



Lusail Real Estate Development Company

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

Lusail Construction Safety Management Procedure – Lockout/Tagout (LOTO)

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1. Description

This element of the LCSMP details Lusail’s requirements for the control of hazardous energy associated with construction equipment and systems. The program, commonly referred to as “Lockout/ Tagout” (LOTO), shall address all types of hazardous energy found on a construction site including electrical, pneumatic, hydraulic, mechanical, kinetic and thermal. The requirements of this element apply to all Lusail personnel, Contractors, Developers, Consultants, and subcontractors working on the Lusail project.

This element does not address requirements for electrical work, which are covered in [LUS-HSE-WG3-446-024](#), Electrical.

2. Definitions

Term	Description
Affected Worker	Person whose job requires him to be in an area where the equipment or system has been de-energized under the LOTO program. The affected worker cannot perform work under a LOTO.
Job Hazard Analysis	A process used to identify the hazards or potential hazards associated with each step of a job or work plan to uncover hazards and then eliminate, control, or remove them before the work is started.
Authorized Worker	Person who locks out and/ or tags out machines, equipment, or systems to perform servicing or maintenance on that machine or equipment. This person must have completed the mandatory training to be qualified as an authorized worker. Only an authorized worker installs locks and/ or tags as required by this program.
Energy Isolating Device	Device that prevents the transmission or release of hazardous energy or hazardous materials. Examples include restraint blocks, electrical circuit breakers, disconnect switches, slide gates, slip blinds, or line valves. For LOTO purposes, isolating devices that provide visible indication of the equipment/ system status are desirable.
Energy Source	The object, equipment or system which contains or has potential to contain a form of hazardous energy.
Exposure	Known, potential or accidental contact with a hazardous chemical, material, energy, or physical hazard through any route of entry into/ onto the body, including inhalation, ingestion, skin contact, or absorption.
Hazardous Energy	Examples include electrical, mechanical, hydraulic, pneumatic, chemical, radiation, and thermal energies, as well as various forms of potential energy, such as that stored in springs, compressed gases, or suspended objects.
Lockbox	A lockable container or location in which keys for the locks applied to energy isolating devices are stored.
Lock(s)	Device that requires a key to operate (not a combination lock) and is capable of holding an energy isolating device in the required position for the protection of personnel.
Lockout/Tagout (LOTO)	Installation of a lock and/ or tag on the energy isolating device(s) to render the energy associated with the tool equipment or system controlled or safe. The lock and/ or tag provide physical and visual assurance that the tool, equipment or system they are isolating cannot be operated until the lock and/ or tag are removed.
Safe Condition Check	An inspection and test of tool, equipment or system following installation of the lock and/ or tag upon the energy isolating device to verify that the lockout has

Term	Description
	successfully controlled the possibility of hazardous energy release.
Servicing and Maintenance	Workplace activities such as reconstructing, installing, setting up, adjusting, inspecting, modifying, and maintaining or servicing machines or equipment. These activities include lubricating, cleaning, or un-jamming machines or equipment and making adjustments or tool changes during which the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy. This applies to all personnel regardless of job title (operator, researcher, maintenance crafts, engineer, or construction personnel).
Tag(s)/ Tagout	A “DANGER” tag or a “DANGER – DO NOT OPERATE” tag which can be securely fastened to an energy isolating device in accordance with this LCSMP element to indicate to Affected Workers that the energy isolating device and the equipment being controlled cannot be operated until the tag is removed.

3. Responsibilities

The Contractor is fully responsible for the pre-planning, development of Method Statements, Job Hazard Analysis, and overall safe work planning and implementation. The Contractor’s Project Management is responsible for the assurance that all work is planned and conducted according to the pre-planning documents, Contractor and Lusail Health Safety & Environment (HSE) procedures and the Qatar Construction Specifications 2010. Should a conflict occur between procedures/ standards or requirements the more stringent shall apply.

4. General Requirements

LOTO must be used when an employee is performing service or maintenance around any machine which, if suddenly set in operation or motion, could cause injury. For example, unexpected startup of equipment or release of stored energy could cause injury to any person near that machinery. LOTO is also required when work is performed on electrical, hydraulic, thermal, pressurized, or chemical conveyance system where failure to control the potential energy could cause injury, death, or equipment damage.

In addition, locks and tags by themselves do not de-energize equipment; they must be attached only after a machine has been isolated from its sources.

Energy isolation and LOTO are applied only by authorized employees trained to perform service or maintenance.

No device is operated with LOTO attached, regardless of circumstances. No person will remove a lock or tag without following proper procedures.

Group lockout devices are used when multiple craftsmen or other contractors are involved in the operation.

Only individually keyed locks are used, and these locks are individually identified.

5. Project LOTO Plan

The Contractor develops and implements a project-specific LOTO plan in accordance with Qatari Law and this section of the LCSMP.

The Project Manager reviews and approves the plan, and designates personnel to maintain a Lockout/Tagout Request Log (Attachment [LUS-HSE-FM4-446-046](#)) and conduct weekly inspections. The project manager facilitates implementation and compliance with the program.

The Contractor monitors the activities of employees and subcontractors to ensure compliance.

The project LOTO plan is included in the Contractors HASP. (Attachment [LUS-HSE-FM4-446-045](#)) shows a sample lockout/tagout plan. The attachment is a template only; it must be modified to address specific project sites. At a minimum, the project LOTO plan includes the following information:

- Name of the person responsible for maintaining the program, and communicating program requirements to employees

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- Name(s) of the personnel assigned responsibility for conducting activities within the program, such as maintaining the LOTO log and conducting weekly inspections
 - LOTO requests
 - LOTO log
 - Locations of, and access to, lockout locks. Generally, locks are located in the jobsite office in a lockbox. The lockbox remains locked at all times except locks are issued and logged. Keys remain in the locks until time of issue. After the lock is issued, the key remains in possession of the person placing the locks.)
 - Outline of methods to be used for:
 - Identifying individual locks
 - Training authorized and affected employees
 - Group LOTO
 - LOTO procedures for specific equipment, if available

6. Permit Requirements for Lockout/Tagout

The Lusail Construction HSE Department implements a comprehensive Permit to Work (PTW) Program intended to minimize potential for incident with various work activities. Lockout/Tagout of any system described above is included in the Lusail PTW Program.

Contractors planning to conduct work on any system which requires LOTO are required to request for a permit to work from their Supervising Consultant. No LOTO work shall occur without first being reviewed by the Supervising Consultant and/ or Lusail HSE, and a valid authorized permit being issued.

Through use of the two-week look ahead planning process, Contractors are expected to know the schedule of work activities which will require LOTO. Contractors shall notify the Supervising Consultant a minimum twenty four (24) hours prior to start of work. The Supervising Consultant and Contractor HSE Representative shall “walk down” the work area where LOTO will be performed.

The Contractor shall describe the work activity planned via a Method Statement, Activity Hazard Analysis (AHA), or similar. This work plan shall clearly identify all controls planned, lockout devices which will be used, personnel involved, systems affected, and a schedule of the planned work activity, at a minimum.

Upon verification by the Supervising Consultant that the Contractor has satisfied all safety requirements, the Supervising Consultant shall issue a Lockout/Tagout Permit, valid for one work shift. The permit shall be signed by both the Consultant and Contractor representatives.

Conditions which would automatically terminate the Permit include: completion of the work and removal of LOTO devices, discovery of previously unknown hazards, conditions, or exposures which are not addressed by the current permit, or failure of the LOTO device(s) to adequately control the hazardous energy source(s) present in the system, equipment, or tool.

The Permit to Work is reference as Form (Attachment [LUS-HSE-FM4-446-048](#)) “Lockout/Tagout Permit.”

7. LOTO Materials

The Contractor provides locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware for isolating, securing, or blocking machines or equipment from energy sources.

- Locks and tags cannot be used for other purposes.
- Locks must meet the following requirements:
 - Capable of withstanding the environment to which they are exposed for the maximum period that exposure is expected
 - Standardized in at least one of the following criteria: color, shape, or size
 - Substantial enough to prevent removal without the use of excessive force or unusual techniques, such as bolt cutters or other metal cutting tools
- Tags must meet the following requirements:

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- Standardized print and format and in at least one of the following criteria: color, shape, or size
 - Constructed and printed so that exposure to weather or wet and damp locations does not cause the tag to deteriorate or the message on the tag to become illegible
 - Does not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored
 - Attach securely using tie wraps (or equivalent) capable of withstanding 50 pounds of force
 - Indicate the date and identity of the employee applying the device(s) or the identity of the group lockbox
 - Contain identifying information about the person who applies it and the control point
 - Contain a statement prohibiting operation of the disconnected equipment and removal of the tag.
 - Warn against hazardous conditions and include a legend such as: “Do Not Start, Do Not Open, Do Not Close, Do Not Operate.”

8. LOTO Procedures

LOTO is conducted in accordance with the following sections.

8.1 Prepare For Shutdown

- Notify all affected employees that servicing or maintenance is required on a specific machine or equipment and that the machine or equipment must be shut down and locked out to perform servicing or maintenance.

8.2 Shut Down and Isolate Equipment

- If the machine or equipment is in operation, shut it down using its operating controls or shutdown procedure (e.g., depress stop button, open switch, close valve).
- If possible, lock out all electrical breakers (if applicable) first to prevent unexpected startup of equipment while isolating valves, etc.
- Position the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s). Ensure that a disconnect switch, circuit breaker, valve, or other energy-isolating mechanism is the SAFE or OFF position.

8.3 Apply Lockout/Tagout Devices

- Lock and tag each energy isolating device with assigned individual locks/tags. Each authorized individual conducting maintenance or servicing must attach his lock and tag to each energy-isolating source.
- If a tag cannot be affixed directly to the energy isolating device, attach the tag as close to the isolating device as possible, in a position that will be immediately obvious to anyone attempting to operate the energy isolating device.

8.4 Control Stored (Potential) Energy

- Inspect each system to ensure that all parts have stopped moving.
- Install ground wires.
- Relieve trapped pressure.
- Release the tension on springs or block the movement of spring-driven parts.
- Block or brace parts that could fall. Use jacks and jack stands under vehicles.
- Block parts in hydraulic and pneumatic systems that could move from loss of pressure. Bleed the lines and leave the vent valves open.
- Drain process piping systems and close valves to prevent hazardous material flow.
- If a line must be blocked where there is no valve, use a blank flange.
- Purge reactor tanks and process lines.
- Allow dissipation of extreme cold or heat. If time does not allow full dissipation, wear protective clothing.
- If stored energy can re-accumulate, monitor it to ensure that it stays below hazardous levels.

8.5 Check Safe Condition

- Ensure that the equipment is disconnected from the energy source(s). First, check that no personnel are exposed, then verify the isolation of the equipment by operating the energy control device(s) or by testing (e.g., voltmeter) to make certain that the equipment will not operate.
- Return operating control(s) to neutral or “off” position after verifying the isolation of the equipment.
- The machine is now locked out.

9. End-Of-Shift Procedures

If only one shift or individual is to work on the equipment, system, or machine, the attached locks/tags remain in place until maintenance/servicing is complete.

Where a second or third shift will continue maintenance or service initiated by the first shift, the authorized individuals from transitioning shifts conduct a turnover of the tasks, systems, etc. The off-going shift personnel remove their locks and tags, and the on-coming shift personnel install their own locks and tags in accordance with the LOTO procedure.

10 LOTO Procedure for Mobile Equipment

To prevent injury from unexpected start up of vehicles and powered industrial equipment during servicing or maintenance operations, the authorized employee performing the maintenance or service institutes the following procedures:

- Remove the keys from the ignition and maintain control of them throughout the time the equipment is serviced.
- Attach a tag at the point of operation (the steering mechanism or control panel) and in an easily seen location on the vehicle or equipment being serviced.
- Take at least one other safety measure to make the vehicle or equipment inoperable (e.g., remove cables from the battery).
- Block the wheels of the vehicle to prevent accidental movement.
- Secure all hydraulic systems to prevent their accidental movement.
- Where possible, guard all sharp instruments or blades to prevent accidental injury.
- Permit only authorized personnel in the work area.

11. Service, Maintenance, and Temporary Reactivation

If equipment must be temporarily reactivated, the authorized employee performing the maintenance or service institutes the following procedures:

- Safeguard all employees by conducting a headcount to make sure everyone is clear of the equipment.
- Notify everyone in the area that LOTO is being removed.
- Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
- Remove all LOTO devices and re-energize the system.
- As soon as the energy is no longer needed, isolate the equipment and reapply LOTO.
- If servicing equipment requires more than one work shift, do not interrupt LOTO protection. Employees leaving work must not remove their locks until the next shift arrives and is ready to lock out.

12. Restoring Equipment to Service

This procedure must be followed when removing LOTO:

- Safeguard all employees by conducting a headcount to make sure everyone is clear of the equipment.
- Notify everyone in the area that LOTO is being removed.
- Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.

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- Check the work area to ensure that all employees have been safely positioned or removed from the area.
 - Verify the equipment or machine controls are in neutral.
 - Remove LOTO devices and re-energize the machine or equipment. Note: The removal of some forms of blocking may require re-energization of the machine before safe removal.
 - Notify affected employees that servicing or maintenance is completed and the machine or equipment is ready for use.
 - Remove the LOTO devices. Each device must be removed by the person who attached it.
 - In some workplaces, the last person to remove a lock may have extra duties, such as removing the hasp and lockout device, and removing tags, signing them, and turning them in. The exception would be in some cases in which the client's designated personnel remove their locks and tags last.

13. Lock/Tag Removal By Other Than Authorized Workers

Only the employee(s) who applied the LOTO device(s) is/ are authorized to remove that device. If the person who applied the device is not available, the device may be removed by the authorized employee's supervisor if the following requirements are met (the supervisor must submit a written report to the superintendent outlining the removal of locks/tags and the reason for this action):

- The machine/equipment must be placed in service because of an emergency.
- If the employee is not available, the supervisor must:
 - Verify that the authorized employee who applied the device is not at the facility.
 - Make all reasonable efforts to contact the employee to advise him that the device has been removed.
 - Ensure that the authorized employee knows that the device has been removed before he returns to that job.
 - Verify that task that was being performed is complete or that the task is at a point where the equipment or machine can be put back in service without damage to the equipment, machine, or personnel.
- After verifying that the equipment is safe, the Contractors Project Manager in charge of the work directs the removal of the lock.

14. Group LOTO

14.1 Communication

- The Consultant requests a copy of the Contractor's LOTO plan.
- Contractors submit copies of their LOTO plans to the Supervising Consultant's HSE Representative. The HSE Representative provides comments to the Contractor.
- Where service or maintenance must be performed with other Contractors' during LOTO, the original Contractor must request the Consultant review the project LOTO program with each of the Contractor's HSE Representatives during the pre-job safety orientation and inform the authorized and affected employees about any differences in the two Contractors' procedures that may cause confusion.

14.2 Group LOTO Procedure

The Contractor shall include a group LOTO procedure in the project LOTO plan to address cases in which equipment or machinery maintenance or servicing is provided by a group. The following requirements apply to the group LOTO procedure:

- The group Supervisor has primary responsibility for all employees working under the protection of a group LOTO.
- The group Supervisor ensures that the protection of each employee in a group LOTO is equal to or better than that of individual LOTO.
- When more than one crew is involved, the responsibility of the overall job-associated lockout or tagout control is assigned to an authorized employee designated to coordinate affected work forces and ensure continuity of protection.

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- Each authorized employee affixes a personal LOTO device to the group lockbox when he begins work and removes those devices when he stops working on the machine or equipment being serviced or maintained.
 - The crew or group using a group lockout device places the keys to the locks in a lock box and locks that box.

15. Periodic Inspection

To ensure that procedures and requirements are being followed, a designated authorized employee (other than those using the energy control procedure) conducts a monthly inspection in accordance with the Lockout/Tagout Inspection Report (Attachment [LUS-HSE-FM4-446-047](#)). The authorized employee submits the completed inspection forms to the HSE Representative each month.

Designated HSE or supervisory personnel conduct weekly inspections of locations selected using the Lockout/ Tagout Request Log (Attachment [LUS-HSE-FM4-446-046](#)) to verify the continued need for each lockout and to ensure lockout devices and tags are still in place.

The Contractor/Consultant reviews the inspection forms and monitors the effectiveness of the program.

16. LOTO Exceptions

This element does not apply to work on cords and plug electric equipment where exposure to the hazards of unexpected energization or startup of the equipment is controlled by unplugging the equipment from the energy source and keeping the plug under the exclusive control (within arm's reach and line of sight) of the employee performing the servicing or maintenance.

LOTO is not required when all of the following elements exist:

- The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shutdown that could endanger employees.
- The machine or equipment has a single energy source that can be easily identified and isolated, and
- The isolation and lockout of that energy source completely de-energizes and deactivates the machine or equipment.
- The machine or equipment is isolated from that energy source and locked out during servicing or maintenance.
- A single lockout device achieves a locked-out condition.
- The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance and may not be used by or shared with other employees.
- Servicing or maintenance does not create hazards for other employees.

Servicing and/or maintenance activities that take place during normal operations are covered by this LOTO procedure only if:

- An employee is required to remove or bypass a guard or other safety device.
- An employee is required to place any part of his body into an area on a machine or piece of equipment where work is actually performed on the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle.

Minor tool changes, adjustments, and other minor servicing activities that take place during normal production operations are not covered by this procedure if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures to provide effective protection.

17. Training

The Contractor trains affected and authorized employees in the project LOTO plan to be used on the worksite.

The Contractor arranges employee training at the time of their initial assignment and whenever a new hazard is introduced to the jobsite. Supervisors are responsible for identifying additional employee training needs during risk mitigation planning (2-week look-ahead).

17.1 Affected Employee

An affected employee is an employee whose job requires him to operate or use a machine or equipment on which servicing or maintenance is being performed under a tag, lock, and try procedure, or whose job requires him to work in an area in which such servicing or maintenance is being performed.

Each affected employee is instructed in the purpose and use of the Lockout/Tagout Plan.

17.2 Authorized Employee

An authorized employee tags, locks, or tries machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include servicing or maintenance.

Each authorized employee receives training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

Authorized employees are trained in the type and magnitude of energy and must understand the hazards of that energy.

17.3 Other Employees

The Contractor discusses the project LOTO plan during the initial orientation with occasional and business visitors, as well as Contractors whose work operations are or may be in an area where energy control procedures may be used. Training includes general information about the procedure and about the prohibition relating to attempts to restart or re-energize machines or equipment that is locked and/ or tagged out.

17.4 Retraining

Retraining is provided for all authorized and affected employees when there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or a change in the energy control procedures.

Additional retraining is conducted when there are deviations from, or inadequacies in, the employee's knowledge or use of the energy control procedures. The retraining re-establishes employee proficiency and introduces new or revised energy control methods and procedures, as necessary.

18. Documentation

The Contractor HSE Representative documents all LOTO instruction, training, and retraining records. Records verifying completion of LOTO training are kept in the individual employee's training files.

Lockout/Tagout Permits which have been closed out will be retained on file by the Contractor and the Supervising Consultant. Permits are multi-copy carbon format to provide this multiple entity filing.

Contractor HSE personnel maintain the LOTO requests and logs.

In each instance that a lock is removed by any person other than that applying the lock, the supervisor submits a report to the Project Manager for review. The Contractor maintains a file of these reports.

The Contractor maintains a file for completed monthly LOTO inspection reports. The Contractor also maintains LOTO project records at the site for the duration of the project and archives them for a minimum retention time of 10 years from creation date.

19. References

Qatar Construction Specifications 2010 Section 11 Part 1.5.3 "Electrical Safety on Site"

Qatar Construction Specifications 2010 Section 11 Part 2.3.4 "Electricity at Work"

20. Attachments

[LUS-HSE-FM4-446-045](#) Sample Project Lockout/Tagout Plan

[LUS-HSE-FM4-446-046](#) Lockout/Tagout Request Log

[LUS-HSE-FM4-446-047](#) Lockout/Tagout Inspection Report

[LUS-HSE-FM4-446-048](#) Lockout/Tagout Permit

