydration Solution (ORS) to all employees to compensate the loss of water & minerals lost by sweating. ➢ Oral dehydration Solution (ORS) shall be provided at site mixed with water in an appropriate ratio/amount. ➢ Continuous temperature and humidity monitoring to ensure the temperature is within the acceptable limit. ➢ Adequate Information, Instruction, Training & Supervision to all employees shall be communicated regarding the Heat stress & necessary safety precautions to be complied with. ➢ Provision of appropriate clothing (e.g., lightweight, cotton, light-colored). ➢ Heat stress and control measures shall be communicated to workers during pre-task briefings, safety induction and specific Heat Stress related trainings.				

Attachment: Lifting Plan

CRITICAL LIFTING PLAN (9 Tons and Above)

Project Name				
Exact Location		Date		
THE CRANE				
Crane Manufacturer		Crane Model		
Crane Registration No.		Crane Rated Capacity		
Single Line Pull Capacity		Number of Parts of Line		
Total Gross Capacity of Hook Block as reeved				
Crane Third Party Certificate No.		Expiry Date		
Crane Operator Name				
Third Party Certificate No.		Expiry Date		
Load Handling Devices				
Load Handling/Boom Attachments	**Stowed**	**Erected**	**N/A**	**Weight**
Swing-Away Jib				
Other Jibs				
Hook Block (MAIN)				
Auxiliary Boom Head				
Headache Ball				
Lifting Devices Required	**YES**	**NO**	**N/A**	**Weight**
Lifting/Spreader Beam Needed				
Does Beam Have Current Inspection Sticker				
Sling, Shackles, etc.				
Other				
Weight of Load to be Lifted				
Total Weight				
THE RIGGER				
Rigger Name		Rigger Category		
Third Party Certificate No.		Expiry Date		
RIGGING				
Hitch Arrangement				
Sling Type(s)				
Sling Size(s)				
Sling Length(s)				
Shackle Size		Capacity		
Capacity of Above Configuration				

CRITICAL LIFTING PLAN (9 Tons and Above)

THE JOB			
Brief Description of Work:			
Total Weight		Boom Length	
Maximum Operating Radius		Boom Angle	
Max. Height of Lift		Counterweight Required?	
Crane SWL (this configuration)		Lift Quadrant (Front, Rear, 360°)	
Total Current % Crane Capacity for this configuration			
Obstruction (O/Head Cables, Existing Building, etc.):			
Ground Conditions:			

LIFTING OPERATION AREA CHECK	
☐ Hazardous overhead cables	☐ Hazardous interface between other groups
☐ Hazardous obstruction	☐ Area suitably demarcated (exclusion zone)
☐ Hazardous adjacent activities	☐ Advised other groups working at the same time
☐ Hazardous underground services	☐ Others:

Additional Information

CRITICAL LIFTING PLAN (9 Tons and Above)

Draw the Lift Sketch here:

	Rigger	Crane Operator
Name		
Date		
Signature		

LIFTING PLAN (Less than 9 Tons)

Project Name	

Exact Location		Date	
THE CRANE			
Crane Manufacturer		Crane Model	
Crane Registration No.		Crane Capacity (SWL)	
Crane Third Party Certificate No.		Expiry Date	
Crane Operator Name			
Third Party Certificate No.		Expiry Date:	
THE RIGGER			
Rigger Name		Rigger Category	
Third Party Certificate No.		Expiry Date:	

LIFTING ACCESSORIES CARRIED

Item	Identification No	S.W.L.	Size	Third-Party Expiry Date

THE JOB

Brief Description of Work:

Load Weight (Kg)		Hook Weight (Kg)	
Headache Ball Weight (Kg)		Lifting Beam Weight (Kg)	
Sling Belts Weight (Kg)		Shackles Weight (Kg)	
Total Weight (Kg)		Boom Length (Meter)	
Max. Radius of Lift (Meter)		Boom Angle	
Max. Height of Lift (Meter)		Crane SWL (this configuration)	
Total Current % Crane Capacity for this configuration			

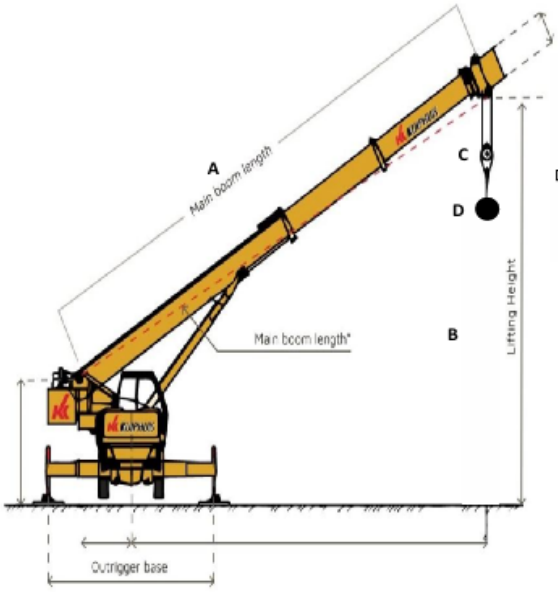
Obstruction (O/Head Cables, Existing Building, etc.):

Ground Conditions:

LIFTING PLAN (Less than 9 Tons)

LIFTING OPERATION AREA CHECK	
☐ Hazardous overhead cables	☐ Hazardous interface between other groups
☐ Hazardous obstruction	☐ Area suitably demarcated (exclusion zone)
☐ Hazardous adjacent activities	☐ Advised other groups working at the same time
☐ Hazardous underground services	☐ Others:

Additional Information



A = _____meters

B = _____meters

C = _____tons

D = 0-2T 2-4T 4-6T 6-8T 8-9T

Total Weight (C+D) = _____tons

	Prepared By	Checked By
Name		
Designation		
Date		
Signature		