

# Excavation and Trenching

## 1 PURPOSE

To minimize losses that may result from excavation and trenching activities.

## 2 SCOPE

This procedure applies to all functional areas, operations, offices, including employees, vendors, visitors and contractors within the scope of the Integrated Management System (IMS).

## 3 DEFINITIONS AND ACRONYMS

### Definitions

**Approved** is certified to meet the minimum established standards.

**Benching** is a series of steps built in the slope direction. Horizontal platforms shaped between two slopes.

**Excavation** is any disturbance of ground that alters the existing ground level in the immediate vicinity of the work, even temporarily. This includes augers, driving of fence posts, power and telephone poles and the like. This does not include pit walls, active mining or digging stockpiled material.

**General Rules** are rules which apply to all employees, vendors, visitors, and contractors regardless of where they work or what they do.

**Job Specific** is a requirement directly associated with a specific job, task, or occupation.

**Positive contact** is when radio or other types of verbal communication are used by more than one person to communicate a need and all persons understand the communication and its intent. A reply back as to having received, understood, agree, or disagree with the communication is required for the completion of the positive contact.

**Pre-Use Inspection** is a daily inspection of vehicles and equipment that shall be completed prior to operation.

**Site** refers to any COMPANY facility.

**Slope** is an upward or downward inclination of dirt masses; ground that forms a natural or artificial incline.

**Slope Shoulder** is the highest point of a slope.

**Trenches** are long narrow excavations also know as ditches or canals.

**Work Area Inspection** is an inspection of the area an employee may work in and/or has responsibility for (e.g. dump, pit, grind, crusher, etc.) to identify possible health and safety hazards/risks which then must be reported and corrected.

### Acronyms

**HMR** HSLP Management Representative

**HSLP** Health, Safety and Loss Prevention

**IMS** Integrated Management System

**PPE** Personal Protective Equipment

## 4 ROLES AND RESPONSIBILITIES

### Document Owner

HMR

### Responsible Roles and Position-Holders

**Contractors/Vendors** are businesses performing a service for the COMPANY. They are responsible for ensuring their employees working on COMPANY sites understand and comply with the requirements as outlined in this procedure.

**All employees** in any position whether COMPANY or contracted employees working on any COMPANY site. They are responsible for complying with the requirements as outlined in this procedure and the applicable permit.

**Visitors** are anyone not employed by the COMPANY in any capacity but are traveling or touring on a COMPANY site. They are responsible for complying with the requirements as outlined in this procedure and the applicable permit.

**HSLP** is any COMPANY employee working under and including the Regional Director of HSLP. They are responsible for periodically auditing for compliance, random excavation site inspections, and providing advice to this procedure and the applicable permit.

**A Supervisor/Foreman or Designee** can be a COMPANY employee or a contractor/vendor working or traveling on any COMPANY site. They are responsible for enforcement of all requirements, rules, and established guidelines as outlined in this procedure. They ensure personnel in his/her responsibility are provided with needed and necessary training for this procedure and the applicable permit including hazard recognition.

## 5 DIRECTION

All employees, vendors, contractors, and visitors traveling/working on site shall comply with and ensure that personnel accountable to them comply with the following requirements of this procedure.

## General Rules

A properly completed excavation permit with appropriate maps shall be present at the excavation site before any excavation takes place.

Prior to excavating in any location, except in areas identified by Electrical, Survey, Utilities, and any other applicable departments, as having no buried utilities, requires an excavation permit. As part of the permitting process the following items must be completed:

- a** Utilities such as power, telecommunication, control cables, and pipelines, shall be identified and marked by the responsible qualified and competent electrical, survey, utility, or other appropriate department personnel before any excavation takes place.
- b** Utilities shall be properly isolated as appropriate according to the SOP Energy Isolation procedure.
- c** Approval from the area supervisor must be obtained.
- d** When unmapped utilities are found during the excavating, they shall be accurately located, surveyed, and the maps or drawings shall be updated through the responsible site drawing control or survey (Step 5.2). Survey needs to be notified as soon as possible (minimum 24 hours) before an excavation takes place in order to ensure adequate scheduling of personnel in non-emergency excavation work.

The Electrical department shall mark the excavation site for utilities identifying type and location using other department assistance such as, site Survey, IT, Utilities, and other appropriate departments (including non-COMPANY utility owners and/or Contracted Managers of the COMPANY owned facilities). All groups shall work together to identify and mark all buried utilities in the excavation area utilizing both drawing control documentation, appropriate detection equipment, and on the ground observations.

Utilities owning non-COMPANY facilities within COMPANY areas are responsible for calling the USA North "Call Before You Dig" number. Authorized representatives of non-COMPANY utility owners and/or contracted management of COMPANY owned facilities shall review and sign off on excavation permits in their areas.

Material removed from any excavation or trench shall be placed no closer than 2 feet to the edge of the excavation opening or no closer to the edge than the depth of the excavation, whichever is greater.

Care must be used not to undercut excavation walls or material slopes.

All excavations shall be flagged off and barricaded or bermed and signed to prevent accidental access by equipment or personnel.

Spotters shall be utilized when equipment and personnel need to work in close proximity to each other and/or when utilities could be potentially damaged.

All excavation permit and marked utilities shall be reviewed by all personnel involved in the excavation work.

A work area inspection must be conducted by the permit supervisor and by all persons working in and around any excavation before persons shall enter the excavation. If there is

evidence of a landslide, or a prevention systems failure, dangerous environment or any other dangerous condition, the necessary precautions must be taken before continuing work in the excavation or trench.

Personnel working in and around excavation must not work under suspended loads or near excavation equipment.

Walkways shall be installed over trenches spanning 2 to 5 feet or barricades installed alongside trenches to prevent personnel from jumping from one edge to the other.

The walkways shall conform to the following:

- Minimum of 3 feet wide
- Substantial handrails, mid-rail, and toe boards
- Solid construction to prevent sag under load
- Secured to prevent dislodging
- Placed every 50 feet
- When walkways conforming to the above standard are not practical, other appropriate safe measures may be utilized with approval from the excavation supervisor

All other procedure and permit requirements (confined space, hot work, working near overhead power, energy isolation, safe work, etc) shall be followed as applicable for all excavation work.

When necessary diversion ditches or other means shall be used to prevent surface water from entering the excavation.

If water accumulates in excavations or trenches work shall be suspended. If pumps are utilized to keep the excavation clear of water this shall be controlled by a qualified supervisor.

If a utility is breached during excavation, all work shall cease until a full assessment of downstream consequences has been evaluated by the area supervisor. Work may resume only after it has been deemed safe by the appropriate area supervisor.

Excavations or trenches 4 feet or deeper require a method to protect people from entering the excavation area and must be in use. Acceptable methods include:

- Sloping to the angle of repose utilizing the information in Table 1 below with benching to ensure overall slope angle never exceeds 45 degrees.
- Benching having a minimum horizontal set back of at least 4 feet on each side of the excavation, for every 4 feet in depth.
- Shoring or shielding designed and approved by a qualified engineer.
- ALL appropriate measures shall be taken, including combinations of the above methods, to ensure the safety of all personnel working in and around excavations and trenches.

Soil Type	Angle from Horizontal	
	Dry Soil	Wet Soil
Compact hard rock	90	90
Hard rock	80	80
Soft rock	55	55
Rock pieces – Agglomerates	45	40
Vegetal Soil	45	30
Clay	40	20
Fine Gravel – Gravel	35	30
Fine Sand	30	20

A means of adequate escape such as a ladder, stairway, or ramp shall be placed so it is no more than 25 feet of lateral travel from individuals working in the excavation.

- When ladders are used, the ladder must be secured and extend at least 3 feet above the top of the excavation.
- When stairways or ramps are used they must be secured to prevent accidental displacement.

Potential sources of gases or vapors which could adversely affect atmospheres within an excavation or trench shall not be used in or near the excavation unless appropriate measures have been taken to ensure adequate ventilation. The COMPANY Confined Space Procedure must be followed if required.

The condition of all shoring, sheeting, or cribbing must be inspected daily during the work area inspection. Any hazardous conditions must be corrected before any persons enter or go near the excavation. If entry is required to correct conditions, adequate measures shall be taken to ensure protection of personnel.

Excavations shall be back filled as soon as practical after the utilities have been surveyed in.

All utilities being buried shall be buried a minimum of 2 feet and require a colored marker tape to be placed approximately 12 inches directly above the utility. Care must be taken to ensure the utility and/or marker tape is not displaced during burial.

**If at all possible**, different utilities shall not be buried in the same trench. Any utilities or part of utilities not buried (temporary or permanent) shall be adequately protected from damage as well as conspicuously marked and labeled.

Utilities that cannot be identified through available detection equipment shall have a tracer line installed with the utility which is capable of being detected by available equipment.

Permits shall be closed out by a signature from the supervisor requesting the permit and shall be returned to the responsible site drawing control or survey along with any changes needed to the drawings or maps.

Maps and drawings shall be updated as soon as possible to show new utility installations as well as discovery of previously unknown burials.

Utilities which do not fall under the permit requirements of this procedure and have the potential of being buried shall have appropriate measures taken by area management to identify the location of the utility if required. (Examples: Leach lines on leach pads, pit water lines, tails lines, temporary power, etc).

### **Drawing Control/Survey for responsible site**

Issue numbered excavation permits for required excavations.

Maintain drawings, maps, etc. regarding any buried utilities.

Update drawings, maps, etc. as new information becomes available i.e. previously unknown utilities.

Keep the original excavation permits.

### **Supervisor**

Fill out an excavation permit and any other required permits for all excavations.

Ensure all buried utilities have been identified and marked before any excavation takes place.

Supervisors must inspect excavations and/or trenches and all auxiliary elements (walkways, stairs, etc.) on a daily basis. This must also be done after a storm or other factor that changes the original characteristics of the excavation.