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1.0 PURPOSE

1.1 The purpose of this procedure is to ensure the safety and health of personnel who work in or around open excavations at the MPC LRD Refinery. This procedure shall provide for the safe construction of excavations, contain the necessary safeguards for protecting employees from the hazards associated with excavation work and comply with the requirements of OSHA's Excavation Standard.

2.0 APPLICATION

2.1 This procedure applies to all Marathon Petroleum Company LP, Louisiana Refining Division (LRD) and Contractor personnel who may work in or around any man-made excavation.

3.0 IMPLEMENTATION

3.1 The implementation of the requirements outlined in the Excavation Standard Practice shall be adhered to on this standard's effective date.

4.0 ADMINISTRATION/RESPONSIBILITIES

4.1 The Division's Safety Supervisor is designated as the administrator of this program and is responsible for its implementation at the Louisiana Refining Division.

5.0 DEFINITIONS

5.1 ***Bank:*** A mass of soil rising above a digging level.

5.2 ***Braces:*** The horizontal members of the shoring system whose ends bear against the uprights or stringers.

5.3 ***Competent Person:*** One who can identify existing and predictable hazards in and around the work area, which are hazardous or dangerous to employees, and who has authority to take prompt corrective measures to eliminate such hazards. This individual is to be provided by the contractor involved in performing the excavation.

5.4 ***Excavation:*** Any man-made cavity or depression in the earth's surface, including its sides, walls, or faces, formed by earth removal and producing unsupported earth conditions for reasons of the excavation. If installed forms or similar structures reduce the depth-to-width relationship, an excavation may become a trench.

5.5 ***Hard Compact Soil:*** All earth materials not classified as running or unstable.

5.6 ***Kickouts:*** Accidental release or failure of a shore or brace.

5.7 ***Sheet Pile:*** A pile or sheeting that may form one of a continuous inner-locking line or rows of timber, concrete, or steel piles, driven in close contact to provide a tight wall to resist the lateral pressure of water, adjacent earth, or other materials.

5.8 ***Shield:*** Structure able to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent or temporary, pre-manufactured, or built on the job to meet OSHA specifications.

5.9 ***Sides, Walls, Faces:*** The vertical or inclined earth surfaces formed as a result of excavation work.

5.10 ***Slope:*** The angle with the horizontal at which a particular earth material will stand indefinitely without movement.

5.11 ***Stringers:*** The horizontal members of a shoring system whose sides bear against the uprights or earth.

5.12 ***Trench:*** A narrow excavation made below the surface of the ground. In general, the depth is greater than the width; but the width of a trench is not greater than 15 feet.

5.13 ***Trench Shield:*** A shoring system composed of steel plates and bracing, welded or bolted together, that support the walls of a trench from the ground level to the trench bottom and that can by moved along as work progresses.

5.14 ***Unstable Soil:*** Earth material that, because of its nature or the influence of related conditions, cannot be depended upon to remain in place without extra support, such as would be furnished by a system of shoring.

5.15 ***Uprights:*** The vertical members of a shoring system.

5.16 ***Barred Bucket:*** An excavation bucket with a bar attached across the tips of the bucket teeth.

5.17 ***Bearing Elevation:*** The interface between the bottom elevation of a foundation and the soil.

5.18 ***Hydro-Excavating:*** A non-mechanical, non-destructive process that utilizes pressurized water and an industrial strength vacuum to simultaneously excavate and evacuate soil.

6.0 REQUIREMENTS

6.1 Underground Installations

6.1.1 All underground utility installations expected to be near the worksite must be determined prior to the start of digging. Utility companies must be contacted, advised of the proposed work, and asked to relay the exact location of the underground installations.

6.1.2 All underground utilities / structures must be supported with the use of sheet piles when determined to have a potential for cave-in when excavating in loose non-cohesive soil or there is evident loss of supporting soil.

6.1.3 Ensure that the bucket teeth have been barred to protect underground utilities from puncture. Exception: In cases where there is no potential to strike underground utilities and it is necessary to utilize the teeth of the bucket (i.e. hard ground).

6.1.4 If the exact location of the underground utilities is unclear, digging may continue until the estimated location is approached. At which time, the exact location must be determined by probing and/or proceeding in a cautious manner to prevent the breakage of underground installations.

6.1.4.1 If probing is necessary, the following guidelines should be followed:

6.1.4.1.1 Probe every 2.5 inches around the perimeter of the excavation;

6.1.4.1.2 Probe at least 1 foot beyond the intended excavation; and

6.1.4.1.3 The probe shall not be hammered into the ground.

6.1.4.2 Preferred methods for uncovering underground lines when within 1' of the known underground line include: pot holing (air vacuum or hydro vacuum) and hand digging.

6.1.5 A review of refinery drawings regarding electrical/instrumentation, piping and structural disciplines shall be performed as necessary prior to the start of any digging.

6.1.6 The Excavation-Trenching-Piledriving Checklist (RSW-0122-FORM 01-GV) must be completed by the responsible parties prior to performing any excavation, trenching, or piledriving activities.

6.1.7 A drawing and field review by the project owner and area owner shall be conducted prior to the written approval of an excavation related work permit.

6.1.8 The Excavation-Trenching-Piledriving Checklist and area underground drawings regarding electrical/instrumentation, piping, and structural disciplines shall accompany and be maintained with the work permit.

6.1.8.1 When an excavation is to take place outside of the LRD fence line, "Louisiana One Call" (811) shall be contacted and local utilities identified prior to excavating activities. The dig number must be documented on the "Excavation-Trenching-Piledriving Checklist."

6.2 Egress from Trench Excavation

6.2.1 A stairway ladder, ramp, or other safe means of egress shall be located in trench excavations four (4) feet or deeper and require no more than 25 feet of lateral travel for employees to access.

6.3 Trenching Operations

6.3.1 In locations where employees may be exposed to vehicular traffic, the employees must wear adequate reflective garments, such as vests, in order to be seen by motorists. Such vests are to be provided by the contractor.

6.3.2 Workers are not permitted under loads handled by excavation equipment, and they must stand away from vehicles when being loaded or unloaded to prevent being struck with any falling material.

6.3.3 When mobile equipment is operated near an excavation, adequate warning systems such as barricades, hand signals, etc. must be used to protect employees from moving equipment.

6.3.4 Should it become necessary for an excavation to remain open and unattended, such as overnight or weekends, sufficient warning signs must be posted, and the area barricaded to prevent the possibility of falling into the excavation. This may be accomplished by blinking lights, barricade tape, and wooden/pvc barricades.

6.3.5 Should an excavation uncover foreign materials, digging must stop and an MPC Supervisor notified. Digging may continue upon verbal permission from the MPC Supervisor.

6.4 Testing of Excavation Atmospheres

6.4.1 All excavations deeper than four (4) feet and those less than four (4) feet where a hazardous atmosphere could exist must be tested prior to employee entry to ensure a hazardous atmosphere does not exist.

6.4.2 This test will consist of monitoring for oxygen and combustible levels, also any specific contaminant which could possibly be present in the excavation. Should a hazardous atmosphere be encountered, established procedures, such as respiratory protection, are to be followed to provide sufficient employee protection. Testing will be done as often as needed to ensure the measured contaminants do not reach dangerous levels.

6.5 Water Accumulation

6.5.1 Employees may not work in excavations in which water is accumulating, unless adequate protective measures have been taken. Such measures may include special shielding systems to prevent water accumulation, pumps, or other forms of water drainage, or the use of a lifeline and safety harness.

6.5.2 Any water removal equipment must be monitored constantly to ensure proper operation.

6.5.3 Any excavation that disrupts water flow must have adequate measures, such as diversion ditches, installed for proper drainage. Excavations must be inspected daily and after every rain by a competent person to ensure the stability of the excavation prior to employee entry into the excavation.

6.6 Excavation Near Structures

6.6.1 Should excavations be necessary near adjacent structures, the stability of the structure must be maintained. This may be done by means of shoring, bracing, or underpinning. Any excavation below the level of the base of an adjoining foundation shall not be permitted except when:

6.6.1.1 A support system is used, and

6.6.1.2 A registered professional engineer has approved otherwise.

6.6.2 Sidewalks, pavements, or structures must not be "tunneled under" unless sufficient support is provided to prevent collapse.

6.6.3 Hydro-Excavating Near Pile Supported Foundations

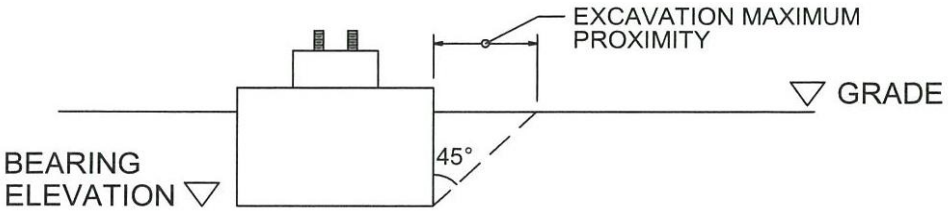
6.6.3.1 Shallow hydro-excavations, those above the bearing elevation of foundations, will not significantly reduce the vertical capacity of pile supported foundations and therefore, will not require engineering contractor consultation.

6.6.3.2 For deep hydro-excavations, those at or beyond the bearing elevation of foundations, the engineering contractor shall be consulted to ensure the foundation is not under a lateral load demand from operating conditions such as thermal expansion of pipes, while also being dependent upon soil embedment for lateral load capacity.

6.6.4 Hydro-Excavating Near Non-Pile Supported Foundations

6.6.4.1 Hydro-excavations in close proximity to non-pile supported foundations shall be no closer to the foundation than a distance given by a 45 degree angle from the

foundation bearing elevation projected vertically outward and upward until the ground surface is reached.



6.7 Protection From Loose Rock or Soil

6.7.1.1 Workers must be protected from loose rock or soil falling from an excavation face at all times while in excavations. This may be accomplished by scaling or installing protective barricades to prevent the loose soil or rock from rolling into the excavation.

6.7.1.2 All excavated material is to be kept at least two (2) feet from the edge of an excavation to prevent the soil from re-entering the excavation. A suitable retaining device may be used in addition to or in place of the above required distance.

6.7.1.3 No hand-held device (i.e. 2X4, shovel, pipe etc.) is to be used to clean the spoil from the auger in an auger-casting operation.

6.8 Inspections

6.8.1 Daily inspection of the excavation, adjacent areas, and protective systems shall be performed by a competent person prior to the start of work and as needed during the job according to all Federal, State, and Local regulations. Once a hazard is discovered, employees must be evacuated from the excavation until the hazard is corrected. The Competent Person Daily Excavation Checklist (RSW-0122-FORM 02-GV) must be filled out for excavations 4' in depth and greater.

6.9 Fall Protection

6.9.1 Walkways or bridges with standard guardrails must be installed if employees are permitted to cross over excavations. Walkways should be equipped with a toeboard to keep objects from falling onto workers below.

6.9.2 All excavation openings, holes, etc. shall be covered or barricaded when the operation is not in progress.

6.9.3 Upon completion of the job, all excavations are to be backfilled.

6.10 Protective Systems

6.10.1 All employees working in excavations must be protected from cave-in or collapse using an adequate protective system.

6.10.1.1 A protective system must be utilized whenever an excavation is five (5) feet or deeper. An excavation less than five (5) feet deep will require a protective system if the possibility of collapse does exist.

6.10.1.2 The protective system must be capable of withstanding any load expected to be applied to the system.

6.10.1.3 All material used for protective systems will be free from damage or defects. In the event equipment is found to be damaged or inoperable, the damaged piece shall be discarded or removed from service until necessary repairs are made.

6.10.2 A protective system will consist primarily of a designed sloping system and secondarily a support system, or both.

6.10.2.1 ~~If a sloping system is used, the slope shall be no steeper than 1½ foot horizontal to one foot vertical (1½:1).~~ In the event adequate clearance is not available for a sloping/benching system, a support system will be utilized.

6.10.2.2 Employees are not to work on the face or slope if it would expose workers in the excavation to falling, rolling, or sliding material or equipment.

6.10.2.3 Employees may not be in protective support systems when they are being installed, removed, or moved.

6.10.3 Soil Classification

6.10.4 The classification of soil shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described by OSHA in 1926 Subpart P Appendix A, or in other recognized methods of soil classification and testing such as those adopted by the America Society for Testing Materials, or the U.S. Department of Agriculture Textural Classification System.

6.10.4.1 Type B

6.10.4.1.1 Cohesive soil with an unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf; or

6.10.4.1.2 Granular cohesionless soils including angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam; or

6.10.4.1.3 Previously disturbed soils except those which would otherwise be classed as type c soil; or

6.10.4.1.4 Soil that meets the unconfined compressive strength or cementation requirements for type a, but is fissured or subject to vibration; or

6.10.4.1.5 Dry rock that is not stable; or

6.10.4.1.6 Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4h:1v), but only if the material would otherwise be classified as Type B.

6.10.4.1.7 Sloping/benching requirements for Type B soil – 1 : 1

6.10.4.2 Type C

6.10.4.2.1 Granular soils including gravel, sand and loamy sand; or

6.10.4.2.2 Submerged soil or soil from which water is freely seeping; or

6.10.4.2.3 Submerged rock that is not stable.

6.10.4.2.4 Material in a sloped, layered system where the layers dip into the excavation or a slope of (4h:1v) or steeper.

6.10.4.2.5 Sloping requirements for Type C soil - 1-1/2 : 1

NOTE: ALL SOIL SHALL BE EVALUATED DURING EXCAVATING ACTIVITIES. PROTECTIVE SYSTEMS SHALL BE DESIGNED FOR CLASSIFICATION OF SOIL AS DETERMINED BY THE COMPENT PERSON.

6.10.4.3 The support system will be designed by a competent person, and will consist mainly of the tight fitting steel support pilings currently in use at the refinery. All cross braces and other components such as wales, uprights, etc. will be used as determined by a competent person at the job site.

6.10.4.3.1 Members of the support system shall be securely connected to prevent slipping, falling, or failure in any way. All support systems must extend completely to the bottom of the excavation.

6.10.4.3.2 Installation of the support system shall begin at the top of the excavation progressing to the bottom. Similarly, removing of the system will begin at the bottom and progress upward. Members shall be removed slowly so as to note any possible collapse of the remaining structure or sides of the excavation.

6.10.4.4 If sloping a sloping/shield combination, the trench box must be rated for the full depth of the trench, and the slope must start 18 inches below the top of the shield.

6.10.5 All pre-engineered protective systems (i.e., trench box) shall be designed and utilized in accordance with manufacturer's tabulated data. The tabulated data shall be readily available for review.

6.10.6 Any protective system not pre-engineered by the manufacturer or without tabulated data for a specific design must be designed by a registered professional engineer. A copy of the design shall be maintained at the jobsite and display the registered professional engineer's stamp.

7.0 TRAINING

7.1 Training for the Excavation Standard Practice and revisions to this practice will be provided to employees and contractors via the monthly HESS meeting.

7.2 MPC employees required to work in or near excavations at the LRD are required to complete an excavation computer based training each year.

8.0 REFERENCES

8.1 OSHA 29 CFR 1926 SUBPART P

9.0 APPENDICES

9.1 EXCAVATION-TRENCHING-PILE DRIVING CHECKLIST (RSW-0122-FORM 01-GV)

9.2 COMPETENT PERSON DAILY EXCAVATION CHECKLIST (RSW-0122-FORM 02-GV)

10.0 REVISION HISTORY

Revision Number	Description of Change	Written by	Approved by	Revision Date	Effective Date
0	Original Approval	Roger Gautreau	Refining Management Team (RMT)	09-18-08	09-18-08
1	6.1.3,6.1.4,6.1.5,6.1.6 change regarding excavation trenching-pile driving, 6.8, daily inspection of excavation, 6.10.2.5,6.10.3, 6.10.4 regarding trench box, AND Appendix A Checklist.	R. Hofmann	RMT via KMS Recommendation	07-01-09	07-01-09
2	6.13 Changes to Probing Underground Installations	R. Hofmann	Refining Management Team (RMT)	10/15/09	10/15/09
3	Add 6.1.2 regarding when to bar the bucket teeth and 5.16 defines a Barred Bucket.	Safety	Refining Management Team (RMT)	11/1/2011	11/1/2011
4	6.1.2 Regarding when to use sheet piles to support underground utilities/structures.	Safety	Safety Department	12/28/2011	12/28/2011
5	Section 6.7.1.3 was added to prohibit the use of a hand held device when cleaning the auger during an auger-casting operation.	Safety	Safety Department	9/18/2012	9/18/2012
6	Three year review- No changes	Amanda Hall	Safety Department	8/15/2014	8/15/2014
7	Changed MOC to MPC	S. Kumpar	S. Windom	10/26/2014	10/26/2014
8	Revised the verbiage in 6.8.1 and added link to Daily Excavation Competent Person Checklist	Amanda Hall	Amanda Hall	5/28/2015	5/28/2015
9	Added Hydro-Excavating requirements	Brent Tamor	VPP & RLT	6/20/2016	6/20/2016
10	Routine triennial review, no changes	Doug Senette	Safety	8/14/2017	8/14/2017
11	Added the requirement for “811” to be performed prior to excavating outside of the refinery fence line.	Nick Martin	VPP & RLT	8/28/2020	9/1/2020
12	Updated RSW to include Type B Soil	Nick Martin	VPP & RLT	11/17/2021	12/1/2021