

**Gulf**of**Mexico**



## **Operations: HSE**

### **Ground Disturbance Safe Work Practice (SWP)**

## AMENDMENT RECORD

Amendment Date	Revision Number	Amender Initials	Amendment
03/01/17	5	MB	Practice is being reviewed with no changes to content. Updated to current HSE template. Practice will be retired in 2017 as part of the shift to the Upstream Control of Work document.
08/15/12	4	PT	Reformatted document to meet new GoM document control template standardization guidelines. Updated Figure 1 Stable Rock to 90°
02/03/12	3	PT	Reviewed chapter – no revisions made
06/01/08	2	RK	Added ground disturbance checklist
02/28/06	1	KK	Changed CD # from 10093 to UPS-US-SW-GOM-HSE-DOC-00083-2 to conform to the new numbering nomenclature inside of the new GoM HSSE Doc base. Changed 3 authorities and 1 custodian.
02/06/02	0	RB	Initial issue as controlled document. Prior revision history located in hard-copy consolidated manual.

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# 1 Purpose/Scope

This document outlines Safe Work Practices for excavations and trenches.

**NOTE:** For diving related Ground Disturbance, refer to the Diving Operation Procedures.

## 2 Key Responsibilities

Location Manager (Issuing Authority [IA], Person in Charge [PIC], On-Site Manager) confirms proper permit(s) are completed and implemented by a competent person.

## 3 Procedures

### 3.1 Excavation

#### 3.1.1 Excavation Steps

Personnel engaged in excavation activities shall adhere to the steps below:

- Before beginning an excavation, identify and mark utility installations, such as sewer, telephone, fuel, power lines, water lines, pipelines, or any other underground installations. If applicable, contact utility companies and advise of proposed work prior to the start of actual excavation and call state/local agencies such as "One Call" or "DIG", as required. After all underground installations have been marked, the BP representative shall determine if these installations are within 10 feet of the proposed excavation area, which could create a hazard if contacted by the probing or excavation tools being used.

**NOTE:** Municipalities or other regulatory agencies may require permits.

- Prepare a JSEA and Ground Disturbance Permit and conduct a pre-job safety meeting. When underground installations are identified, the area shall be excavated using procedures approved by a BP supervisor.
- Confirm that all identified hazards are outlined on the Ground Disturbance permit and JSEA forms.
- Unprotected electric lines and nonmetallic pipelines shall always be isolated, de-energized, and locked out/tagged out prior to beginning any excavation activity.
- The BP representative shall confirm that markings remain in place during digging and excavation operations. Pipeline crossings shall be marked with orange plastic barrier(s) or equivalent. The barriers shall remain in place until that area is ready for excavation.
- When BP is performing excavation and trenching, a BP representative shall be on site if excavation is within 10 feet of any buried utility or other underground installation.
- BP Representative shall confirm that all appropriate personnel are on site prior to any excavation. Examples of appropriate personnel are qualified backhoe operator, spotter, and roustabouts.
- A spotter is required while excavating and trenching where the potential for hitting a line exists. More than one spotter may be required while working around overhead power lines.

- Use a moboard/digging bar (a flat piece of metal attached to the teeth of the bucket to prevent the puncture of a pipe) on backhoe/track hoe when digging in known proximity of lines.
- Backhoe operator shall dig parallel to the line. Appropriate training for the equipment operator shall be verified.
- Decide whether to guard the walls by shoring, sloping, benching, or some other equivalent means. Perform sloping or shoring in accordance with Occupational Safety and Health Administration (OSHA) regulations. A registered professional engineer shall design sloping or benching for excavations greater than 20-feet deep.

**Table 1 Maximum Allowable Slopes (H:V) for Excavations**

Soil or Rock Type	Less than 20 Feet Deep
Stable Rock	Vertical (90°)
Type A Soil	¾ : 1 (53°)
Type B Soil	1 : 1 (45°)
Type C Soil	1½ : 1 (34°)
Mixed Soil Types	1½ : 1 (34°)

**NOTE:** Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from horizontal, H = horizontal and V = vertical.

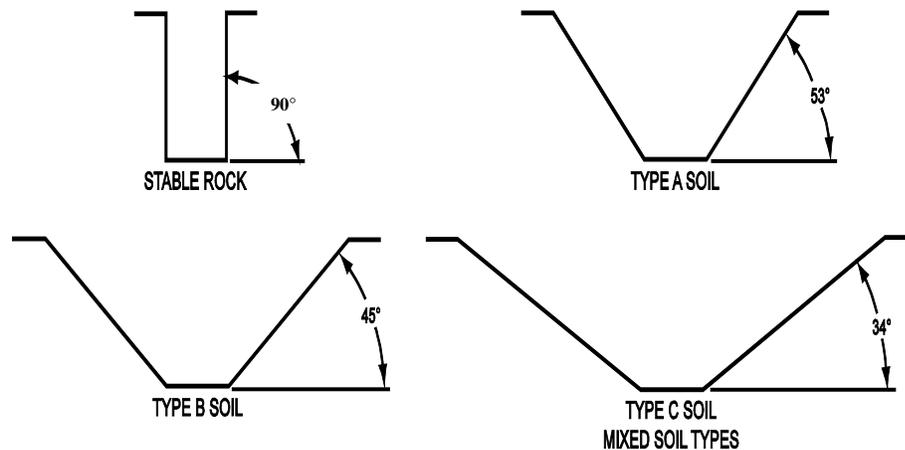


Figure 1: Required Slopes for Different Soil Types

### 3.1.2 Excavation Safety Practices

When working in excavations and trenches more than four feet deep, a Confined Space Entry Permit is required, as outlined in the Confined Space Entry Program of the CoW SWP.

- Ladders, steps, or ramps located so that no more than 25 feet of lateral travel is required to reach.
- Excavated soil, material, or equipment that could fall or roll into an excavation shall be stored and retained at least two feet from the edge of the excavation.
- If excavations endanger the stability of adjacent structures (building, walls, or other structures), support systems shall be utilized.
- A Competent Person shall make daily inspections of excavations prior to the start of the work shift. This person has the authority and responsibility to modify shoring or work methods as necessary to provide greater safety. If evidence of possible cave-ins or slides (such as accumulating water or seepage) is apparent, all work in the excavation shall cease until necessary precautions have been taken to safeguard personnel.
- Use barriers and barricades as necessary to protect individuals and mobile operating equipment near the excavation.
- Personnel shall not be in the excavation or trench when power equipment is being used to perform the excavation.

## 4 Definitions

Term	Definition
Benching	Shaping the sides of an excavation to form one or more horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
Competent Person	A person capable of identifying existing and predictable hazards, soil types in the surroundings, or working conditions that are unsanitary, hazardous, or dangerous to personnel and who has authorization to take prompt corrective measures to eliminate them.
Excavation	Any man-made cut, cavity, trench, or depression in an earth surface that is formed by earth removal.
Shoring	A structure that supports the sides of an excavation and one that is designed to prevent cave-ins. Examples of such shoring systems are metal, hydraulic, mechanical, or 'timber-shoring'.
Sloping	Tapering the sides of an excavation. The angle of incline is a variable of factors including soil type, environmental conditions of exposure, and surface load.
Soil Classification System	Classification used by the National Bureau of Standards.
Stable Rock	Natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.
Thumb Penetration Test	A test used to estimate the unconfined compressive strength of cohesive soils. This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2488 - "Standard Recommended Practice for Description of Soils (Visual - Manual Procedure)."
Trenching	Refers to an excavation where the depth is larger than its width that

	does not exceed a 15 foot width at the bottom.
Type A Soil	A cohesive soil with an unconfined compressive strength of 1.5 tons/ft <sup>2</sup> (tsf) or greater; examples are clay, silty clay, sandy clay, clay loam, silty clay loam, sandy clay loam, caliche, and hardpan (if a soil is fissured, subject to vibration, or previously disturbed, it is not considered Type A).
Type B Soil	A less-cohesive soil with an unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf; examples are angular gravel or crushed rock, silt, silt loam, sandy loam, dry rock that is not stable, partly sloped material, and previously disturbed Type A soil that is not considered Type C soil.
Type C Soil	The least-cohesive classification of soil, with an unconfined compressive strength of 0.5 tsf or less; examples are gravel, sand, loamy sand, submerged soils or freely seeping soils, submerged rock that is not as stable, or a layered system.

## 5 Key Documents/Tools/References

<b>CHECK LIST FOR GROUND DISTURBANCE</b>	
<b>Facility Name and Job Description:</b>	
_____	
_____	
Notes:	
1) This form is to be used when excavating, digging around existing pipe, underground equipment or buried electric lines.	
2) Once job is complete, this form is to be filed in the appropriate facility, well, or construction file.	
<b>Pre-Excavation Checks:</b>	
OK	1. Has the state "One Call" been made? Document the "One Call" verification number. Verification # _____.
_____	OK 2. If the state's "One Call" has not been notified, then the excavation shall not proceed.
_____	a) In the event of an emergency the BP Supervisor has the authority to excavate the location.
OK	3. Are all of the lines marked and flags visible? Is the pipeline right-of-way barricaded?
_____	OK 4. Have the Minimum Requirements For Excavation of Buried Lines been reviewed?
_____	OK 5. Has the excavator/contractor been informed of the BP Minimum Requirements?
_____	OK 6. Does the contractor know what their job duties are regarding the excavation? (Backhoe operator, spotter, etc.)
_____	OK 7. No digging within 1' foot of any line with a motorized tool.
_____	a) Determine whether any installations within 10' foot of the proposed excavation area might possible create a hazard if contacted by the probing or excavation tools being used. If Yes, the area should be excavated using procedures approved by the BP Supervisor, and discussed in this meeting.
OK	8. If excavating around electrical lines, are the lines de-energized? And are they LOTO (Per Minimum Excavation Requirements)
_____	OK 9. If excavating or digging around fiberglass or poly lines are they de-energized? And are they LOTO? (Per Minimum Excavation Requirements)
_____	OK 10. Excavated soil or other materials / equipment that could pose a hazard by falling or rolling into excavation shall be stored or retained at least two (2) feet from the edge of the excavation.

OK 11. Potential for a hazardous atmosphere? Describe the purge process in the comments section below.

       OK 12. If a pipeline is to be cut-into during the entry, how is the initial "minimal entry" going to be accomplished:

Method \_\_\_\_\_ Hacksaw cut  
Used: \_\_\_\_\_  
          \_\_\_\_\_ Pneumatic saw or drill  
          \_\_\_\_\_ Other equivalent "non-spark producing" means  
          Describe: \_\_\_\_\_

       OK 13. How are escape routes out of the excavation provided?

       OK No more than 25' of lateral travel is required from anywhere in excavation.

       OK Ladders, steps, or ramps.

       OK Other provisions, Describe below:  
\_\_\_\_\_

Preference is to have minimum of two routes of escape meeting the following criteria:

1. At opposite ends of the excavation.
2. Situated on opposite sides of piping in the excavation.

       OK 14. Pre-Entry atmospheric checks: O2 \_\_\_\_% LEL \_\_\_\_% or H2S \_\_\_\_.

Note: Atmosphere is to be continuously monitored for LEL and O2.

Circle the appropriate response for the following criteria:

- |     |    |    |  |
|-----|----|----|--|
| Yes | No | 1. | Contains or has a potential to contain a hazardous atmosphere  |
| Yes | No | 2. | Contains a material that has the potential for engulfing an entrant  |
| Yes | No | 3. | Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward to a smaller cross-section |
| Yes | No | 4. | Contains any other recognized serious safety and health hazard   |
| Yes | No | 5. | Contains a hydrocarbon line that will be opened  |

**Note: If any of the previous 5 questions are answered Yes, then a Confined Space exists and entry shall be approved by a Q.P. / Entry Supervisor.**

Notes /

Comments:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6 SIGNATURE OF ON-SITE SUPERVISOR OR DESIG. ALTERNATE:

DATE: \_\_\_\_\_