

**QATAR STEEL COMPANY  
(QPSC)**

Procedure	2.32.2.1.12.01
Established	16-Jun-2013
Effective date	15-Mar-2020
Revision	02



# PROCEDURE

## Excavation Work

Excavation Procedure

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**Prepared By:**  
HSE Department

**Issued By:**  
HSE Department

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## REVISION HISTORY

Revision No.	Issue Date	Amendment Description	Date Effective	Date to be Revalidated
00	16-Jun-2013	Newly Established	16-Jun-2013	15-Jun-2016
01	17-Jun-2016	Changes – Department Name Change and Permit form revised.	17-Jun-2016	15-Mar-2019
02	15-Mar-2020	Procedure Revised due to: 1. New Format Transformation. 2. Updated inconsistencies observed. 3. Excavation permit form revised. 4. Definitions added. 5. Procedure steps, method and scanning/trial pit digging revised.	15-Mar-2020	14-Mar-2023

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## 1. INTERNAL CONTROLS:

### 1.1. REVIEW OF PROCEDURES

To assure Managements, Shareholders and External agencies confidence in the company's policies & practices, QATAR STEEL internal Audit may verify, compliance with this procedure. [Department Owner] shall review this procedure every three years to ensure that it continues to serve the purpose intended.

### 1.2. EMPLOYEE RESPONSIBILITIES

All employees of the company are required to observe and abide with this procedure.

### 1.3. APPROVAL

This procedure and any amendments made thereto require the following approvals.

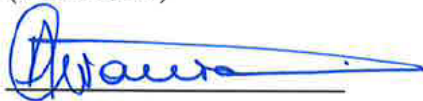
AUTHORITY

DATE



12/3/2020

**Approved By:**  
**Mohammed Nasser Al-Hajri**  
Managing Director & Chief Executive Officer  
(MD&CEO)



11/03/2020

**Checked By:**  
**Alexander Stramrood**  
Manager – HSE Department



04-MAR-2020

**Drafted by**  
**Hemesh Ashok**  
Safety Engineer – HSE Department

This document has been reviewed by Document Controller. It complies with the requirements of policy 1.12.0.1.01.01 and it is considered ready for issue.

Signed by  Date 03-03-2020

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## 2. PURPOSE:

The purpose of this Excavation Procedure is to ensure and maintain safe work for construction, civil & excavation inside Qatar Steel premises.

## 3. SCOPE:

The Excavation procedure is required in the entire Qatar Steel site and premises.

## 4. DEFINITIONS:

- 4.1. **Area In-Charge:** The person who has direct control and overall supervision of the area of excavation/penetration activities, usually the Qatar Steel Area In-charge or Plant In-charge.
- 4.2. **Area Maintenance Planner:** is a person responsible for planning, scheduling, and coordination of the plant maintenance and repair jobs. The area maintenance planner ensures that the excavation/penetration activities schedule is aligned with plant shut down repair schedule.
- 4.3. **Earthworks:** any works created through the processing of parts of the earth's surface involving quantities of ground soil or rocks. Digging may take place or removal of ground soil or rocks ie. moving of the earth's surface by shovel loader.
- 4.4. **Electrical Section:** The Section responsible for handling Electrical & Instrumentation utilities within Qatar Steel premises, including electrical and instrument transmission lines & cables.
- 4.5. **Engineering Section:** The Section who is responsible in Qatar Steel to handle civil jobs and providing engineering drawings & layout (such as electrical, mechanical, civil & piping drawings). If the Locator marks and sketches a new drawing, it is the responsibility of the Engineering Section to update it for future reference.
- 4.6. **Excavation:** Any breaking of ground or pavement including previously installed roadways, slabs or foundation in excess or equal to 300mm. This includes all excavation works, ground penetration works, earthworks, and underground works. Excavation shall be classified as unsupported excavation or supported excavation.
  - **Unsupported Excavation:** is an excavation without supporting structure on its sides design to retain surrounding soil. The side of excavation maybe made vertical or sloped.
  - **Supported Excavation:** is an excavation with structural support system designed to retain surrounding ground.

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- 4.7. Excavation Works:** means any works involving the removal of soil or rock from a site to form an open face, hole or cavity using tools, machinery or explosives. Excavation may be classified such as top soil excavation, earth excavation, rock excavation, muck excavation, etc.
- 4.8. Facility Department:** Department responsible for domestic sewage drainage, potable water distribution line, irrigation water line and building plumbing pipeline within the Qatar Steel premises.
- 4.9. Field Coordinator:** A Qatar Steel employee from Maintenance & Engineering Department - Engineering Section, who shall coordinate and ensure that the excavation/penetration is done as per the Excavation Procedure and the requested Excavation Permit.
- 4.10. Fire In-Charge:** This is a person responsible from HSE Department - Fire & Security Section for firefighting water pipelines.
- 4.11. Ground Penetration:** Any activity that involves driving an object into the ground or concreted ground, drilling or piling work.
- 4.12. Hand or Manual Excavation:** Any excavation which uses only hand tools for ground breaking or removing earth.
- 4.13. I.T. Department:** Department responsible for handling I.T network cables, telephone lines and other communication lines, within the Qatar Steel premises.
- 4.14. Locator:** The person who determines the location of the existing underground services i.e. gas pipeline, water pipeline, electrical cables, instrument cable, drainage line, IT cable, fire water pipeline etc. Usually this person is a plant supervisor in charge of the above mentioned underground services or a person assigned by Section or Department as a Locator, within their own working area responsibility limits.
- 4.15. Machine or Mechanical Excavation:** Any excavation which uses machines for breaking the earth's surface.
- 4.16. Ground Probing:** Ground probing radar locates hidden utility services before construction crews break ground, and helps avoid the possible risk of project delays, increased costs and even fatalities
- 4.17. Requesting Department:** The Section/Department who raises the Excavation Permit request.

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**4.18. Risk:** The product of the measure of the likelihood (frequency) of occurrence of an undesired event during the excavation work and the potential adverse consequences which this event may have upon to:-

- People injury or harm to physical or psychological health.
- Assets (or revenue) damage to property (assets) and consequential business loss
- Environment: water, air, soil, animals, plants and social
- Reputation of QS, employees and third parties

Calculation of Risk = Frequency x Consequences

**4.19. Shall** is used where the provision is an absolute requirement to be followed strictly in order to conform to this Procedure.

**4.20. Should** is used where provision is recommended to conform to this procedure.

**4.21. Site In-charge (Contractor):** The Contractor person who is in charge of the excavation/ ground penetration jobs and it's crew and who is assigned to ensure that all safety controls are followed in the execution of excavation /ground penetrations jobs.

**4.22. Site In-charge (Qatar Steel):** A Qatar Steel employee who is assigned to work with the contractor, provide additional safety controls to prevent any excavation related work incident and ensure that the contractor is following all safety recommendations and requirements of Excavation Permit.

**4.23. Underground Services:** Any underground services of utilities/facilities of gas pipelines, water pipelines, electrical cables, instrument cables, domestic sewage pipeline, drainage pipe lines, IT cables, fire water pipeline etc. at the area affected by excavation work.

**4.24. Underground Works:** Any works beneath the surface of the earth or any development works of underground space for infrastructures and equipment ie: tunnels, horizontal boring of the ground, etc.

**4.25. Utility Section:** The Section responsible for handling water & gas utilities and its pipeline within the Qatar Steel premises such as: Natural gas, Compressed Air, Oxygen, Nitrogen, Argon, Plant/Machinery Cooling Water, Process Cooling Water, Seawater, Fresh Water and Main Potable Water.

**4.26. Trench:** A trench is defined as a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth of a trench is greater than its width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).

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## **5.PROCEDURE:**

### **5.1. Abbreviation:**

QS	:	Qatar Steel
QP-MIC	:	Qatar Petroleum - Mesaieed Industrial City
PTW	:	Permit to Work
EWP	:	Excavation Work Permit
HSE	:	Health, Safety & Environment
I.T	:	Information Technology
F.D	:	Facility Department
JSA	:	Job Safety Analysis
MOS	:	Method of Statement
HIRA	:	Hazard Identification Risk Assessment
SOP	:	Standard Operation Procedure
LOTO	:	Lockout & Tagout
PPE	:	Personal Protective Equipment
P&IDs	:	Piping and Instrumentation Drawings
PFDs	:	Process Flow Diagrams
MOC	:	Management of Change
M&E	:	Maintenance & Engineering Department

### **5.2. General Safety Requirement:**

- 5.2.1. Any excavation works, ground penetration works, earthworks, and underground works from the ground surface level or any bore hole or driven earth rod work, within Qatar Steel premises shall require an Excavation Permit and other supporting permit/documents, prior to the start of excavation/ ground penetration activities.
- 5.2.2. Scanning of underground services is recommended for critical excavation/ground penetration activities. Scanning should be under the scope of either Contractor or Qatar Steel Department/Section.
- 5.2.3. After scanning the excavation/ground penetration work area, in case of any further doubt about the exact location of underground services or as an alternative method that can be used for confirming the underground services, a trial pit digging can be perform. The material of shovel to be used for trial pit digging shall be plastic type. (or other non-conductive material).
- 5.2.4. Trial pit digging shall be performed only after the Excavation Permit application is approved by all the concerned In-Charges/Managers of the Section/Department.

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- 5.2.5. Work should not commence until the site inspection by the authorized persons such as Site In-Charges, Authorized Engineer from Engineering Section, Area In-Charges, and Field Coordinators has been carried out and all part of excavation works, ground penetration works, earthworks, or underground works has been found safe to work.
- 5.2.6. Every part and stages of an excavation works, ground penetration works, earthworks, or underground works, where persons are employed should be inspected by Site In-Charges and authorized person from Engineering Section at regular intervals, at least once a day and record the results of such inspections.
- 5.2.7. Sites of excavation works, ground penetration works, earthworks, and underground works shall be thoroughly inspected:
- Daily, prior to each shift and after interruption in work of more than one day.
  - After an unexpected fall of the ground.
  - After substantial damage to supports.
  - After a heavy rain or wind.
- 5.2.8. No heavy load, heavy vehicle or equipment should be placed or moved near the edge of any excavation works, ground penetration works, earthworks, or underground works, where it is likely to cause its collapse and thereby endanger any person or cause property damage, unless precautions such as the provision of shoring and piling are taken to prevent the sides from collapsing.
- 5.2.9. Adequately anchored stop blocks, barriers and signage should be provided to prevent vehicles being driven into excavation works, ground penetration works, earthworks, or underground works. Heavy vehicles used for excavation/ground penetration activities should not be allowed near the excavation works, ground penetration works, earthworks, or underground works, unless the ground support works has been specially designed to permit it.

### **5.3. Excavation Permit Application and Approval:**

#### **Permit Request, Attached Documents, Drawings, Safety Procedures, Other permits etc.**

- 5.3.1. Before starting an excavation/ ground penetration activities in Qatar Steel premises, the Excavation Permit shall be obtained, so as to avoid any possible damage to existing underground services, adjacent operating equipment and nearby structures, buildings & roadways.

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- 5.3.2. The Requesting Department should initiate the request for Excavation Permit application and attached with the Excavation Permit, the other documents and drawings.
- 5.3.3. All excavation works, ground penetration works, earthworks, or underground works activities should be planned properly and safely. All MOS/SOP & HIRA/JSA and other supporting documents for the safe execution of the excavation / ground penetration activities need to be prepared and submitted together with the Excavation Permit application. All Excavation Permit request and the attached documents submitted is to be reviewed thoroughly and verified before approval by the concerned Sections/Departments underground services owners.
- 5.3.4. If excavation work is more than 1.2 meters or greater than 4 feet deep, a confined space entry permit shall be applied with all other supporting documents, which satisfies the requirements for confined space entry. ***This is limited to trenches as per OSHA Trenching and Excavation Safety guidelines.***
- 5.3.5. The drawings to be attached should preferably be an As-built CAD drawing showing all underground services passing within 2 meters of the proposed excavation / ground penetration work area, overlaying the limits of excavation / ground penetration.
- 5.3.6. The type of drawings to be attached with the Excavation Permit sheet (but not limited to these drawings only) are as follows:-
- a) CAD drawing of the excavation works, ground penetration works, earthworks, or underground works with overlaying underground services located or passing at the excavation / ground penetration work area.
  - b) Isometric drawings of the underground piping if available.
- 5.3.7. The Site In-Charges and the Area In-charge shall ensure that the suitably marked up drawing copies of the underground services are attached to the Excavation Permit.

## **Scanning of Excavation / Ground Penetration Work Area.**

- 5.3.8. If the drawing of underground services is not available, then scanning of excavation / ground penetration work area is recommended. The underground services are to be identified during the scanning.
- 5.3.9. The Requesting Department and the Area In-charge should verify that the scanning of underground services has been done by knowledgeable person; machine is in good

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running condition and calibrated. Calibration report shall be reviewed before the scanning job.

- 5.3.10. During the scanning, all the concerned authorities or representatives from individual Department / Section - Utility Section, Electrical Section, IT Dept, Facility Dept, HSE Dept - Fire & Safety Section), who is approving the Excavation Permit should be present at site to witness the scanning.

Type of scanning machine:

- Metal /Electrical cable detector – to detect buried metallic cables and pipes by electromagnetic sensor.
- Ground Penetrating Radar – to detect buried nonmetallic cables ie: optical fiber cables, clay pipes, plastic pipes, etc. by radar sensor.
- PVC pipe detector – to detect buried nonmetallic pipe ie: PVC pipe, sewers, etc by acoustic methods.

- 5.3.11. After Scanning verified by the Site In-charge (Contractor) and (Qatar Steel) of the Requesting Department, the Area In-charge and the concerned Sections/Departments approving the Excavation Permit application.

- 5.3.12. The underground services found during scanning shall be overlaid, clearly indicated and marked on the excavation / ground penetration work area drawings. The concerned Sections/Department approving the Excavation Permit should review and confirm the location of the underground services identified in the scanning.

## **Review, checking and verification before Excavation Permit approval**

- 5.3.13. Prior to submission of the Excavation Permit application, the Site In-charge (Contractor) and Site In-charge (Qatar Steel) shall mark all underground services in the field using a suitable marking.
- 5.3.14. For uneven ground area where accurate marking is not possible, verification and confirmation of the field markings by concerned Sections/Departments approving the Excavation Permit is required.
- 5.3.15. The field markings should accurately reflect the underground services indicated on the drawing at the work site. The field markings should also indicate to the site workers, the actual location of the underground services in the excavation / ground penetration work area.

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- 5.3.16. The concerned Sections/Departments approving the Excavation Permit should thoroughly review, verify and identify all the relevant underground services which could be encountered at the excavation/ground penetration work area.
- 5.3.17. The concerned Sections/Departments approving the Excavation Permit should confirm and ensure that the field markings of the underground services at site is matching with the location of underground services marked/highlighted on the drawings.
- 5.3.18. The concerned supervisors or field representative of Sections/Departments approving the Excavation Permit shall inspect and verify all field markings at site, before completing the filling-up of the underground services location checklist and before signing their approval to the Excavation Permit.
- 5.3.19. The concerned Sections/Departments approving the Excavation Permit should discuss with the Site In-charges the excavation / ground penetration activities, to identify work hazards, assess and agree what underground services risks are applicable, prepare safety precautions necessary to minimize the risks and implement risk mitigation actions.
- 5.3.20. The Area In –charge should ensure that all relevant information regarding the underground services declared and endorsed by the concerned Section/Department approving the Excavation Permit is communicated to the Site In-Charges, prior to the start of any excavation/ ground penetration activities.
- 5.3.21. The authorized Civil Engineer from Engineering Section should verify the stability of the ground and check that the excavation / ground penetration would not affect any adjoining buildings, structures or roadways, prior to the start of any excavation/ ground penetration activities.

**Removal, closing or isolation of underground services affected by excavation / ground penetration.**

- 5.3.22. Prior to the start of excavation/ground penetration, if necessary to prevent danger, the underground services such as gas pipelines, water pipelines and electrical cables should be shut off or disconnected.
- 5.3.23. The affected underground services shall be clearly stated and indicated as a remark on the Excavation Permit and attached drawings by concerned Sections/Departments approving the Excavation Permit application.

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- 5.3.24. The excavation / ground penetration should be avoided in the area where there is any underground services which cannot be shut-off or disconnected and are susceptible to getting damage while doing the excavation/ground penetration job. In this case, the scope of excavation / ground penetration jobs is to be reviewed and changed to another location.
- 5.3.25. However, in case the excavation/ground penetration job in the area is essential, wherein the underground services will be affected, then the relocation of the underground services shall be done first by the underground Service Owner and the Excavation Permit Requesting Department/Section, prior to starting the excavation / ground penetration activities. The scope of relocation is to be discussed and approved by the Requesting Department, the Area In-charge and the concerned Sections/Departments approving the Excavation Permit application.
- 5.3.26. In case the shut off, disconnection or relocation of the underground services is not practical, hand digging with appropriate safety precaution given by underground services owner shall be specified within a one-meter envelope of the expected depth of the affected underground service location. The affected underground services shall be exposed and secured first, before proceeding further on excavation / ground penetration jobs.

## **Other Safety Precaution before starting excavation / ground penetration activities**

- 5.3.27. In case the underground services location is shallow (i.e. less than 0.5 meters ~ 1 meters depth) and cannot be removed or disconnected, then the Excavation Permit Requesting Department/Section should prepare a MOS on how to support and protect the underground services by fencing or hanging up. This document should be attached to the Excavation Permit application. Supporting/ providing protection to the underground services shall be done by Excavation Permit Requesting Department/Section during execution of excavation/ground penetration but under the supervision of the underground services owner.
- 5.3.28. In case the excavation is below the ground water level and the underground electrical cable trench is located or the underground electric cables are passing beside the excavated area, then the executor of the excavation should make a detailed dewatering strategy as part of their work scope and a JSA/Risk Assessment with special focus on electrocution hazards. The dewatering strategy, the special safety PPE to be used and the JSA/Risk Assessment is to be reviewed and approved by Electrical Section and Area In-Charge.
- 5.3.29. For excavation with underground electric cables passing beside the excavated area, the Excavation Permit Requesting Department/Section should prepare a MOS describing steps/procedure for returning/ re-installing back of the electric cables after

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completing the excavation. The procedure should be attached to Excavation Permit application to be reviewed and approved by Electrical Section.

- 5.3.30. A separate approval has to be taken from the KAHRAMAA concerned authorities, in case KAHRAMMA cables are passing beside or within the excavation/ground penetration work area. The approval from KAHRAMAA should be taken first and to be attached to the Excavation Permit application. The clearance from KAHRAMAA shall be a pre-requisite to the approval of Excavation Permit by Electrical Section.
- 5.3.31. A nominated full time representative of Utility Section shall supervise a specified trial pit digging for underground natural gas services piping and the underground main freshwater supply services piping.
- 5.3.32. Utility Section representative shall carryout a daily excavation safety inspection using the Daily Excavation Safety Check Sheet within their work area limit, for critical gas and water underground services such as underground natural gas piping, underground compressed air piping, underground main freshwater supply piping and underground main potable water supply piping.

## 5.4. Excavation Permit Filling-up & Restrictions:

- 5.4.1. Excavation Permit is an important document that has to be taken care to control excavation / ground penetration activities related safety risk by filling in all information relevant to the requirement and fulfilling all the documents to be prepared and attached to the permit application.
- 5.4.2. The Requesting Department shall fill in all the details properly. The Actual work start column shall be filled in only when the work starts and after receiving the completely approved Excavation Permit from HSE.
- 5.4.3. All approvals from the concerned Departmental/Sections owner of the underground services and working area shall include their In-Charge and Manager signatures with remarks if any.
- 5.4.4. Area In-Charge column is meant for the Person, Section or Department where the excavation / ground penetration working area is situated.
- 5.4.5. No other Department will write /fill-in information in HSE Department part. It is exclusively kept for HSE Department use.

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- 5.4.6. **Over writing or using correction fluid on the Excavation Permit (After approved by HSE Department) is against HSE Regulations and this violation is punishable & considered a serious offence.**
- 5.4.7. Permit applicant shall provide all relevant marked drawings, drawing size shall be not less than A4 (or preferably A3 and above), and to **be provided in duplicate** so that HSE Department can retain one copy of the same for their records.
- 5.4.8. The validity of Excavation Permit shall be up to the date registered on the Duration of excavation. An extension of validity shall be allowed for one time only. However, the validity extension is to be reviewed and approved by HSE Department.
- 5.4.9. Excavation Permit submission or receiving **shall not be accepted** from any Contractor Staff. Qatar Steel Site In-charge or representative shall handle the permit request submission and receiving of the approved permit.
- 5.4.10. HSE Department shall have the right to accept, reject or suspend the Excavation Permit depending on the valid reason for the safety of company property or human Safety.
- 5.4.11. Whenever required, HSE Department shall have the right to ask for further documents to support the Excavation Permit.
- 5.4.12. Only a duly registered and latest revision Excavation Permit Form (Sample form is shown in Section 8 - Attachment) shall be accepted. The latest revised Excavation Permit Form shall be posted at HSE Department I-Center portal.

## 5.5. Site In-Charge (Qatar Steel) Responsibility

- 5.5.1. Provide copies of drawings for excavation /ground penetration site with overlaid underground services passing or within the excavation / ground penetration working area.

Provide information on the Excavation Permit request and on the drawing, all the necessary information to describe the excavation / ground penetration jobs and activities

- 5.5.2. Communicate the scope of work to the Locator through discussion, written drawings and documents.
- 5.5.3. Ensure that all safety recommendations, controls and requirement stated in the Excavation Permit, MOS, JSA or HIRA, PTW, Work Procedure, Drawings etc. are

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followed and implemented by Contractor executing the excavation / ground penetration jobs.

**NOTE:** If drawing is not available, the locator markings and sketches generated location survey will subsequently be utilized as the basis for new drawings.

## 5.6. Site In-Charge (Contractor) Responsibility

- 5.6.1. Supervise the safe execution of excavation / ground penetration jobs and activities.
- 5.6.2. Follow all safety recommendations, requirements and controls stated in the Excavation Permit, MOS, JSA or HIRA, PTW, Work Procedures, Drawings etc. of the excavation / ground penetration jobs are followed and implemented by Contractor executing the excavation / ground penetration jobs.
- 5.6.3. Provide and display at site the Approved Excavation Permit and the contact details of the Site In-Charges (both Qatar Steel and Contractor).

## 5.7. Excavation Permit Validity

- 5.7.1. Excavation Permit shall be approved for 60 days. However, Permit extensions may be granted once only for a period of 30 calendar days. Extension of excavation / ground penetration jobs execution and activities beyond the maximum of 90 calendar days shall require a new Excavation Permit. The final decision on extension of permit validity and permit renewal shall be subject to the outcome of HSE Department review.

## 5.8. Excavation Permit Approval

- 5.8.1. The Excavation Permit approval by the concerned Departments/Sections ie: Maintenance & Engineering Department (Utility Section & Electrical Section), Facility Department, I.T. Department, Area In-Charge, Fire In-Charge & HSE Department, do not constitute an approval of the Locator Survey. The approval only indicates each concerned Departments/Sections underground services owner review of their Locator Survey Report.
- 5.8.2. The Site In-charge (Contractor) receiving of the approved Excavation Permit indicates that he fully agrees to the scope of the document, is aware of all the requirements, and agrees to perform the work within the requirement of this procedure.

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**Prepared By:**  
HSE Department

**Issued By:**  
HSE Department



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## 5.9. Excavation Permit, Documents & Attachments:

An Excavation Permit Package consists of at least, but not limited to, the following documents:

5.9.1 QS HSE Approved Excavation Permit

5.9.2 JSA or HIRA & MOS

5.9.3 Excavation / Ground Penetration Work Drawings and Underground Services As-Built Drawings

## 5.10. Hazard & Risk Review Meeting On Excavation Work Permit Application:

5.10.1. Prior to the excavation, the following stakeholders shall have a review meeting to discuss the excavation plans and review the hazards and the related risk assessment of the job site: Area Maintenance Planner, Area In-Charge, a member of Utility Section & Electrical Section, Engineering Section, Maintenance & Engineering Department, I.T. Department, Facility Department, HSE Department and the Excavation Supervisor/Site In-Charge of the crew performing the excavation work.

The review meeting should be scheduled by excavation permit requester.

5.10.2. The review meeting shall consist of a field inspection to review the location of the excavation /ground penetration working area and the affected underground services and review the drawings associated with the excavation.

## 5.11. Excavation Ground/Pavement Markings

5.11.1. The concerned Sections/Departments approving the Excavation Permit ie: Maintenance & Engineering Department (Utility Section, Electrical & Instrumentation Section), Facility Department, I.T. Department, HSE Department & Area In-Charge shall ensure that prior to the start of the excavation/ground penetration job, the person/contractor executing the excavation/ground penetration has properly locate and mark all the known underground services affected.

5.11.2. The limits of marking shall be a minimum of 1.2 meters beyond the proposed limits of the excavation / ground penetration area.

5.11.3. Excavations of paved areas shall have underground services obstructions located and identified with red or orange paint on the pavement.

## 5.12. Probing/Scanning/Trial pit digging:

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- 5.12.1. Scanning for underground obstacles shall be performed prior to and during any excavation where mechanical equipment is used to excavate.
- 5.12.2. The Area in-charge shall ensure that the personnel are performing the excavation probe for known underground obstructions and take precautions when non-metallic lines are to be probed.

## **5.13. Safety Precaution at Excavation / Ground Penetration Work Site:**

- 5.13.1. Adequate risk assessment and safety precautions at Excavation / Ground Penetration Work Site should be taken by all concerned in any excavation works, ground penetration works, earthworks, and underground works.
- 5.13.2. Use a suitable shoring or other means of protection guard against danger to workers from falling or dislodgment of earth, rock or any other materials that may fall or collapse during excavation/ground penetration whenever the excavation depth exceeds 1.5 meter. Shoring or other support for any part of an excavation works, ground penetration works, earthworks or underground works should not be erected, altered or dismantled except under the supervision of a Site In-Charge and the Authorized Civil Engineer from Engineering Section.
- 5.13.3. Use a suitable protection guard against dangers arising from the fall of persons, materials or objects or the in rush of water into the excavation works, ground penetration works, earthworks or underground works.
- 5.13.4. Provide secure and adequate ventilation at the workplace, so as to maintain an atmosphere fit for respiration and to ensure that the workplace is free from dangerous fumes, gases, toxic vapors, dust etc. which is injurious to the health of the workers at site. Limit any fumes, gases, vapors, dust etc. to levels which are not dangerous or injurious to health and are within limits.
- 5.13.5. Gas testing and monitoring of oxygen levels at the work place is to be done at regular intervals, as stated in the PTW or Confined Space entry issued for excavation/ground penetration jobs.
- 5.13.6. The rescue plan is to be prepared as required and ensure that the workers can evacuate safely in the event of an unsafe condition or incident at work site such as fire or inrush of water or material collapse.
- 5.13.7. Eliminate the risk to workers arising from possible confined space entry dangers such as circulation of fluids or the presence of pockets of gases at excavation work site by conducting appropriate investigations to locate them and isolate, prior to start of excavation activities.

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- 5.13.8. Ensure that an authorized person supervise all excavation /ground penetration jobs and the workers doing the work should be given clear instructions on safety of the job and the work site.
- 5.13.9. The authorized person or the Site In-charge supervising the excavation / ground penetration work site shall see that the land to be excavated is not contaminated by harmful chemicals or gases or by any other hazardous waste material.
- 5.13.10. The Area in-charge shall ensure that the authorized person in charge or the Site In-charge of the excavation /ground penetration work site and its crew is aware of all permitting procedures.
- 5.13.11. The person in charge or the Site In-charge of the excavation /ground penetration work site should ensure that all technical and safety requirement of the Excavation Permit and other Permits requirement are strictly followed by all of its crew.
- 5.13.12. The person in charge or the Site In-charge of the excavation / ground penetration job shall discuss and update to the Area In-charge or his representative, the progress of the job and the safety concern in the work site each day prior to the issuance of PTW or Confined Space Entry Permit.
- 5.13.13. In case the excavation/ground penetration is likely to affect the stability of a nearby structures in the work site or the area where person is working, precautions should be taken to protect the structure from collapse.
- 5.13.14. All support work shall be regularly checked to ensure that the props, wedges etc., are tight and no undue deflection or distortion is taking place
- 5.13.15. All wooden installations subject to varying weather conditions shall be regularly checked for dryness, shrinkage or rot.
- 5.13.16. Create and maintain a safe work site.
- 5.13.17. Minimize risk of damage to equipment and facilities.
- 5.13.18. Ensure external vendors or contractors follow this procedure.
- 5.13.19. Ensure any change of scope is reflected as a new Locating survey, and a new permit.
- 5.13.20. Excavation shall be protected by engineering method (Shoring, Benching, and Shielding) method.
- 5.13.21. Ensure appropriate access and egress in place.

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- 5.13.22. The concern department or Contractor shall provide adequate barricade, excavation & traffic signage and night flashers.
- 5.13.23. All personnel shall comply with adequate and appropriate PPE.
- 5.13.24. As far as possible, excavated soil should not be placed within 1 m of the edge of the trench or depth of trench whichever is greater.
- 5.13.25. During excavation any of the utilities such as electrical cable insulation is found damaged or pipeline found damage or any other unidentified discrepancies observe, then the excavation work shall be suspended or stopped immediately and inform to the concerned section/department.
- 5.13.26. During excavation regular visit of the authorized Civil Engineer from Engineering Section should be done to verify the stability of the ground and check that the excavation / ground penetration is not affecting any adjoining buildings, structures or roadways.
- 5.13.27. Do not allow vehicles to operate too close to excavated area. Maintain at least 2m distance from the edge of excavation.
- 5.13.28. No heavy weight load, heavy vehicle or equipment shall be placed or moved near the edge of any excavation, where it is likely to cause its collapse and thereby endanger any person or cause property damage, unless precautions such as the provision of shoring and piling are taken to prevent the sides from collapsing.
- 5.13.29. Adequately anchored stop blocks, barriers and signage should be provided to prevent vehicles being driven into excavation. Heavy vehicles used for excavation/ground penetration activities should not be allowed near the excavation, unless the ground support works has been specially designed to permit it.
- 5.13.30. While excavating trenches exceeding depth more than 1.5 m, a safe angle of repose should be maintained. Based on site conditions, provide proper slope, usually 45° and suitable bench of 0.5 m width at every 1.5 m depth of excavation in all soils except hard rock or provide proper shoring and strutting to prevent cave in or slides.
- 5.13.31. After the completion of the excavation work, the Excavation Supervisor should prepare and follow a standard procedure for the laying of the cables back in the excavated area. The cable markers to be provided above the ground with proper identification.
- 5.13.32. Housekeeping to be maintained around the excavation / ground penetration work area while carrying out the work and after the full completion of the work.

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5.13.33. Disposal of the excavated ground/soil to be done by the contractor immediately upon completion of the excavation/ground penetration.

## 5.14. Completed Permits

- 5.14.1. Once the job is completed the Area in-charge should forward the completed permit to the Area Owning Representative for review, filing and closing.
- 5.14.2. After closing by Area in-charge transfer permit to Engineering section to update drawings and close permit.
- 5.14.3. Finally go to Department Safety Engineer to verify and completed permit closing.
- 5.14.4. Area in-charge is responsible to complete permit closing process.

## 5.15. External agency

- 5.15.1. Comply with all necessary external agency permits (Approval to Proceed) requirements wherever necessary before applying for the excavation permit with QS HSE.
- 5.15.2. The above is required whenever a regulation from QP-MIC, Kahramaa or Qatar (Ministerial) regulations are applicable
- 5.15.3. Department in-charge shall enforce contractor to fully comply with these regulations.

## 6. RELATED PROCEDURE

2.32.2.1.04.01	Personal Protective Equipment (PPE)
2.32.2.1.20.01	Isolation & Lockout Procedure (LOTO)
2.32.2.1.03.01	Hazard identification & Risk Assessment Procedure (HIRA)
2.32.2.1.06.01	Permit to Work Procedure
2.32.2.1.13.01	Confined Space Entry Procedure

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## 7. MANAGEMENT OF CHANGE

No changes shall be made to this procedure without approval from HSE Department Manager. Any suggestions or recommendations for updates or improvements or any changes to this procedure should be submitted in writing to HSE Department Manager. Each submission should give details of the proposed amendment and the reason why it is considered necessary.

The HSE Department Manager will keep a log of all change requests, prioritize them for action and, subject to his approval, schedule them for inclusion in the next relevant update of the document. The latest version of this procedure shall be made available through the Qatar Steel computer network. Earlier versions shall be retained for a minimum of three years in accordance with the Qatar Steel document management System.

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## 8. ATTACHMENTS: Excavation Permit Form

<b>Excavation Permit</b> S. #. _____ COR/HSE/SE/F-004-00																																																		
1) Requesting Dept. ----- 2) Maint. & Eng -- 3) Facility -- 4) Area In-Charge -- 5) IT Dept. -- 6) HSE Dept. -- 7) Requesting Dept. -- 8) Engg section -- 9) HSE dept																																																		
All-Please confirm the drawings, make your comments overleaf if required or attached document for clear understanding																																																		
REQUESTING DEPARTMENT	Requesting Date: _____ Requesting Dept: _____ Section: _____ Shop: _____ Place of Work: (Please attach the necessary drawings) Reason for Excavation: Work Executed by: Site In-Charge (Contractor): _____ Tel. _____ Mob. _____ Site In-Charge (QS) & Emp No: _____ Tel. _____ Mob. _____																																																	
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%;">Dimension of Excavation</th> <th style="width: 20%;">Duration of Excavation</th> <th style="width: 40%;">Actual work Started on: _____</th> <th style="width: 20%;">Nature of Excavation</th> </tr> <tr> <td>Length: _____ meter</td> <td>From: _____</td> <td rowspan="3">Completed on: _____</td> <td><input type="checkbox"/> By Hand</td> </tr> <tr> <td>Width: _____ meter</td> <td>To _____</td> <td><input type="checkbox"/> By Machine</td> </tr> <tr> <td>Depth: _____ meter</td> <td>Extension: _____</td> <td style="text-align: center;"><b>Mark only one</b></td> </tr> </table>	Dimension of Excavation	Duration of Excavation	Actual work Started on: _____	Nature of Excavation	Length: _____ meter	From: _____	Completed on: _____	<input type="checkbox"/> By Hand	Width: _____ meter	To _____	<input type="checkbox"/> By Machine	Depth: _____ meter	Extension: _____	<b>Mark only one</b>																																			
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Any excavations involving removal of trees or plants shall obtain prior permission from Environment section Remarks: _____																																																		
Closing Requesting department _____ Engineering section _____ HSE Document controller _____ Area in charge _____																																																		
1. In case of Emergency, Please contact Ext. : 8333 --- 2. Issue of Permit to subcontractor through Dept. Co-ordinator only																																																		

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