

## **HEALTH AND SAFETY PROGRAM 318 – Excavation Safety**

### **1.0 PURPOSE**

- 1.1** The purpose of this procedure is to define the minimum requirements for performing excavation work at the Westlake Plaquemine Plant. This procedure addresses the requirements contained in OSHA Standards 29 CFR 1926 “Subpart P – Excavations”.

### **2.0 SCOPE**

- 2.1** The scope of this procedure applies to all excavation work performed on plant property.

### **3.0 DEFINITIONS**

- 3.1 Benching or Stepping** a method of protecting personnel from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near vertical surfaces between levels.
- 3.2 Cave-In** the separation of a mass of soil or rock material from the side of any excavation, or the loss of soil from underneath a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury or otherwise injure or immobilize a person.
- 3.3 Competent Person** an experienced person, qualified by the Excavation Contractor, and capable of identifying existing and predictable hazards in the working conditions or surroundings which are unsanitary, hazardous, or dangerous to personnel, and, who is authorized to take prompt corrective measures to eliminate them.
- 3.4 Excavation** any penetration below grade such as, but not limited to, man-made cuts, cavities, trenches or depressions in the earth’s surface made by the removal of material.
- 3.4.1** Activities which will not be considered as excavations include removing the top layer of concrete, gravel or shell in preparation for probing; digging or removing previously piled or mounded earth from above existing grade; and surface leveling, provided that the leveling activities do not extend below grade.
- 3.5 Excavating Equipment** means any piece of equipment that is mechanically driven and designed to penetrate soil below grade. These devices include but are not limited to the following: backhoes, track hoes, bulldozers, drilling rigs, and soil sampling devices. Manual posthole diggers, shovels, probing tools are not considered to be excavating equipment.
- 3.6 Grade** the uppermost level of soil in a given area. Gravel, limestone, shell and concrete are considered above grade.
- 3.7 Job Proprietor** the Westlake representative or his designee responsible for following the excavation work.

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- 3.8 Hazardous Atmosphere** an atmosphere, which, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen-deficient or otherwise harmful, may cause death, illness or injury.
- 3.9 Protective System** a method of protecting personnel from cave-ins of material that could fail or roll from an excavation face or into an excavation or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching/stepping systems, shield systems and other systems that would provide necessary protection.
- 3.10 Registered Professional Engineer** a person who is registered as a Professional Engineer in the State where excavation work is performed. However, a Professional Engineer, registered in any State is deemed to be a “Registered Professional Engineer” within the meaning of this program procedure when approving designs for manufactured systems or tabulated data to be used for interstate commerce.
- 3.11 Scrape and Probe** the procedure by which the Excavating Contractor will identify known underground obstructions when initial probing does not identify all known underground obstructions. The Excavating Contractor will scrape and probe until the excavation is complete or all known underground obstructions are located.
- 3.12 Shield and Trench Box** a structure that is able to withstand the forces imposed on it by a cave-in and thereby protects personnel within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Shields used in trenches are referred to as trench boxes.
- 3.13 Shoring** a structure such as a metal, hydraulic, mechanical or timber shoring system that supports the sides of an excavation and is designed to prevent cave-ins.
- 3.14 Sloping** a method of protecting personnel from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of inclination required to prevent cave-in varies with differences in such factors as the soil type, environmental conditions of exposure and application of surcharge loads.
- 3.15 Trench** a narrow excavation made below the surface of the ground. In general, the excavation’s length and depth is greater than the width, and its width is not greater than 15 feet.

## **4.0 RESPONSIBILITIES**

### **4.1 Engineering Department Representative**

- 4.1.1** Visits the proposed excavation site with the Job Proprietor and reviews existing drawings to identify all known obstructions and adjacent structures or activities that could affect the excavation prior to probing.
- 4.1.2** Identifies and documents known obstructions on the Probing/Excavation

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Authorization and reviews the information with the Job Proprietor.

- 4.1.3 Contacts Louisiana One Call whenever the possibility exists that outside utilities or other companies' pipelines are located in the vicinity of the excavation area.
- 4.1.4 Assembles the Probing/Excavation Authorization and related drawings for review, approval and issue by the Job Proprietor to the Probing Contractor.
- 4.1.5 After the probing results review is completed, assembles the Probing/Excavation Authorization for approval by the Job Proprietor and Engineering Manager (or designee) and for issue by the Job Proprietor to the Excavation Contractor.
- 4.1.6 Updates any new obstructions on underground reference drawings.
- 4.1.7 Maintains Probing/Excavation Authorization for one week after completion of each excavation. If an incident involving the excavation occurs, the Probing/Excavation Authorization will be sent to the Manager of the Health and Safety Department.

#### **4.2 Job Proprietor**

- 4.2.1 Initiates Probing/Excavation Authorization based on request for excavation work.
- 4.2.2 Identifies and marks excavation area with white paint.
- 4.2.3 Authorizes probing on the probing portion of the Probing/Excavation Authorization and reviews probing results with the Probing Contractor.
- 4.2.4 Authorizes excavation on the excavation portion of the Probing/Excavation Authorization and reviews the Authorization with the Excavation Contractor
- 4.2.5 Oversees excavation activities to ensure Authorization restrictions are followed.
- 4.2.6 Terminates authorizations and all permits associated with the excavation if authorization restrictions are not followed or if changing conditions warrant a re-evaluation of the excavation activities.
- 4.2.7 Returns the Probing/Excavation Authorization to Engineering at the completion of each phase of the process.

#### **4.3 Probing Contractor**

- 4.3.1 Obtains a copy of the approved Probing/Excavation Authorization prior to performing any probing in the designated excavation work area.
- 4.3.2 Obtains a Safe Work Permit from Operations and any other applicable permits prior to performing any work.

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- 4.3.3 Conducts all probing and marking operations based on information and documents provided by the Engineering Department.
- 4.3.4 Signs the Probing/Excavation Authorization indicating that the proposed excavation site has been probed, the authorization documents have been marked, all known underground obstructions have been verified and all new discoveries have been communicated to the Engineering Department.
- 4.3.5 Where probing could not identify all known obstructions, Probing Contractor will document this information on the Authorization documents and notify the Job Proprietor.
- 4.3.6 Remains involved throughout the probing and scraping process by the Excavation Contractor until all known underground obstructions have been located.

#### **4.4 Excavation Contractor**

- 4.4.1 Provides a “Competent Person” to supervise excavation activities and conduct daily inspections.
- 4.4.2 Obtains a copy of the approved Probing/Excavation Authorization prior to performing any mechanical excavation work.
- 4.4.3 Obtains a Safe Work Permit from Operations and all other applicable permits prior to performing any work.
- 4.4.4 Works within the scope of the Probing/Excavation Authorization and all other applicable permits, including probe and scrape activities when required.
- 4.4.5 Performs all excavation activities in accordance with OSHA 29 CFR 1926, Subpart P and all applicable Westlake standards and permits.
- 4.4.6 Conducts daily inspections of excavation site prior to any activities inside the excavation. Contractor’s “Competent Person” must conduct these inspections.
- 4.4.7 Documents daily inspection results and submits report to the Job Proprietor.
- 4.4.8 Immediately notifies Job Proprietor if conditions change outside the scope of the authorization or permits.
- 4.4.9 Communicates any unidentified underground obstructions to the Job Proprietor and marks the Probing/Excavation Authorization drawings accordingly.

#### **4.5 Operations**

- 4.5.1 Reviews the Probing/Excavation Authorization prior to issuing a Safe Work

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Permit.

- 4.5.2 Issues a Safe Work Permit and all other applicable permits to the Probing and/or Excavation Contractors. Copies of the Probing/Excavation Authorization must be attached to the approved Safe Work Permit (original and contractor's copy). A separate Safe Work Permits is required for probing and for excavation activities.

### **4.6 General Requirements**

- 4.6.1 Trees, rocks, and other surface objects that may create a hazard to employees involved in excavation work will be removed.
- 4.6.2 Tools, materials or unearthed ground that may create hazards, should be placed a minimum of three feet away from the excavation edge and sloped to the angle of repose.
- 4.6.3 Underground installations must be protected, supported, or removed while excavations are open.
- 4.6.4 Excavations in which personnel are working must be inspected by a "Competent Person" to determine required safety precautions. Excavations with walls more than five (5) feet deep, in which personnel are working, must be guarded by shoring, sloping, or some other equivalent means of preventing wall collapse.
- 4.6.5 Personnel will not be permitted to work on the face of sloped or benched excavations at levels above other workers.
- 4.6.6 A warning system (such as those listed below) must be used when mobile equipment is operated next to an excavation when the equipment operator does not have a clear or direct view of the excavation edge:
  - 4.6.6.1 Barricades
  - 4.6.6.2 Hand Signals
  - 4.6.6.3 Mechanical Signals
  - 4.6.6.4 Stop Barriers
- 4.6.7 When the estimated location of an underground obstruction is approached by heavy equipment, the exact location should be determined using hand tools.
- 4.6.8 All excavation perimeters must be enclosed with a barrier, and a sufficient number of warning signs posted to alert anyone in the area.
- 4.6.9 Personnel must stand back from the excavation site during loading and unloading of vehicles and equipment.
- 4.6.10 Ladders must be provided for entry and exit at depths of 4 feet or more.

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- 4.6.11 Ladders must be placed every 25 feet for entry and exit of personnel.
- 4.6.12 If structural ramps are used for excavation entry or exit, they must be:
  - 4.6.12.1 Designed by a person qualified in structural design
  - 4.6.12.2 Constructed of uniform thickness
  - 4.6.12.3 Installed according to the design
  - 4.6.12.4 Attached in a manner to prevent tripping
  - 4.6.12.5 Provided with cleats or other surface treatments to prevent slipping
- 4.6.13 When excavations are located near vehicular traffic, personnel must be provided with warning vests.
- 4.6.14 Excavations on or near a roadway that will remain open at night must be equipped with hard barricades and flashing lights.
- 4.6.15 Excavations 4 feet or more in depth will be considered confined spaces and must follow procedures outlined by Westlake's, Plaquemine Complex, Confined Space Permit Program.
- 4.6.16 Daily inspections of excavations, adjacent areas, and protective systems must be made by Contractor's "Competent Person" for evidence of a situation that could result in cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions.
- 4.6.17 Excavation Contractor's "Competent Person" must be present during all excavation operations.
- 4.6.18 The Probing/Excavation Authorization will be valid for the duration of the defined job scope only. As a minimum new Safe Work Permits will be issued for each work shift or daily when only one shift is worked per day.

## **4.7 Water Control and Excavations**

- 4.7.1 Employees are not permitted to work in excavations in which there is an accumulation of water, unless adequate precautions have been taken against cave-ins, falls, engulfment, etc.
- 4.7.2 If excavation work interrupts the natural drainage of surface water such as streams, then diversion ditches, dikes, or other suitable means to prevent surface water from entering excavations must be provided.
- 4.7.3 If water is controlled or prevented from accumulating by the use of water removal equipment, a monitor must be present to ensure proper operation.
- 4.7.4 The Contractor's "Competent Person" must perform an inspection of the excavation site after every rainstorm or other hazard-increasing occurrence.

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### **4.8 Protective Systems**

- 4.8.1 Employees must be protected from cave-ins by an adequate protective system.
- 4.8.2 Protective systems should have the capacity to resist, without failure, all loads that are intended or could reasonably be applied to the system.
- 4.8.3 Slopes and configurations of sloping and benching systems must be selected and constructed per OSHA 29 CFR 1926.652(b).
- 4.8.4 Designs of support systems, shield systems, or other protective systems selected and constructed must meet requirements in accordance with OSHA 29 CFR 1926.652(c).
- 4.8.5 Materials and equipment used for protective systems must be free from damage or other defects that might impair their proper function.

## **5.0 PROCEDURES**

### **5.1 Probing/Excavation Authorization Requirements**

- 5.1.1 It is the policy of the Westlake Plaquemine Facility to require an approved Safe Work Permit, which includes a Probing/Excavation Authorization approved by the Engineering Manager or designee, whenever a mechanical excavation is to be performed on plant property (Appendix A - Probing/Excavation Authorization).
- 5.1.2 The Probing/Excavation Authorization must sufficiently communicate the scope of the excavation. The following information must be on the Authorization:
  - 5.1.2.1 The location of the excavation to be probed and/or excavated.
  - 5.1.2.2 Indication of underground utilities and/or pipelines and their locations within the excavation site and information as to which utilities and/or company pipelines were identified.
  - 5.1.2.3 Communication with Louisiana One Call if applicable.
  - 5.1.2.4 Probing/Excavation Authorization approval.
- 5.1.3 Probing
  - 5.1.3.1 Get authorization for probing is from the Engineering Department.
  - 5.1.3.2 Understand the scope of work to be performed.
  - 5.1.3.3 Understand the location of the excavation site and physical boundaries.
  - 5.1.3.4 Obtain Safe Work Permit from Operations and obtain other applicable permits prior to probing.
  - 5.1.3.5 Know the depth limitations of the excavation. Probe one foot below planned excavation depth to a maximum depth of eight feet.
  - 5.1.3.6 Where water probing is used, do not exceed 80psig of water pressure.

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- 5.1.3.7 Stake location of all underground lines, utilities or obstructions throughout the excavation site. Note depth on each stake.
- 5.1.3.8 Do not hammer probe into ground under any circumstances.
- 5.1.4 Probing/Excavation Authorization: Authorizations require the written approval of at least the following prior to performing mechanical excavation work:
  - 5.1.4.1 Engineering Department (authorizes probing and/or excavation)
  - 5.1.4.2 Job Proprietor (approves authorization and oversees excavation activities)
  - 5.1.4.3 Probing/Excavation Contractor's Competent Person (supervises and inspects the probing and/or excavation process)
- 5.1.5 Authorization Duration: The Probing/Excavation Authorization is valid for the duration of the probing and excavation defined scope of work provided work commences within six (6) months of the issue date.
- 5.1.6 Changes in Personnel: When there is a change in personnel performing the probing or excavation work, the changes must be reflected on the Authorization. Competent Person must review the permits and the job requirements with the new personnel.
- 5.1.7 Changes in Condition: In all cases of work being performed in the plant, all personnel, including but not limited to Operators, Shift Supervisors, Maintenance personnel and Contractor personnel are responsible, within the scopes of their activities, for observing and finding changes in conditions, or new conditions arising, that might make the excavation work unsafe. When such changes occur, all personnel have the authority to stop the work until safe conditions are re-established.
- 5.1.8 Excavation Procedures
  - 5.1.8.1 A request is made for a Probing/Excavation Authorization to the Engineering Department.
  - 5.1.8.2 The Job Proprietor marks the proposed excavation site with white paint.
  - 5.1.8.3 The Engineering Department representative surveys the proposed excavation site and surrounding structures and activities.
  - 5.1.8.4 The Engineering Department contacts Louisiana One Call a minimum of forty-eight (48) hours prior to beginning excavation if the potential for outside utilities and/or other company pipelines exist in the excavation area. If the excavation is an emergency, Engineering will contact Louisiana One Call as soon as possible.
  - 5.1.8.5 Outside utilities and companies mark their utilities, pipelines, etc.
  - 5.1.8.6 The Engineering Department representative identifies known underground obstructions from a master set of drawings and attaches a copy of the referenced drawings to the Probing/Excavation Authorization.

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- 5.1.8.7 The Engineering Department representative reviews known underground obstructions with the Job Proprietor.
- 5.1.8.8 The Job Proprietor authorizes probing on the Probing /Excavation Authorization and reviews the known underground obstructions with the Probing Contractor.
- 5.1.8.9 The Probing Contractor probes the excavation site, stakes the location of all underground lines, utilities or obstructions, indicates their depth on the stake and marks any new underground obstructions discovered on the Authorization drawings.
- 5.1.8.10 Where the Probing Contractor cannot probe the area because of soil conditions or cannot identify all known underground obstructions, he or she will document this on Authorization.
- 5.1.8.11 The Probing Contractor will sign the authorization verifying he has probed, identified and staked all known underground obstructions or that he cannot identify all known underground obstructions.
- 5.1.8.12 The Engineering Department will review the results of the probing and will complete the excavation section of the Probing/Excavation Authorization. The Engineering Manager or designee will approve the Authorization.
- 5.1.8.13 The Job Proprietor will sign the excavation portion of the Probing/Excavation Authorization and will review the results of the probing findings with the Excavation Contractor.
- 5.1.8.14 In the event the site cannot be probed per the probing requirements (Sect. 5.1.8.10), the Probing Contractor will work with the Excavation Contractor to scrape, probe and locate underground obstructions. Their locations will be documented on the Authorization drawings.
- 5.1.8.15 Upon completion of the excavation the Excavation Contractor will return the Authorization and drawings to the Job Proprietor.
- 5.1.8.16 The Job Proprietor will return the Authorization package to the Engineering Department for record keeping.
- 5.1.8.17 The Engineering Department will update Westlake underground drawings to indicate newly identified underground obstructions and new underground installation from as built information.

## **6.0 RECORDKEEPING**

### **6.1 Engineering Department**

- 6.1.1 The Engineering Department will be responsible for maintaining Probing/Excavation Authorizations. Probing/Excavation Authorizations will be maintained for one week after completion of the job. If an accident or incident is involved during the excavation, the Probing/Excavation Authorization will be sent to the manager of the Health and Safety Department for filing.
- 6.1.2 The Engineering Department will be responsible for maintaining and updating drawings associated with underground obstructions.
- 6.1.3 The Engineering Department will update master drawings if any new

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underground obstructions were identified while probing or excavating.

### **7.0 PROGRAM REVIEW**

The Westlake Health and Safety Program 318 - Excavation Safety will be reviewed periodically. The Health and Safety Department Manager will ensure that this review is performed. The purpose of these reviews is to assess compliance, to ensure that all employees who should be included are included and to evaluate program effectiveness.

### **8.0 REFERENCES**

29 CFR 1926 Subpart P – Excavations

### **9.0 ATTACHMENTS**

9.1 Probing / Excavation Authorization

### **Revision History**

| <b>Rev</b> | <b>Changes</b>                                                                                                                                                             | <b>Approved</b> | <b>Date</b> |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|
| 4          | <i>Reviewed per schedule, no content changes, updated logo, added “Current Review Date” and “Review Cycle” to 5 years. Added “Sections” under 9.0 to name “Appendices”</i> | H. Garner       | 3/16/23     |

## PROBING / EXCAVATION AUTHORIZATION

|                                          |                                                        |
|------------------------------------------|--------------------------------------------------------|
| <b><u>Requested by:</u></b><br><br>_____ | <b><u>Area:</u></b> _____<br><b><u>Grid:</u></b> _____ |
| <b><u>Issue No:</u></b> _____            | <b><u>Issue Date:</u></b> _____                        |

### Location and Description of Work:

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### Know Underground Obstructions:

[illegible]

**Louisiana One Call contacted:** YES: ☐ NO: ☐ N/A: ☐

**All Outside Utilities marked:**      YES: ☐      NO: ☐      N/A: ☐

**Probing/Excavation Authorization good for duration of excavation work; Approved Safe Work Permit required daily. Attach copies of Probing/Excavation Authorization to back of Safe Work Permit (original and contractor's copy).**

### Probing Authorization:

**Job Proprietor (signature):** \_\_\_\_\_

**Probing Contractor (name):** \_\_\_\_\_

I have probed the excavation area and have identified all known obstructions per the drawings and documents. I have staked each obstruction and marked their depths per the procedure:

**Probing Contractor (signature)**

**OR**

I have probed the excavation area and have **NOT** been able to identify all known underground obstructions:

\_\_\_\_\_  
Probing Contractor (signature)

**Underground Obstructions NOT Identified:**

1. \_\_\_\_\_ 2. \_\_\_\_\_

3. \_\_\_\_\_ 4. \_\_\_\_\_

5. \_\_\_\_\_ 6. \_\_\_\_\_

NOTE: If probing contractor cannot identify all known underground obstructions, scrape and probe is required.

Scrape and Probe Required: YES

☐

NO

☐

**Excavation Authorization:**

Engineering Manager (signature): \_\_\_\_\_

Job Proprietor (signature): \_\_\_\_\_

Excavation Contractor (signature): \_\_\_\_\_

**Authorization Rescinded:** \_\_\_\_\_ **Date/Time:** \_\_\_\_\_  
(Job Proprietor, signature)

Reason Authorization Rescinded: \_\_\_\_\_

\_\_\_\_\_  
**Authorization Reinstated:** \_\_\_\_\_ **Date/Time:** \_\_\_\_\_  
(Job Proprietor, signature)

Excavation Completed: \_\_\_\_\_ **Date:** \_\_\_\_\_  
(Job Proprietor, signature)