



Lusail Real Estate Development Company

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

Lusail Construction Safety Management Procedure – Excavations

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1. Description

This element of the LCSMP details Lusail’s requirements and guidelines for any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal. This element applies to all Lusail personnel, Contractors, Developers, Consultants and subcontractors working on the Lusail project.

This element does not provide specific engineering requirements for shoring systems.

2. Definitions

Term	Description
Job Hazard Analysis (JHA)	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.
Adjacent Structure Stability	The stability of the foundation of adjacent structures whose location may create surcharges, changes in soil conditions, or other disruptions that could extend into the failure zone of the excavation.
Aluminum Hydraulic Shoring	A manufactured shoring system consisting of aluminum hydraulic cylinders (cross braces) used with vertical rails (uprights) or horizontal rails (wales). Such a system is designed to support the sidewalls of an excavation and prevent cave-ins.
Bell-bottom Pier Hole	A type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.
Benching or Benching System	A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or more horizontal steps, usually with vertical or near-vertical surfaces between levels.
Competent Person	A person trained to identify unsafe hazards or working conditions in the workplace or working conditions with authority to have the hazards eliminated or controlled.
Cross Braces	The horizontal members of a shoring system installed from side to side of the excavation. The cross braces bear against either uprights or wales.
Excavation	Any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.
Faces or Sides	The vertical or inclined earth surfaces formed as a result of excavation work.
Hazardous Atmosphere	An atmosphere that is explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, and that may cause death, illness, or injury.
Kickout	The accidental movement or failure of a cross brace.
Protective System	A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Term	Description
Ramp	An inclined walking or working surface that is used to gain access to one point from another. A ramp may be constructed from earth or from structural materials such as steel or wood.
Sheeting	The members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.
Shield or Shield System	A structure used in an excavation to withstand cave-ins and that protects employees working within the shield system. Shields can be permanent structures or portable units moved along as work progresses. Commonly referred to as “trench boxes.”
Shoring or Shoring System	A structure that is built or put in place to support the sides of an excavation to prevent cave-ins.
Sloping or Sloping System	Sloping the sides of the excavation away from the excavation to protect employees from cave-ins. The required slope varies with soil type, weather, and surface or near surface loads that could affect the soil in the area of the trench (e.g., adjacent buildings, or vehicles near the edge of the trench).
Stable Rock	Natural solid mineral material that can be excavated with vertical sides that will remain intact while exposed.
Structural Ramp	A ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.
Support System	A structure such as underpinning, bracing, or shoring that provides support to an adjacent structure, underground installation, or the sides of an excavation.
Surface Encumbrances	Underground utilities, foundations, streams, water tables, transformer vaults, and geologic anomalies.
Surcharge	An excessive vertical load or weight caused by spoil, overburden, vehicles, equipment, or activities that could affect stability.
Trench	Any excavation whose width or length is less than 4.5 meters (15’).
Unconfined Compressive Strength	The load per unit area at which soil will fail in compression.
Underground Installations	Utilities, tunnels, shafts, vaults, foundations, and other underground fixtures or equipment that might be encountered during excavation work.
Uprights	The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights that are placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called sheeting.
Wales	Horizontal members of a shoring system placed in the direction of the excavation face whose sides bear against the vertical members of the shoring system or earth (uprights or sheeting).

3. Responsibilities

The Contractor is fully responsible for the pre-planning, development of Method Statements, Job Hazard Analyses, overall safe work planning and implementation. 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. Project Excavation Plan

The Project Manager leads the development and implementation of a project excavation plan in accordance with Qatar laws and standards, and Lusail policies and procedures.

During the design phase, the Project Manager conducts a search for drawings of all areas requiring excavation. All pertinent drawings are included in the excavation plan. As early in the design stage as possible, the Project Manager holds a constructability meeting with the Supervising Consultant and Lusail Representative

The Construction Manager facilitates implementation and compliance with the excavation plan. The Project Manager designates a competent person to oversee excavations, complete excavation permits or notification forms, and perform daily excavation inspection.

The HSE Representative audits the excavation activities of the Contractor and subcontractors to ensure compliance with the plan and Lusail procedures.

The project excavation plan must include site-specific provisions for the following:

- Excavation permits for each excavation (issued by Supervising Consultant)
- Design requirements for protective systems
- Identification of underground installations
- Warning system for mobile equipment
- Risk Assessment
- Job hazard analysis (JHA)
- Method Statement

5. Excavation Permits

The Contractor's competent person must prepare and submit a completed Excavation Permit (Attachment [LUS-HSE-FM4-446-066](#)) to the Supervising Consultant for review and approval. An authorized permit shall be in place prior to excavation starting.

Before excavation is started, the HSE Representative shall ensure that a complete geophysical investigation (scanning) reports has been obtained for the proposed excavation area. The Contractor shall ensure that all known and identified underground installations are adequately marked and communicated to all persons involved in the excavation activity.

The competent person classifies the soil using industry standard soil classification visual and manual tests. Soil type, classification, and required protective systems must be indicated on the excavation permit. Designs for protective systems by the project engineer must be submitted to the Project Manager as an attachment to the excavation permit.

Before starting the excavation and authorizing the excavation permit, the Contractor HSE Representative and Supervising Consultant conduct a pre-job walkthrough to verify that all necessary controls have been provided, workers are trained, and protective systems are in place.

The Supervising Consultant verifies the information on the permit and authorizes the permit. The original permit is to be maintained at the excavation site, with copies provided to the Consultant and Lusail HSE, upon request.

6. Surface Encumbrances

Prior to and during excavation, Contractors must remove all surface encumbrances that might create a hazard to employees or support them as necessary to safeguard employees.

Do not store excavated or other material closer than 0.6 meters (2') from the edge of any excavation; where possible store such material a minimum of 1.2 meters (4') from the edge of any excavation.

Ensure that remaining surface items are visible to heavy equipment operators and vehicle drivers and are tagged with high-visibility tape or a reflectorized flag mounted above the object(s). Inform operators and drivers of the location of these surface items at morning tailgate safety meetings.

Where equipment and/or vehicles must travel adjacent to surface encumbrances, Contractors must provide a flag person/ banksman to assist the operator/driver.

7. Barriers

Barrier tape (at a minimum) is required to be placed around the perimeter of an excavation so that any employee working on the site can recognize an open excavation hazard. Excavations/trenches shall remain identified with barrier tape as long as the excavation/trench remains open.

Barriers must be erected far enough back from the excavation/trench to allow for adequate warning and protection. Preferably, barriers will be set back a minimum of 1.8 meters (6') from the leading edge of the excavation.

Barriers selected must be adequate for the level of hazard created by the excavation. Excavation depth, proximity to roads, and extent of worker occupancy all shall be considered when selecting barriers. The greater the hazard or exposure, the more rigorous the barricade should be.

Barriers around excavations which are exposed to vehicular traffic must be artificially lighted or otherwise made visible during hours of darkness. Adequate signs to indicate the hazard need be posted at the excavation.

The HSE Representative will evaluate all open excavations to determine the level of barriers required based on the level of hazard and/or exposure.

8. Underground Installations

The Contractor shall use all necessary means to effectively identify and locate buried utilities and other installations. As-built drawings are an initial resource with which Contractors can gain knowledge of buried installations.

8.1 Identification of Installations

Prior to excavation, Contractors shall be responsible for locating utility installations such as sewer, telephone, fuel, electric, water lines, or any other underground installations that could be encountered during excavation work.

Where utilities are known to be present in the proposed excavation area, Management will contact the utility owners to advise them of the proposed work, and ask them to locate and mark the underground utility or installation.

Where excavation comes within 0.5 meters of a marked utility or installation, Contractors are required to use non-aggressive means to locate the utility of installation. The competent person may elect to use either hand digging (shovel), or a dry or water probing system.

De-energize known underground electrical cables where possible. Where this is not possible, use only a non-conductive hand shovel to remove soil or an air lance to loosen soil within 0.5 meters (18") of the utility(s).

The depth of probing must always exceed the depth of excavating by at least 0.3 meters (1'). The selected depth of probing must be consistent.

During hand excavations, if a worker's head is below the top of the excavation or if the trench is deeper than 1.5 meters (5'), protective systems are required. If working inside trenches deeper than 4' which are suspected of containing, or having potential to contain, a hazardous atmosphere, the Contractor need implement air monitoring in accordance with [LUS-HSE-WG3-446-015](#), Confined Space Entry.

8.2 Marking Of Installations

Upon identification of buried installations, the Contractor must adequately mark the area(s) above the identified installation in a method understood by all personnel. The precise location of underground installations will be maintained by frequent inspection of previously placed markings by the competent person and re-marking as necessary.

Contractors shall use color-coded paints or flags to indicate the type, location, owner, and directional conveyance of buried installations.

As illustrated on the Uniform Color Code Card (Attachment [LUS-HSE-FM4-446-069](#)), the colors and corresponding installation type are as follows:

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- WHITE: Proposed excavation
 - RED: Electric power lines, cables, conduit and lighting cables
 - PINK: Temporary survey markings
 - YELLOW: Gas, oil, steam, petroleum or gaseous materials
 - ORANGE: Communication, alarm or signal lines, cables or conduit
 - BLUE: Water, irrigation, and slurry lines
 - GREEN: Sewers and drain lines
 - PURPLE: Reclaimed water, irrigation, and slurry lines

All markers (flags) used must indicate the name, initials, or logo of the Contractor that is planning excavation. Flagging should indicate the type of utility and approximate depth.

If the surface over the buried installation is to be removed, use supplemental offset marking. Offset markings must on a uniform alignment and must clearly indicate that the actual installation is a specific distance away.

9. Access and Egress

Employees working in excavations/trenches ≥ 1.2 meters (4') must be provided with ladder access/egress. Workers shall not be required to travel more than 7.5 meters (25'), lateral distance, to reach a ladder exiting the excavation.

Where employees or equipment must cross over excavations greater than 1.2 meters (4') in depth, the Contractor shall provide a walkway or bridge with standard guardrails. The walkway/bridge must overlap the excavation edges by a minimum of 12". Walkways/bridges need be secured from movement and inspected daily by the competent person.

Structural ramps used for access or egress of equipment must be designed by a qualified person, and will be constructed in accordance with the design specifications:

- Ramps and runways constructed of two or more structural members must have the structural members connected together to prevent displacement.
- Structural members used for ramps and runways must be of uniform thickness.
- Cleats or other appropriate means used to connect runway structural members must be attached to the underside of the runway or must be attached in a manner to prevent tripping.
- Structural ramps used in lieu of steps must be equipped with cleats or other surface treatments on the top surface to prevent slipping. Cleats should be spaced no more than 0.5 meters (16") apart and should span the width of the ramp.
- Ramps/runways should be secured from movement.

10. Exposure to Vehicular Traffic

Employees exposed to heavy equipment and/or vehicular traffic must be provided with, and must wear, reflectorized high visibility traffic vests or other suitable garments. High visibility colors recognized by Lusail include fluorescent orange, green and yellow.

Temporary traffic control may be necessary where normal traffic routes are disrupted.

11. Exposure to Falling Loads

Employees shall not be permitted to work or travel underneath suspended loads or below suspended portions of lifting or digging equipment. Personnel shall stand clear of vehicles being loaded or unloaded to avoid being struck by any spillage or falling materials.

Drivers of vehicles not equipped with overhead cab protection are required to exit their cabs when being loaded. Drivers may remain in the cabs of vehicles being loaded when the vehicles are equipped with overhead cab protection.

Dump truck/lorry drivers are prohibited from standing on/in the can while it is being loaded/ unloaded.

12. Warning System for Mobile Equipment

Operations of mobile equipment near excavations are conducted in accordance with [LUS-HSE-WG3-446-025](#), Motor Vehicles and Heavy Equipment, and the following guidelines:

- When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, Contractors shall provide a warning system to include soil berms or stop logs, high visibility barriers, and banksmen.
- Banksmen shall be provided to safely direct trucks/equipment required to travel adjacent to the edge of an excavation/trench.
- Where possible, the Contractor will prepare the area so that the grade slopes away from the excavation.
- The Contractor shall use spotters, who are stationed adjacent to the excavation, to assist equipment operator(s) in visually identifying obstructions and alerting the operator when obstructions or installations are identified.
- Excavation must be stopped immediately when spotters are called away from the excavation area.

13. Hazardous Atmospheres

Where a hazardous atmosphere exists or could reasonably be expected to exist inside an open excavation, the excavation shall be presumed to be a permit-required confined space, unless determined otherwise by the HSE Representative, in accordance with [LUS-HSE-WG3-446-015](#), Confined Space Entry.

Hazardous atmospheres would include lower explosive limit (LEL) of 10% or greater; vapors, gases, or fumes at concentrations greater than their associated permissible exposure level (PEL); and oxygen deficiency (< 19.5%) or oxygen enrichment (>22.0%).

Contractors shall take adequate precautions to prevent employee exposure from hazardous atmospheres identified inside excavations/trenches. The following minimum requirements apply:

- Excavations > 1.2 meters (4') deep shall be monitored for oxygen content, presence of flammable gases, and known or unknown airborne toxic or hazardous materials.
- Initial detection of hazardous atmospheres requires all personnel to exit the excavation until the HSE Representative can assess the conditions and implement the necessary control measures.
- Engineering controls (ventilation, modified processes) will be exhausted prior to resorting to personal protective equipment (PPE).
- When necessary, implement respiratory protection in accordance with [LUS-HSE-WG3-446-008](#), Respiratory Protection Program.
- Atmospheric monitoring shall be conducted as often as necessary to ensure that the atmosphere remains safe.
- Contractors shall not require personnel to work in excavations where immediately dangerous to life and health (IDLH) conditions exist. IDLH conditions include LEL > 10%, oxygen concentrations < 19.5%, hydrogen sulfide and cyanide gas concentrations > applicable PEL.

14. Rescue Equipment

Emergency excavation rescue equipment, such as self contained breathing apparatus (SCBA), full body harness and means of extraction, and a basket stretcher, must be readily available on site where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment must be maintained in proper working condition and attended by the competent person when in use.

Employees entering bell-bottom pier holes or other similar deep and confined footing excavations must wear a full body harness with a lifeline securely attached to it at all times while inside the excavation/trench. The lifeline must be separate from any line used to handle materials, and must be individually attended at all times while the employee wearing the lifeline is in the excavation.

Contractors shall perform emergency excavation extraction drills at least annually.

15. Protection from Hazards Associated With Water Accumulation

Employees cannot work in excavations in which water has accumulated, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against excavation cave-in, electrocution, and drowning hazards.

The Contractor shall make all attempts to remove water from the excavation and stop the flow of water into an excavation prior to allowing worker entry. Pumps and associated hoses shall be set up in such a manner as not to create carbon monoxide introduction into the excavation, and trip hazards.

Activities which cause a flow of water into the excavation shall be halted to berms/diversions set. If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means must be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation.

Where the flow of water into an excavation cannot be stopped, Contractors shall provide trench shoring or shielding systems inside the excavation. Workers shall work only inside the protective systems.

The competent person shall include water accumulation in his daily excavation inspection.

16. Stability of Adjacent Structures

Support systems such as shoring or underpinning must be provided for sidewalks, pavements, and adjacent structures that may be undermined by excavation operations. Excavations below the level of the base or footing of an adjacent structure are not permitted unless:

- A support system (e.g., underpinning) is used.
- The excavation is in stable rock.
- The project engineer and competent person have determined that the structure is sufficiently removed from the excavation to avoid cave-ins.
- The project engineer and competent person have determined that no other hazard exists.

17. Protection of Employees From Falling Debris

The Contractor shall protect employees from loose rock or soil that could pose a falling object hazard by falling or rolling from an excavation face. Methods of protection available consist of:

- Scaling to remove loose material
- Installing protective barricades (screens) at intervals as necessary on the face of the excavation to stop and contain falling material
- Other means that provide equivalent protection.

Employees must be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Such protection is provided by:

- Placing and keeping such materials or equipment at least 0.6 meters (2') from the edge of excavations
- Using retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations
- A combination of the above, if necessary

Employees are not permitted to work above other employees on the faces of sloped or benched systems except when employees at the lower levels are protected from the hazard of falling, rolling, or sliding material or equipment.

18. Protective Systems

Employees working in excavations 1.5 meters (5') or greater must be protected by an approved protective system. Protective systems available include shoring, shielding, sloping, and benching. Contractors are instructed to refer to 29 CFR 1926, Subpart P, Appendix F for selection of protective systems.

Through comprehensive soil analysis, the competent person determines the soil classification (Type A, B, C, solid rock) of the proposed excavation area. Based on soil type, work area configuration, presence of buried installations, and scope of work, the Contractor selects the protective system(s) to be used.

The competent person and project engineer ensure that manufacturer's specifications and regulatory tabulated data are adhered to when designing shoring and shield systems. Protective systems must have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

Excavations made entirely in stable rock, as verified by the project engineer, do not require additional protective systems. Fracturing or fissuring of rock strata, which contains potential for failure, will require the Contractor to implement a protective system.

The competent person determines the degree of slope reduction below the maximum allowable level when equipment, material, or personnel loads are imposed. When it is infeasible to attain required slope configurations in accordance with (Attachment [LUS-HSE-FM4-446-068](#)) Support Systems a qualified project engineer must design the protective systems to be used.

The competent person shall monitor the construction, maintenance, and condition of protective systems and their use in excavations on a daily basis, as part of the Daily Excavation Inspection (Attachment [LUS-HSE-FM4-446-067](#)). Deficiencies in the system or evidence that systems may be failing shall cause the Contractor to close the excavation. The project engineer then evaluates the protective system and makes recommendations for the necessary repairs.

Excavations shall be re-opened only after necessary repairs are completed and the excavation is re-inspected and certified safe.

18.1 Sloping and Benching

The Contractor shall slope and bench the walls of excavations/trenches in accordance with the 29 CFR 1926 Subpart P, Appendix B, Sloping & Benching.

Excavations which are greater than 6.0 meters (20') in depth require a professional engineer to design sloping and benching specifications.

Slopes and benches must be designed to meet slope angle requirements per soil classification. Layering, fractures and fissures may require the Contractor to implement multiple slope/bench angles within the same excavation.

18.2 Shoring or Shielding

The Contractor shall implement shoring and shield systems inside excavations/trenches in accordance with 29 CFR 1926 Subpart P, Appendix C&D.

Employees are not permitted to be inside trench shields when shields are being installed, removed, or moved (vertically or horizontally).

Material may be excavated to a maximum of 0.6 meters (2') below the bottom of the lowest member of a support system if the system is designed to resist the forces for the full depth of the excavation and there is no indication of soil loss from behind or below the bottom of the support system.

Construct the support system to support the vertical portion of a trench and extend above the bottom of any sloped excavation/trench walls at least 0.5 meters (18"), to prevent material from rolling/sliding into the shielded work area.

Place timber cross braces or trench jacks in a true horizontal position, spaced vertically, and secured to prevent sliding, falling, or kickouts. Place wales with the greater dimension horizontal. Trench boxes or sliding trench shields selected as the protective system shall be used in accordance with the manufacturer's recommendations.

19. Fall Protection

Fall protection is required for employees working at the edge of excavations greater than 1.8 meters (6') in depth if the excavation is not readily seen because of plant growth or other visual barrier. Fall protection is also required for personnel working on a vertical wall of the excavation, on the shoring or shield, or on any other structure inside the excavation where exposure to falls in excess of 1.8 meters exists.

Walkways and bridges over excavations which are 1.2 meters (4') in depth or greater must be equipped with standard guardrails in accordance with [LUS-HSE-WG3-446-018](#), Walking and Working Surfaces. All wells, pits, shafts, etc., must be barricaded or covered.

Upon completion of exploration and similar operations, all wells, pits, shafts, etc., must be backfilled.

20. Inspections

The Contractor's excavation (soils) competent person must conduct daily inspections of excavations, access ramps, adjacent areas, and protective systems in accordance with the Daily Excavation Inspection (Attachment [LUS-HSE-FM4-446-067](#)) for evidence of:

- Situations that could result in possible cave-ins
- Failure of protective systems
- Hazardous atmospheres or conditions
- Water infiltration

The competent person conducts inspections when employee exposure can be reasonably anticipated:

- Prior to the start of work
- As needed throughout the shift
- After every rainstorm or other hazard-increasing condition

If the competent person finds evidence of a situation that could result in a possible cave-in or any hazardous condition, he immediately instructs all workers to exit the excavation/trench and notifies the Construction Manager of the situation and condition(s).

The competent person is responsible for taking whatever measures are appropriate to correct or eliminate potentially hazardous conditions associated with the excavation before any additional work may resume inside the excavation.

The competent person submits the completed daily excavation inspection reports to the HSE Representative each week. The HSE Representative reviews inspection reports and monitors excavations and competent person activities to improve the excavation safety program on site.

21. Training

The Contractor is responsible for training all employees who are required to enter and perform work inside excavations and trenches on excavation hazards and safe working procedures inside excavations.

Employees are trained on the following excavation safety topics:

- Requirements of the standards
- Requirements of the project excavation plan
- Hazards relating to excavation work
- Methods of protection for excavation hazards
- Required PPE and use of PPE
- Procedures regarding hazardous atmospheres and confined spaces
- Emergency and non-entry rescue procedures

The Contractor excavation competent person shall be appropriately trained in competent person responsibilities, and possess the necessary level of experience required to identify excavation hazards and take action to correct them.

The HSE Representative arranges training for the excavation competent person on an annual basis, at a minimum. Training includes the following topics:

- Methods of evaluating the site and conducting inspections in accordance with this Procedure
- Evaluation and selection of protection methods
- Requirements under additional applicable elements such as [LUS-HSE-WG3-446-015](#), Confined Space Entry and [LUS-HSE-WG3-446-022](#), Fall Protection

During daily tool box safety meetings, supervisors review the relevant Activity Hazard Analyses with excavation workers and brief them on details of the following:

- Type of excavation to be performed
- Location, depth, and overall size of the excavation

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- Permit requirements
 - Shoring/shielding/sloping requirements
 - Means of entry and egress, and locations
 - Special conditions and permits anticipated (such as confined space)
 - Existing buried utilities and hazards
 - Remaining surface items located near the excavation
 - Equipment to be used
 - Required PPE
 - Provisions for disposal of spoilage
 - Work to be performed in the excavation
 - Emergency response

Personnel shall be retrained on excavation hazards every three (3) years or when there are inadequacies in the employee’s knowledge of excavation hazards, or excavation safety procedures.

Using an acceptable training form, the HSE Representative maintains a record of all training or instruction given to employees. Records verifying completion of training are kept in the employee’s individual training files.

22. Documentation

All information regarding the identification of underground installations is transferred to the appropriate drawings and/or prints and must be maintained available on site. Drawings and/or prints are maintained for the life of the project.

The project engineer’s recommended protective systems must be documented in sufficient detail to establish compliance with Lusail excavation safety requirements, per this Procedure. The recommendations must be signed by the project engineer, and the report must be maintained at the jobsite.

When manufactured shoring and shield systems are used, the manufacturer’s written specifications, recommendations, and product limitations must be maintained at the jobsite.

The HSE Representative maintains the project records (including designs, permits, notices, and completed inspection reports) at the site for the duration of the project and archives them at a minimum retention time of 10 years from creation date.

23. References

Qatar Construction Specifications 2010 Section 1 Part 10.3 “Special Safety Precautions”

Qatar Construction Specifications 2010 Section 11 Part 1.5.4 “Working In and Around Excavations”

24. Attachments

LUS-HSE-FM4-446-066	Excavation Permit
LUS-HSE-FM4-446-067	Daily Excavation Inspection Form
LUS-HSE-FM4-446-068	Support Systems
LUS-HSE-FM4-446-069	Uniform Color Code Card