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STATE OF ALASKA
DEPARTMENT OF LABOR
DIVISION OF LABOR STANDARDS AND SAFETY

DOSH Program Directive 90 - 8

Date: ~~November~~ 12/7, 1990

To: All OSH Personnel

From: Tom Stuart, Director

Subject: Inspection Procedures for Enforcing the Excavation Standards - 05.160-.162, Alaska Construction Code (ACC)

A. Purpose. This DOSH Program Directive (PD) establishes inspection procedures and provides clarification to ensure uniform enforcement of the Excavation Standards.

B. Background. The Excavation and Trenching Standard in the Alaska Construction Code effective September 12, 1990 was revised. This standard:

1. 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 standard 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 revised standard makes it clear that these requirements apply only to those excavations which are also trenches.

C. 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 Federal OSHA preamble provides further guidance and rationale for changes in the existing standard. (See Appendix A)

2. Program Compliance. During all inspections at construction sites, where excavation standards are or will be applicable, compliance personnel shall ensure that compliance with 05.160, ACC, is in accordance with the Compliance Manual, 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 officer (CO) or industrial hygienist (IH) shall evaluate the employer's compliance with the specific requirements of the standard.

3. CO and IH Responsibilities. The following procedural guidance provides a general framework that is designed to assist the CO or IH 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 program. This shall include an evaluation of the training of affected employees and the effectiveness of the employer's enforcement of its program. (See 05.030(b)(1)(B) and 05.030(b)(2)(A)(i).)

c. Evaluate compliance with requirements for periodic inspection of excavations. (See 05.161(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 05.030(b)(1)(B) and 05.030(b)(2)(A)(i).)

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 05.160(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.

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. COs and IHs 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 immediate supervisor. The immediate supervisor will contact federal OSHA's Regional Office of Technical Support if assistance is required.

2 In appropriate cases, the Regional Office may refer deficient or inadequate engineering designs of protective systems to the State Board of Certification and Registration for Professional 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. Cos and IHs 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 competent person if the person lacks the authority to take prompt corrective measures to eliminate existing or potential hazards.

(3) Hazardous Atmospheres. The CO or IH shall check for hazardous or oxygen deficient atmospheres. For example, these include irritating atmospheres which could be encountered in areas close to a landfill, where it is not uncommon to encounter hydrogen sulfide (H_2S).

(4) Registered Professional Engineer. The CO or IH 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.

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

(5) Tabulated Data. The CO or IH shall examine and ensure that all tabulated data for protective systems are approved by a Registered Professional Engineer.

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 05.161(b) and applies to all employees at the construction worksite. (See 05.161(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 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 05.161(b)(2) and (3).)

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

NOTE: Many cities, boroughs and municipalities require the "one call system" prior to the start of excavation work. (See 05.161(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 05.161(b)(3).)

(d) The CO or IH shall determine that underground installations have been protected, supported or removed as necessary to protect employees. (See 05.161(b)(4).)

(e) The sloped end of a trench, e.g., an earth ramp, may be considered a safe means of egress only if employees are able to walk the ramp in an upright manner when entering or exiting the trench.

1 The CO or IH 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 Alaska OSH 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 05.161(c)(2) and page 45918 of Appendix A)

(f) The prohibition against employees being under loads handled by lifting or digging equipment includes both excavated materials and slung loads (pipe, etc.) (See 05.161(e).)

(g) The CO or IH shall ensure that an adequate warning system has been provided for mobile equipment operating adjacent to or without a 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 05.161(f).)

(3) Hazardous Atmospheres. In addition to the requirements set forth in Subparts D and E of this part (Sections 05.040 - 05.050), to prevent exposure to harmful levels of atmospheric contaminants and to ensure acceptable atmospheric conditions, the following additional requirements apply: (See 05.161(g).)

(a) Air quality tests shall be taken before employees enter excavations more than four 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 (0^2) 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 05.161(g)(2)(A).)

(d) Daily inspections must be conducted by a competent person. Evidence of the lack of such inspections may include indication of failure of protective systems or employees exposed to hazardous atmospheres. (See 05.161(k)(1) and (2).)

d. Requirements for Protective Systems.

(1) When the employer has elected to protect employees by sloping, 05.162(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 Alaska OSH 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 CO or IH, 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 CO or IH 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 05.162(a)(2).)

(3) In evaluating the design of sloping and benching systems, the CO or IH shall refer to the decision chart found in Figure 2 of Appendix

F, Selection of Protective System. (See 05.162(b)(1) through (b)(4).)

(4) In evaluating the design of support systems, shield systems and their protective systems, the CO or IH shall refer to the decision chart found in Figure 3 of Appendix F, Selection of Protection Systems. (See 05.162(c)(1) through (c)(4).)

(5) The CO or IH shall examine appropriate structural members of any protective system for damage or defects. (See 05.162(d)(1).)

(6) Observation by COs or IHs 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 05.162(e)(2)(A) and (g)(2).)

e. Appendices in the Standard.

(1) The following compliance guidelines apply whenever COs or IHs encounter excavation operations where employers have elected to provide protective systems using the appendices in this standard. COs or IHs 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 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 with the meaning of the standard, and his determination was not based on both one visual and one manual test. 05.162(a) will be cited, but the gravity of the violation will be reduced. (See 05.162(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.

(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 Alaska OSH 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 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 of the Standard - Sloping and Benching. Under section (c)(3)(B) 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)(B). The requirement to slope back in accordance with (c)(3)(B) shall be triggered in situations where the surcharge loads cause signs of distress.

h. Appendix C of the Standard - 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 the Standard - 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 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 Cos and IHs 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. Initial training has been provided to most COs and IHs by the consultant who received a train-the-trainer class on this standard at the OSHA Institute. Further training will be provided at the annual staff meeting/training session that will be held in FY 1991.