

STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

INTER-OFFICE MEMORANDUM

To: All Branch Managers and District OSHCOs Date: March 19, 1990

From: Harold W. Barks, Administrator

Subject: Guideline on Section 12-132-3 and 4, Excavation and Trenching

The attached OSHA Instruction CPL 2.87, Inspection Procedures for Enforcing Excavation Standards provides the guidance for application of our proposed identical standard. It is useful for information and training now and will be applicable upon adoption of the State standards.


Harold W. Barks, Administrator

Source: OSHA Instruction CPL 2.87

U.S. Department of Labor

Assistant Secretary for
Occupational Safety and Health
Washington, D.C. 20210

DEPT. OF LABOR AND
INDUSTRY



OSHA Instruction CPL 2.87

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OCCUPATIONAL SAFETY & HEALTH
HONOLULU, HAWAII

SUBJECT: Inspection Procedures for Enforcing the Excavation Standards - 29 CFR 1926, Subpart P

- A. Purpose. This instruction establishes inspection procedures and provides clarification to ensure uniform enforcement of the Excavation Standards.
- B. Scope. This instruction applies OSHA-wide.
- C. References.
 - 1. Construction Safety and Health Standards, Subpart P, 29 CFR 1926.650, 651, and 652.
 - 2. OSHA Instruction CPL 2.45B, June 15, 1989, the Revised Field Operations Manual (FOM).
 - 3. OSHA Instruction CPL 2.34, September 1, 1979, the Construction SAVES Manual.
- D. Cancellation. OSHA Instruction STD 3-14.1, October 30, 1978, Citation Policy - Specific Trenching Requirements, is canceled.
- E. Action. Regional Administrators and Area Directors shall ensure that the guidelines in this instruction are followed and that compliance officers are familiar with the contents of the standard.
- F. Federal Program Change. This instruction describes a Federal program change which affects State programs. Each Regional Administrator shall:
 - 1. Ensure that this change is forwarded to each State designee.
 - 2. Explain the technical content of the change to the State designee as requested.

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3. Ensure that State designees acknowledge receipt of this Federal program change in writing, within 30 days of notification, to the Regional Administrator. This acknowledgment should include the State's intention to follow the inspection guidelines described in this instruction, or a description of the State's alternate guidelines which are "at least as effective as" the Federal guidelines.
 - a. If a State intends to follow the revised inspection guidelines described in this instruction, the State must submit either a revised version of this instruction, adapted as appropriate to reference State law, regulations and administrative structure, or a cover sheet describing how references in this instruction correspond to the State's structure. The State's acknowledgment letter may fulfill the plan supplement requirement if the appropriate documentation is provided.
 - b. Any alternative State inspection guidelines must be submitted as a State plan supplement within 60 days. If the State adopts an alternative to Federal inspection guidelines, the State's submission must identify and provide a rationale for all substantial differences from Federal guidelines in order for OSHA to judge whether a different State guideline is as effective as a comparable Federal guideline.
4. After Regional review of the State plan supplement and resolution of any comments thereon, forward the State submission to the National Office in accordance with established procedures. The Regional Administrator shall provide a judgment on the relative effectiveness of each substantial difference in the State plan change and an overall assessment thereon with a recommendation for approval or disapproval by the Assistant Secretary.

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5. Review policies, instructions and guidelines issued by the State to determine that this change has been communicated to State personnel.
- G. Background. The Occupational Safety and Health Administration after 15 years of experience involving the adopted Federal standards for covered employees in the construction industry (36 CFR 25232 December 30, 1971) issued revised rules for Subpart P to 29 CFR 1926 (54 CFR 45894 October 31, 1989).
1. These rules have been reviewed by the Advisory Committee on Construction Safety and Health (ACCOH) and many of the changes reflect their recommendations and those of other interested parties.
 2. On April 15, 1987, OSHA issued a notice of proposed rulemaking on excavations (52 FR 12288). After an extensive comment period and public hearings, the hearing transcript and related submissions were certified and closed on December 15, 1988.
 3. The final rule resolves many issues raised in earlier attempts to regulate this activity within the construction industry. Many of these issues involved previous decisions under the existing standard.
 - a. It is the intent of this rule to establish one set of requirements which are applicable to all excavations, including trenches.
 - b. Where compliance requirements are intended to be applicable only to trenches, the final rule makes it clear that these requirements apply only to those excavations which are also trenches.
 4. So that ongoing guidance may be provided, enforcement problems, including misinterpretations or other difficulties being experienced by employers

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and apparent efforts by employers to circumvent the standard, shall be promptly reported to the Office of Construction and Maritime Compliance Assistance.

H. Inspection Guidelines (Compliance Procedures).

1. Excavation Protection Programs. This standard provides requirements which allow employers flexibility in developing programs that provide effective protection for employees working in excavations. In addition to the standard itself, the preamble provides further guidance and rationale for changes in the existing standard.
2. Program Compliance. During all inspections at construction sites, where excavation standards are or will be applicable, compliance personnel shall ensure that compliance with 29 CFR 1926, Subpart P, Excavations, is in accordance with the FOM, Chapter III, D.7 and D.8.
 - a. This review shall include any documentation by employers of the methodology and background information used to determine whether shoring systems are required and the type of systems used.
 - b. The compliance safety and health officer (CSHO) shall evaluate the employer's compliance with the specific requirements of the standard.
3. CSHO Responsibilities. The following procedural guidance provides a general framework that is designed to assist the CSHO with all inspections:
 - a. Ask the employer for the basis on which the employee excavation protection program related to the standard was developed.
 - b. Interview a representative cross-section of affected employees to verify the employer's

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program. This shall include an evaluation of the training of affected employees and the effectiveness of the employer's enforcement of its program. (See 29 CFR 1926.20(b)(1) and 1926.21(b)(2).)

- c. Evaluate compliance with requirements for periodic inspection of excavations. (See 29 CFR 1926.651 (k)(1).)
- d. Identify all persons (competent person, registered professional engineer, etc.) responsible for excavation activities and/or operations.
- e. Evaluate compliance with training requirements identified by periodic inspections or changes in equipment and/or procedures. This shall include an evaluation of the effectiveness of the employer's inspection procedures and training program for assessment and correction of situations resulting in near misses and/or injuries or circumstances indicating that modifications are necessary. (See 29 CFR 1926.20(b)(1) and 1926.21(b)(2).)

4. Specific Excavation Requirements.

- a. Scope and Application. This subpart applies to all open excavations made in the earth's surface. Excavations are defined to include trenches. All trenches are excavations; all excavations are not trenches. (See 29 CFR 1926.650(a).)

NOTE: If installed form work or other similar obstructions reduce the depth-to-width dimensions for a particular excavation, it may become a trench as defined later in the specific requirements of this instruction.

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b. Definitions. The definitions contained in the excavation standard shall be relied upon to interpret and apply the standard properly. In some cases terms within a definition are themselves defined within the same section.

(1) Accepted Engineering Practices. CSHOs shall verify with the employer which aspects of the employee protection system have been designed or approved by a registered professional engineer. The name of such individual or, if a firm, the firm's name, the name of the engineer of record that approved the work for the firm, and the registration number shall be recorded.

(a) Field offices may review any work which must be certified as to the status of such certification with the State Board of Certification and Registration for Professional Engineers and Land Surveyors in their respective States.

(b) Verification shall also be made for all other aspects of the onsite excavation conditions which the employer indicates are under the direct supervision of a registered professional engineer.

1 All inquiries relating to the adequacy of the engineering design shall be referred to the Regional Office of Technical Support (ARA-TS).

2 In appropriate cases, the Regional Office may refer deficient or inadequate engineering designs of

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protective systems to the
State Board of Certification
and Registration for Profes-
sional Engineers.

- (c) Any equipment, shoring devices, shields or other special aspects of an employer's excavation program in which the compliance investigation reveals the use of a Registered Professional Engineer shall be so noted on OSHA 1-B during the onsite investigation. If such devices, shields or other special aspects of the employer's program do not comply with the requirements of the standard, appropriate citations shall be issued.
- (2) Competent Person. CSHOs shall pay particular attention to the investigation and documentation of data to establish that any person serving in this capacity possesses the capability of identifying existing and potential hazards for workers.
 - (a) To be a "competent person" under this standard, a person must have had training in, and be knowledgeable about, soils analysis, the use of protective systems and the requirements of this standard.
 - (b) The competent person having such training and knowledge must be capable of identifying existing and predictable hazards in excavation work and have the authority to take prompt measures to abate these hazards. Thus, a backhoe operator who would otherwise meet the requirements of the definition is not a

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competent person if the person lacks the authority to take prompt corrective measures to eliminate existing or potential hazards.

- (3) Hazardous Atmospheres. The CSHO shall check for hazardous or oxygen deficient atmospheres. For example, these include irritating atmospheres which could be encountered in areas close to a land-fill, where it is not uncommon to encounter hydrogen sulfide (H₂S).
- (4) Registered Professional Engineer. The CSHO shall determine that the Registered Professional Engineer of record is in fact working within a discipline applicable to the excavation work; i.e., it would be inappropriate for an electrical engineer to approve shoring design for an excavation. See also the definition for acceptable engineering practices in this instruction.
- (5) Tabulated Data. The CSHO shall examine and ensure that all tabulated data for protective systems are approved by a Registered Professional Engineer.

NOTE: The use of tabulated data appearing in the appendices to this standard is excluded from this requirement.

c. General Requirements.

- (1) Surface Encumbrances. The standard requires that all surface encumbrances that are located so as to create a hazard to employees shall have been removed or supported, as necessary, to safeguard employees. The requirement is the same as the existing 1926.651(b) and applies

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to all employees at the construction worksite. (See 29 CFR 1926.651 (a).)

- (2) Underground Installations. The estimated location of utility installations, such as sewer, telephone, fuel, electric, and water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall have been determined prior to opening an excavation.
 - (a) Utility companies or owners shall have been contacted, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation.
 - 1 An employer need not contact utility companies where the excavation work is to be performed in a remote location where no underground installations are likely to be encountered and there are no features which would indicate the presence of underground installations.
 - 2 When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by State or local law) or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and detection equipment or

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other acceptable means of locating utility installations are used.

- 3 The employer is required, while the excavation is open, to ensure that underground installations are protected, supported, or removed to safeguard employees from hazards. (See 29 CFR 1926.651 (b) (2) and (3).)

- (b) The CSHO shall ascertain whether the employer has contacted the appropriate utility companies to establish the location of underground installations that may be encountered.

NOTE: Many States require the "one call system" prior to the start of excavation work. (See 29 CFR 1926.651(b) (2).)

- (c) When excavation operations approach the estimated location of underground installations, the exact location of the underground installation shall be determined by means that are safe to employees. (See 29 CFR 1926.651 (b) (3).)
- (d) The CSHO shall determine that underground installations have been protected, supported or removed as necessary to protect employees. (See 29 CFR 1926.651(b) (4).)
- (e) The sloped end of a trench, e.g., an earth ramp, may be considered a safe means of egress only if

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employees are able to walk the ramp in an upright manner when entering or exiting the trench.

- 1 The CSHO shall consider such factors as the degree of the slope, depth of the excavation, soil and environmental conditions, and the presence of any obstructions in determining whether or not the earth ramp can be used for safe egress.
 - 2 An employer may not use knotted rope lines to assist employees using sloped areas as access to trenches.
 - 3 OSHA does not consider lifting equipment as "an other safe means of egress." For example, employees riding in a backhoe bucket to either enter or exit trench excavations, is not "other safe means of egress" for purposes of the standard. (See 29 CFR 1926.651(c)(2) and 54 FR 45918 (Oct. 31, 1989)).
- (f) The prohibition against employees being under loads handled by lifting or digging equipment includes both excavated materials and slung loads (pipe, etc). (See 29 CFR 1926.651(e).)
- (g) The CSHO shall ensure that an adequate warning system has been provided for mobile equipment operating adjacent to or without a

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clear view of the edge of excavations.

NOTE: This requirement does not apply to equipment used to push spoil back into the excavation for backfilling. (See 29 CFR 1926.651(f).)

(3) Hazardous Atmospheres. In addition to the requirements set forth in Subparts D and E of this part (29 CFR 1926.50 -- 1926.107), to prevent exposure to harmful levels of atmospheric contaminants and to ensure acceptable atmospheric conditions, the following additional requirements apply: (See 29 CFR 1926.651(g).)

- (a) Air quality tests shall be taken before employees enter excavations more than 4 feet in depth when a hazardous atmosphere exists or could be expected to exist.
- (b) Tests shall be conducted as often as necessary to ensure the quality and quantity of the atmosphere. This includes checks for flammable gases and oxygen (O_2) deficiency.
- (c) Where hazardous atmospheres exist or may reasonably be expected to exist, emergency rescue equipment must be on the worksite and readily accessible to employees. (See 29 CFR 1926.651(g)(2)(i).)
- (d) Daily inspections must be conducted by a competent person. Evidence of the lack of such inspections may include indication of failure of

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protective systems or employees
exposed to hazardous atmospheres.
(See 29 CFR 1926.651(k)(1) and
(2).)

d. Requirements for Protective Systems.

- (1) When the employer has elected to protect employees by sloping, 1926.652(b)(1) requires that the slope be not steeper than 1.5H:1V "unless the employer uses one of the other options"
- (a) In a contested case proceeding once OSHA shows that no support system was used and that the sides of the excavation were steeper than 1.5H:1V, the employer has the burden of showing its compliance with one of the other sloping options.
- (b) The CSHO, however, shall document all relevant facts to evaluate the hazard to obtain information which may be necessary for rebuttal of the employer's case.
- (2) If the CSHO observes that a protective system appears inadequate or in danger of failure, the employer's representative or competent person shall be notified immediately so as to remove any employees in the excavation until such danger of failure has been abated. (See 29 CFR 1926.652 (a)(2).)
- (3) In evaluating the design of sloping and benching systems, the CSHO shall refer to the decision chart found in Figure 2 of Appendix F, Selection of Protective System. (See 1926.652(b)(1) through (b)(4).)

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- (4) In evaluating the design of support systems, shield systems and their protective systems, the CSHO shall refer to the decision chart found in Figure 3 of Appendix F, Selection of Protection Systems. (See 29 CFR 1926.652(c)(1) through (c)(4).)
- (5) The CSHO shall examine appropriate structural members of any protective system for damage or defects. (See 29 CFR 1926.652(d)(1).)
- (6) Observation by CSHOs of excavations beneath the protective system requires confirmation that the support system was designed to resist forces calculated for the full depth of the trench. (See 29 CFR 1926.652(e)(2)(i) and (g)(2).)

e. Appendices in the Standard.

- (1) The following compliance guidelines apply whenever CSHOs encounter excavation operations where employers have elected to provide protective systems using the appendices in this standard. CSHOs shall provide documentation, including soil tests where applicable, to support or reject the employer's decisions on protective systems.
- (2) When the employer elects to use sloping option 2 or support option 1, the soils classification procedures are mandatory. Employer guesses or other shortcuts taken in classifying soils do not meet the intent of the standard.
 - (a) Thus, citations shall be issued where one or more provisions of Appendix A have been violated even

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if the degree of sloping turns out to be appropriate.

- (b) Example: A backhoe operator slopes an excavation at what turns out to be an appropriate slope, but the operator is not a competent person within the meaning of the standard, and his determination was not based on both one visual and one manual test. 1926.652(a) will be cited, but the gravity of the violation will be reduced. (See 29 CFR 1926.652(a)(1).)

f. Appendix A to Subpart P - Soil Classification. This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions and on the structure and compaction of earth deposits. Appendix A contains further definition directly related to soil classification.

- (1) The classification of soil and rock deposits shall be made based on the results of at least one visual and one manual test.
 - (a) Such analysis shall be conducted by a competent person using the tests described in paragraph (d) of this appendix.
 - (b) The specific soil tests referenced in this Appendix are given as examples for an employer to use in making a soil classification. However, other recognized methods of soil classification and testing, such as those adopted by the American Society for Testing Materials (ASTM), are acceptable for purposes of compliance with the standard.

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- (c) The competent person conducting the soil classification may not base a classification by "feeling" the strength or composition of the soil through the use of heavy equipment.
 - 1 This method is not an acceptable "other recognized method" of soil classification and testing" contemplated by Appendix A, (c)(2).
 - 2 OSHA believes this is too indirect a method to classify properly the qualitative as well as the quantitative properties of soil.
 - 3 For example, an employer may not classify the soil as Type A solely because its backhoe experienced difficulty digging the excavation.
- (2) Each soil and rock deposit shall have been classified by a competent person as either stable rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of Appendix A.
- (3) In a layered system, the system shall have been classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.
- (4) If, after classifying soils and rock deposits, the properties, factors, or conditions affecting its classification

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change in any manner, such as after a rainstorm, such changes shall have been evaluated by the competent person on site. The soil and rock deposits shall have been reclassified as necessary to reflect any changed circumstances.

- g. Appendix B to Subpart P - Sloping and Benching. Under section (c)(3)(ii) of this Appendix, whenever surcharge loads from stored material or equipment, operating equipment, or traffic are to be present, the competent person's determination of the degree to which the actual slope must be reduced below the maximum allowable slope shall have been based on the requirements set forth in (c)(3)(ii). The requirement to slope back in accordance with (c)(3)(ii) shall be triggered in situations where the surcharge loads cause signs of distress.
- h. Appendix C to Subpart P - Tables. The compliance officer should note that Tables C-1.1-1.3 are actual size measurements based on mixed oak or equivalent with a bending strength not less than 850 psi. On the other hand, Tables C-2.1, 2.2 and 2.3 are nominal (S4S-Surface 4 Sides) measurements based on Douglas fir or equivalent with a bending strength not less than 1500 psi.
- i. Appendix D to Subpart P - Aluminum Hydraulic Shoring for Trenches. This appendix contains criteria that can be used when aluminum hydraulic shoring is to be used as a method of protection in trenches not exceeding 20 feet in depth, in the absence of manufacturer's tabulated data. The appendix is provided for those situations where manufacturers' data, permitted under paragraph 1926.652(c)(2), has been lost or is otherwise not available. When referenced, Appendix D must be used in

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conjunction with Appendix A, Soil Classification.

- I. Training. Field inspection procedures must be modified to reflect the more technical nature of soils classification and protection systems requirements of the new standard. To classify soils properly, visual and manual tests must now be performed. It is imperative that CSHOs be trained in the techniques used in these tests. The training program will consist of detailed instructions on the new standard and the compliance directive.
1. Train-the-trainer sessions on the new standard will be conducted at the OSHA Training Institute. These trainers will then conduct sessions for their respective Regional and Area Offices.
 2. This program will supplement OSHA Training Institute Course 301, Excavation, Trenching and Soils. Additional training will be developed and presented as needed to maintain currency of the new excavation standard for CSHOs.
- J. SAVES. Existing SAVES for 29 CFR 1926.651 and 1926.652 as found in the existing Construction SAVES Manual, OSHA Instruction CPL 2.34, shall not be used for citation of excavation or trenching violations after March 5, 1990. The attached draft SAVES are provided for interim use and may be modified, as deemed appropriate, at the discretion of the Regional Administrator, to accommodate local circumstances, until the final SAVES are published and distributed.



Gerard F. Scannell
Assistant Secretary

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Distribution: National, Regional, and Area offices,
All Compliance Officers,
State Plan Designees,
Consultation Project Managers
NIOSH Regional Program Directors

DRAFT SAVES

Revised 1/16/90

- 1 29 CFR 1926.651(a): All surface encumbrances that were located so as to create a hazard to employees were not removed or supported, as necessary, to safeguard employees:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY)

- 2 29 CFR 1926.651(b)(1): The estimated location of underground utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, were not determined prior to opening an excavation:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY AND WHAT UTILITY WAS ENCOUNTERED DURING EXCAVATING OPERATIONS)

- 3 29 CFR 1926.651(b)(2): Utility companies or owners were not contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of an actual excavation:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY)

- 4 29 CFR 1926.651(b)(3): When excavation operations approached the estimated location of underground installations, the exact location of the installations was not determined by safe and acceptable means:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY AND WHAT SHOULD HAVE BEEN A SAFE AND ACCEPTABLE MEANS TO FIND THE UNDERGROUND UTILITY)

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- 1 29 CFR 1926.651(b)(4): While the excavation was opened, underground installations were not protected, supported or removed as necessary to safeguard employees:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY AND WHAT SHOULD HAVE BEEN PROVIDED TO SAFEGUARD THE EMPLOYEES)

OPTION 1

- 2 29 CFR 1926.651(c)(1)(i): Structural ramps that were used solely by employees as a means of access or egress from excavations were not designed by a competent person:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY AND WHAT THE RAMP(S) WERE BEING USED FOR BY THE EMPLOYEES)

OPTION 2

- 3 29 CFR 1926.651(c)(1)(i): Structural ramps used for access or egress of equipment were not designed by a competent person qualified in structural design:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY AND THE COMPETENT PERSON'S LACK OF QUALIFICATIONS IN STRUCTURAL DESIGNS)

OPTION 3

- 4 29 CFR 1926.651(c)(1)(i): Structural ramps used for access or egress by employees were not constructed in accordance with the design:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(s) WHERE NECESSARY AND WHY THE RAMPS DID NOT MEET THE DESIGN)

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- 1 29 CFR 1926.651(c)(1)(ii): Ramps and runways constructed of two or more structural members did not have the structural members connected together to prevent displacement:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY)

- 2 29 CFR 1926.651(c)(1)(iii): Structural members used for ramps and runways were not of uniform thickness:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY)

OPTION 1

- 3 29 CFR 1926.651(c)(1)(iv): Cleats or other appropriate means used to connect runway structural members were not attached to the bottom of the runway:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY AND WHAT MEANS WAS USED TO CONNECT THE MEMBERS TOGETHER)

OPTION 2

- 4 29 CFR 1926.651(c)(1)(iv): Cleats or other appropriate means used to connect runway structural members were not attached in such a manner to prevent tripping:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY AND HOW STRUCTURAL MEMBERS WERE CONNECTED TO CAUSE A TRIPPING HAZARD)

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- 1 29 CFR 1926.651(c)(1)(v): Structural ramps used in lieu of steps were not provided with cleats or other surface treatments on the top surface to prevent slipping:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY AND WHAT IF ANYTHING WAS PROVIDED ON THE RAMP SURFACE)

- 2 29 CFR 1926.651(c)(2): A stairway, ladder, ramp or other safe means of egress was not located in trench excavations that were 4 feet (1.22m) or more in depth so as to require no more than 25 feet (7.62m) of lateral travel for employees:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY, MEASUREMENTS AS NEEDED, AND WHAT IF ANYTHING WAS PROVIDED)

OPTION 1

- 3 29 CFR 1926.651(d): Employees exposed to public vehicular traffic were not provided with a warning vest or other suitable garments marked with or made of reflectorized or high-visibility material:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(s) WHERE NECESSARY)

OPTION 2

- 4 29 CFR 1926.651(d): Employees exposed to public vehicular traffic were not required to wear warning vest provided by the employer:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE WHAT IF ANYTHING THE EMPLOYEE(S) WERE WEARING TO WARN THE TRAFFIC IN THE AREA)

OPTION 1

- 5 29 CFR 1926.651(e): Employee was not prohibited to be underneath loads handled by lifting or digging equipment:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE EQUIPMENT BEING USED)

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OPTION 2

- 1 29 CFR 1926.651(e): Employees were not required to stand away from any vehicles being loaded or unloaded to avoid being struck by any spillage or falling materials:
 - (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE EQUIPMENT, WHETHER LOADING OR UNLOADING, AND TYPE OF MATERIAL BEING HANDLED BY THE EQUIPMENT)
- 2 29 CFR 1926.651(f): A warning system was not utilized such as barricades, hand or mechanical signals, or stop logs when mobile equipment was operated adjacent to an excavation, when such equipment was required to approach the edge of an excavation, and the operator did not have a clear and direct view of the edge of the excavation:
 - (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE WHAT IF ANYTHING WAS WRONG WITH THE WARNING SYSTEM PROVIDED, AND WHAT OBSTRUCTED THE OPERATOR'S VIEW)
- 3 29 CFR 1926.651(g)(1)(i): Where oxygen deficiency atmosphere containing less than 19.5 percent oxygen or a hazardous atmosphere existed or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation were not tested before employees entered excavations greater than 4 feet (1.22m) in depth:
 - (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE TYPE OF HAZARD(S) WHERE NECESSARY, WHAT THE OXYGEN PERCENT LEVEL TAKEN WAS, AND DEPTH OF EXCAVATION MEASUREMENT OBTAINED)
- 4 29 CFR 1926.651(g)(1)(ii): Adequate precautions were not taken to prevent employee exposure to atmospheres containing less than 19.5-percent oxygen and other hazardous atmospheres:
 - (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY AND WHAT WAS LACKING IN PRECAUTIONS TAKEN)

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- 1 29 CFR 1926.651(g)(1)(iii): Adequate precautions were not taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY, TYPE OF GAS ENCOUNTERED, AND PERCENT OF GAS OVER THE LOWER LIMIT)

- 2 29 CFR 1926.651(g)(1)(iv): When controls were used that were intended to reduce the level of atmospheric contaminants to acceptable levels, testing was not conducted as often as necessary to ensure that the atmosphere remains safe:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY, TYPE OF CONTROLS BEING USED, AND ATMOSPHERIC CONTAMINANTS)

OPTION 1

- 3 29 CFR 1926.651(g)(2)(i): Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, was not readily available where hazardous atmosphere conditions existed or could reasonably be expected to develop during work in an excavation:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY, THE NEED FOR ANY OR ALL OF THIS EQUIPMENT, AND LOCATION OF EQUIPMENT PROVIDED)

OPTION 2

- 4 29 CFR 1926.651(g)(2)(i): Emergency rescue equipment listed in this section was not attended when in use:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY AND WHY THE EQUIPMENT WAS NOT ATTENDED)

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OPTION 1

- 1 29 CFR 1926.651(g)(2)(ii): Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, did not wear a harness with a lifeline securely attached to it:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY AND WHAT THE EMPLOYEES WERE ENTERING)

OPTION 2

- 2 29 CFR 1926.651(g)(2)(ii): The lifeline provided for employee protection was not separate from any line used to handle materials:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY, AND TO WHAT THE EMPLOYEE LIFELINE WAS ATTACHED)

OPTION 3

- 3 29 CFR 1926.651(g)(2)(ii): The employee lifeline was not individually attended at all times while the employee wearing the lifeline was in the excavation:

(A) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY AND DETERMINE AS TO WHY THE LIFELINE WAS NOT ATTENDED)

- 4 29 CFR 1926.651(h)(1): Employees were permitted to work in excavations in which there was accumulated water, or excavations in which water was accumulating, and adequate precautions had not been taken to protect employees against the hazards posed by water accumulation:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY, WHAT PRECAUTIONS THE EMPLOYER WAS LACKING, AND WHERE WAS THE WATER COMING FROM)

DRAFT

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- 1 29 CFR 1926.651(h)(2): Where water was controlled or prevented from accumulating by use of water removal equipment, the water removal equipment and operations were not monitored by a competent person to ensure proper operation:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE AND IDENTIFY WATER REMOVAL EQUIPMENT BEING USED, AND HAZARDS INVOLVED)

OPTION 1

- 2 29 CFR 1926.651(h)(3): Where excavation work interrupted the natural drainage of surface water such as streams, diversion ditches, dikes, or other suitable means were not used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE EXCAVATION WORK BEING ACCOMPLISHED, AND HAZARDS WHERE NECESSARY)

OPTION 2

- 3 29 CFR 1926.651(h)(3): Excavations subject to runoff from heavy rains were not inspected by a competent person to ensure compliance with paragraphs (h)(1) and (h)(2) of this section:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY, PROVIDE DATE OF LAST INSPECTION AND LAST HEAVY RAIN)

- 4 29 CFR 1926.651(i)(1): Where the stability of adjoining buildings, walls, or other structures was endangered by excavation operations, support systems such as shoring, bracing or underpinning was not provided to ensure the stability of such structures for the protection of employees:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE WHAT WAS ENDANGERED RESULTING FROM EXCAVATION OPERATIONS, AND WHAT IF ANY TYPE OF SUPPORT SYSTEM WAS PROVIDED)

DRAFT

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- 1 29 CFR 1926.651(i)(2): Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to the employees was not prohibited:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY, WHAT THE EXCAVATION WAS EXCAVATED BELOW OF)

NOTE: See exceptions listed in paragraphs (i)-(iv) of this section

- 2 29 CFR 1926.651(i)(3): A support system or another method of protection was not provided beneath sidewalks, pavements, and appurtenant structures to protect employees from the possible collapse of such structures:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE TYPE OF STRUCTURE NEEDING SUPPORT AND ANY INADEQUATE SUPPORT SYSTEM PROVIDED)

OPTION 1

- 3 29 CFR 1926.651(j)(1): Adequate protection was not provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT IF ANYTHING WAS PROVIDED)

OPTION 2

- 4 29 CFR 1926.651(j)(1): Equivalent protection to protect employees such as scaling to remove loose materials; installation of protective barricades at intervals as necessary on the face to stop and contain falling material was not provided to protect employees:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT TYPE OF PROTECTION SHOULD HAVE BEEN PROVIDED TO PROTECT THE EMPLOYEES)

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OPTION 1

- 1 29 CFR 1926.651(j)(2): Employees were not protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, MATERIAL OR EQUIPMENT, AND WHAT PROTECTION SHOULD HAVE BEEN PROVIDED)

Option 2

- 2 29 CFR 1926.651(j)(2): Protection was not provided by placing and keeping such materials or equipment at least 2 feet (.61m) from the edge of excavations, or by the use of retaining devices that were sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, MATERIALS OR EQUIPMENT, AND WHAT PROTECTION SHOULD HAVE BEEN PROVIDED)

OPTION 1

- 3 29 CFR 1926.651(k)(1): Daily inspections of excavations, the adjacent areas, and protective systems were not made by a competent person for evidence of a situation that could have resulted in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHEN THE LAST DAILY INSPECTION WAS CONDUCTED)

OPTION 2

- 4 29 CFR 1926.651(k)(1): An inspection was not conducted by the competent person prior to the start of work and as needed throughout the shift:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY, AND WHAT INDICATED THAT INSPECTION WAS NOT CONDUCTED BEFORE AND AFTER WORK WAS STARTED)

DRAFT

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OPTION 3

- 1 29 CFR 1926.651(k)(1): Inspections were not made after every rainstorm or other hazard increasing occurrence:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT INDICATED AN INSPECTION WAS NEEDED)

- 2 29 CFR 1926.651(k)(2): Where the competent person found evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees were not removed from the hazardous area until the necessary precautions had been taken to ensure their safety:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT WAS UNSAFE AND WHAT PRECAUTIONS SHOULD HAVE BEEN TAKEN)

- 3 29 CFR 1926.651(l)(1): Where employees or equipment are required or permitted to cross over excavations, walkways or bridges with standard guardrails were not provided:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT WAS LACKING GUARDRAILS, AND PROVIDE OVERALL MEASUREMENTS INCLUDING THE FALLING DISTANCE)

OPTION 1

- 4 29 CFR 1926.651(l)(2): Adequate barrier physical protection was not provided at all remotely located excavations:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT TYPE OF PHYSICAL BARRIER SHOULD HAVE BEEN PROVIDED)

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OPTION 2

- 1 29 CFR 1926.651(1)(2): All wells, pits, shafts, etc., were not barricaded or covered:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT SHOULD HAVE BEEN PROVIDED)

OPTION 3

- 2 29 CFR 1926.651(1)(2): Upon completion of exploration and similar operations, temporary wells, pits, shafts, etc., were not backfilled:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHEN OPERATIONS WERE COMPLETED)

- 3 29 CFR 1926.652(a)(1): Each employee in an excavation was not protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT WAS LACKING IN PROTECTIVE SYSTEM DESIGN)

NOTE: See exception in (i) and (ii) of this section

- 4 29 CFR 1926.652(a)(2): Protective systems did not have the capacity to resist without failure all loads that were intended or could reasonably be expected to be applied or transmitted to the system:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT WAS LACKING IN THE PROTECTIVE SYSTEM TO CAUSE A FAILURE)

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OPTION 1

- 1 29 CFR 1926.652(b): The slopes and configurations of slope and benching systems were not selected and constructed by the employer or his designee:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHO MADE THE SELECTION OF THE SYSTEM TO BE USED)

OPTION 2

- 2 29 CFR 1926.652(b): The slopes and configurations of sloping and benching systems selected to be used were not constructed in accordance with the requirements of paragraph (b)(1):

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT WAS LACKING IN THE SYSTEM THE EMPLOYER SELECTED TO USE)

OPTION 1

- 3 29 CFR 1926.652(c): Designs of support systems shield systems, and other protective systems were not selected and constructed by the employer or his designee:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHO SELECTED THE PROTECTIVE SYSTEM, OR SHIELD SYSTEM BEING USED)

OPTION 2

- 4 29 CFR 1926.652(c): Designs of support systems shield systems being used were not designed and constructed in accordance with the requirements of paragraph (c)(1); or, in the alternative, paragraph (c)(2); or, in the alternative, paragraph (c)(3); or, in the alternative, paragraph (c)(4):

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT WAS LACKING IN THE DESIGN AND CONSTRUCTION OF THE SUPPORT SYSTEMS, OR SHIELD SYSTEM BEING USED)

DRAFT

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- 1 29 CFR 1926.652(d)(1): Materials and equipment used for protective systems were not free from damage or defects that might impair their proper function:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT WAS DAMAGE OR DEFECT IN THE MATERIALS OR EQUIPMENT BEING USED IN THE PROTECTIVE SYSTEM)

OPTION 1

- 2 29 CFR 1926.652(d)(2): Manufactured materials and equipment used for protective systems were not maintained in a manner that was consistent with the recommendations of the manufacture:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT WAS WRONG WITH THE MATERIALS OR EQUIPMENT BEING USED THAT IT WAS NOT CONSISTENT WITH THE MANUFACTURER'S RECOMMENDATIONS)

OPTION 2

- 3 29 CFR 1926.652(d)(2): Manufactured materials and equipment used for protective systems were not used in a manner that was consistent with the recommendations, and in a manner that would have prevented employee exposure to hazards:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT WAS WRONG WITH THE MATERIALS OR EQUIPMENT THAT PRESENTED A HAZARD TO THE EMPLOYEES)

OPTION 1

- 4 29 CFR 1926.652(d)(3): When material or equipment that was used for protective systems was damaged, a competent person did not examine the material or equipment and evaluate its suitability for continued use:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT WAS DAMAGED IN THE PROTECTIVE SYSTEM BEING USED AND ITS SUITABILITY FOR CONTINUED USE)

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OPTION 2

- 1 29 CFR 1926.652(d)(3): When the competent person could not ensure that the material or equipment was able to support the intended loads or was otherwise suitable for safe use, then such material or equipment was not removed from service:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT WAS DEFECTIVE WITH THE MATERIAL OR EQUIPMENT THAT NEEDED TO BE REMOVED FROM SERVICE)

OPTION 3

- 2 29 CFR 1926.652(d)(3): Material or equipment used for protective systems that was found to be damaged and had been removed from service was not evaluated and approved by a registered professional engineer before being returned to service:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT WAS DEFECTIVE IN THE PROTECTIVE SYSTEM BEING USED, WHO APPROVED THE MATERIAL OR EQUIPMENT TO BE PUT BACK INTO SERVICE)

- 3 29 CFR 1926.652(e)(1)(i): Members of support systems were not securely connected together to prevent sliding, falling, kickouts, or other predictable failure:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND HOW THE MEMBERS OF THE SUPPORT SYSTEMS WERE CONNECTED TOGETHER)

- 4 29 CFR 1926.652(e)(1)(ii): Support systems were not installed and removed in a manner that protected employees from cave-ins, structural collapses, or from being struck by members of the support system:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT WAS WRONG WITH THE SUPPORT SYSTEM THAT IT PRESENTED HAZARD TO EMPLOYEES WHILE BEING INSTALLED OR REMOVED)

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- 1 29 CFR 1926.652(e)(1)(iii): Individual members of support systems were subjected to loads exceeding those which those members were designed to withstand:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT THE LOADS WERE THAT EXCEEDED THOSE THE MEMBERS OF SUPPORT SYSTEMS WERE DESIGNED TO WITHSTAND)

- 2 29 CFR 1926.652(e)(1)iv): Before temporary removal of individual members was begun, additional precautions were not taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT PRECAUTIONS SHOULD HAVE BEEN TAKEN BY THE EMPLOYER PRIOR TO TEMPORARY REMOVAL OF SUPPORT SYSTEM MEMBERS)

OPTION 1

- 3 29 CFR 1926.652(e)(1)(v): Removal of members from support system did not begin at, and progress from, the bottom of the excavation:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARD(S) WHERE NECESSARY, AND WHERE DID REMOVAL OF MEMBERS OF SUPPORT SYSTEM BEGIN)

OPTION 2

- 4 29 CFR 1926.652(e)(1)(v): Members were not released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation:

- (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND AREA WHERE MEMBERS WERE RELEASED TOO FAST INDICATING A FAILURE OR CAVE-IN WAS EVIDENT)

DRAFT

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- 1 29 CFR 1926.652(e)(1)(vi): Backfilling did not progress together with removal of support systems from excavations:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHEN DID BACKFILLING START AS THE SUPPORT SYSTEM WAS REMOVED)

OPTION 1

- 2 29 CFR 1926.652(e)(2)(i) Excavation of material to a level no greater than 2 feet (.61m) below the bottom of the members of a support system was permitted where the system was not designed to resist the forces calculated for the full depth of the trench, and there were indications while the trench was open of a possible loss of soil behind or below the bottom of the support system:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND HOW FAR BELOW SUPPORT SYSTEM EXCAVATING WAS ACCOMPLISHED)

OPTION 2

- 3 29 CFR 1926.652(e)(2)(i): Excavation of material to a level no greater than 2 feet (.61m) below the bottom of the members of the support system was allowed when there were indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHERE LOSS OF SOIL WAS OCCURRING)

- 4 29 CFR 1926.652(e)(2)(ii): Installation of a support system was not closely coordinated with the excavation of trenches:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHEN WAS THE INSTALLATION OF THE SUPPORT SYSTEM STARTED RELATIVE TO THE EXCAVATING OPERATION)

DRAFT

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- 1 29 CFR 1926.652(f): Employees were permitted to work on the faces of sloped or benched excavations at levels above other employees when employees at the lower levels were not adequately protected from the hazard of falling, rolling, or sliding material or equipment:
 - (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT WERE THE EMPLOYEES WORKING ON THE FACE DOING, AND WHAT WERE THEY WORKING WITH THAT CREATED A HAZARD)
- 2 29 CFR 1926.652(g)(1)(i): Shield systems were subjected to loads exceeding those which the system was designed to withstand:
 - (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT WERE THE LOADS THE SHIELD SYSTEMS WERE SUBJECTED TO THAT EXCEEDED THOSE THE SYSTEM WAS DESIGNED TO WITHSTAND)
- 3 29 CFR 1926.652(g)(1)(ii): Shields were not installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads:
 - (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND HOW THE SHIELD WAS INSTALLED TO ALLOW LATERAL AND OTHER HAZARDOUS MOVEMENT)
- 4 29 CFR 1926.652(g)(1)(iii): Employees were not protected from the hazard of cave-ins when entering or exiting the area protected by shields:
 - (a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHAT WAS DIRECTION OF TRAVEL BY THE EMPLOYEES)

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- 1 29 CFR 1926.652(g)(1)(iv): Employees were allowed in shields when shields were being installed, removed, or moved vertically:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT WAS BEING DONE WITH THE SHIELD WHILE EMPLOYEES WERE IN SHIELD)

OPTION 1

- 2 29 CFR 1926.652(g)(2): Excavations of earth material to a level no greater than 2 feet (.61m) below the bottom of a shield was permitted, when the shield was not designed to resist the forces calculated for the full depth of the trench, and there were indications while the trench was open of a possible loss of soil from behind or below the bottom of the shield:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, WHAT INDICATED THAT SHIELD FAILED TO RESIST THE FORCES CALCULATED AND POSSIBLE LOSS OF SOIL FROM BEHIND THE SHIELD)

OPTION 2

- 3 29 CFR 1926.652(g)(2): Excavation of material to a level no greater than 2 feet (.61m) below the bottom of a shield system was allowed when there were indications while the trench was open of a possible loss of soil from behind or below the bottom of the shield system:

(a) (LOCATION) (IDENTIFY SPECIFIC OPERATIONS AND/OR CONDITIONS) (DESCRIBE HAZARDS WHERE NECESSARY, AND WHERE LOSS OF SOIL WAS OCCURRING)