PNL-8613 Pt 4B

Students Guide — Part 1

Construction Safety in DOE

Safety & Health Training
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*operated for the U.S. Department of Energy by Battelle Memorial Institute.

Construction Safety in DOE

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EVALUATION FORM
C-101—Construction Safety in DOE

Date _____

Name (optional) _____

Title _____

Location _____

Please evaluate various features of the course you have just completed. The information you provide here will be combined with that from other attendees and summarized for the sponsor, the U.S. Department of Energy. Results from this evaluation will be used to improve this course.

Course Content	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Overall, as a result of this course I believe that I:					
developed specific skills and competencies in occupational safety compliance that I can use on the job.	5	4	3	2	1
gained a greater understanding of 29 CFR 1926, Safety and Health Regulations for Construction	5	4	3	2	1
gained factual knowledge about Federal safety and health program requirements related to Construction	5	4	3	2	1
compliance knowledge gained from this course will make work environments safer.	5	4	3	2	1
would recommend this course to others.	5	4	3	2	1

Testing Materials	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
The final test was a good measure of the knowledge gained in the course.	5	4	3	2	1

Topic Areas

Please evaluate each topic area using the 5-point scale below.

5 Excellent **4** Very Good **3** Good **2** Satisfactory **1** Unsatisfactory

	Content					Instructor				
General Interpretations	5	4	3	2	1	5	4	3	2	1
General Safety and Health Provisions	5	4	3	2	1	5	4	3	2	1
Occupational Health & Environmental Control/Haz Mat	5	4	3	2	1	5	4	3	2	1
Personal Protective Equipment	5	4	3	2	1	5	4	3	2	1
Fire Protection and Prevention	5	4	3	2	1	5	4	3	2	1
Signs, Signals and Barricades	5	4	3	2	1	5	4	3	2	1
Materials Handlings Storage, Use and Disposal	5	4	3	2	1	5	4	3	2	1
Hand and Power Tools	5	4	3	2	1	5	4	3	2	1
Welding and Cutting	5	4	3	2	1	5	4	3	2	1
Electrical	5	4	3	2	1	5	4	3	2	1
Scaffolding	5	4	3	2	1	5	4	3	2	1
Floor and Wall Openings	5	4	3	2	1	5	4	3	2	1
Cranes, Derricks, Hoists, Elevators and Conveyors	5	4	3	2	1	5	4	3	2	1

Motor Vehicles, Mechanized Equipment & Marine Operations	5	4	3	2	1	5	4	3	2	1
Excavations	5	4	3	2	1	5	4	3	2	1
Concrete and Masonry Construction	5	4	3	2	1	5	4	3	2	1
Steel Erection	5	4	3	2	1	5	4	3	2	1
Underground Construction, Caisson, Cofferdams, and Compressed Air (Optional Section)	5	4	3	2	1	5	4	3	2	1
Demolition (Optional Section)	5	4	3	2	1	5	4	3	2	1
Blasting and the Use of Explosives (Optional Section)	5	4	3	2	1	5	4	3	2	1
Power Transmission and Distribution	5	4	3	2	1	5	4	3	2	1
Rollover Protective Structures, Overhead Protection	5	4	3	2	1	5	4	3	2	1
Ladders	5	4	3	2	1	5	4	3	2	1

1. Please briefly describe how your expectations of this course were or were not met. _____

2. The **most** helpful topics covered or activities presented in this course were: _____

3. The **least** helpful topics or activities in this course were: _____

4. More emphasis should be given to: _____

5. Less emphasis should be given to: _____

6. What specific suggestions do you have for improving future sessions? _____

7. Other materials to supplement or substitute for the provided handouts? _____

8. Daily schedule/timing of activities, worktime? _____

9. Facilities/training room arrangements? _____

10. What other types of safety training courses would you like to see available? _____

11. Any further comments? _____

12. **Overall rating:** Based on your comments above, please rate the course on a 5-point scale by circling the number of your choice.

5 Excellent ***4 Very Good*** ***3 Good*** ***2 Satisfactory*** ***1 Unsatisfactory***

CONSTRUCTION SAFETY IN DOE
Bonneville Power Administration
March 1-5, 1993

Day 1	8:00-9:00	Introductions/Requirements/Objectives	Ed Handwerk
	9:00-10:00	Introduction / Class Objectives	Ed Handwerk, Peter Cucuz
	10:00-11:00	Subpart C, General Safety and Health Provisions	Peter Cucuz
	11:00-12:00	Subpart D, Occupational Health & Environmental Control/Haz Mat	Ed Handwerk
	12:00-1:00	Lunch	
	1:00-2:00	Subpart D, Hazard Communications	Ed Handwerk
	2:00-3:00	Subpart E, Personal Protective Equipment	Ed Handwerk
	3:00-4:00	Subpart I, Hand and Power Tools	Peter Cucuz
	4:00-5:00	Exercise 1	
Day 2	8:00-9:00	Subpart F, Fire Protection and Prevention	Ed Handwerk
	9:00-10:00	Subpart J, Welding and Cutting	Ed Hanwerk
	10:00-12:00	Subpart X, Stairways and Ladders	Peter Cucuz
	12:00-1:00	Lunch	
	1:00-2:00	Subpart M, Floor and Wall Openings	Ed Handwerk
	2:00-4:00	Subpart K, Electrical	Peter Cucuz
	4:00-5:00	Exercise 2	
Day 3	8:00-9:00	Subpart H, Materials Handling, Storage, Use and Disposal	Ed Handwerk
	9:00-11:00	Subpart L, Scaffolding	Peter Cucuz
	11:00-12:00	Subpart O, Motor Vehicles, Mechanized Equipment and Marine Operations Subpart W, Rollover Protective Structures, Overhead Protection	Ed Handwerk
	12:00-1:00	Lunch	
	1:00-2:00	Subpart T, Demolition	Ed Handwerk
	2:00-3:00	Subpart Q, Concrete and Masonry Construction	Peter Cucuz
	3:00-5:00	Subpart V, Power Transmission and Distribution	Ed Handwerk
Day 4	8:00-9:00	Subpart R, Steel Erection	Peter Cucuz
	9:00-10:00	Subpart R/ Fall Protection	Peter Cucuz
	10:00-11:00	Subpart H, Materials Handling, Storage, Use and Disposal	Ed Handwerk
	11:00-12:00	Subpart G, Signs, Signals and Barricades	Ed Handwerk
	12:00-1:00	Lunch	
	1:00-3:00	Subpart N, Cranes, Derricks, Hoists, Elevators and Conveyors	Peter Cucuz
	3:00-4:00	Subpart P, Excavations (.650/.651)	Ed Handwerk
	4:00-5:00	Subpart P, Excavations (.652, Appendices)	Peter Cucuz
Day 5	8:00-9:00	Subpart P, Excavations	Peter Cucuz
	9:00-12:00	Site Visit	
	12:00-1:00	Lunch	
	1:00-2:00	Site Visit / Hazard Identification	
	2:00-3:00	Review	
	3:00-5:00	Final Examination	

CONSTRUCTION SAFETY IN DOE
REFERENCES

U.S. DEPARTMENT OF ENERGY; U.S. Government Printing Office, Washington, DC.

1. Memoranda. 1974. U.S. Department of Energy and the U.S. Atomic Energy Commission.
2. Memorandum of Understanding. 1990. U.S. Department of Energy and the Department of Health and Human Services.
3. DOE 1324.2, Records Disposition
4. DOE 3410.1B, Training
5. DOE 3790.1A, Federal Employers Occupational Safety and Health Program
6. DOE 3792.2, Smoking Regulations
7. DOE 4700.1, Project Management System
8. DOE 5000.3A, Occurrence Reporting and Processing of Operations Information
9. DOE 5400.1, General Environmental Protection Program
10. DOE 54002.A, Environmental Compliance Issue Coordination
11. DOE 5400.4, Comprehensive Environmental Response, Compensation and Liability Act Requirements
12. DOE 5400.5, Radiation Protection of the Public and the Environment
13. DOE 5440.1C, Implementation of the National Environmental Policy Act
14. DOE 5480.1B, Environment, Safety and Health Program for Department of Energy Operations
15. DOE 5480.2, Occupational Safety and Health
16. DOE 5480.3, Safety Requirements for the Packaging and Transportation of Hazardous Wastes
17. DOE 5480.4, Environmental Protection, Safety, and Health Protection Standards
18. DOE 5480.5, Safety of Nuclear Facilities
19. DOE 5480.6, Safety of DOE-Owned Nuclear Reactors
20. DOE 5480.7, Fire Protection
21. DOE 5480.8, Contractor Occupational Medical Program
22. DOE 5480.9, Construction Safety and Health Program
23. DOE 5480.10, Contractor Industrial Hygiene Program
24. DOE 5480.11, Radiation Protection for Occupational Workers
25. DOE 5480.19, Conduct of Operations
26. DOE 5481.1B, Safety Analysis and Review System
27. DOE 5482.1B, Environment, Safety and Health Appraisal Program

28. DOE 5483.1A, Occupational Safety and Health Program for DOE Contractor Employees at GOCO Facilities - Standards, Instructions, Inspections, Complaints, Investigations

29. DOE 5483.1B, Contractor Occupational Safety and Health Program (Draft of October 15, 1991)

30. DOE 5484.1, Environment Protection, Safety and Health Protection Information Reporting Requirements

31. DOE 5500.1A, Department of Energy Emergency Management System

32. DOE 5500.3, Reactor and Non Reactor Nuclear Facility Emergency Planning, Preparedness, and Response Program for DOE Operations

33. DOE 5700.6B, Quality Assurance

34. DOE 6430.1A, General Design Criteria

35. DOE/EV-0043, Standard on Fire Protection for Portable Structures

36. Title 42 U.S.C. 2011, et seq., Atomic Energy Act of 1954, as amended, which authorizes the conduct of atomic energy activities and establishes authority for protecting the health and safety of the public

U.S. DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION,; U.S. Government Printing Office, Washington, DC.

37. 15 USC et seq., The Toxic Substances Control Act, As Amended

38. 29 CFR 1910, Occupational Safety and Health Standards

39. 29 CFR 1926, Safety and Health Regulations for Construction

40. 29 CFR 1960, Federal Worker Safety and Health Provisions

41. ACGIH, *Threshold Limit Values and Biological Exposure Indices*, Cincinnati, OH, latest edition

42. National Cancer Institute, 1972, *Minimum Standards of Biological Safety and Environmental Control for Contractors of the S.V.C.P.*, Office of Biohazard and Environmental Control, National Institutes of Health, Bethesda, Maryland

43. OSHA, 29 CFR Part 1990, Identification, Classification, and Regulations of Potential Occupational Carcinogens

U.S. ENVIRONMENTAL PROTECTION AGENCY; U.S. Government Printing Office, Washington, DC.

44. 40 CFR 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

45. 40 CFR 266, Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities

46. 40 CFR 300, National Oil and Hazardous Substances Pollution Contingency Plan

47. 40 CFR 761, Polychlorinated Biphyenys (PCBs) Manufacturing Processing, Distribution in Commerce, and Use Prohibitions

48. 48 CFR 070.5204-2, Safety and Health (government owned or leased)

49. 48 CFR 923.70, Environment, Conservation and Occupational Safety

50. 48 CFR 970.23, Environment, Conservation and Occupational Safety Programs

51. OSHA, 29 CFR Part 1990--Identification, Classification, and Regulations of Potential Occupational Carcinogens

52. USEPA, EPA 560/5-85-024, June 1985, *Guidance for Controlling Asbestos-Containing Materials in Buildings*

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) Codes:

53. NFPA 1, Fire Prevention Code

54. NFPA 30, Flammable and Combustible Liquids Code

55 .NFPA 70, National Electrical Code

56. NFPA 101, Life Safety Code

57. NFPA 241, Construction, Alteration and Demolition Operations

AMERICAN NATIONAL STANDARDS INSTITUTE:

58. ANSI/AC, Z49.1, 1983, Safety in Welding and Cutting

59. ANSI, A10.2-44, Safety Code for Building Construction

60. ANSI, C1-71, National Electrical Code

61. ANSI, Z117.1, 1977, Safety Requirements for Working in Tanks and Other Confined Spaces

62. ANSI, Z136.1, 1980, Safe Use of Lasers

63. ANSI, Z87.1-68, Practice of Occupational and Educational Eye and Face Protection

64. ANSI, Z88.1, 1980, Practices for Respiratory Protection

65. CGA, P-1, 1965, Safe Handling of Compressed Gases

TEXT BOOKS

66. National Safety Council (NSC). 1988. *Accident Prevention Manuals for Industrial Operations*, Volumes I and II, 9th edition. NSC, Chicago, Illinois.

67. National Safety Council. 1971. *Fundamentals of Industrial Hygiene*. NSC, Chicago, Illinois.

68. National Safety Council. 1975. *Industrial Noise and Hearing Conservation*. NSC, Chicago, Illinois.

69. Peterson, Arnold P. 1980. *Gen Rad, Handbook of Noise Measurement.* Gen Rad, Inc., Concord, MS.

70. Brauer, Roger L. 1990. *Safety and Health for Engineers.* Van Nostrand, New York, NY

71. Dickie, D.E. 1978. *Rigging Manual, Construction Safety Association of Ontario,* 3rd edition. Construction Safety Association of Ontario, Ontario, Canada.

72. Garby, Ronald G. 1991. *IPT's Crane and Rigging Handbook.*

OCCUPATIONAL SAFETY AND HEALTH TRAINING INSTITUTE (OTI); Des Plaines, Illinois 60018

73. 100-184, Principles of Safety and Health Management.
74. 120, Initial Compliance Course for Industrial Hygienists
75. 121, Introduction to Industrial Hygiene for Safety Personnel
76. 151, Analytical Laboratory Orientation for State Consultants
77. 200, Construction Standards
78. 201, Hazardous Materials
79. 205, Cranes and Material Handling for Construction
80. 220, Industrial Noise
81. 221, Principles of Industrial Ventilation
82. 222, Respiratory protection
83. 223, Industrial Toxicology
84. 224, Laboratory Safety and Health
85. 225, Principles of Ergonomics
86. 226, Confined Space Entry
87. 232, Workplace Back Injuries
88. 233, Indoor Air Quality
89. 234, Biohazards
90. 242, OSHA Trainer Course
91. 301, Excavations, Trenching and Soil Mechanics
92. 308, Principles of Scaffolding
93. 309, Electrical Standards for CSHO
94. 1908-7C-1, Electrical Hazards II
95. 320, Advanced Noise Control
96. 322, Applied Welding Principles
97. 340, Advanced Principles of Safety and Health Management
98. 500, Basic Instructor's Course in Occupational Safety and Health Standards for the Construction Industry

INTRODUCTION

TERMINAL OBJECTIVE

Identify the OSHA standards, 29 CFR 1926 and 29 CFR 1910, that apply to the construction industry in DOE along with related standards, orders, and training criteria.

OBJECTIVES

1. Illustrate/highlight OSHA manuals in order to complete classroom assignments and identify related occupational safety and health requirements at the work site.
2. Identify major subparts and key sections of 29 CFR 1910 and 29 CFR 1926 referring to
   - construction safety
   - fatality occurrences (1985-1989)
   - OSHA's functions and
   - the most frequently cited serious violations for 1992.
3. Explain the difference between horizontal and vertical standards, public laws and executive orders that refer to occupational safety and health on a construction site.
4. Identify DOE Orders and trends that relate to construction safety.

REFERENCES

1. OSHA Training Institute. *Basic Instructors Course in Occupational Safety and Health Standards for the Construction Industry (#500).*
2. U.S. Department of Labor. 1991. *29 CFR 1926, Safety and Health Regulations for Construction; 29 CFR 1910, General Safety and Health Standards; 29 CFR 1990, Identification, Classification and Regulations of Potential Occupational Carcinogens; 29 CFR 1960, Federal Worker Safety and Health Provision.* U.S. Government Printing Office, Washington, DC.
3. U.S. DOE Orders: 3790.1A, 5480.1B, 5480.2, 5480.3, 5480.4, 5480.5, 5480.6, 5480.7, 5480.8, 5480.9, 5480.10, 5481.1B, 5482.1B, 5483.1A, 5483.1B.

DURATION

One hour

INSTRUCTOR MATERIALS

Course manual with instructor notes
Viewgraphs
White board, markers and pointer
Overhead Projector
Demonstration Models

A
&
B

29 CFR 1926—SUBPARTS A & B
General Interpretations

TERMINAL OBJECTIVE
To acquaint the participant with the scope of the construction standards, including variances, inspections and the rules of practice for enforcement of the standards. General interpretations will be covered in Subpart B, along with Compliance Directives (CPL) and Standard Directives (STD).

ENABLING OBJECTIVES
1. Define the term's subcontractor and prime contractor
2. Define the terms performance standard and technical standard.
3. Explain the extent to which a subcontractor must comply with the standards, with relationship to multi-employer worksites.

REFERENCES

1. DOE Orders 5480.9, 5480.10, 5482.1B, 5483.1A and 5483.1B (draft)
2. National Fire Protection Association (NFPA) Codes.
3. National Safety Council (NSC). *Accident Prevention Manual for Industrial Operations*; Volume I. 9th edition.
4. New Comprehensive Occupational Safety and Health Reform Act (HR 3160, S1622). 1991.
5. Standard on Ergonomic Hazards (HR 3160, S1622-Section 407). August 1991.
6. U.S. Department of Labor. 1991. *29 CFR 1926, Safety and Health Regulations for Construction.* Government Printing Office, Washington, DC.

DURATION
30 Minutes

INSTRUCTOR MATERIALS
Course manual with instructor notes
Viewgraphs
White board, markers and pointer
Overhead Projector

Terminal Objective

Identify OSHA standards, 29 CFR 1926 and 29 CFR 1910, that apply to the construction industry in DOE along with related standards, orders, and training criteria.

Enabling Objectives

1. **Illustrate/highlight OSHA manuals in order to complete classroom assignments and identify related occupational safety and health requirements at the work site.**
2. **Identify major subparts and key sections of 29 CFR 1910 and 29 CFR 1926 referring to**
   - **construction safety**
   - **fatality occurrences (1985-1989)**
   - **OSHA's functions and**
   - **the most frequently cited serious violations for 1992.**

Enabling Objectives

3. **Explain the difference between horizontal and vertical standards, public laws and executive orders that refer to occupational safety and health on a construction site.**
4. **Identify DOE Orders and trends that relate to construction safety.**

Federal Register Notation

1st sub paragraph
lower case letters

Part

sub paragraph
arabic numeral

sub paragraph small roman
numerals

1926.652 (b)(4)(ii)(A)
.500 (f)(1)(vi)(*d*)

sub paragraph small
italic roman numeral
(rarely used)

Subpart A—General

Sec.	
1926.1	Purpose and scope
1926.2	Variances from safety and health standards
1926.3	Inspections—right of entry
1926.4	Rules of practice for administrative adjudications for enforcement of safety and health standards

Subpart B—General Interpretations

1926.10	Scope of subpart.
1926.11	Coverage under section 103 of the act distinguished.
1926.12	Reorganization Plan No. 14 of 1950.
1926.13	Interpretation of statutory terms.
1926.14	Federal contracts for "mixed" types of performance.
1926.15	Relationship to the Service Contract Act; Walsh-Healey Public Contracts Act.
1926.16	Rules of construction.

Subpart C—General Safety and Health Provisions

1926.20	General safety and health provisions
1926.21	Safety training and education
1926.22	Recording and reporting of injuries. [Reserved]
1926.23	First aid medical attention
1926.24	Fire protection and prevention
1926.25	Housekeeping
1926.26	Illumination
1926.27	Sanitation
1926.28	Personal protective equipment
1926.29	Acceptable certifications
1926.30	Shipbuilding and ship repairing
1926.31	Incorporation by reference
1926.32	Definitions

Subpart D—Occupational Health and Environmental Controls

1926.50	Medical services and first aid
1926.51	Sanitation
1926.52	Occupational noise exposure
1926.53	Ionizing radiation
1926.54	Nonionizing radiation
1926.55	Gases, vapors, fumes, dusts, and mists
1926.56	Illumination
1926.57	Ventilation
1926.58	Asbestos, tremolite, anthophyllite, and actinolite
1926.59	Hazard communication

Subpart E—Personal Protection and Life Saving Equipment

Sec.	
1926.100	Head protection
1926.101	Hearing protection
1926.102	Eye and face protection
1926.103	Respiratory protection
1926.104	Safety belts, lifelines, and lanyards
1926.105	Safety nets
1926.106	Working over or near water
1926.107	Definitions applicable to this subpart

Subpart F—Fire Protection and Prevention

1926.150 Fire protection
1926.151 Fire prevention
1926.152 Flammable and combustible liquids
1926.153 Liquefied petroleum gas (LP-Gas)
1926.154 Temporary heating devices
1926.155 Definitions applicable to this subpart

Subpart G—Signs, Signals, and Barricades

1926.200 Accident prevention signs and tags
1926.201 Signaling
1926.202 Barricades
1926.203 Definitions applicable to this subpart

Subpart H—Materials Handling, Storage, Use, and Disposal

1926.250 General requirements of storage
1926.251 Rigging equipment for material handling
1926.252 Disposal of waste materials

Subpart I—Tools—Hand and Power

1926.300	General requirements
1926.301	Hand tools
1926.302	Power operated hand tools
1926.303	Abrasive wheels and tools
1926.304	Woodworking tools
1926.305	Jacks—lever and ratchet, screw and hydraulic

Subpart J—Welding and Cutting

1926.350	Gas welding and cutting
1926.351	Arc welding and cutting
1926.352	Fire prevention
1926.353	Ventilation and protection in welding, cutting, and heating
1926.354	Welding, cutting and heating in way or preservative coatings

Subpart K—Electrical

GENERAL

1926.400	Introduction
1926.401	[Reserved]

INSTALLATION SAFETY REQUIREMENTS

1926.402	Applicability
1926.403	General requirements
1926.404	Wiring design and protection
1926.405	Wiring methods, components, and equipment for general use
1926.406	Specific purpose equipment and installations
1926.407	Hazardous (classified) locations
1926.408	Special systems
1926.409	1926.415 [Reserved]

Subpart K—Electrical

SAFETY-RELATED WORK PRACTICES

1926.416 General requirements

1926.417 Lockout and tagging of circuits

1926.418-1926.430 [Reserved]

Subpart K—Electrical

SAFETY-RELATED MAINTENANCE AND ENVIRONMENTAL CONSIDERATIONS

1926.431 Maintenance of equipment

1926.432 Environmental deterioration of equipment

1926.433-1926.440 [Reserved]

SAFETY REQUIREMENTS FOR SPECIAL EQUIPMENT

1926.441 Battery locations and battery charging

1926.442-1926.448 [Reserved]

DEFINITIONS

1926.449 Definitions applicable to this subpart

Subpart L—Scaffolding

1926.450 [Reserved]

1926.451 Scaffolding

1926.452 Guardrails, handrails, and covers

Subpart M—Floor and Wall Openings

1926.500 Definitions applicable to this subpart
1926.501 [Reserved]
1926.502 Definitions applicable to this subpart
APPENDIX A TO SUBPART M—ROOF WIDTHS

Subpart N—Cranes, Derricks, Hoists, Elevators, and Conveyors

1926.550 Cranes and derricks
1926.551 Helicopters
1926.552 Material hoists, personnel hoists and elevators
1926.553 Base-mounted drum hoists
1926.554 Overhead hoists
Sec.
1926.555 Conveyors
1926.556 Aerial lifts

Subpart O—Motor Vehicles, Mechanized Equipment, and Marine Operations

1926.600 Equipment
1926.601 Motor vehicles
1926.602 Material handling equipment
1926.603 Pile driving equipment
1926.604 Site clearing
1926.605 Marine operations and equipment
1926.606 Definitions applicable to this subpart

Subpart P—Excavation

1926.650	Scope, application, and definitions applicable to this subpart
1926.651	General requirements
1926.652	Requirements for protective systems

Subpart P—Excavation

APPENDIX A TO SUBPART P—Soil Classification
APPENDIX B TO SUBPART P—Sloping and Benching
APPENDIX C TO SUBPART P—Timber Shoring for Trenches
APPENDIX D TO SUBPART P—Aluminum Hydraulic Shoring for Trenches
APPENDIX E TO SUBPART P—Alternatives to Timber Shoring
APPENDIX F TO SUBPART P—Selection of Protective Systems

Subpart Q—Concrete and Masonry Construction

1926.700	Scope, application, and definitions applicable to this subpart
1926.701	General requirements
1926.702	Requirements for equipment and tools
1926.703	Requirements for cast-in-place concrete
1926.704	Requirements for precast concrete
1926.705	Requirements for lift-slab construction operations
1926.706	Requirements for masonry construction

APPENDIX A TO SUBPART Q—REFERENCES TO SUBPART Q OF PART 1926

Subpart R—Steel Erection

1926.750	Flooring requirements
1926.751	Structural steel assembly
1926.752	Bolting, riveting, fitting-up, and plumbing-up

Subpart S—Underground Construction, Caissons, Cofferdams...

Sec.

1926.800	Underground construction
1926.801	Caissons
1926.802	Cofferdams
1926.803	Compressed air
1926.804	Definitions applicable to this subpart

APPENDIX A TO SUBPART S—Decompression Tables

Subpart T—Demolition

1926.850	Preparatory operations
1926.851	Stairs, passageways, and ladders
1926.852	Chutes
1926.853	Removal of materials through floor openings
1926.854	Removal of walls, masonry sections, and chimneys
1926.855	Manual removal of floors
1926.856	Removal of walls, floors, and material with equipment
1926.857	Storage
1926.858	Removal of steel construction
1926.859	Mechanical demolition
1926.860	Selective demolition by explosives

Subpart U—Blasting and Use of Explosives

1926.900	General provisions
1926.901	Blaster qualifications
1926.902	Surface transportation of explosives
1926.903	Underground transportation of explosives
1926.904	Storage of explosives and blasting agents
1926.905	Loading of explosives or blasting agents
1926.906	Initiation of explosive charges—electric blasting

Subpart U—Blasting and Use of Explosives

1926.907	Use of safety fuse
1926.908	Use of detonating cord
1926.909	Firing the blast
1926.910	Inspection after blasting
1926.911	Misfires
1926.912	Underwater blasting.
1926.913	Blasting in excavation work under compressed air
1926.914	Definitions applicable to this subpart

Subpart V—Power Transmission and Distribution

1926.950	General requirements
1926.951	Tools and protective equipment
1926.952	Mechanical equipment
1926.953	Material handling
1926.954	Grounding for protection of employees
1926.955	Overhead lines
1926.956	Underground lines
Sec.	
1926.957	Construction in energized substations
1926.958	External load helicopters
1926.959	Lineman's body belts, safety straps, and lanyards
1926.960	Definitions applicable to this subpart

Subpart W—Rollover Protective Structures; Overhead Protection

1926.1000	Rollover protective structures (ROPS) for material handling equipment
1926.1001	Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors
1926.1002	Protective frame (ROPS) test procedures and performance requirements for wheel-type agricultural and industrial tractors used in construction
1926.1003	Overhead protection for operators of agricultural and industrial tractors

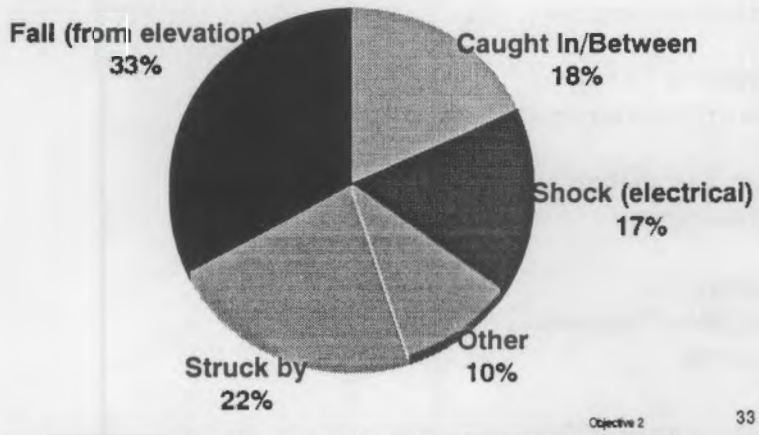
Subpart X—Stairways and Ladders

Sec.

1926.1050	Scope, application, and definitions applicable to this subpart
1926.1051	General requirements
1926.1052	Stairways
1926.1053	Ladders
1926.1054-1926.1059	[Reserved]
1926.1060	Training requirements

APPENDIX A TO SUBPART X—LADDERS

Analysis of Construction Fatalities The OSHA Data Base 1985-1989



OSHA Has Two Functions

- Enforcement
- Standard Promulgation

Most Frequently Cited Violations Construction (Serious) FY91

Consensus Standards

- Consensus Safety Standards include many professional forums considered subject-matter experts. For example
  - ANSI—American National Standards Institute
  - ACGIH—American Conference of Governmental Industrial Hygienists
  - NFPA—National Fire Protection Association
  - ASTM—American Society of Testing and Materials
  - AWS—American Welding Society
  - SASE—Society of Automotive Safety Engineers
- CPL—Compliance (CSHO) Directives
- STD—Standard Directives

Public Law 91-596

Williams-Steiger Occupational Safety and Health Act (December 29, 1970)

It shall be the responsibility of the head of each Federal Agency to establish and maintain an effective and comprehensive Occupational Safety and Health Program.

Building Blocks to Safety Compliance

PL 91-596-Occupational Safety and Health Act of 1970

"To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act;...by providing for research, information, education, and training in the field of occupational safety and health.."

Executive Order 12196 (February 26, 1980)

President Carter:

"As the Nation's largest employer, the Federal Government has a special obligation to set an example for all employers by providing a safe and healthful working environment for its employees."

Additional Elements of Executive Order 12196

- Applies to ALL AGENCIES of the executive branch
- Incorporates a General Duty Clause
- Requires designation of an agency official
- Necessitates prompt abatement
- Establishes anti-discrimination clause

Federal Agencies Must Ensure

- General Safety and Health Provisions are covered
- Conduct Periodic inspections
- Ensure Prompt response to complaints
- Provide for Employee representation
- Maintain OSHA Records
- Conduct ongoing Training

Definitions

- Multi-Employer, OSHA cites these in private sector
  - Controlling employer
  - Creating employer
  - Correcting employer
  - Exposing employer (company who exposes the employer to hazard)

DOE Implementing Orders and Notices

	DOE Order Title
3790.1A	Federal Employee Occupational Safety and Health Program
5480.1B	Environment, Safety and Health for DOE Operations
5480.4	Environmental Protection, Safety and Health Standards
5480.9	Construction Safety
5480.10	Contractor Industrial Hygiene
5483.1A	Occupational Safety and Health Program for Contractor Employees
5484.1	Environmental, Safety and Health Information Requirements

DOE 5480.1B Environment, Safety and Health Program for DOE Operations

- This order establishes the Environment, Safety and Health (ES&H) program for DOE contractors at all GOCO facilities.
- DOE policy assures the protection of the environment and the health and safety of the public.
- Line management is responsible for effective ESH performance.

DOE 5480.4 Environmental Protection, Safety and Health Protection Standards

- This order establishes mandatory standards applicable to all DOE and DOE contractor operations.
- Mandatory standards include:
  - 29 CFR 1910
  - 29 CFR 1926
  - ANSI Standards

DOE 5480.9 Construction Project Safety and Health Management

Draft 2-8-93

- This order establishes specific requirements for management of Occupational Safety and Health (OSH) on Department of Energy (DOE) construction projects by supplimenting the OSH program for DOE contractor employees prescribed under DOE Order 5483.XX.
- References
  - (a) DOE 4700.1, Project Management System
  - (b) DOE Draft 5483.XX, Occupational Safety and Health Program for DOE Contractor Employees
- Definitions
  - Responsibilities and Authorities
  - Program Requirements
  - Inspections and Hazard Abatement

DOE 5480.10 Contractor Industrial Hygiene Program

- This order states DOE policy to assure that:
  - contractor employees and representatives have the opportunity to participate in their employer's industrial hygiene program
  - contractors make well-defined assignments of responsibilities within their organizations for employee industrial hygiene programs

Draft DOE 5483.XX Overview

- Reflects the new culture mandated by the Secretary
- Conforms to the Secretary's 10-Point Initiative
- Complies with Adm. Watkins' direction to respond to OSHA's comments as contained in the December 1990 "Evaluation of the U.S. Department of Energy's Occupational Safety and Health Program for its Government-Owned Contractor-Operated Facilities"
- Provides clear and consistent program direction, authorities, requirements, and responsibilities for DOE program elements
- Increases emphasis on Occupational Safety and Health
- Reflects DOE's commitment to full conformance with relevant OSH standards and directives
- Contains tenets similar to OSHA's Program Management Guidelines
- Provides framework for OSH excellence

5483.XX (Draft)—OS&H Program for DOE Contractor Employees

- Establishes the foundation for effective implementation of DOE's contractor OSH program
- Establishes OSH Standards for all contractors on DOE-sponsored facilities
- Sets forth the programmatic requirements for:
  - DOE line organizations
  - Covered contractors
    - M&O
    - Construction management
    - Others designated by PSOs

5483.XX (Draft)

OCCUPATIONAL SAFETY PROGRAM

- Fire Protection/ Prevention
- Life Safety
- Industrial Safety
- Construction Safety
- Pressure Vessel Safety
- Electrical Safety
- Explosives Safety
- Firearms Safety
- Mine and Tunnel Safety
- Performance Assessment
- Safety Analysis

OCCUPATIONAL HEALTH PROGRAM

- Industrial Hygiene Standards
- Hazardous Exposure Assessment
- Chemical Protective Clothing and Equipment
- Engineering Controls
- Occupational Medicine
- Preventive Medicine
- Emergency Medical Treatment
- Medical Program Appraisals
- Worker Health Surveillance
- Epidemiology
- Epidemiologic Data Repository
- Health Communications
- Dose Reconstruction

DOE Contractor Employee Occupational Safety and Health

Policy Statement

"It is the Department of Energy policy to provide a safe and healthful workplace for all contractor personnel. These conditions shall be ensured through an aggressive and comprehensive OSH program fully endorsed by the Secretary of Energy and implemented through line management. DOE line management regards worker safety and health as a fundamental value, and is committed to understanding the underlying science and developing, improving, and implementing occupational safety and health technologies and management practices that will afford optimal OSH protection to contractor employees and enable the Department to continually improve the quality of its OSH performance."

Recent Events in DOE Safety and Health Programs

- DOE advisory panel on occupational health, epidemiology, public health has been established to:
  - monitor health-related activities
  - conduct internal, short term epidemiological studies
  - long term epidemiological studies will be conducted by DHHS
- DOE Construction Advisory Panel established in EH-30

Review of Trends in Tiger Team Assessments

- Inadequate compliance with the following standards:
  - construction activities
  - machine guarding
  - electrical safety
  - use of toxic substances
  - walking/working surfaces
  - fire protection

References

CONTRACT WORK HOURS AND SAFETY STANDARDS ACT OF 1962 (CONSTRUCTION SAFETY ACT)

(P.L.87.581. 87th Congress H.R. 10786 August 13, 1962, as amended by the Construction Safety Act. P.L.91-54. 91st Congress, H.R. 10946, August 9, 1969)

This handout contains provisions of the Construction Safety Act which are applicable to the safety and health of contractor employees.

Sec. 107 (a). It shall be a condition of each contract which is entered into under legislation subject to Reorganization Plan Numbered 14 of 1950 (64 Stat. 1267), and is for construction, alteration , and/or repair, including painting and decorating, that no contractor or subcontractor contracting for any part of the contract work shall require any laborer or mechanic employed in the performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety, as determined under construction safety and health standards promulgated by the Secretary by regulation based on proceedings pursuant to section 553 of title 5, United States Code, provided that such proceedings include a hearing of the nature authorized by said section. In formulating such standards, the Secretary shall consult with the Advisory Committee created by sub-section (e). (As added August 9, 1969, by P.L. 91-54).

(b). The Secretary is authorized to make such inspections, hold such hearings, issue such orders, and make such decisions based on findings of fact, as are deemed necessary to gain compliance with this section and any health and safety standard promulgated by the Secretary under sub-section (a), and for such proposes the Secretary and the United States district courts shall have the authority and jurisdiction provided by sections 4 and 5 of the Act of June 30, 1936 (41 U.S.C. 38,39). In the event that the Secretary of Labor determines noncompliance under the provisions of the section after an opportunity for an adjudicatory hearing by the Secretary of any condition of a contract of the type described in clause (1) and (2) of section 103 (a) of this Act, the governmental agency for which the contract work is done shall have the right to cancel the contract, and to enter into other contracts for the completion of the contract work, charging any additional cost to the original contractor. In the event of noncompliance, as determined by the Secretary after an opportunity for an adjudicatory hearing by the Secretary of any condition of a contract of a type described in clause (3) section 103 (a), the government agency by which financial guaranteed assistance, or insurance for the contract work is provided shall have the right to withhold any such assistance attributable to the performance of the contract. Section 104 of this Act shall not apply to the enforcement of this section (As added August 9, 1969, by P.L. 91-54).

(c). The United states district courts shall have jurisdiction for cause shown, in any actions brought by the Secretary, to enforce compliance with the construction safety and health standards promulgated by the Secretary under subsection (a). (As added August 9, 1969, by P.L. 91-54).

(d)(1). If the Secretary determines on the record after an opportunity for an agency hearing that by repeated willful or grossly negligent violations of this Act, a contractor or subcontractor has demonstrated that the provisions and subsections (b) and (c) are not effective to protect the safety and health of his employees, the Secretary shall make a finding to that effect and shall, not sooner than thirty days after giving notice of the findings to all interested persons, transmit the name of such contract or subcontractor to the Comptroller General.

(d)(2). The Comptroller General shall distribute each name so transmitted to him to all agencies of the Government. Unless the Secretary otherwise recommends, no contract subject to this section shall be awarded to such contractor or subcontractor or to any person in which such contractor or subcontractor has a substantial interest until three years have elapsed from the date the name is transmitted to the Comptroller General. If, before the end of such three-year period, the Secretary, after affording interested persons due notice and opportunity for hearing, is satisfied that a contractor or subcontractor whose name he has transmitted to the Comptroller General will thereafter comply responsibly with the preceding sentence to such contractor or subcontractor (and to any person in which the contractor or subcontractor has a substantial interest); and when the Comptroller General is informed of the Secretary's action he shall inform all agencies of the Government thereof.

(d)(3). Any person aggrieved by the Secretary's action under subsections (b) or (d) may, within sixty days after receiving notice thereof, file with the appropriate United States court of appeals a petition for review of such action. A copy of the petition shall be forthwith transmitted by the clerk of the court to the Secretary, who shall thereupon file in the court the record upon which he based his action, as provided in section 2112 of title 28, United States Code. The findings of fact by the Secretary if supported by substantial evidence, shall be final. The courts have power to make and enter a decree enforcing, modifying, and/or enforcing as so modified, or setting aside in whole or in part order of the Secretary of the appropriate Government agency. The judgement of the court shall be subject to review by the Supreme Court of the United States upon certiorari or certification as provided in section 1254 of title 289, United States Code. (As added August 9, 1969, by P.L.91-54)

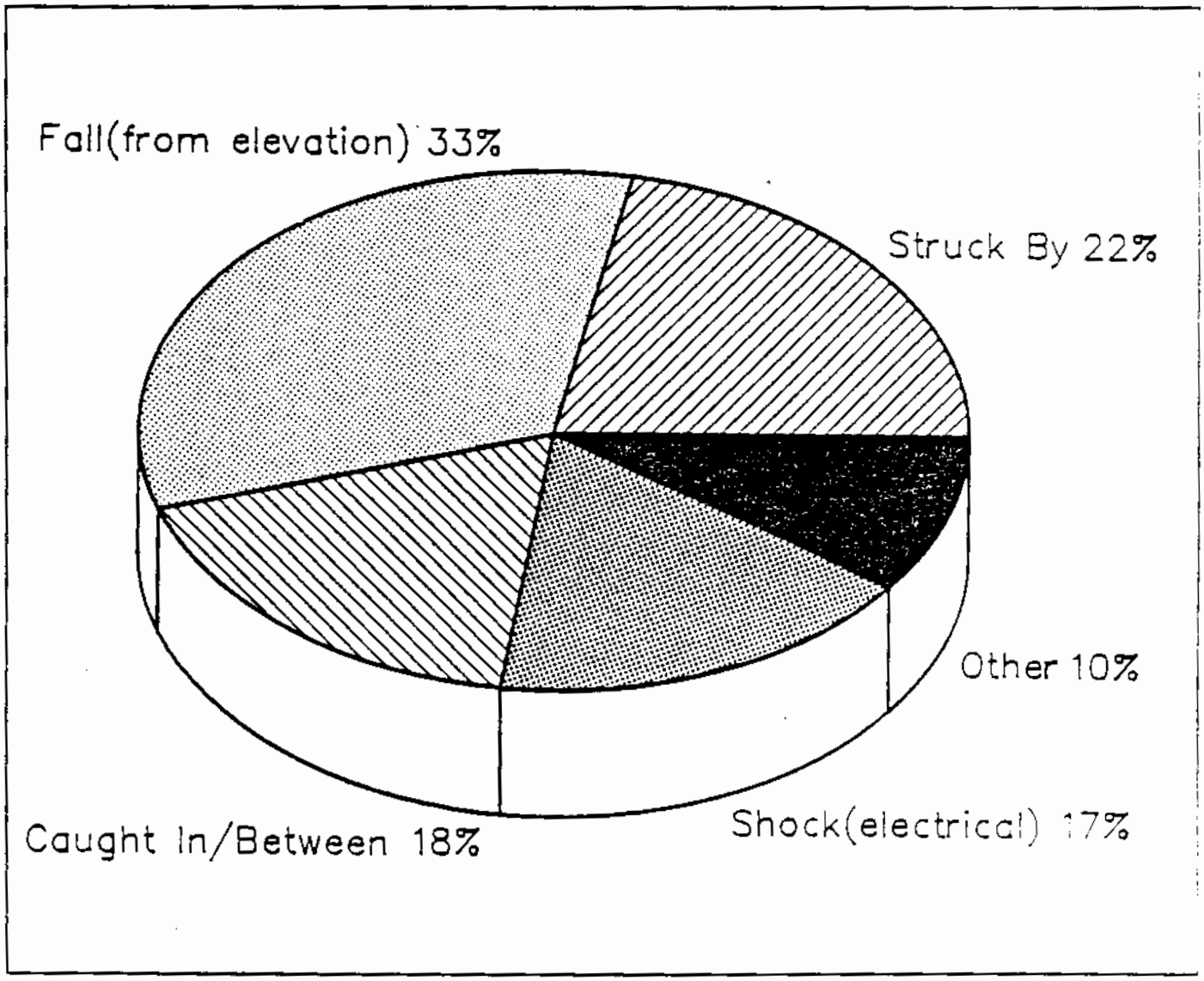
(e)(1). The Secretary shall establish in the Department of Labor an Advisory Committee on Construction Safety and Health (hereinafter referred to as the 'Advisory Committee') consisting of nine members appointed, without regard to the civil service laws, by the Secretary. The Secretary shall appoint one such member as Chairman. Three members of the Advisory Committee shall be persons representative of contractors to whom this section applies, three members shall be persons representative of employees primarily in the building trades and construction industry engaged in carrying out contracts to which this section applies, and three public representatives who shall be selected on the basis of their professional and technical competence and experience in the construction health and safety field.

(e)(2). The Advisory Committee shall advise the Secretary in the formulation of construction safety and health standards and other regulations, and with respect to policy matters arising in the administration of this section. The Secretary may appoint such special advisory and technical experts or consultants as may be necessary to carry out the functions of the Advisory Committee.

Analysis of Construction Fatalities-The OSHA Data Base 1985-1989

U.S. Department of Labor
Occupational Safety and Health Administration

November 1990



SITE SAFETY PLANNING

If you fail to plan, you plan to fail...

Site safety planning makes control of injury and illness on the jobsite more manageable. Many major contracting companies already use site safety planning as standard operating procedures.

Usually the contractor develops a generic site safety plan for each construction project during the project proposal phase for client review. The site safety plan is then further refined at the field level at job inception to include more job specific requirements. After the start of a job, the site safety plan is periodically updated and reviewed to account for changes on the jobsite as project conditions dictate.

To help you understand how a site safety plan is set up, use the check list, below. This site plan check list gives you the basic elements found in a successful site safety plan.

On the pages following this site plan check list are additional lists to incorporate into your plan for specific work operations, tools or injury control problems. Remember, these lists are not complete. They offer only recommendations. You must tailor them to your specific workplace.

SITE SAFETY PLAN CHECK LIST

An effective site safety plan:

1. **Names the key person and alternates responsible for safety and health on the jobsite.** The contractor must designate at least one competent person as a safety officer. The competent person must be on the construction site and have the authority and knowledge needed to make the plan work. Often, to adequately cover all the various operations, the contractor may need to designate other competent persons to work with the safety officer for specific work operations or tasks.

2. **Describes the safety and health risks for each site task and operation.** This includes information on known or suspected hazards. Use the check lists on the following pages to help.

3. **Describes the worker training required, including any special training, competence, skill or medical or physical capabilities needed to safely perform the job.** Again, use the check lists on the following pages to help you complete this requirement.

4. **Describe the personal protective equipment laborers need for each kind of work task.** Use the attached check lists to help.

5. **Describes any site specific medical monitoring requirements.** OSHA regulations describe the minimum medical monitoring required. Your employer may adopt stricter medical requirements, but not weaker ones. In particular, pay attention medical fitness requirements for wear of respirators and periodic evaluation of persons exposed to high noise levels.

6. **Describes any periodic air monitoring, personnel monitoring and environmental sampling.** Cover the types and frequency of monitoring, the instruments used and the methods of calibration and maintenance of equipment. For most construction sites noise and chemical are the most common exposures for which you may need to monitor.

7. **Describes site control measures.** This includes material loading zones, hoisting zones, equipment servicing zones and other site work zones where special operations requiring special controls can be confined. Developing a site map is also a good idea.

8. **Lists standard operating procedures for the site.** This include the contractor's general work rules, safety requirements and other work procedures. Also includes information on the chain of command, grievance and discipline policies and procedures and other policies which impact on or relate to the roles, duties and responsibilities of labor and management in maintaining a healthy and safe workplace.

9. **Describes how the contractor will respond to emergencies, should they happen,** including the necessary personal protective equipment and emergency response phone numbers (police, fire department, ambulance, rescue squad, etc.).

Sample:

Site Safety Plan Contractor/Subcontractor Requirements

Contractor/Subcontractor Project Safety Requirements

Contractor/Subcontractor shall prepare and submit to _____ for approval its project safety and health program fully describing the Contractor/Subcontractor commitments for meeting its obligations to provide safe and healthful working conditions for its employees and generally contribute to an enhance the safety at the project site. The Contractor/Subcontractor program shall reference federal and state OSHA/MSHA standards and any other rules and regulations applicable to construction activities in the state of _____. The Contractor/Subcontractor project safety and health program shall include, but not be limited to, the following subjects:

1. New-Hire Safety Orientation Program

Contractor/Subcontractor shall provide safety orientation for all new hires, which shall include as a minimum the topics outlined below. The Contractor/Subcontractor shall familiarize all its employees with the requirements of the Contractor/Subcontractor safety program.

Each new or reassigned employee of the Contractor/Subcontractor shall receive a thorough safety orientation. This gives the employee the basic information about the Contractor/Subcontractor project safety and health program, federal and state OSHA/MSHA, and other applicable safety rules and regulations. If necessary, the Contractor/Subcontractor shall provide additional safety instruction at a later date for the performance of hazardous or unfamiliar tasks. Employee attendance shall be required and records kept on file in the Contractor/Subcontractor office for review by _____.

The Contractor/Subcontractor new-hire safety orientation shall include, but not be limited to, the following topics:

- Employer/Employee responsibilities under the federal/state OSHA/MSHA safety and health acts
- Eye Protection
- Head protection
- Hearing protection
- Respiratory protection
- Safety belts and lifelines
- Scaffolding

- Perimeter guarding
- Housekeeping
- Fire protection
- First aid facilities and emergency procedures
- Toxic substances
- Special project requirements and procedures
- Trenching and excavations
- Material handling, rigging procedures and crane safety
- Electrical safety

2. Weekly Tool Box Safety Meetings

Contractor/Subcontractor shall conduct weekly tool box safety meetings to provide its employees with up-to-date safety information. Employee attendance shall be required and records shall be kept on file in the Contractor/Subcontractor office for review by _____.

3. Supervisors' Safety Orientation

Contractor/Subcontractor must familiarize all its supervisory personnel with Contractor/Subcontractor safety responsibilities by conducting a supervisor's safety orientation with each supervisor upon promotion or assignment. Each such orientation must cover as a minimum the subjects outlined below. Orientation records shall be kept on file in the Contractor/Subcontractor office for review by _____.

- Contractor's Safety Program

Contractor/Subcontractor shall review its safety program and the Project Site Safety Plan in detail with each supervisor.

- Safe Work Areas

Contractor/Subcontractor shall require each of its supervisors to be familiar with the conditions in each area of the project to which employees of each supervisor's crew or group are assigned. The Contractor/Subcontractor shall direct its supervisors to correct when possible unsafe conditions that exist in the work area before work begins. Otherwise, the problem shall be brought to the attention of the next higher level of supervision for resolution.

- Safe Work Practices

Contractor/Subcontractor shall require each supervisor, when making work assignments, to inform the crew or group involved about the safety practices, work methods and personal protective equipment required. Each supervisor shall be responsible for determining that each worker has the proper protective equipment and suitable tools for the work assignment.

- Supervising for Safety

Contractor/Subcontractor supervisors shall constantly review the safe practices and procedures used by their crews and initiate corrective action when necessary.

- Tool Box Meetings

Contractor/Subcontractor shall require each supervisor to conduct a Tool Box Safety Meeting with the entire crew or group at the time specified, using the subject material provided by the contractor/subcontractor.

- Supervisors' Safety Meetings

Contractor/Subcontractor shall schedule supervisors' safety meetings on a monthly basis. Topics discussed at these meetings must be chosen to assist each supervisor in supervising for safety. Attendance at these meetings shall be mandatory and attendance records shall be kept on file for review by _____.

- Emergency Procedures

Contractor/Subcontractor shall familiarize all supervisors with the emergency procedures developed for the project so that they may provide the leadership required to cope with serious injuries, fires, evacuation and similar situations.

- Accident Investigations

Contractor/Subcontractor shall require each supervisor to participate actively in the investigation of any accident which results in (a) personal injury to a member of that supervisor's crew or group, (b) equipment or property damage in that supervisor's area of responsibility, or (c) near misses that had a potential for serious injury or death.

- First Aid

Contractor/Subcontractor shall require each supervisor to notify all employees under his or her supervision of their obligation to immediately report injuries, however minor, in accordance withproject procedures.

- Fire Protection and Prevention

Contractor/Subcontractor shall require its supervisors to maintain a constant awareness of the fire potential in their area of responsibility. If a potential fire hazard is noted, the supervisor must initiate corrective action and notify _____.

4. Incident Reporting

Contractor/Subcontractor shall cooperate with the owner and or _____ in investigating any major safety-related incidents. Additionally, the Contractor/Subcontractor shall immediately investigate and submit to owner/_____ written reports of any accident wherein disabling injuries or fatalities occur or which results in damage to property or fire loss in excess of $500. These reports shall be submitted within 24 hours of the occurrence.

5. Safety Meetings

Contractor/Subcontractor designated safety representative, who shall be a non-manual employee with authority to correct safety problems shall attend monthly safety meetings with _____ and or the owner's project safety personnel.

6. Safety Inspection

Contractor/Subcontractor shall participate, through a C?-designated representative acceptable to _____, in periodic general safety inspection tours conducted by a member of the _____ Safety Department. During these inspections the Contractor/Subcontractor safety representatives must identify and record safety violations and list such items for action and immediate correction by the C?. If the Contractor/Subcontractor has any Contractor/Subcontractor a representative of each subcontractor may accompany the inspection. The Contractor/Subcontractor must provide _____ with a list of items designated for correction. Contractor/Subcontractor shall participate in specialized inspections conducted by _____ Safety Department which focus on specific aspects of safety and health, e.g., scaffolding, shoring, electrical hazards or noise.

7. Barricades

Contractor/Subcontractor shall be responsible for erecting and maintaining any and all required barricades that may be needed to protect its employees.

8. Safety Signs

Contractor/subcontractor shall be responsible for posting any signs or requirements that advise its employees of unsafe areas or conditions.

9. Scaffolds

Contractor/Subcontractor shall develop a scaffold-tagging procedure to ensure proper scaffolds and to advise employees if the scaffold is not properly erected.

10.Confined Spaces

Contractor/Subcontractor shall have a confined space entry procedure. This procedure shall include posting, testing, monitoring and recordkeeping.

11. Floor and Roof Openings

Contractor/Subcontractor shall have a program for securing and marking floor and roof openings to protect employees from falls.

12. Respiratory Protection

Contractor/Subcontractor shall have a respiratory protection program.

13. Hearing Protection

Contractor/Subcontractor shall monitor noise levels in its work area and post signs and issue hearing protection to employees as required.

14. Crane Safety and Material Handling Program

Contractor/Subcontractor shall comply with the (name of project) project crane safety and material handling program. Contractor/Subcontractor shall not bring equipment or machinery intended for material or personnel handling onsite without filing with _____ written proof of current annual inspection.
Contractor/Subcontractor shall renew any annual inspection report prior to expiration. Failure to maintain current inspection will result in shutdown of the equipment.

15. Occupational Health

Contractor/Subcontractor shall take all reasonable steps and precautions to protect health and minimize danger from all hazards to life and property. The Contractor/Subcontractor shall conduct occupation health monitoring and/or sampling as required or request by _____ to determine the levels of exposure of its employees to hazardous or toxic substances or environmental conditions.

16. First Aid

Who provides first aid??????

17. Employee Sanctions

Contractor/Subcontractor shall advise its employees that any employee who jeopardizes his or her health or safety or the health or safety of others will receive disciplinary action as specified in the Project Disciplinary Warning Procedures.

18. Reports

Contractor/Subcontractor shall provide a system for submitting reports of all accidents resulting in disabling injuries, fatalities, property/equipment damage or fire loss to _____ within 24 hours of the incident.

19. Recordkeeping

Contractor/Subcontractor must complete and maintain the OSHA 200 Form for all safety-related incidents or have the forms available for inspection and review By_____. The contractor shall complete injury forms as required after an occupational injury or illness.

Fire Protection and Prevention

Contractor/Subcontractor operations shall be conducted in such a manner as to (i) not create any fire hazards and (ii) comply with the Project fire protection, prevention and suppression requirements.

Contractor/Subcontractor shall provide fire extinguisher that are adequate for potential hazards that be encounter during its operations and shall instruct its employees in the proper use of such equipment.

Contractor/Subcontractor shall verify that the material it proposes to use on the Project conforms to the Project requirements insofar as flame-resistant and fireproof characteristics are concerned. Specific materials in this category include fuels, solvents and coatings, plastic covering material, construction lumber, scaffold planks, paper, boxes and crating materials.

Contractor/Subcontractor may be required to provide manpower for the Project Fire Brigade. Employees assigned to the Project Fire Brigade are required to attend training sessions and practice drills.

General and Special Conditions

The following General and Special Condition articles are included in this contract:

A.

B.

C.

...

Z.

SAFETY CHECKLIST

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BACK

	Yes	No	
Planning			
The contractor provides forklift trucks, hand and power trucks, dollies, rollers, belt conveyors, pneumatic conveying equipment, overhead conveyors, cranes, lifting platforms, block and tackle systems or hoists for handling loads whenever possible.			
The contractor places mechanical devices close to where they are used, saving time and backs.			
The contractor plans storage, movement and availability of materials so they are near where they are used.			
The contractor requires that hand carried loads are broken into smaller loads whenever possible.			
The contractor arranges work to minimize movement from level to level.			
The contractor has a buddy system for handling awkward loads.			
The contractor has strict work rules regarding proper lifting and carrying techniques, including single person weight limits and load size requirements.			
The contractor prohibits carrying items which block vision on stairs.			
The contractor prohibits carrying items up ladders where hoists are feasible.			
The contractor assigns one person, a competent person or foreman, to monitor and enforce the availability and use of lifting equipment and correct lifting procedures.			
The contractor assigns one person, a competent person or a foreman, to keep the worksite free of clutter, tools, equipment, supplies, personal belongings, litter, slippery spills, ice or snow and other tripping hazards.			
The contractor maintains and reviews records of the causes of all back injuries and incorporates results in training programs.			
The contractor tracks and records laborers' physical condition and complaints of back strain.			
The contractor shares accident information with other leaders.			
The contractor avoids assigning manual lifting and carrying to laborers with chronic back pain.			
The contractor provides periodic physical exams to assure laborers are physically suited to manual lifting/carrying tasks where loads exceed 30 pounds.			
The contractor clearly states and communicates safety policies in writing, in safety meetings, in tool box meetings and during training.			

BACK (continued)

	Yes	No	
On-the-Job			
Laborers use forklift trucks, hand and power trucks, dollies, rollers, belt conveyors, pneumatic conveying equipment, overhead conveyors, cranes, lifting platforms, block and tackle systems or hoists for handling loads when possible.			
Laborers avoid repeatedly bending over to pick up heavy loads without straightening the back up or bending knees.			
Laborers distribute loads evenly before lifting, carrying and placing.			
Laborers lift with arm and leg muscles instead of back muscles.			
Laborers hold loads close to their bodies.			
Laborers carry loads in an upright position, not bent over.			
Laborers have clear vision over loads.			
Laborers walk normally when carrying loads.			
Laborers minimize lifting load from one platform to another.			
Laborers avoid twisting while lifting or placing objects.			
Laborers minimize repetitive bending down for an object and lifting or placing it.			
Laborers avoid holding loads for extended periods.			
Laborers avoid carrying loads across tripping or slipping hazards.			
Laborers ask for help (use the buddy system) when loads are large.			
Laborers keep work areas clear of tripping and slipping hazards.			
Laborers know rules for safe lifting, carrying and placing of loads (ask them to explain them to you).			
Training			
Laborers are trained in proper lifting, carrying and handling of loads by a qualified fitness expert.			
Laborers are provided annual refresher training in lifting techniques.			
The contractor has a tool box training program covering lifting, carrying and handling of loads to supplement other training.			
Training includes explanation of contractor rules and OSHA regulations.			
The contractor displays posters or distribute wallet-size cards illustrating proper lifting and carrying techniques.			
Laborers are tested for their knowledge and ability to lift, carry and handle loads.			

CROWBARS PRYBARS

	Yes	No	
Planning			
The contractor replaces or repairs damged crowbars or prybars.			
The contractor provides crowbars and prybars in a variety of sizes and weights at the jobsite.			
The contractor's safety control program includes policies and procedures covering crowbars and prybars.			
The contractor assigns one person, a competent person or foreman, to monitor and enforce the availability of safe and proper crowbars or prybars for each job and their proper use by laborers.			
The contractor has a written policy assigning a specific employee to inspect crowbars and prybars periodically for wear and damage.			
The contractor maintains and reviews records of the causes of all injuries involving crowbars or prybars and incorporates results in training programs.			
The contractor clearly states and communicates safety policies for crowbars and prybars in writing, in safety meetings, in tool box meetings and during training.			
On-The-Job			
The laborer uses crowbars and prybars in good condition, free of jagged or chipped edges.			
The laborer selects appropriate bars for the job, e.g., thick bars for wrecking work and thin bars for fragile work.			
The laborer eases materials away, using as little force as needed.			
When possible, the laborer pries the object away from his or her body.			
The laborer stands on a sta'le surface when using the crowbar or prybar.			
The laborers know rules for proper selection and use of bars (ask them to explain them to you).			
Training			
Laborers are trained and tested in selecting bar size and weight appropriate for different kinds of jobs.			
Laborers are trained and tested to recognize damaged bars.			
Laborers are trained in safe use of bars, including prying away from the body and how much force to apply.			
Laborers are provided annual refresher training on the selection and use of crowbars and prybars.			
The contractor has a tool box training program covering selection and use of prybars to supplement other training.			
Training include explanation of contractor rules and OSHA regulations.			

FALLS ELEVATIONS

	Yes	No	
Planning			
CHECKLIST-GENERAL			
The contractor allows only experienced laborers to erect or rig scaffolding or swing stages.			
The contractor keeps elevated work platforms free of tripping hazards such as tools, equipment, litter, personal belongings.			
The contractor keeps elevated work platforms free of slipping hazards such as spills, oil, grease, ice and snow.			
The contractor prohibits use of crates, boxes or barrels as makeshift work platforms.			
The contractor arranges to supply the right ladder or scaffolding for each job.			
The contractor sets up hoisting equipment to lift tools and other equipment to elevated work areas where feasible.			
The contractor sets up or repositions elevated work locations to avoid making laborers overreach.			
The contractor assigns an engineer or competent person daily responsibility for checking elevated work platforms.			
The contractor assigns an engineer or competent person responsibility for inspecting, at least daily, all ladders and scaffolds.			
The contractor assigns one person, a competent person or foreman, to monitor and enforce the safe erection, use and maintenance of ladders, scaffolds, swing stages and other elevated work platforms or protections for roof edges or floor openings.			
The contractor requires laborers working at elevations to wear non-slip safety shoes at all times.			
The contractor assigns work at heights only to laborers trained and tested to do it.			
The contractor prevents laborers not wearing the proper safety qhoes from working on roofs or other elevated platforms.			
During stormy or high wind conditions the contractor prohibits laborers from working on ladders or scaffolds.			
The contractor clearly communicates rules and regulations regarding work at elevations in writing, in safety meetings, in tool box meetings and during training.			
The contractor post signs and posters stating rules and regulations concerning work at elevations.			
CHECKLIST-WORK EQUIPMENT			
The contractor uses only ladders constructed of sound materials -- free of splits, cracks, warping, rust, corrosion, and other defects.			
The contractor does not use ladder with split siderails.			
The contractor does not use ladders with loose steps or rungs.			

FALLS ELEVATIONS (continued)

	Yes	No	
The contractor does not use ladders with loose nails, screws, bolts or other metal parts.			
The contractor removes from service ladders with cracked, broken or split siderails, braces or steps and damaged or worn feet.			
The contractor removes from service any ladder that wobbles due to side strain or loose or bent spreaders.			
The contractor supplies ladders with non-slip safety feet securely attached to side-rails.			
The contractor requires ladders placed on stable and level footing.			
The contractor requires scaffolds, swing stages, roof or floor edges or openings to be protected with guardrails, midrails and toeboards.			
The contractor requires all open ends of scaffolds and work platforms to be protected by guardrails, midrails and toeboards.			
The contractor uses only scaffolds or stages constructed of sound materials – free of splits, cracks, warping, rust, corrosion, and other defects.			
The contractor braces overlapping scaffold planking from below.			
The contractor makes sure locking pins or other locking devices on built-up scaffolds are in good condition and installed properly.			
The contractor plumbs each level of built-up scaffolding.			
The contractor anchors built-up scaffolds at least every 25 feet of height and length.			
The contractor requires each scaffold frame braced to at least one other frame.			
The contractor requires wheels on rolling scaffolds to be locked before work begins and riding rolling scaffolds is prohibited.			
The contractor requires all scaffolds erected on level and stable ground.			
The contractor requires suspended scaffolds or swing stages to be properly rigged, tied and anchored to prevent swaying.			
The contractor attaches scaffolds, swing stages or rigging to stable parts of a building (not to pipes, drains, awnings and so on).			
The contractor provides only ropes and cables in good condition, free of damage, abrasion, kinks and so on.			
The contractor removes from service scaffold or swing stage materials that are damaged, corroded, warped or cracked.			
HOUSEKEEPING			
Contractor rules emphasize the consequences of leaving tools, equipment, scrap, personal belongings and other clutter on elevated platforms.			
Contractor housekeeping policies include rules for cleaning up spills, grease and other slippery conditions on elevated work platforms and access ways.			

FALLS ELEVATIONS (continued)

	Yes	No	
Contractor rules give procedures concerning ice and snow removal.			
RECORDKEEPING			
The contractor maintains and reviews records of the causes and costs of falls from elevations and incorporates results in planning and training programs.			
The contractor shares accident information with other leaders.			
On-the-Job			
Laborers on ladders, scaffolds or swing stages keep work within a comfortable arm's length to avoid overreaching.			
Laborers avoid use of makeshift work platforms, such as crates, boxes and barrels.			
Laborers refrain from carrying heavy tools or other objects while ascending or descending ladders or scaffolds.			
Laborers refrain from climbing ladders one-handed or with backs to the steps.			
Laborers face ladders when ascending or descending.			
Laborers work no higher than the second step from the top of ladders.			
Laborers hoist their tools and equipment rather than carry them while climbing up a ladder or scaffold.			
Only one laborer is on a ladder at a time.			
Only two or fewer laborers are on a swing stage at the same time, unless specifically designed to hold more by qualified engineer.			
Laborers on suspended scaffolds or swing stages wear proper safety belts and lifelines.			
Laborers always use safety equipment, such as safety belts and lifelines.			
Laborers clean up known slippery surfaces caused by spills.			
Laborers keep ladders and scaffolds or swing stage platforms free of clutter.			
Laborers check ladders, scaffolds, work platforms, swing qtages, roof edge and perimeter guards before each use.			
All laborers wear non-slip workshoes.			
Laborers keep safety shoes free of mud or grease.			
Laborers know rules for safe use of ladders, scaffolds and other elevated work platforms (ask them to explain them to you).			
Laborers refrain from working at elevation while intoxicated or under the influence.			

FALLS ELEVATIONS (continued)

	Yes	No	
Training			
Laborers erecting scaffolds are trained to do so.			
Laborers rigging and tying scaffolds are trained to do so.			
Laborers are trained in proper use of ladders, scaffolds and other elevated platforms.			
Laborers are trained how to work safely on roofs.			
Laborers are trained to maintain good housekeeping.			
Laborers are trained in what protective equipment to use for work at heights.			
Laborers are trained to identify the key components of a safe ladder, scaffold or elevated work platform.			
Laborers assigned to work at elevated heights are trained in the proper use of ladders and scaffolds.			
Training includes explanation of contractor rules and OSHA regulations.			
The contractor has a tool box training program covering work at heights to supplement other training.			
Laborers assigned to work at elevated heights are tested at graduated height levels.			
The contractor provides an annual refresher course on work at heights for those laborers who frequently work at heights.			

FALLS: STAIRS

	Yes	No	
Planning			
The contractor makes sure all stairs have handrails.			
The contractor constructs stairs of sound materials -- free of loose steps, splits, cracks, warping, rust, corrosion, and other defects.			
The contractor assigns a foreman or competent person to inspect stairs for sound construction and to keep stairs and stair wells free of clutter such as tools, equipment, litter, personal belongings.			
The contractor equips the jobsite with hoisting devices that keep load carrying on stairs to a minimum.			
The contractor requires all laborers to wear non-slip safety shoes at all times.			
SAFETY PROGRAM			
The contractor clearly communicates good housekeeping rules in writing, at safety meetings, at tool box meetings and during training.			
The contractor's housekeeping policies include rules for cleaning up spills, grease and other slippery conditions on stairs. The contractor have rules for ice and snow removal and prohibit laborers from using stairs from which ice and snow are not removed.			
RECORDKEEPING			
The contractor maintains and reviews records of the causes of falls on stairs and incorporate results in planning and training programs.			
The contractor shares accident information with other leaders.			
On-the-Job			
Laborers going up and down stairs use hand rails.			
Laborers going up and down stairs avoid carrying heavy loads.			
Laborers going up and down stairs avoid carrying loads that block vision.			
Laborers going up and down stairs walk, not run.			
Laborers clean up spills immediately.			
Laborers keep stairs free of ice or snow.			
Laborers keep tools, equipment, litter or personal belongings picked up off stairs.			
Do the laborers know rules for safe use of stairs (ask them to explain them to you).			
Training			
Laborers are trained and re-trained in housekeeping rules.			
Training include explanation of housekeeping rules.			

FALLS: STAIRS (continued)

	Yes	No	
Training explain the safety consequences of leaving tools, equipment, scrap and other clutter on stairs.			
Training cover the dangers of no handrail or the failure to use handrails and of carrying loads you can't see over on stairs.			
Training include explanation of contractor rules and OSHA regulations.			
The contractor have a tool box training program covering stairs and stair wells to supplement other training.			
The contractor post signs and posters stating housekeeping rules around worksites.			

HAMMERS & MALLETS

	Yes	No	
Planning			
The contractor provide a variety of hammers and mallets so that the the right hammer can be selected for each job.			
Curved claw hammers for general carpentry.			
Ripping claws for rough work and dismantling.			
Ball peen hammers for metal work.			
Sharp edged cross peen or straight peen hammers for shaping.			
Tack hammers for tacking.			
Mallets, either wood, plastic or rubber, to drive chisels or shape metal.			
Sledge hammers, usually weighing 2 to 20 pounds, for heavy work.			
Non-sparking hammers for work done in the presence of flammable materials or explosive dusts and vapors.			
Steel or fiber glass handles on hammers used in excessive heat or humidity.			
The contractor has a tool inspection/cleanup and repair/replacement program to keep hammers in good condition.			
The contractor assigns a competent person, or foreman, to periodically inspect hammers for damage and defects and have them repaired or replaced.			
The contractor's program makes sure handles tightly fitted and free of splitting or cracking.			
The contractor requires that large nails or spikes are pulled with nail pulling wrecking bars instead of claw hammers.			
SAFETY PROGRAM			
The safety control program includes policies and procedures covering the safe use of hammers and mallets.			
The contractors safety policies are clearly stated and communicated.			
The contractor has a program to inspect hand tools, including hammers and mallets for wear.			
The contractor removes damaged hammers from service and repair or replace them.			
On-The-Job			
The laborer uses the right hammer for the job.			
The hammer or mallet used by the laborer is in good condition.			
The handle of the hammer or mallet used by the laborer is securely attached to the head and free of splitting or cracking.			

HAMMERS & MALLETS (continued)

	Yes	No	
The laborer keeps his eyes on his work.			
The laborer strikes the object squarely.			
The laborer uses nail pulling wrecking bars instead of claw hammers to pull large nails or spikes.			
Laborers use holding tongs for two-person sledge work.			
The laborer wears protective goggles for high impact work that may cause chipping.			
The laborer inspects hammers periodically for wear and damage.			
The laborer keeps hammers clean and free of dirt or corrosion.			
Training			
The contractor trains laborers in safe use of hammers and mallets.			
Training include information about types of hammers and mallets and their uses.			
The contractor's training program include training in how to inspect hammers and mallets for defects.			
Training includes explanation of contractor rules and OSHA regulations.			

JACKHAMMERS & PAVEMENT BREAKERS

	Yes	No	
Planning			
The contractor provides jackhammers and pavement breakers that produce the lowest possible vibration.			
Whenever possible, the contractor installs vibration-damping material in the handles of the jackhammers and pavement breakers.			
The contractor provides medical monitoring, especially frequent hearing tests, for laborers regularly using jackhammers and pavement breakers to identify at-risk laborers.			
The contractor's safety policy encourages jackhammer or pavement breaker operators to report, without repercussion, injuries or hearing loss problems.			
SAFETY PROGRAM			
The contractor clearly states and communicates safety policies and rules regarding jackhammer and pavement breaker operation in writing, at safety meetings at tool box meetings and during training.			
The contractor allows frequent rest breaks for jackhammer or pavement breaker operators.			
The contractor practices job rotation for jackhammer or pavement breaker operators to reduce noise and vibration exposure.			
The contractor keeps jackhammers and pavement breakers well-tuned and properly maintained.			
The contractor provides and requires use of personal protective equipment for jackhammer or pavement breaking operations.			
The contractor keeps air compressors in good working order.			
On-The-Job			
The laborer inspects the jackhammer or pavement breaker before each use.			
The laborer insures all parts are in good working order.			
The laborer checks the coupling between the air hose and jackhammer or pavement breaker to make sure it is secure.			
If more than one hose is used, The laborer chains them together with safety wires between coupling holes, or with an automatic locking connector.			
The laborer wears proper PPE, such as ear plugs, goggles, gloves, non-slip safety shoes and a hard hat to prevent flying debris from injuring the eyes, hands, feet or head.			
The operator runs the jackhammer or pavement breaker only when the work surface is contacted.			
The operator works with the fewest number of movements toward a point of give.			
The operator uses just enough pressure to hold the jackhammer or pavement breaker steady, not riding the tool.			
Does the jackhammer or pavement breaker operator takes frequent rest breaks.			

JACKHAMMERS & PAVEMENT BREAKERS (continued)

	Yes	No	
Training			
The contractor trains laborers in safe operations of jackhammers and pavement breakers.			
Training includes information about noise and vibration and their effects on the body.			
Training includes how to recognize symptoms of excessive noise and vibration and what to do to alleviate the problem.			
Training covers hearing loss and hearing loss prevention.			
The training program cover the safe use of jackhammers and pavement breakers.			
Laborers are required to demonstrate a minimum level of proficiency in operating jackhammers or pavement breakers before they do so on the job.			
Training includes explanation of contractor rules and OSHA regulations.			

LADDERS

	Yes	No	
Plannning			
The contractor provides ladders of varying types and sizes, to ensure that the right ladder is available for every job.			
The contractor uses only ladders which meet applicable ANSI standards.			
The contractor uses only ladders in good repair.			
Non-slip ladder steps in good repair, not broken, cracked, loose or missing.			
Non-slip ladder steps clean and free of wet, oily or greasy substances.			
Non-slip ladder steps attached solidly to the side rails.			
Joints between the non-slip ladder steps and side rails tight.			
Side rails firmly attached to the non-slip ladder steps.			
Side rails free of damage or cracks.			
Extension locks not missing, broken or loose.			
Locks and other movable parts move, without binding or excess play.			
The contractor keeps metal ladders free of corrosion.			
The contractor makes sure metal ladders are marked that they are metal and conduct electricity.			
The contractor keeps wood ladders unpainted, so as to reveal cracks and defects.			
The contractor uses only ladders with non-skid rubber feet (safety shoes).			
The contractor prohibits laborers from working on ladders during stormy or high wind conditions.			
SAFETY PROGRAM			
The contractor clearly states and communicates safety control policies and rules regarding ladders in writing, in safety meetings, in tool box meeting and during training.			
The contractor assigns a competent person or a foreman to inspect ladders for damage, deterioration or corrosion daily.			
The contractor requires that ladders are inspected before reuse if dropped or otherwise damaged while in use.			
The contractor tags and removes from the workplace any defective ladders for repair or, if not salvageable, for destruction.			
The contractor provides mats or sawdust boxes for laborers to clean shoes before using ladders.			
The contractor installs guards or barricades around any ladder used near foot or vehicle traffic.			
If a ladder must be placed in front of a door or passage, the contractor requires that the door is locked or the passage barricaded.			

LADDERS (continued)

	Yes	No	
The contractor keeps accurate records on ladder accidents and injuries.			
The contractor shares accident information with other industry leaders.			
On-The-Job			
The laborer inspects the ladder for defects before use.			
The laborer uses the right type of ladder for each job and uses it in the proper manner.			
The laborer selects for use ladders that extend the proper distance above the top level.			
5 feet overlap if the ladder extends 48 to 60 feet.			
4 feet overlap if the ladder extends 36 to 48 feet.			
3 feet overlap if the ladder extends under 36 feet.			
Extension ladders over 60 feet cannot be used.			
The laborer sets the ladder base at a distance from the structure equal to about 1\4 of the ladder's height to its top resting place.			
The laborer sets up the ladder on a firm level surface -- not on boxes, barrels, scaffold platforms, blocks or soft soil.			
The laborer braces or stakes the feet of the ladder to prevent slipping.			
The laborer lashes off or ties off the ladder at the top whenever feasible.			
If a ladder cannot be tied off at top or braced with stakes at the feet, a second laborer steadies the base whenever a laborer is on the ladder.			
The laborer uses guards or barricades around any ladder near foot or vehicle traffic.			
The laborer keeps the area surrounding the top and bottom of the ladder clear.			
If the ladder is placed in front of a door or passage, the laborer makes sure the door is locked or the passage barricaded.			
The laborer keeps metal ladders away from electrical equipment or energized lines.			
The laborer keeps hands clean of grease, oil and other slippery substances.			
The laborer uses both hands for climbing ladders.			
The laborer wears clean, slip-resistant shoes.			
The laborer cleans wet, greasy or oily shoes before climbing a ladder.			
The laborer avoids climbing ladders while carrying tools and materials.			
The laborer uses lifts or hoists for heavy equipment or materials.			
The laborer works below the top rung.			

LADDERS (continued)

	Yes	No	
The laborer avoids overreaching, so as not to lose balance.			
If a step ladder is used, the laborer is never higher than the second step from the top.			
The laborer opens out step ladders fully.			
The laborer climbs the front section of a stepladder, not the back section.			
Laborers do not work on scaffolds during stormy or high wind conditions.			
TRAINING			
The contractor trains laborers to inspect, place and safely use ladders provided to them.			
Laborers are trained to identify the key attributes of a safe ladder.			
Laborers assigned to work at heights are trained in the proper use of ladders.			
Training includes how to ascend and descend a ladder and how to use a hoist or lift to carry tools or materials.			
Laborers are trained not to use metal ladders around electrical equipment or energized lines.			
Training includes explanation of contractor rules and OSHA regulations.			
Laborers are given an opportunity for "hands-on" training before going into the field.			
Laborers assigned to work at elevated heights are tested at graduated height levels.			
The contractor provides an annual refresher training course for laborers assigned to work on ladders.			
The contractor has a tool box training program on ladder safety to supplement other training.			

POWER DRILLS

	Yes	No	
Planning			
The contractor provides only power drills which are grounded or double-insulated.			
Grounding is done by one of these two methods. 1) electricity- conducting wires enclosed in a cable or cord that ends in an approved three-prong grounding contact. 2) electricity- conducting wires enclosed in a metal case with a special grounding attachment.			
The contractor requires that the sequence of connection from the drill to the extension cord to the power source is grounded.			
The contrator requires and provides only power cords and extension cords in good condition - not frayed or cut.			
The contractor uses only three prong twist lock connectors if more than a single extension cord is used to make connections to a power source.			
The contractor provides drills that have a constant pressure switch control or a lock-on control that turns off by a single motion of the same fingers that turn it on.			
The contractor uses ground-fault circuit interrupters (GFCI) for additional worker protection where available.			
The contractor periodically checks all electrical tools for ground continuity.			
The contractor requires use of protective goggles if the danger of flying particles exists.			
The contractor uses and enforces a "tag out" system for removing defective tools from the jobsite.			
Safety Program			
The contractor has clearly stated and communicated safety policies and rules regarding power drill operations.			
The contractor requires laborers using power drill to wear short sleeves or long sleeves buttoled at the wrist.			
The contractor prohibits laborers to use electric tools in or near wet areas.			
On-The-Job			
The laborer make a pilot hole or prick punch for the drill point to prevent the drill from slipping.			
The laborer selects the correct drill bit for the material being drilled.			
If the drill bit can pass through the material being drilled, the laborer takes precautions against damage or injury to people or materials on the other side.			
The laborer wears short sleeves or long sleeves buttoned at the wrist, no loose clothing which can catch in the drill.			
The laborer pulls back long hair and removes loose jewelry.			
The laborer secures small pieces to prevent "spinning" by the drill.			

POWER DRILLS

	Yes	No	
The laborer keeps all electrical cords out of traffic areas and away from corrosive chemicals and hot surfaces.			
The laborer does drilling in a dry area, away from puddles or wet spots.			
The laborer wears protective goggles if the danger of flying particles exists.			
Training			
The contractor provide training for laborers on safe power drill operation.			
Training includes how to guard against electrocution while using power drills.			
Training includes proper attire for drilling operations and...			

POWER SAWS

	Yes	No	
Planning			
Power saws should be appropriate for the job, in good condition, properly guarded and up to safety standards. The individual responsible for assigning work with power saws must check for the following:			
The contractor uses only power saws which have permenent guards affixed, have deadman on-off switches and are grounded or double insulated.			
Grounding is done by one of these two methods. 1) electricity- conducting wires enclosed in a cable or cord that ends in an approved three-prong grounding contact. 2) electricity- conducting wires enclosed in a metal case with a special grounding attachment.			
Is the sequence of connection from the saw to the extension cord to the power source grounded.			
The contractor assigns a competent person to inspect power saws before use for signs of wear or damage.			
The contractor checks saw blades regularly to make sure they are sharp, straight and true and otherwise undamaged.			
The contractor provides the correct blades for the material being cut. Check the manufacturer's recommendations.			
Is all visible wiring, such as power cords and extension cords, in good condition - not frayed or cut.			
The contracotr requires the use of lockout tags when the saws are not operating properly.			
The contractor replaces or repairs all worn or damaged equipment immediately.			
The contractor regularly cleans, tests and inspects saws.			
The contractor assigns face shields, safety glasses and ear muffs or plugs to all laborers using power saws.			
The contractor uses only portable hand saws equipped with a fixed guard over the upper half of the blade and a movable guard covering the lower half of the blade.			
The contractor uses only table and bench saws with complete blade guards, splitter and non-kick-back attachments.			
The contractor assigns a competent person or foreman to make sure attachments operate freely.			
The contractor uses only swing cut-off saws that have the upper half of the saw completely covered; have a device provided to return the saw automatically to the back of the table when released and have a limit chain or other stopping device provided to prevent the saw from swinging beyond the front edge of the table (If counterweights are used with swing cut-off saws, are they secured with chains or are they cable-fastened to the counterweights and enclosed).			
If the contractor allows a swing cut-off saw to be used for ripping, it is equipped with an anti-kick-back attachment adjusted for the thickness of the lumber being cut.			
The contractor supplies only horizontal pull saws which are guarded on the upper half of the blade and have limit stops provided.			
The contractor provides extension tables provided for radial and table saws.			

POWER SAWS (continued)

	Yes	No	
The contractor provides along fence with a conventional table saw.			
The contractor assigns a helper to assist in handling long stock.			
SAFETY PROGRAM			
The contractor's safety control policies and rules regarding operation and use of power saws are clearly stated and communicated.			
The contractor keeps accurate records of the causes of injuries and uses the information to change work practices and improve training.			
The contractor implements engineering and design controls to improve safety whenever feasible.			
The contractor analyzes jobs involving power saws to determine the steps required to do the job without causing injury.			
The contractor hires only laborers for jobs involving power saws who are physically suited for the work.			
On-The-Job			
The laborer inspects the saw before using it.			
The labor understands why guards important.			
The labor does not believe it is acceptable to operate a power saw without guards.			
The laborer turns off saws when not in use.			
The laborer operates saws only with safety guards in place and operating properly.			
The laborer secures any small pieces being cut by bench clamps or other means.			
The laborer cuts green or wet material slowly and with extra caution.			
The laborer checks material being cut for nails, hard knots and other obstructions.			
If a table or bench saw is used, the laborer keeps the table and surrounding area clean and free of debris.			
If short stock is being ripped, the laborer uses a "pusher" stick.			
The laborer holds pieces being cut on a table saw firmly against the back guide or fence.			
The laborer eases the saw into the work. It is not jammed or crowded.			
The laborer cuts all material in a single steady pass, without stopping before the cut is completed.			
If a warped board is cut the laborer makes sure it is touching the table too at the line of cut.			
The laborer always wears the proper personal protective equipment. For example, gloves, safety glasses with side shields, a kickback apron and hearing protection.			

POWER SAWS (continued)

	Yes	No	
Training			
Training in power saw use include reasons why guards are needed.			
Training include how to select and install the proper guards.			
Training include use of proper PPE. Safety glasses or face shield. Ear muffs or plugs. Kickback apron.			
The labor-management training program cover the safe use of power saws.			
Laborers are expected to demonstrate a minimum level of proficiency in the operation of a power saw before being allowed to work alone.			

SCAFFOLDS (continued)

	Yes	No	
The contractor makes sure locking pins or other locking devices on built-up scaffolds are in good condition and installed properly.			
The contractor plumbs each level of built-up scaffolding.			
The contractor anchors built-up scaffolds at least every 25 feet of height and length.			
The contractor requires each scaffold frame braced to at least one other frame.			
The contractor requires wheels on rolling scaffolds to be locked before work begins and riding rolling scaffolds is prohibited.			
The contractor requires all scaffolds erected on level and stable ground.			
The contractor requires suspended scaffolds or swing stages to be properly rigged, tied and anchored to prevent swaying.			
The contractor requires life lines affixed overhead to a permanent part of the structure or building – not to the scaffold.			
The contractor attaches scaffolds, swing stages or rigging to stable parts of a building (not to pipes, drains, awnings and so on).			
The contractor provides only ropes and cables in good condition, free of damage, abrasion, kinks and so on.			
The contractor removes from service scaffold or swing stage materials that are damaged, corroded, warped or cracked.			
HOUSEKEEPING			
Contractor rules emphasize the consequences of leaving tools, equipment, scrap, personal belongings and other clutter on scaffold platforms.			
Contractor housekeeping policies include rules for cleaning up spills, grease and other slippery conditions on scaffolds.			
Contractor rules cover procedures concerning ice and snow removal on scaffold platforms.			
RECORDKEEPING			
12. The contractor maintains and reviews records of the causes and costs of falls from scaffolds and incorporates results in planning and training programs.			
13. The contractor shares accident information with other leaders.			
SCAFFOLD MATERIALS			
The contractor assigns a competent person or foreman to ensure scaffolds are constructed of sound materials that meet OSHA requirements.			
CHECKLIST			
The contractor makes sure all steel materials used in scaffolds are free of rust, corrosion, warps, or kinks.			

SERVICING EQUIPMENT

	Yes	No	
Planning			
The contractor requires lockout tags used when equipment is being repaired or serviced.			
The contractor keeps the maintenance shop off-limits to unauthorized personnel.			
The contractor keeps a realistic maintenance schedule to assure work is not haphazardly done.			
The contractor requires that equipment be tested before being sent back to the work site.			
DESIGN AND ENGINEERING			
The contractor makes safety a prime consideration in the design and planning of maintenance areas.			
The contractor arranges for maintenance work to be performed away from normal traffic patterns.			
The contractor has made provisions for fire protection and prevention.			
The contractor properly stores and labels hazardous materials used in maintenance and repair work.			
The contractor provides adequate ventilation to and from the maintenance area.			
The contractor requires personal protective equipment be available and used as appropriate during maintenance work. PPE would include safety goggles, face shields, gloves, safety shoes, chemical resistant aprons, dusk masts and possibly respirators if hazardous gases or vapors are emitted.			
The contractor requires that the maintenance area be kept brightly lit.			
RECORDS/WRITTEN MATERIALS			
The contractor keeps all operator handbooks, maintenance manuals and service bulletins from the manufacturer readily available.			
The contractor requires maintenance reports generated for review and evaluates them to establish repair and breakdown trends in equipment.			
The contractor keeps maintenance records on each machine or piece of equipment serviced.			
The contractor employs only maintenance personnel fully qualified for the work they perform.			
The contractor defines maintenance responsibilities and assigns them to the most qualified personnel.			
Training			
The contractor is committed to employing a highly trained, well-qualified maintenance staff.			
The contractor holds regular safety meetings for maintenance personnel.			
The contractor has a HazCom Program in place in the maintenance area which includes a written program, product labeling, worker training and MSDS's readily available.			
The contractor sends maintenance personnel for training from the manufacturer or dealer when it is offered.			

SHOVELS, SPADES AND PICKS

	Yes	No	
Planning			
The contractor provide shovels, spades and picks that are in good condition. Handles are free of splinter, splits, and cracks and are securely attached to the blades.			
The contractor keeps blades or heads properly dressed -- sharp and free of jagged and split edges.			
Safety Program			
The contractor's safety control program include policies and procedures covering shovels, spades and picks.			
The contractor's policies are clearly stated in writing and communicated.			
The contractor inspects of all shovels, spades and picks before use.			
The contractor immediately removes damaged shovels, spades or picks from service.			
The contractor promptly replaces or repairs damaged shovels, spades and picks.			
The contractor have an effective "tag out" system for damaged tools.			
On-The-Job			
The laborer inspects all shovels, spades and picks before use.			
When the laborer uses a pick, he makes sure no one is too close to him.			
If a shovel, spade or pick becomes damaged while in use, the laborer stops and gets an undamaged tool.			
When the shovel, spade or pick is not in use, the laborer keeps it picked up so it cannot be stepped on or tripped over.			
Laborers wear non-skid, steel-toed safety shoes.			
Training Program			
The contractor trains laborers in safe use of shovels, spades and picks.			
The contractor trains laborers to keep work areas clear before using a tool that involves swinging movements.			

SCAFFOLDS (continued)

	Yes	No	
The contractor makes sure locking pins or other locking devices on built-up scaffolds are in good condition and installed properly.			
The contractor plumbs each level of built-up scaffolding.			
The contractor anchors built-up scaffolds at least every 25 feet of height and length.			
The contractor requires each scaffold frame braced to at least one other frame.			
The contractor requires wheels on rolling scaffolds to be locked before work begins and riding rolling scaffolds is prohibited.			
The contractor requires all scaffolds erected on level and stable ground.			
The contractor requires suspended scaffolds or swing stages to be properly rigged, tied and anchored to prevent swaying.			
The contractor requires life lines affixed overhead to a permanent part of the structure or building – not to the scaffold.			
The contractor attaches scaffolds, swing stages or rigging to stable parts of a building (not to pipes, drains, awnings and so on).			
The contractor provides only ropes and cables in good condition, free of damage, abrasion, kinks and so on.			
The contractor removes from service scaffold or swing stage materials that are damaged, corroded, warped or cracked.			
HOUSEKEEPING			
Contractor rules emphasize the consequences of leaving tools, equipment, scrap, personal belongings and other clutter on scaffold platforms.			
Contractor housekeeping policies include rules for cleaning up spills, grease and other slippery conditions on scaffolds.			
Contractor rules cover procedures concerning ice and snow removal on scaffold platforms.			
RECORDKEEPING			
12. The contractor maintains and reviews records of the causes and costs of falls from scaffolds and incorporates results in planning and training programs.			
13. The contractor shares accident information with other leaders.			
SCAFFOLD MATERIALS			
The contractor assigns a competent person or foreman to ensure scaffolds are constructed of sound materials that meet OSHA requirements.			
CHECKLIST			
The contractor makes sure all steel materials used in scaffolds are free of rust, corrosion, warps, or kinks.			

SCAFFOLDS (continued)

	Yes	No	
The contractor makes sure that all wood materials used in scaffolds are seasoned, straight-grained, free of large loose or dead knots, splits and other defects.			
The contractor makes sure that casters are the correct size on rolling scaffolds.			
The contractor makes sure overhead protection is in place if work goes on above.			
The contractor prohibits laborers from working on scaffolds in stormy or high wind conditions.			
Safety Program			
The contractor maintains accurate records of causes of injuries involving scaffolds and incorporate this information into jobsite design and training programs.			
On-the-Job			
1. Laborers on scaffolds or swing stages keep work within a comfortable arm's length to avoid overreaching.			
2. Laborers avoid use of makeshift work platforms, such as crates, boxes and barrels.			
1. Laborers refrain from carrying heavy tools or other objects while ascending or descending scaffolds.			
4. Laborers refrain from climbing scaffold ladders one-handed.			
5. Laborers face scaffold ladders when ascending or descending.			
7. Laborers hoist their tools and equipment rather than carry them while climbing up a scaffold.			
Only two or fewer laborers are on a swing stage at the same time, unless specifically designed to hold more by qualified engineer.			
Laborers on suspended scaffolds or swing stages wear proper safety belts and lifelines.			
8. Laborers always use safety equipment, such as safety belts and lifelines on swing stage or suspended platform scaffolds.			
9. Laborers clean up known slippery surfaces caused by spills.			
10. Laborers keep scaffolds or swing stage platforms free of clutter.			
11. Laborers check scaffolds and swing stages before each use.			
12. All laborers wear non-slip workshoes.			
13. Laborers keep safety shoes free of mud or grease.			
14. Laborers know rules for safe use scaffolds (ask them to explain them to you).			
Laborers do not work on scaffolds during stormy or high wind conditions.			
15. Laborers refrain from working on scaffolds while intoxicated or under the influence.			
Laborers do not ride rolling scaffolds when they are moved.			

SCAFFOLDS (continued)

	Yes	No	
Laborers always lock casters on rolling scaffolds before mounting them.			
Are scaffolds protected from trucks and other vehicles.			
Training			
Laborers erecting scaffolds are trained to do so.			
Laborers rigging and tying scaffolds are trained to do so.			
Laborers are trained in proper use of scaffolds.			
Laborers are trained to maintain good housekeeping.			
Laborers are trained in what protective equipment to use for work on scaffolds.			
Laborers are trained to identify the key components of a safe scaffold.			
Training includes explanation of contractor rules and OSHA regulations.			
The contractor has a tool box training program covering work on scaffolds to supplement other training.			
Laborers assigned to work on scaffolds are tested at graduated height levels.			
The contractor provides an annual refresher course on scaffolds for those laborers who frequently work on them.			
The contractor has a certification program for laborers charged with erecting and rigging scaffold.			

SERVICING EQUIPMENT

	Yes	No	
Planning			
The contractor requires lockout tags used when equipment is being repaired or serviced.			
The contractor keeps the maintenance shop off-limits to unauthorized personnel.			
The contractor keeps a realistic maintenance schedule to assure work is not haphazardly done.			
The contractor requires that equipment be tested before being sent back to the work site.			
DESIGN AND ENGINEERING			
The contractor makes safety a prime consideration in the design and planning of maintenance areas.			
The contractor arranges for maintenance work to be performed away from normal traffic patterns.			
The contractor has made provisions for fire protection and prevention.			
The contractor properly stores and labels hazardous materials used in maintenance and repair work.			
The contractor provides adequate ventilation to and from the maintenance area.			
The contractor requires personal protective equipment be available and used as appropriate during maintenance work. PPE would include safety goggles, face shields, gloves, safety shoes, chemical resistant aprons, dusk masts and possibly respirators if hazardous gases or vapors are emitted.			
The contractor requires that the maintenance area be kept brightly lit.			
RECORDS/WRITTEN MATERIALS			
The contractor keeps all operator handbooks, maintenance manuals and service bulletins from the manufacturer readily available.			
The contractor requires maintenance reports generated for review and evaluates them to establish repair and breakdown trends in equipment.			
The contractor keeps maintenance records on each machine or piece of equipment serviced.			
The contractor employs only maintenance personnel fully qualified for the work they perform.			
The contractor defines maintenance responsibilities and assigns them to the most qualified personnel.			
Training			
The contractor is committed to employing a highly trained, well-qualified maintenance staff.			
The contractor holds regular safety meetings for maintenance personnel.			
The contractor has a HazCom Program in place in the maintenance area which includes a written program, product labeling, worker training and MSDS's readily available.			
The contractor sends maintenance personnel for training from the manufacturer or dealer when it is offered.			

SHOVELS, SPADES AND PICKS

	Yes	No	
Planning			
The contractor provide shovels, spades and picks that are in good condition. Handles are free of splinter, splits, and cracks and are securely attached to the blades.			
The contractor keeps blades or heads properly dressed – sharp and free of jagged and split edges.			
Safety Program			
The contractor's safety control program include policies and procedures covering shovels, spades and picks.			
The contractor's policies are clearly stated in writing and communicated.			
The contractor inspects of all shovels, spades and picks before use.			
The contractor immediately removes damaged shovels, spades or picks from service.			
The contractor promptly replaces or repairs damaged shovels, spades and picks.			
The contractor have an effective "tag out" system for damaged tools.			
On-The-Job			
The laborer inspects all shovels, spades and picks before use.			
When the laborer uses a pick, he makes sure no one is too close to him.			
If a shovel, spade or pick becomes damaged while in use, the laborer stops and gets an undamaged tool.			
When the shovel, spade or pick is not in use, the laborer keeps it picked up so it cannot be stepped on or tripped over.			
Laborers wear non-skid, steel-toed safety shoes.			
Training Program			
The contractor trains laborers in safe use of shovels, spades and picks.			
The contractor trains laborers to keep work areas clear before using a tool that involves swinging movements.			

SCAFFOLDS

	Yes	No	
Planning			
The contractor has clearly stated employer rules and regulations for use of scaffolds and enforces them.			
The contractor requires that all scaffolds be erected with proper materials and used in accordance with OSHA requirements and manufacturer's recommendations.			
The contractor allows only competent and experienced laborers to erect or rig scaffolding or swing stages.			
The contractor keeps scaffolds free of tripping hazards such as tools, equipment, litter, personal belongings.			
The contractor keeps scaffolds free of slipping hazards such as spills, oil, grease, ice and snow.			
The contractor prohibits use of crates, boxes or barrels as makeshift scaffolds.			
The contractor arranges to supply the right scaffold for each job.			
The contractor sets up hoisting equipment to lift tools and other equipment onto scaffolds where feasible.			
The contractor sets up or repositions scaffolds to avoid making laborers overreach.			
The contractor assigns an engineer or competent person daily responsibility for checking scaffolds.			
The contractor assigns an engineer or competent person responsibility for inspecting scaffolds, at least daily.			
4. The contractor assigns one person, a competent person or foreman, to monitor and enforce the safe erection, use and maintenance of scaffolds or swing stages.			
The contractor requires laborers working on scaffolds to wear non-slip safety shoes at all times.			
The contractor assigns work on scaffolds only to laborers trained and tested to do it.			
The contractor prevents laborers not wearing the proper safety shoes from working scaffolds.			
During stormy or high wind conditions the contractor prohibits laborers from working on scaffolds.			
The contractor clearly communicates rules and regulations regarding work on scaffolds in writing, in safety meetings, in tool box meetings and during training.			
The contractor post signs and posters stating rules and regulations concerning work on scaffolds.			
CHECKLIST-WORK EQUIPMENT			
The contractor requires all open ends of scaffolds and work platforms to be protected by guardrails, midrails and toeboards.			
The contractor uses only scaffolds or stages constructed of sound materials – free of splits, cracks, warping, rust, corrosion, and other defects.			
The contractor braces overlapping scaffold planking from below.			

EYE

	Yes	No	
Planning			
The contractor has an eye protection program.			
The contractor enforces the eye protection program.			
The contractor provides proper eye protection to laborers which meets requirements of OSHA regulation 29 CFR 1926.101.			
Proper eye protection is maintained by assigned personnel.			
The contractor provides eye protection in good condition. Lenses clear, unscratched and free from dirt or residue. Frames clean and free from dirt or residue. And all straps, connectors, bows or other parts of the eye protection in good repair.			
The contractor promptly repairs or replaces eye protection when lenses become damaged or scratched or when straps, bows or other parts of the eye protection become damaged.			
The contractor knows which eye protection is appropriate for the various jobs laborers perform.			
The contractor equips all safety glasses with sideshields.			
The contractor requires safety glasses with sideshields to always be worn under face shields.			
The contractor ensures that eye protection gear is available and distributed before work operations begin.			
The contractor has special provisions for dealing with laborers who wear glasses for vision correction.			
The contractor makes sure eye protection given to those laborers requiring vision correction either:			
1) fits comfortably over regular glasses without disturbing the adjustment of the glasses, or			
2) incorporates corrective lenses mounted behind the protective lenses of safety glasses or goggles.			
The contractor uses engineering controls (such as guards on tools) to control flyaway particles that injure eyes whenever feasible. The contractor enforces strict rules regarding use of guards on power tools.			
On-the-Job			
Laborers wear eye protection on their eyes, not around their necks or on top of their hard hats.			
The laborers' eye protection is in good condition. Lenses clear, unscratched and free from dirt or residue. Frames clean and free from dirt or residue. And all straps, connectors, bows or other parts of the eye protection in good repair.			
The laborers' eye protection fit snugly.			
The laborers' eye protection does not unduly interfere with work operations or movement.			
The laborers' eye protection is comfortable, durable, clean and in good repair as required by OSHA.			
Laborers using corrosive and toxic cleaning products wear chemical splash goggles.			

EYE (continued)

	Yes	No	
Laborers handling, transferring, pouring or using chemicals wear chemical splash goggles.			
Laborers performing acetylene-burning, cutting or welding operations wear approved welding goggles with tinted safety lenses.			
Laborers performing arc welding operations wear either welding goggles with tinted lenses or welding helmets over safety glasses with tinted lenses and sideshields.			
Laborers operating power saws, grinders and sanders wear either approved safety glasses with sideshields or safety goggles.			
Laborers use only power saws, grinders and sanders which have guards in place.			
Laborers working in close vicinity to other laborers operating power saws, grinders and sanders wear either safety glasses with sideshields or safety goggles.			
Laborers wear eye protection that meets requirements of OSHA regulation 29 CFR 1926.101.			
Laborers know which eye protection is appropriate for the various jobs they perform.			
Laborers do not throw or toss tools or materials to each other.			
Training			
The contractor trains laborers to understand the consequences of work-related eye injuries.			
The contractor trains laborers to know the proper type of eye protection required for various work operations and how to use the protective eye wear correctly.			
Laborers are trained in proper use of the eye protection provided them.			
The contractor use teaching aids such as wall charts and posters illustrating proper eye protection reinforce training.			
The contractor use signs and posters to list eye protection required for various operations.			

FACE

	Yes	No	
Planning			
The contractor keeps face shields in good repair: lenses clear and unscratched, head bands clean and attached to face shields.			
The contractor uses only tools and machines with required guards.			
The contractor has a method to make sure face shields are provided to laborers using power tools, machinery or chemical-containing products that present a splashing hazard and that the laborers wear the equipment.			
The contractor ensures that only trained, experienced laborers operate machines and power tools.			
The contractor uses only machines and tools equipped with guards.			
The contractor periodically examines, tests, cleans and overhauls all power tools and machines.			
The contractor tags out and removes from service any tools and equipment missing guards.			
The contractor examines and dresses, sharpens or replaces cutting edges or blades for all power and hand tools dressed, sharpened or replaced prior to use.			
The contractor makes face shields available for laborers assigned to jobs that may expose them to flying particles, sparks or chemical splashes.			
The contractor makes welding goggles and/or hoods available to laborers assigned to welding work.			
The contractor provides sun visors to laborers working for extended periods out of doors to prevent harmful effects from overexposure to the sun.			
The contractor keeps face shields, welding goggles and/or hoods and sun visors in stock and readily available.			
The contractor keeps face shields, welding goggles and/or hoods and sun visors clean and in good repair.			
SAFETY PROGRAM			
The contractor has strict rules regarding the use of power tools, machines and equipment.			
The contractor restricts the use of power tools, machines and equipment to trained and experienced laborers.			
The contractor has a certification program for use of heavy tools and machinery.			
The contractor's rules for face protection are clear and in writing and constantly remind laborers of the rules.			
On-the-Job			
Laborers assigned to work with machinery and power tools are trained and experienced in their operation.			
Laborers using machines, power tools and chemical-containing products wear face shields.			

FACE (continued)

	Yes	No	
Laborers use only machines and tools equipped with guards. Laborers operate equipment with guards in place and with face protection.			
Power tool operators are free of the influence of alcohol or drugs.			
Laborers working with machines and power tools handle the equipment in a safe and experienced manner.			
Laborers only use machines and tools equipped with guards.			
Laborers do not throw or toss tools or materials to each other.			
Training			
The contractor instructs laborers about the potential for and consequences of occupational face injuries.			
The contractor trains laborers to identify and use the proper face protection for cutting, grinding, welding and other common operations.			
Training include use of tools and machinery, identification of proper guarding and how to wear face protection correctly.			

FOOT

	Yes	No	
Planning			
The contractor purchases or pays for some part of the cost for safety shoes for laborers.			
The contractor requires that all safety shoes meet ANSI standards.			
The contractor requires that the inner sole of safety shoes protect from penetration of sharp objects as well as against penetration of water, oil, solvents and heat.			
The contractor requires that all safety shoe soles are non-slip or non-skid.			
The contractor requires laborers working in street shoes or unapproved, below-standard safety shoes, to leave the job until proper footwear is obtained.			
The contractor have a system to enforce clean-up of walking/working surfaces.			
The contractor keeps the work area free of broken glass and other sharp objects.			
The contractor keeps the jobsite kept clean, free of tripping hazards.			
The contractor requires snow removal and salts or melts down icy areas.			
The contractor requires whenever feasible that loads are transported via dolly, forklift or other moving equipment.			
Safety Program			
The contractor has a strict and specific safety shoe requirement.			
The contractor specifically states the minimum acceptable safety shoe impact and compression resistance rating in accordance with the ANSI standard.			
The contractor clearly communicates in writing and in orientation of new laborers the safety shoe policy.			
The contractor regularly reminds laborers about housekeeping on the job.			
On-the-Job			
Laborers wear approved non-slip or skid, safety-toe shoes or boots at all times.			
Laborers understand safety shoe/boot ratings and standards.			
Laborers moving materials pay careful attention to what they're doing or where they're going.			
Laborers keep tools or other objects off of walking/working surfaces.			
Laborers' boots or shoes are tied to prevent tripping.			
Laborers working at heights keep tools and other items away from edges.			
Laborers working at heights use tools and equipment properly and alertly.			
Laborers keep up housekeeping as they work.			

FOOT

	Yes	No	
Laborers clean up spills and other slippery conditions immediately.			
Laborers operating forklifts, pulling dollevs or carrying loads watch where they're going.			
Training			
laborers' training includes information about the incidence of occupational foot injuries and the importance of protective footwear.			
Training includes explanations of safety shoe impact and compression resistance ratings.			
The training program and policy stress housekeeping. Are housekeeping rules clearly posted.			

HEAD

	Yes	No	
Planning			
The contractor enforces hard hat rules.			
The contractor provides laborers with quality hard hats that meet ANSI standards for impact and compression resistance.			
The contractor provides adjustable hard hats so laborers of all head sizes can wear them comfortably.			
The contractor makes every effort to arrange work so that laborers do not have others overhead.			
When work is done overhead, the contractor provides wire kick screens topside and the overhead area is clearly marked.			
The contractor uses florescent warnings to mark low beams or low ceilings or other hard to see hazards.			
The contractor requires that all working surfaces, ground level, scaffolds or other elevated platforms are kept free of clutter, spills, ice and other slippery conditions.			
The contractor requires workers to stay out of material hoist zones.			
The contractor arranges to direct moving vehicles carrying loads with protruding steel or wood beams around laborers working nearby.			
On-the-job			
Laborers perform jobs below other work on elevated surfaces.			
Laborers on scaffolds and other elevated platforms keep surfaces clean and orderly.			
Laborers near low beams or low ceilings attend to the physical limitations of the work area.			
Laborers carrying loads watch where they're going.			
Laborers working with hoists, ropes and other suspended objects handle them safely.			
Laborers secure hoists, ropes and other suspended objects from swinging so as to prevent being struck by fly away cable or hoist.			
Laborer do not toss objects from one worker to another.			
Training			
The contractor trains laborers about the consequences of occupational head injuries.			
Laborers are trained about the incidence of occupational head injuries and the importance of protective headwear.			
Laborers know why and when they must wear hard hats.			
Laborers understand hard hat ratings and what they mean in terms of protection.			

HEARING LOSS

	Yes	No	
Planning			
The contractor has identified areas or jobs where excessive noise is a problem.			
The contractor has a noise control program in place for laborers using or working near compressed air tools like pavement breakers, impact hammers and wrenches, sandblast or waterblast rigs or powder-actuated tools like nail guns; for laborers using or working near high speed tools include grinders, chippers, polishers and power saws; for workers using or laborers using or working near petrol-powered heavy equipment such as diesel engines, compressor engines or around other heavy mechanical equipment, such as lifts, conveyor belts or various mixers or separators.			
The contractor conducts periodic noise monitoring of work operations to evaluate the need for noise control.			
ENGINEERING CONTROLS			
The contractor keeps all noise producing equipment in good operating condition.			
The contractor keeps all noise-producing engines well-tuned.			
The contractor replaces immediately any worn parts, such as bearings, which create noise.			
The contractor uses muffling exhaust stacks on all diesel equipment.			
The contractor encloses all noise-producing equipment, such as air compressors, in sound/absorbing materials or set it up near work areas that help muffle or contain the sound as far from workers as possible.			
The contractor considers noise-reducing features when new equipment is purchased.			
The contractor uses barriers between the noise source and the laborers to limit the amount of noise reaching workers whenever possible.			
The contractor uses sound-absorbing materials, such as acoustical tiles, wherever possible.			
The contractor provides enclosed, sound-proof work stations, such as the cab on a tractor or crane, when practicable.			
ADMINISTRATIVE CONTROLS			
The contractor rotates laborers in and out of noisy jobs.			
The contractor provides frequent rest breaks away from excessive noise in a low noise area for workers exposed to high noise levels.			
The contractor organizes work so that laborers always work as far away as possible from the sources of noise.			
The contractor provides periodic audiometric tests to laborers to assure that the noise control program is actually protecting hearing.			
PERONAL PROTECTIVE EQUIPMENT			
The contractor provides earmuffs or plugs for laborers exposed to noise when other controls prove impracticable.			

HEARING LOSS (continued)

	Yes	No	
The contractor provides laborers with a choice of ear protection and explains how much each type cuts down on noise levels.			
Contractors, other leaders, wear ear protection when entering a noisy work area.			
On-the-job			
The laborer wears earmuffs or plugs when exposed to noise.			
The laborer rotates in and out of noisy jobs.			
The laborer takes frequent breaks away from noisy areas.			
The laborer has hearing checks each year.			
The laborers wear ear protection whenever the workplace noise level is high enough to require workers less than 10 feet away from each other to yell to be heard.			
Training			
The contractor educates workers about how hearing loss occurs and the importance of wearing hearing protectors to prevent it.			
The contractor trains laborers in noise exposure reduction techniques.			

HEALTH: EXPOSURE ROUTES

	Yes	No	
Planning			
The contractor tries to use non-toxic substitutes whenever possible.			
The contractor tries to use ventilation equipment, both general and local, in areas where toxic mists, gases, fumes or vapors can be released into the air.			
The contractor provides all necessary proper personal protective equipment, such as gloves, goggles, face shields or respirators for laborers to use.			
The contractor keeps all PPE in good condition and replaces it when necessary.			
The contractor consults an industrial hygienist if a particularly hazardous material is introduced.			
The contractor forbids eating, drinking or smoking in areas wheretoxic chemicals are present			
On-The-Job			
The laborer knows if he or she is exposed to hazardous chemical product, excessive dust or metal fume.			
The laborer knows if he is exposed to a hazardous chemical, fume or dust.			
The laborer knows which routes of exposure the substance he or she uses can take to enter the body.			
The laborer has checked the product label or the MSDS to see what the exposure routes are.			
Faced with an inhalation risk, the laborer utilizes ventilation, such as exhaust fans or hoses, when feasible.			
The laborer uses PPE to prevent hazardous exposure.			
Laborers do not eat, drink or smoke in areas where hazardous substances are used or stored.			
ABSORPTION			
Laborers know chemicals can pass through skin into the bloodstream.			
Laborers know chemical contact with exposed skin is the leading cause of dermatitis.			
Laborers avoid washing hands or face with solvents.			
Laborers work with solvents, acids, alkalines, corrosives or other chemicals only when wearing protective gloves or body coverings.			
Laborers know it's a myth that they're at risk only if their skin is cut.			
Laborers know washing hands at day's end is not enough to eliminate exposure risk.			
INHALATION			
Laborers know breathing airborne chemicals, fumes or dusts can damage lung tissue.			
Laborers know chemicals inhaled into the lungs pass easily into the bloodstream.			

HEALTH: EXPOSURE ROUTES (continued)

	Yes	No	
Laborers know how to use fans to reduce the airborne concentrations of hazardous vapors and dusts.			
Laborers receive physical evaluations to determine their ability to wear respirators.			
Laborers are fit-tested for the respirators they wear.			
Laborers know how to select, fit and maintain the respirators they wear.			
The respirator worn by the laborer is appropriate for the airborne contaminant.			
The contractor measures airborne concentrations of chemicals prior to selecting respirators for workers.			
INGESTION			
Laborers know toxic chemicals or dusts coughed up from lungs with mucous can be swallowed.			
Laborers know swallowed chemicals and dusts can pass into the bloodstream or cause intestinal diseases.			
Laborers know that prohibitions on eating, drinking and smoking on the jobsite help prevent ingestion of toxic materials.			
INJECTION			
Laborers know that if a sharp object, such as a nail or broken glass, penetrates the skin that contaminants on it can pass into the bloodstream.			
Laborers know the role of "good housekeeping" in preventing injection injury.			
Laborers know the role of protective equipment, such as safety shoes with steel sole plates or wire mesh or chrome leather gloves, in preventing injection injury.			
Training			
The contractor instructs laborers on how hazardous chemicals can enter their bodies.			
The contractor informs laborers of the steps to protect themselves from harmful exposures.			
The contractor's Hazard Communication Training Program includes training on routes of exposure.			
The contractor provides respirator training for all laborers required to wear respirators.			

HEALTH HAZARD COMMUNICATION

	Yes	No	
Planning			
The contractor has a written Hazard Communication Program to inform the laborers about the hazards of the chemicals they work with or could be exposed to.			
The contractor has a written program describing how the contractor meets the specific requirements of the Hazard Communication Standard.			
The contractor has labels on all workplace containers of hazardous materials.			
The contractor keeps Material Safety Data Sheets on file for all hazardous products and made available for review by laborers and their union representatives.			
The contractor trains all laborers in general hazard recognitionand control and in specific workplace chemical hazards.			
WRITTEN HAZARD COMMUNICATION PROGRAM			
The contractor has a complete written program.			
The contractor has the written program readily available for inspection by all laborers in the contractor's employ.			
The contractor's written program describes methods the company uses to inform employees of hazard determination procedures.			
The contractor's written program describes the workplace labeling system.			
The contractor's written program describes the company's hazard communication training program.			
The contractor's written program includes a hazardous chemical inventory.			
The contractor's written program identifies individuals responsible for the Hazard Communication Program.			
LABELING			
The contractor has labels on all containers of hazardous materials.			
The labels include identity of the material, the hazards of the materials and the name and address of the manufacturer.			
The contractor has a procedure to follow in the event that the manufacturer's label is damaged or missing.			
MATERIAL SAFETY DATA SHEETS			
The contractor routinely receives new and revised Material Safety Data Sheets (MSDSs) for products used in the workplace from the manufacturer.			
The contractor has MSDS's on file for every product listed in the Hazardous Chemical Inventory (see the Written Program).			
The contractor has assigned a competent person to review the MSDS's to check that they are complete.			

HEALTH HAZARD COMMUNICATION (continued)

	Yes	No	
The contractor has a system so a laborer can readily obtain a copy of an MSDS for a chemical product during the work shift.			
Training			
The contractor trains laborers on hazardous chemicals in the workplace at the time of their initial assignment and whenever a new hazard is introduced into their work.			
The contractor's training includes information about employers' and employees' rights and obligations under the Hazard Communication Standard.			
The contractor's training include information about operations in an employee's work that use hazardous chemicals.			
The contractor's training includes the location and availability of the written hazard communication program, which contains the hazardous chemical inventory and the location of the MSDS's.			
The contractor trains laborers in methods and observations used to detect the presence or release of a hazardous chemical in the workplace.			
The contractor informs laborers about physical and health hazards of the specific chemical groups in products they use.			
The contractor's training includes measures laborers can take to protect themselves from exposure to hazardous chemicals. For example, appropriate safety controls, emergency procedures and use of personal protective equipment.			
The contractor's training provides details of the HazCom program, including explanation of the labeling system, MSDS's and how employees obtain and use hazard information.			
On-The-Job			
Laborers know the hazardous ingredients of products they use each day.			
Laborers can name the hazardous effects of products they use each day.			
Laborers can identify the methods of protection required for products they use each day.			
Laborers know where to get a copy of the MSDS for these products.			
Laborers can identify the major hazards of their trade.			
Laborers can identify the routes of exposure.			
Laborers can name some methods of protection from hazardous exposure.			
Laborers can identify what information should be on a product label.			
Laborers know what an MSDS is and what data it should contain.			
Laborers know what HazCom is and can name some of its basic requirements.			
Laborers can list some "signs and symptoms" of over exposure.			
Laborers can give examples of acute and chronic effects.			

HEALTH: PPE

	Yes	No	
Planning			
The contractor monitors whether or not necessary PPE is provided and worn.			
The contractor requires laborers to use PPE.			
The contractor discourages the "Macho" attitude.			
The contractor has done an adequate hazard assessment.			
The contractor selects proper PPE for laborers to use.			
The contractor provides PPE which fits properly.			
The contractor has a program to inspect and maintain PPE.			
The contractor provides training in the use of each kind of PPE the labor must use.			
The contractor provides fit testing for all laborers required to use respirators.			
The contractor provides medical fitness examinations for laborers required to wear respirators.			
The contractor wears respirators when entering an area where laborers are required to wear respirators.			
CHECKLIST-PPE SELECTION			
The contractor provides proper PPE required to perform work safely.			
The protective clothing is suited for the hazard. For example, it is chemical resistant for work with chemicals.			
Eye protection is appropriate. For instance, safety glasses have sideshields.			
Proper protective gloves are provided. For example, heavy duty leather for handling rope or chemical-resistant for handling corrosives.			
Selected respirators are appropriate for the hazard.			
If cartridge respirators are used, the cartridges are correct for the hazard.			
The contractor provides only respirators which are clean, disinfected and free of defects or damage.			
The contractor makes sure that if airline respirators are used, the hoods or masks and hoses are in good condition; the compressor is in proper working order, and all required alarms are in place and operational.			
SAFETY PROGRAM			
The contractor has a respirator program which meets OSHA requirements. The program includes policies for respirator selection, fit-testing, training, inspection and maintenance of respirators.			
The contractor assigns a competent persons or formen accountable for monitoring PPE use.			
The contractor assigns the competent person or the foreman the daily responsibility to check for availability, distribution and proper use of PPE.			

HEALTH: PPE (continued)

	Yes	No	
The contractor clearly communicates rules regarding use of PPE. The contractor post signs and posters stating PPE rules and regulations all around worksites.			
The contractor provides physical examinations to determine which laborers are physically suited for the required PPE.			
The contractor uses a physician to determine if a laborer should or should not wear a negative pressure respirator if that laborer has any of the following: emphysema chronic obstructive pulmonary disease bronchial asthma x-ray evidence of pneumoconiosis coronary artery disease or cerebral blood vessel disease severe or progressive hypertension epilepsy, grand mal or petit mal anemia, pernicious diabetes, insipidus or mellitus punctured eardrum pneumomediastinum gap communication of sinus through upper jaw to oral cavity breathing difficulty when wearing a respirator claustrophobia or anxiety when wearing a respirator.			
The contractor exempts laborers with beards or mustaches from work requiring cartridge respirators or requires them to shave.			
The contractor promotes or rewards laborers who regularly use PPE.			
The contractor makes safe work performance a basis for job promotions or bonuses.			
The contractor talks to laborers on the job if they are not using proper PPE and provides discipline, including firing, if the laborer refuses to comply.			
On-the-Job			
The laborer using PPE has been trained in its proper use.			
The laborer is physically able to use the PPE provided.			
The laborer wearing a negative pressure respirator, does not have a beard or other facial hair that prevents proper fit.			
Laborers who wear eye glasses, are provided with eye protection that fits over the laborer's regular glasses or is provided appropriate perscription lenses for safety glasses.			
Laborers with physical impairments that keep them from using PPE are assigned to work where the PPE is not required.			
Laborers assigned to work with respirators are fit tested for the respirator they wear and conduct daily qualitative checks prior to entering a toxic environment.			
Laborers do not wear cotton gloves to work with corrosive chemicals or solvents that penetrate skin, they use chemical resistant gloves.			
Laborers do not wear safety glasses to work with corrosives or solvents. They use chemical splash goggles.			

HEALTH: PPE (continued)

	Yes	No	
Laborers do not wear dust masks for cleaning jobs with organic solvents. They use organic chemical cartridge respirators.			
Laborers do not wear cartridge respirators without conducting fit tests.			
Laborers do not wear cartridge respirators with thick mustaches, beards or other facial hairs that disrupts face seal.			
Laborers do not wear respirators with spent cartridges.			
Laborers do not wear respirators with wrong type of cartridges.			
Laborers do not use supplied-air hoods with torn hoods.			
Laborers do not use air compressors without alarms and filters as a source of fresh breathing air.			
Laborers do not use supplied-air respirators with broken end fitting attachments.			
Laborers do not use respirators with cracked or otherwise damaged facepieces.			
Laborers do not use respirators that have not been cleaned and disinfected.			
Laborers working with hazardous materials wear appropriate protective clothing.			
Laborers wear appropriate gloves for the work they're doing or the materials they're handling.			
Laborers working with hazardous liquids wears chemical splash goggles.			
Laborers working around airborne contaminants wear appropriate respiratory protection.			
Laborers are fit-tested for respirators they're wearing.			
Laborers clean and protect respirators between use.			
Laborers understand the need for PPE in performing their work safely.			
Laborers do not skip PPE use to speed production.			
Training			
The contractor provide training which includes explanation of OSHA rules and regulations regarding PPE.			
Laborers are trained in the proper use of the respirators or other PPE.			
Laborers are trained in respirator cleaning and maintenance procedures.			
Laborers understand why PPE is required.			
The contractor see that all laborers required to use PPE are trained in the proper use, care and maintenance of the equipment provided them.			
The contractor retrains laborers every time a new piece of PPE is introduced.			

HEALTH MSDS

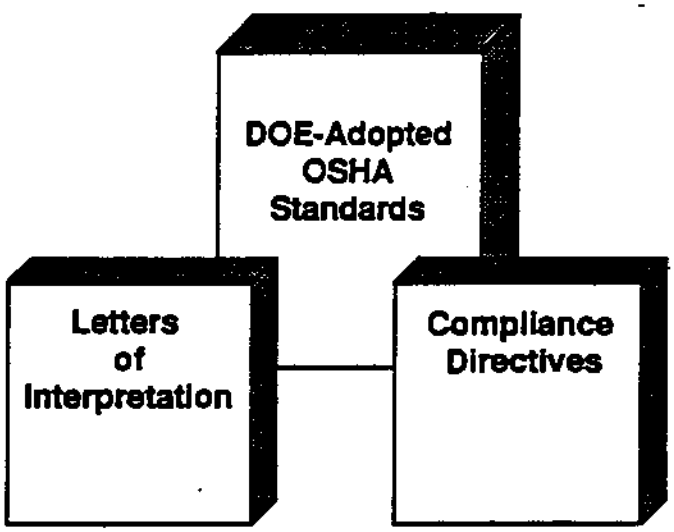
	Yes	No	
Planning			
The contractor has complete MSDS's available on all hazardous products he uses.			
The contractor maintains an MSDS file.			
The contractor has an MSDS for every chemical-containing product listed in his Hazardous Chemical Inventory (the inventory is a required part of the Hazard Communication Written Program).			
The contractor MSDS's are completely filled out. Use of "N/A" is acceptable under the regulation.			
The contractor has provisions for obtaining MSDS's from manufacturers that send incomplete MSDS's or don't respond at all. (A standard form letter can be used for this purpose).			
The contractor keeps MSDS's in an accessible location so laborers may obtain copies during their work shift.			
The contractor makes MSDS's available during all work shifts to any laborer who requests one.			
The contractor helps the laborer get the information from theMSDS needed to perform the job safely. The laborer should know what to do in the event of an emergency – fire, explosion, spill, leak or personal injury.			
HAZARD COMMUNICATION COMPLIANCE			
The contractor is in compliance with provisions of the HazComStandard, particularly the requirement for obtaining and maintaining MSDS's for hazardous chemical products.			
The contractor makes MSDS's available to laborers on request.			
The contractor designates a competent person to help laborers comprehend information on an MSDS.			
On-The-Job			
Laborers are aware of the existence and purpose of MSDS's.			
Laborers have requested or used MSDS's.			
Check laborers understanding of MSDS information. Here are sample questions you could ask to assist a laborer who is examining an MSDS.			
Who is the manufacturer of this product.			
What is the name of the product.			
Name three chemicals in the product.			
What does TLV mean.			
What section of the MSDS concerns spill or leak procedures.			
Is this product flammable, reactive.			
What kind of gloves should be worn when handling this product.			

HEALTH MSDS (continued)

	Yes	No	
What other PPE should be worn when using this product.			
What symptoms will you experience if you are overexposed to thisproduct.			
Does this product affect your brain or nervous system.			
the chronic effects you might expect from this product.			
What are the acute effects you might expect from this product.			
Laborers avail themselves of training in reading MSDS's provided by the contractor, the union or the labor-management trainingprogram.			
Training			
The contractor provides laborers with training in reading MSDS's.			
The contractor trains laborers in how to read an MSDS.			
The contractor's training includes a test of the laborers'comprehension of MSDS information.			
Additional training is provided for other industry leadersresponsible for assisting laborers in obtaining MSDS's andinterpreting the contents.			

DOE Interpretations Guide to OSH Standards

Standards 1926.16 - 1926.551



Volume 6

OSH Information - Building Blocks for Compliance

Department of Energy
Washington, DC 20585

ATTENTION: GUIDE HOLDERS

This Guide was developed in cooperation with the Department of Labor's Occupational Safety and Health Administration (OSHA) and consists of seven volumes. The Guide is a collection of the most recent and relevant OSHA interpretations and compliance directives that apply to DOE and is intended to provide additional guidance regarding the OSHA Regulations. It contains applicable OSHA Regulations from Title 29, Code of Federal Regulations (CFR), compliance directives, and interpretations of the OSHA Standards.

The Guide is indexed and tabbed according to parts contained in the OSHA Regulations (e.g., 29 CFR 1903). Behind each tab, the OSHA Regulation is listed first and the applicable directives, if any, are next. The directives are followed by the applicable interpretations. Interpretations are explanations of standards and their workplace application, addressing scope and limitation, and any other questions which may arise regarding application to situations.

As OSHA issues new compliance directives or interpretations, the Assistant Secretary for Environment, Safety and Health (EH) will review them for inclusion in this guide as appropriate. EH will also be developing specific DOE guidance and interpretations of OSHA Regulations, and other OSH standards, as they relate to Government-owned Contractor-operated (GOCO) facilities for inclusion in the Guide.

Upon receipt of the guide, the user is requested to complete the accompanying holder registration card. This will entitle the holder to receive automatic updates for future additions/revisions. Please return the holder card to the Office of Occupational Safety, EH-31.2, Attention: Director, Technical Support Division.

Any questions, comments, or recommendations regarding the use, content, or organization of the Guide should be directed to the Technical Support Division, EH-31.2, Office of Occupational Safety, EH-31, at (301) 903-4435 or FTS 233-4435. Your comments would be invaluable for changes/modifications to the guide and would be appreciated no later than April 30, 1992.

29 CFR 1926—SUBPART C
General Safety and Health Provisions

TERMINAL OBJECTIVE

Identify and use specific standards dealing with the general safety and health provisions of Subpart C.

ENABLING OBJECTIVES

1. State and explain employer's accident prevention responsibilities regarding work in hazardous environments per the OSH Act, 29 CFR 1926 and DOE Order 5480.9.
2. Identify the components of a good safety and health program, as indicated in OSHA CPL 3-1.1.
3. State and explain the areas of employee instruction and training required to be provided by the employer per Subpart C.
4. Identify relevant sections of the following areas of 29 CFR 1926.
   - .20 General Safety and Health Provisions
   - .21 Safety Training and Education
   - .22 Recording and Reporting Injuries
   - .25 Housekeeping
   - .28 Personal Protective Equipment
5. Identify the national consensus standards relevant to 29 CFR 1926 and those standards incorporated into it by reference.
6. Define the terms competent person, qualified person, and designated person.
7. Define the following terms:
   - horizontal standard
   - vertical standard
   - Compliance Directive (CPL)
   - Standard Directive (STD)

REFERENCES

1. U.S. Department of Labor. *29 CFR 1926, Safety and Health Regulations for Construction.*
2. U.S. Department of Labor. *29 CFR 1910, General Safety and Health Standards.*
3. DOE Orders: 5480.9, 5480.10, 5482.1B,5483.1A and 5483.1B (draft).
4. National Safety Council. *NSC Accident Prevention Manuals for Industrial Operations*; 9th ed., Volume I and II.

DURATION
One hour

INSTRUCTOR MATERIALS
Course manual with instructor notes
Viewgraphs
White board, markers and pointer
Overhead Projector
29 CFR 1926.20-32

Terminal Objective

Identify and use specific standards dealing with the general safety and health provisions of Subpart C.

Enabling Objectives

1. **State and explain employer's accident prevention responsibilities regarding work in hazardous environments per the OSH Act, 29 CFR 1926 and DOE Order 5480.9.**
2. **Identify the components of a good safety and health program, as indicated in OSHA CPL 3-1.1.**
3. **State and explain the areas of employee instruction and training required to be provided by the employer per Subpart C.**

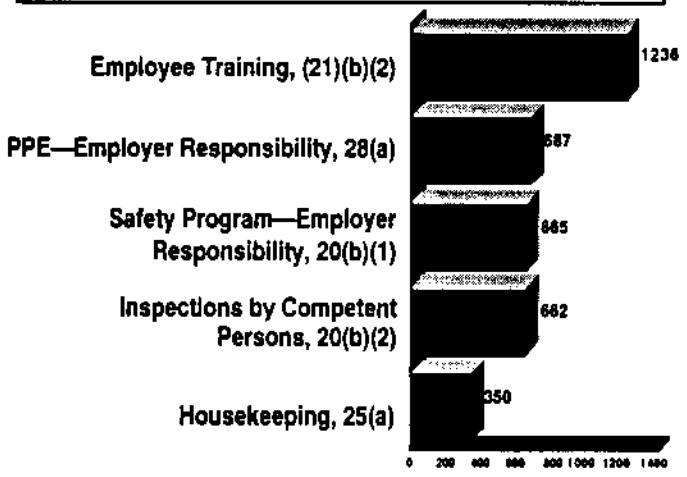
Enabling Objectives

4. **Identify relevant sections of the following areas of 29 CFR 1926:**
   - **.20 General Safety and Health Provisions**
   - **.21 Safety Training and Education**
   - **.22 Recording and Reporting Injuries**
   - **.25 Housekeeping**
   - **.28 Personal Protective Equipment**

Enabling Objectives

5. Identify the national consensus standards relevant to 29 CFR 1926 and those standards incorporated into it by reference.
6. Define the terms competent person, qualified person, and designated person.
7. Define the following terms:
   - horizontal standard
   - vertical standard
   - compliance Directive (CPL)
   - standard Directive (STD)

Violations Most Cited in 1992



Public Law 91-596

91st Congress, S. 2193
December 29, 1970
As amended by Public Law 101-552, §3101, November 5, 1990

AN ACT

To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the States in their effort to assure safe and healthful working conditions; by providing for research, information, education and training in the field of occupational safety and health; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this act may be cited as the "Occupational Safety and Health Act of 1970."

DUTIES

SEC 5. 5. (a)

Each employer—

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

1926.20(a) Contractor Requirements

(a) Contractor Requirements—Construction

- No laborer shall be required to work in conditions which are unsanitary, hazardous or dangerous to their health or safety.

NOTE: Defined in DOE Order 5480.9

1926.20(b) Accident Prevention Responsibilities

Employer

(1) Shall initiate and maintain programs to comply with 29 CFR 1926.

(2) Shall provide frequent and regular inspections made by a competent person, "designated by the employers," of the job sites, materials and equipment

1926.20(b) Accident Prevention Responsibilities

Employer

(3) Shall prohibit use of tools, equipment, machinery or materials prohibited, under this part such shall be identified unsafe by tagging or locking the controls to render them inoperable or they shall be physically removed from the site

(4) Shall permit only those employees qualified by training or experience to operate equipment and machinery.

1926.32(f) Competent Person—defines

- Competent person
  - one who is capable of identifying existing and predictable hazards in the surrounding, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

1926.32 Definitions

- Designated or Authorized Person
  - "Approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location at a job site."
- Qualified Person
  - "By possession of a recognized degree, certificate, professional standing, extensive knowledge, training and experience, has successfully demonstrated ability to solve or resolve problems relating to the subject matter, the work or the project."

1926.32(f) Competent Person

The preamble of the Final Rule notes

- That what constitutes a "competent person" depends on the context in which the term is used. In order to be a "competent person" for the purpose of this standard one must have had specific training in, and be knowledgeable about, soils analysis, the use of protective systems, and the requirements of this standard. One who does not have such training or knowledge cannot possibly be capable of identifying existing and predictable hazards in excavation work or taking prompt corrective measures.

1926.32(f) Competent Person

It is also the:

- Agency's intent that the "competent person can act as the employer's designee for the purpose of choosing a protective system from the options provided in 1926.652(b) and (c) below, but cannot take an original design responsibility allowed by 1926.652(b)(3), (c)(3) or (c)(4), unless otherwise qualified
- OSHA instruction CPL 2.87 dated 02/20/90 established inspection procedures and provides clarification to ensure uniform enforcement of the Excavation Standards.

1926.21 Safety Training and Education

(a) Secretary of Labor shall establish and supervise programs for the education and training of employers in the recognition, avoidance and prevention of unsafe conditions in employments covered by The Act.

1926.21(b) Safety Training and Education

(1) Employers should avail themselves of safety and health training program

(2) The employer shall instruct each employee in the RECOGNITION and AVOIDANCE OF UNSAFE CONDITIONS and the REGULATIONS applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury.

1926.21(b) Safety Training and Education

Employee shall be trained:

(3) Handling poisons, caustics and other harmful substances

(4) Harmful plants and animals

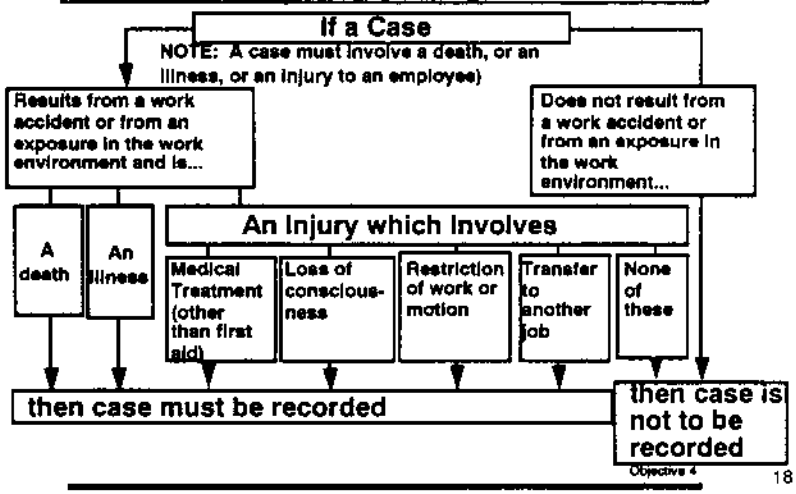
(5) Safe handling of flammable liquids, gases or toxic materials

(6) Confined space entry hazards, and PPE to be used

1926.22 Recording and Reporting of Injuries

- This standard is reserved, pending standard implementation by OSHA.
- DOE Order 5484.1A states that DOE contractors will record injuries and illnesses using the OSHA 200 Form or equivalent.

1922.22 Recording and Reporting of Injuries



1926.25 Housekeeping

(a) Scrap Lumber with protruding nails and all other debris

- cleared from work areas, passage ways and stairs

(b) Combustible scrap and debris

- removed at regular intervals during the course of construction

(c) Containers

- provided for collection and separation of waste, trash, rags, refuse
- equipped with covers for garbage, flammables and hazardous waste
- disposal at regular and frequent intervals

1926.28 Personal Protective Equipment

(a) The employer is responsible for requiring the wearing of appropriate personal protective equipment.

(b) Use, selection and maintenance of personal protective equipment shall comply with Subpart E

1926.31 Incorporation by Reference

(a) The specifications, standards and codes of agencies not of the U.S. Government but incorporated by reference in this part have the same force and effect as other standards of this subpart.

STD 3-1.1

(a) Management Commitment and Leadership

(1) Policy Statement: goals established, and communicated to employees.

(2) Program revised annually.

(3) Participation in safety meetings, inspections; agenda item in meetings.

(4) Commitment of resources is adequate.

(5) Safety rules and procedures incorporated into site operations.

(6) Management observes safety rules.

STD 3-1.1

(b) Assignment of Responsibility

(1) Safety designee on site, knowledgeable, and accountable.

(2) Supervisors (including foremen) safety and health responsibilities understood.

(3) Employees adhere to safety rules.

STD 3-1.1

(c) Identification and Control of Hazards

(1) Periodic site safety inspection program involves supervisors.

(2) Preventative controls in place (PPE, maintenance, engineering controls)

(3) Action taken to address hazards.

(4) Safety Committee, where appropriate.

(5) Technical references available.

(6) Enforcement procedures by management.

STD 3-1.1

(d) Training and Education

(1) Supervisors receive basic training.

(2) Specialized training taken when needed.

(3) Employee training program exists, is ongoing, and is effective.

STD 3-1.1

(e) Recordkeeping and Hazard Analysis

(1) Records maintained of employee illnesses, injuries and posted

(2) Supervisors perform accident investigations, determine causes and propose corrective action.

(3) Injuries, near misses, and illnesses are evaluated for trends, similar causes; corrective action.

STD 3-1.1

(f) First Aid and Medical Assistance

(1) First aid supplies and medical services available.

(2) Employees informed of medical results.

(3) Emergency procedures and training where necessary.

Related Definitions

- **Horizontal Standards**
  - Broadbased standard covering many areas of employee safety and health (example: 1910 General Industry Standard).
- **Vertical Standards**
  - Narrow standard based upon a particular industry or operation (example: 1926 Construction Industry Standard and 1926.304 Woodworking Subsection)
- **Technical Standard**
  - Covers specific requirements to insure employee safety and health with the standard.
- **Performance Standard**
  - Covers general areas without specific technical criteria for implementation of the standard.

Related Definitions

- **Compliance Directive**
  - Issued by OSHA headquarters based upon court decisions related to the interpretations of standards by industry and OSHA.
- **Standard Directive**
  - Issued by OSHA headquarters based upon inquiries as to standard interpretation and use.
- **Shall**
  - Used in text means "it will be done"
- **Should**
  - Used in text means "it is recommended..."

References

COURT SET IMPORTANT TREND BY UPHOLDING OSHA STANDARD

The U.S. Supreme Court issued a decision upholding OSHA's "Cotton Dust Standard"--a decision which carries far-reaching implications for protecting the health and safety of every American worker, not only those in the cotton industry.

In a nutshell, the court upheld two important principles established by OSHA to protect present and future workers in the cotton industry from the debilitating and ultimately fatal effects of breathing cotton dust. The court agreed that OSHA had the authority to require cotton industry employers to not only provide respirators for employees exposed to dust, but to pay for them as well.

Further, OSHA had sought the use of respirators only as a stop-gap measure to protect employees until OSHA-required ventilation systems were installed in work areas by employers. Again the court agreed that OSHA had not overstepped its authority. The court based its decision on their interpretation that the OSH Act requires a standard be set "which most adequately assures to the extent feasible...that no employee will suffer material impairment of health or functional capacity..."

The most crucial element in the court's decision is that OSHA's authority to set health and safety standards "to the extent feasible" requires only that OSHA adopt standards which are "capable of being done."

In other words, the costs of protecting workers' health, even when high, do not make a standard infeasible. On the contrary, the court recognized that OSHA is under a mandate from Congress to adopt the most effective measures to protect workers from disabling illness, disease, injury and death, and Congress fully expected this would take money.

Congress allowed OSHA this broad authority, the court explained, because they are convinced that the costs to society of leaving workers unprotected were as large or larger than the cost of removing the dangers to health and safety.

Index of General Industry Standards
Applicable to Specific Construction Industry Standards

Current Standard	Applicable 1910 Standard	Current Standard	Applicable 1910 Standard
1926.16	1910.11 1910.12 1910.16 1910.19	1926.251(c)	1910.184(c)(2)(3) 1910.184(c)(5) 1910.184(c)(7) 1910.184(c)(10)(11)(12) 1926.184(f)(2)(3)(4)
1926.18	1910.132(b)(c) 1910.136	1926.251(d)	1910.184(h)(2) thru (5)
1926.51	1910.141(a)(1) 1910.141(a)(2)(v) 1910.141(a)(5) 1910.141(g)(2) 1910.141(h) 1910.151(e)	1926.251(e)	1910.184(h)(2)(3) & (4) 1910.184(i)(6) & (7) 1910.184(i)(9)
1926.55	1910.161(a)(2)	1926.300	1910.212(a)(3) 1910.212(a)(5) 1910.212(b)
1926.103	1910.94(a)(1)(ii) 1910.94(a)(5)(i) 1910.94(a)(5)(ii)(b) 1910.94(a)(8) 1910.134	1926.302	1910.244(b)
1926.152	1910.106(a)(22) 1910.106(g)(1)(i)(g) 1910.106(g)(4) 1910.106(j)(1)(2)	1926.305	1910.244(a)(2)(iii-viii)
1926.153	1910.110(a)(1)(2) 1910.110(a)(4) 1910.110(a)(5)(iii) 1910.110(d)(1)(2) 1910>110(d)(7)(vii)(vi) 1910.110(d)(10)	1926.451	1910.21(g)(9) 1910.28(a)(15) 1910.28(a)(18) 1910.28(a)(20) 1910.29(a) 1910.29(c)
1926.250	1910.30(a)(1)(2) 1910.30(a)(4)(5) 1910.176(c)	1926.500	1910.21(a)(10) 1910.23(b)(5) 1910.169
1926.251	1910.184(a)	1910.600	1910.160 1910.176(f)
1926.251(b)	1910.184(e)(3)(i) & (ii)	1910.900	1910.109(g)(2)(ii) 1910.109(h)(3)(ii)
		1910.905	1910.109(e)(3)(iii) 1910.109(a)(12)

Supplement 1
Text of Other OSHA Standards Incorporated by Reference In Those Part 1910 Standards Identified as Applicable to Construction

Safety Standards

1910.23(e)(11)	Wall opening screen
1910.106(b)	Tank storage
1910.106(c)	Piping, valves and fittings
1910.110(b)	Basic Rules (LPG)
1910.184(d)	Inspections (slings)

Health Standards

1910.6	Incorporated by reference
1910.100	Standards organizations
1910.133	Eye and face protection
1910.135	Occupational head protection
1910.136	Occupational foot protection
1910.141(d)(1)(2)(3)	Washing facilities
1910.141(e)	Change rooms
1910.145(d)(4)	Caution signs
1910.1018	Inorganic arsenic
1910.1029	Coke oven emissions
1910.1043	Cotton dust
1910.1044	1,2-Dibromo-3-Chloropropane
1910.1045	Acrylonitrile

Standards Incorporated by Reference Into 29 CFR 1926

SUBPART	SECTION	STANDARD	INCORPORATED BY REF.
C	.30	Shipbuilding and Ship Repairing	29 CFR 1915 Ship Repairing, 29 CFR 1916 Shipbuilding
D	.56	Illumination	ANSI A11.1-1965, R 1970
E	.100	Head Protection	ANSI Z89.1 - 1969 ANSI Z89.2 - 1971
E	.104	Safety Belts, Lifelines, Lanyards	Federal Specification QQ-P-416 (Type I, Class B)
F	.150	Fire Protection	NFPA No. 10A-1970 Maintenance and Use of Portable Fire Extinguisher
F	.152	Flammable and Combustible Liquids	NFPA No. 251-1969 Standard Methods of Fire Test of Building Construction & Material NFPA No. 80-1970 Standard for Fire Doors and windows NFPA No. 30-1969 Flammable and Combustible Liquids Code NFPA No. 13-1969 Standards for the Installation of Sprinkler Systems NFPA No. 385-1966 Standards for Tank Vehicles for Flammable and Combustible Liquids
F	.153	Liquified Petroleum Gas	49 CFR Part 178 Shipping Container Specifications
G	.200	Liquified Petroleum Gas	ANSI D6.1-1971 Manual on Uniform Traffic Control Devices and Equipment ANSI Z35.1-1968 Specifications for Accident Prevention Signs ANSI Z35.2-1966 Specifications for Accident Prevention Tags
G	.201	Liquified Petroleum Gas	ANSI D6.1-1971 Manual on Uniform Traffic Control Devices and Equipment
I	.300	Liquified Petroleum Gas	ANSI B15.1-1953 Safety Code for Mechanical Power (Revision 1958) Transmission Apparatus
I	.302	Power Operated Hand Tools	Schedule 30; U.S. Bureau of Mines ANSI A10.3-1970 Safety Requirements for Explosive-Actuated Fastening Tools
I	.303	Abrasive Wheels and Tools	ANSI B7.1-1970 Safety Code for the Use, Care and Protection of Abrasive Wheels
I	.304	Woodworking Tools	ANSI 01.1-61 Safety Code for Woodworking Machinery
J	.350	Gas Welding and Cutting	49 CFR Part 178 (Subpart C) Specifications for Cylinders ANSI Z49.1-1967 Safety in Welding and Cutting NEC Article 630, NFPA 70-1971 ANSI C-1-1971 (Revision 1968) Electrical Welders

J	.351	Arc Welding and Cutting	DOT 49 CFR 192 Minimum Federal Safety Standards for Gas Pipelines
J	.352	Fire Prevention	49 CFR Part 192 Minimum Federal Safety Standards for Gas Pipelines
K	.407	Hazardous (Classified Locations)	NEC, NFPA 70
N	.550	Cranes and Derricks	ANSI B30.5-1968 Safety Code for Crawler, Locomotive or SAE J959-1966 and Truck Cranes ANSI B15.1-1958 (Revision) Safety Code for Mechanical Power Transmission Apparatus 49 CFR 177 and 393 SAE J743 PCSA No. 2 Crane and Shovel Association Mobile Hydraulic Crane Standard ANSI B30.6-1969 Safety Code for Derricks ANSI B30.2-1967 Safety Code for Overhead and Gantry Cranes
N	.552	Material Hoists, Personnel Hoists and Elevators	ANSI A10.5-1969 Safety Requirements for Material Hoists ANSI A10.4-1963 Safety Requirements for Workmen's Hoists ANSI A17.1-1965 A17.1a-1967;A17.1b-1968 A17.1c-1969;A17.1d-1970 A17.2-160;A17.2a-1965 A17.2-1967 Permanent Elevators ANSI B20.1-1957 Safety Code for Conveyors, Cableways, and Related Equipment
N	.556	Aerial Lifts	ANSI A92.2-1969 Vehicle Mounted Elevating and Rotating Work Platforms
O	.601	Aerial Lifts	49 CFR Part 571 (Department of Transportation Federal Motor Vehicle Safety Standards)
O	.602	Aerial Lifts	SAE J386-1969 Seat Belts for Construction Equipment SAE J333a-1970 Operator Protection for Agricultural and Light Industrial Tractors SAE J237-1971 Loader Dozer SAE J236-1971 Graders SAE J319b-1971 Scrapers SAE J166-1972 Trucks SAE J231a-1970 Fenders for Pneumatic Tired Earthmoving Haulage Equipment PCSA No 1, 2, 3 Power Hovel and Crane Associations Standards No. 1 and No. 2-1968, No. 3-1969 ANSI B56.1-1969 Safety Standards for Powered Industrial Trucks
O	.603	Pile Driving Equipment	ASME Power Boilers (Section I) ASME Pressure Vessels (Section VI)
O	.605	Pile Driving Equipment	29 CFR 1918 Safety and Health Regulations for Longshoring

U	.902	Pile Driving Equipment	14 CFR 103 Air Transportation 46 CFR 146-149 Water Carriers 49 CFR 171-179 Highways an Railways 49 CFR 180 Pipelines 49 CFR 390-397 Motor Carriers 26 CFR 181 IRS Storage or Explosives and Blasting Agents 26 CFR 181 Commerce in Explosives
V	.951	Tools and Equipment	ANSI J6.6-1971 Rubber Insulating Gloves ANSI J6.7-1935 (Revision 1971) Rubber Matting for Use Around Electric Apparatus ANSI J6.4-1971 Rubber Insulating Blankets ANSI J6.2-1950 (Revision 1971) Rubber Insulating Hoods ANSI J6.1-1950 (Revision 1971) Rubber Insulating Line Hose ANSI J6.5-1971 Rubber Insulating Sleeves ANSI Z89.2-1971 Industrial Protective Helmets for Electrical Workers (Class B)
W	.1002	Protective Frame (ROPS)-for Wheel-type Agricultural and Industrial Tractors Used in Construction	SAE J168 Protective Enclosures, Test (July 1970) Procedures, and Performance Requirements

CFR/DIRECTIVES GUIDE
Construction Industry - 29 CFR 1926

SUBPART	STANDARD		DIRECTIVE
C	20	General S&H provisions	STD 3-1.1
C	21	Safety training	STD 3-1.1
C	28	PPE	STD 1-8.2, STD 3-3.1
D	50	First aid	STD 1-23.2, STD 1-8.2
D	51	Sanitation	STD 1-8.2
D	55	Gases, vapors, dusts	STD 3-8.1
D	58	Asbestos	CPL 2-2.40
D	59	Hazard Communication	CPL 2-2.38C
E	105	Safety nets	STD 3-3.1
F	155	Definitions	STD 3-4.1A
H	250	General storage requirements	STD 3-6.1, STD 3-6.2
I	302	Power hand tools	STD 1-13.2A
I	304	Woodworking tools	STD 1-13.4
J	350	Gas welding and cutting	STD 3-8.2, STD 3-17.1
J	353	Ventilation in welding	STD 3-8.1
J	354	Welding-preservative coatings	STD 3-8.1
L	450	Ladders	STD 1-1.3, STD 3-10.5
L	451	Scaffolding	STD 3-10.4, STD 3-3.1, STD 3-10.3, STD 3-10.1B, STD 3-10.6, STD 3-10.2
M	500	Guardrails, handrails and covers	STD 3-3.1, STD 3-11.1
M	502	Definitions	STD 3-11.1
N	Subpart N		STD 3-12.2
N	550	Cranes and derricks	STD 1-11.2B, STD 3-12.2, STD 3-12.1A, STD 3-12.4
O	603	Pile driving	STD 3-13.1
O	604	Site clearing	STD 1-15.5
o	605	Marine operations	STD 3-13.2, STD 1-23.2
P	650-652	Excavations	CPL 2.87
Q	700	Concrete, general provisions	STD 1-12.13, STD 3-6.2, STD 3-15.1, STD 3-3.1, STD 3-15.2
Q	701	Forms and shoring	Std 3-6.2
Q	702	Definitions	STD 3-6.2
Q	705	Lift-slab operations	STD 3-15.3
R	750	Flooring requirements	STD 3-3.1
S	Subpart S		STD 3-17.3
S	800	Tunnels and shafts	STD 3-17.1, STD 3-17.2
U	902	Transportation of explosives	STD 3-19.1
U	912	Underwater blasting	STD 1-23.2

SAFETY AND HEALTH COMPETENT PERSON ASSIGNMENTS

Project

Contractor/Subcontractor

Area/Shift

Date

Senior Supervisor

Safety Program Coordinator

Area/Shift Supervisor

Area/Shift Competent Person

SUBPARTS		DESIGNATED PERSON
1926 .20	Job Site Inspections	
1926 .50	Medical Services/ First Aid	
1926 .53	Ionizing Radiation Technician	
1926 .54	Laser Operators[a]	
1926 .55	Industrial Hygienist/ Technician	
1926 .101	Hearing Protection— Fitting	
1910 .134	Respiratory Protection	
1926 .155	Fire Protection	
1910 .184	Sling/Wire Rope Inspections	
1926 .302	Powder-Actuated Tools-Trainer	
1926 .354	Welding-Industrial Hygienist	
1926 .400	Assured Equip. Grounding Conductor Program	
1926 .451	Scaffolding	
1926 .500	Roofing—MSS	
1926 .550	Cranes—Annual Inspection	
1926 .552	Hoists—Inspections & Tests	
1926 .556	Aerial lifts— Operations	
1926 .601	Motor Vehicles— Daily Inspections	

[a] Denotes requirement of Qualified Persons, all others shall be Competent Persons.

SUBPARTS		DESIGNATED PERSON
1926 .603	Pile Driving— Signalmen	
1926 .650	Excavations— Inspections	
1926 .651	Excavations— Inspections	
1926 .651	Excavations— Design[a]	
1926 .700	Concrete— Inspection	
1926 .752	Iron Work— Supervision	
1926 .800	Tunnels— Ventilation	
1926 .800	Tunnels— Inspection[a]	
1926 .800	Tunnels— Equipment	
1926 .803	Compressed Air— Senior Designee	
1926 .803	Compressed Air— Gauge Tender	
1926 .850	Demolition— Pre-Job Survey	
1926 .859	Demolition— Site Surveys	
1926 .900	Blaster-In-Charge	
1926 .900	Blasters[a]	
1926 .900	Blasting— Program	
1926 .950	Power Transmission— Safety Designee	
1926 .955	Live-Line Bare-Hand Supervisor[a]	

Alphabetical Listing of Frequently Used Acronyms

ACGIH - American Conference of Governmental Industrial Hygienists
AD - Area Director
ADM - Administrative (Directives System)
AIHA - American Industrial Hygiene Association
ALJ - Administrative Law Judge
ANSI - American National Standards Institute
AO - Area Office
ARA - Assistant Regional Administrator
ASME - American Society of Mechanical Engineers
ASSE - American Society of Safety Engineers
AVD - Alleged Violation Description

BILA - Bureau of International Labor Affairs
BLMRCP - Bureau of Labor-Management Relations and Cooperative Programs
BLS - Bureau of Labor Statistics
BNA - Bureau of National Affairs

CASPA - Complaints About State Program Administration
CCH - Commerce Clearing House
CFR - Code of Federal Regulations
CGA - Compressed Gas Association
CPL - Compliance (Directives System)
CSA - Construction Safety Act
CSHO - Compliance Safety and Health Officer

DASHO - Designated Agency Safety and Health Official
DIS - Discrimination (Directives System)
DOL - Department of Labor

ESA - Employment Standards Administration
EPA - Environmental Protection Agency
ETA - Employment Training Administration

FAA - Federal Aviation Administration
FACOSH - Federal Advisory Council on Occupational Safety and Health
FAP - Federal Agency Program
FAPO - Federal Agency Program Officer
FIN - Financial (Directives System)
FINOSH - Financial Management - OSHA
FOIA - Freedom of Information Act
FOM - Field Operations Manual
FR - Federal Register
FSAO - Full Service Area Office
FSHC - Federal Safety and Health Council
FSO - Federal State Operations
FTS - Federal Telecommunications System

GAO - Government Accounting Office
GPO - Government Printing Office

HCL - Hazard Correction List
HHS - Health and Human Services

IG - Inspector General
IH - Industrial Hygienist
IHTM - Industrial Hygiene Technical Manual
IMIS - Integrated Management Information System

LWOI - Lost Workday Injury Rate

MCL - Maintenance and Calibration Lab
MSDS - Material Safety Data Sheet
MSHA - Mine Safety and Health Administration

NACOSH - National Advisory Committee on Occupational Safety and Health
NBS - National Bureau of Standards
NEC - National Electrical Code
NEP - National Emphasis Program
NFPA - National Fire Protection Association
NIOSH - National Institute on Occupational Safety and Health
NO - National Office
NRC - Nuclear Regulatory Commission
NSC - National Safety Council

OASAM - Office of the Assistant Secretary for Administration and Management
OASVET - Office of the Assistant Secretary for Veteran's Employment and Training
OCL - OSHA Calibration Laboratory
OFAP - Office of Federal Agencies Programs
OFCCP - Office of Federal Contract Compliance Programs
OIG - Office of the Inspector General
OLMS - Office of Labor-Management Standards
OMB - Office of Management and Budget
ONTI - OSHA National Training Institute
OSH Act - Occupational Safety and Health Act
OSHA - Occupational Safety and Health Administration
OSHRC - Occupational Safety and Health Review Commission
OTI - OSHA Training Institute
OWCP - Office of Workers' Compensation Programs

PAE - Program Operations, Analysis and Evaluation (Directives System)
PEL - Permissible Exposure Limit
PER - Personnel (Directives System)
PL - Public Law
PMA - Petition for Modification of Abatement
PPE - Personal Protective Equipment
PWBA - Pension and Welfare Benefits Administration

RA - Regional Administrator
RO - Regional Office
RSI - Regional Supervisory Investigator
RUL - Rulemaking (Directives System)

SAVE - Standard Alleged Violation Element
SBA - Small Business Administration
SEP - Special Emphasis Program
SIC - Standard Industrial Classification
SLCAL - Salt Lake City Analytical Laboratory
SOL - Solicitor
STD - Standards (Directives System)
STP - State Programs (Directives System)

TDC - Technical Data Center
TECFAP - Training, Education, Consultation, and Federal Agency Programs
TLV - Threshold Limit Value
TWA - Time Weighted Average

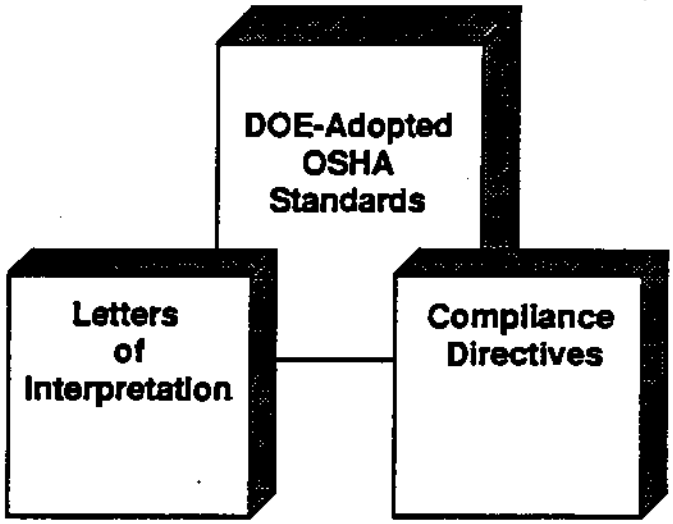
USCG - United States Coast Guard
USPHS - United States Public Health Service

VPP - Voluntary Protection Programs
VETS - Veteran's Employment and Training Service

WB - Women's Bureau
WHPCA - Walsh Healy Public Contracts Act

DOE Interpretations Guide to OSH Standards

Standards 1926.16 - 1926.551



Volume 6

OSH Information - Building Blocks for Compliance

OSHA Instruction STD 3-3.1

JUL 18, 1983

Subject: Fall Protection in Construction; 29 CFR 1926.28(a) and 29 CFR 1926.105(a)

A. Purpose This instruction clarifies the meaning of 29 CFR 1926.28(a) and 1926.105(a) as they apply to the protection of employees exposed to falling hazards in the construction industry.

B. Scope. This instruction applies OSHA-wide

C. Reference OSHA Instruction STD 3-13.1, October 30, 1978, originally issued January 31, 1978.

D. Action Regional Administrators and Area Directors shall ensure that the interpretative guidelines given in this instruction are adhered to when inspecting construction sites where employees are exposed to falling hazards not covered under more specific standards.

E. Federal Program Change. This instruction describes a Federal program change which affects State programs. Each Regional Administrator shall:

1. Ensure that this change is promptly forwarded to each State designee.

2. Explain the technical content of this change to the State designee as requested

3. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing, within 30 days of notification, to the Regional Administrator. This acknowledgment should include a description either of the States plan to implement the change or of the reasons why the change should not apply to that State.

4. Review policies, instructions and guidelines issued by the State to determine that this change has been communicated to State program personnel. Routine monitoring activities (accompanied inspections and case file reviews) shall also be used to determine if this change has been implemented in actual performance.

F. Background. The construction industry, although employing only about 5 percent of the work force, accounts for about 20 percent of occupational fatalities occurring annually in the United States. Of these fatalities, approximately 25-30 percent are the result of falls from elevated locations.

1. OSHA has numerous standards designed to prevent such accidents. Some of these standards apply to specific situations and contain specific requirements, such as for guardrails on open-sided floors or on scaffolds, the use of ladders to gain access to elevated locations, and, for particular operations, the use of safety belts (1926.700(b)(1)) or of solidly planked flooring (1926(b)(2)(i)).

2. There are many situations, however, not covered by specific standards. For these, general standards must be used. For this reason 29 CFR 1926.28(a) and 1926.105(a) have become among the most frequently cited standards. The requirements of these two general standards are as follows:

a. 1926.28(a) requires the use of appropriate personal protective equipment whenever employees are exposed to hazardous conditions.

b. 1926.105(a) requires that employees exposed to falls of more then 25 feet be protected by safety nets whenever protection by other means (identified in the standard) is impractical.

3. OSHA believes that the meaning of applicability of these standards have been clarified through its enforcement policies and by consistent and authoritative interpretation of these standards by the Occupational Safety and Health Review Commission.

4. Several United States Courts of Appeals, however, have vacated citations under these two standards on the grounds that the standards fail to provide employers with adequate notice of what they must do to comply with the Act. These decisions have not been uniform, however, and do not establish consistent enforcement guidelines. A recent decision, recognizing this lack of consistency, suggested that OSHA promulgate new standards on the matter or issue an instruction clarifying the requirements of the present standards. In keeping with the Court's recommendation, this OSHA Instruction is being issued.

G. Guidelines. The following interpretative guidelines are established for the use of 29 CFR 1926.28(a) and 1926.105(a)

1. 1926.28(a). OSHA interprets this standard to mean that employers are required to ensure that employees wear and use safety belts to protect them from falling when exposed to falls from heights of 10 feet or more or from heights below 10 feet under certain particularly hazardous circumstances such as those described in G.1.b.

   a. A reasonably prudent employer in the construction industry would recognize a hazard warranting the use of safety belts whenever an employee is exposed to a fall of 10 feet or more.

   b. The same employer would also recognize a hazardous situation warranting the use of a safety belt even if the potential fall distance is less then 10 feet, such as when employees are working over machinery, moving equipment, or objects posing an impalement hazard.

   c. OSHA believes that requiring fall protection under 1926.28(a) at 10 feet or more is consistent with other fall protection provisions in the construction regulations, e.g., 1926.451, where guardrails are generally required for scaffold platforms above 10 feet, and 1926.500, where guardrails are generally required for fall distances of 6 feet or more.

   d. Safety belts generally are not required for heights of less than 10 feet under 1926.28(a) due to the need for maneuverability and the common use of safety belts with a 6-foot lanyard.

2. 1926.105(a) OSHA interprets this standard to mean that, when employees are exposed to falls of over 25 feet, the employer is required either to provide a safety net or to enforce the use of other safety devices listed in the standard, as appropriate, for the protection of exposed employees.

   a. The requirements of the standard are met only if use of one of the listed devices provide adequate fall protection to employees. Thus, for example, use of a catch platform does not satisfy the standard if employees are still exposed to a fall when working on or adjacent to the platform.

   b. 1926.105(c) sets forth the requirements which must be met if the employer chooses to use netting for employee protection.

3. Relationship Between 1926.28(a) and 1926.105(a). In general, construction falling hazards of 10 through 25 feet not covered by a specific standard are governed by 1926.28(a) while those of more than 25 feet are addressed by 1926.105(a).

   a. Falling Hazards to the Interior of Buildings. The application of these standards to falling hazards to the interior of buildings shall be governed by the following principles;

      (1) In the structural steel construction of tiered buildings, 1926.28(a) shall be cited in situations in which employees are exposed to falls of 10 to 25 feet. When employees are exposed to falls of more than 25 feet (or 30 feet when the employer has failed to comply with the flooring requirements of 1926.750(b)(2)(i)), the appropriate steel erection flooring requirements standard shall also be cited.

(2) In other types of construction 1926.28(a) shall be cited for falling hazards of 10 through 25 feet. For falling hazards of more than 25 feet 1926.105(a) shall be cited as the more specific standard. Correction of a 1926.105(a) violation can be accomplished by any of the methods listed in the standard as long as employees are adequately protected from falls.

b. Falling Hazards to the Exterior of Buildings. For all types of construction, including steel erection, exterior falling hazards shall be cited under 1926.28(a) when the potential falling distance is 10 through 25 feet under 1926.105(a) when the potential falling distance is greater than 25 feet.

4. Impossibility and Greater Hazard. OSHA, in recognition of long-standing Review Commission and court precedent, has acknowledged in the past and continues to acknowledge that there are affirmative defenses which excuse the employer from a violation which has otherwise been proved. (See FOM, Chapter V,E.)

a. The employer may establish a defense when certain specific conditions exist. The conditions are as follows:

(1) If compliance with the standard is either impossible or more hazardous than non-compliance; and

(2) There is no alternative means of protecting employees; and

(3) A variance would be inappropriate.

b. If it is apparent that compliance with a standard would meet the conditions in subparagraph a, a citation shall not be issued.

c. OSHA considers it to be the employer's responsibility to demonstrate that the conditions are met. At the same time the CSHO shall attempt to gather contrary evidence in accordance with the guidelines in the FOM, Chapter V,E.2.

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RECORD ID 1446

STANDARD NUMBER 1926.28; 1926.104; 1926.105; 1926.500(d)(1)
INFORMATION DATE 810113

ABSTRACT This interpretation pertains to the applicability of standards to overhand-bricklaying. Masons and mason tenders involved in overhand-bricklaying are exempt from certain construction standards.

(NOTE: None of the standards listed have been amended since the 1981 interpretation letter).

INTERPRETATION 29 CFR 1926.28; 1926.104; 1926.105; 1926.500(d)(1)

January 13, 1981

This is in response to your letter of January 6, 1981 concerning the applicability of standards 29 CFR 1926.28, 29 CFR 1926.104, 29 CFR 1926.105, and 29 CFR 1926.500(d)(1) to the process of overhand-bricklaying.

It is the interpretation of OSHA that these standards do not apply to the process of overhand-bricklaying and that, therefore, masons and mason tenders are exempt from these regulations.

The Occupational Safety and Health Administration will continue to study the problem by consulting with the (committee) (association), the (union), (union A), and other interested parties, to determine what new regulations, if any, would be appropriate for promulgation concerning this matter.

RECORD ID 2194

STANDARD NUMBER 1926.28; 1962.451
INFORMATION DATE 850930

ABSTRACT Fall protection for employees engaged in erecting or dismantling scaffolds is not specifically required at all times. However, employees erecting or dismantling scaffolds must wear safety belts and lanyards in performing work at a stationary location for a period of time which allows for the practical use of safety belts and lanyards.

(NOTE: This standard has not been amended since 1986 when the authority citation was added.)

INTERPRETATION 29 CFR 1926.28; 1962.451

Sep 30, 1985

This is in response to your letter of September 11, concerning fall protection for employees engaged in erecting or dismantling scaffolds.

The Occupational Safety and Health Administration's (OSHA) policy has been to require fall protection whenever employees are exposed to hazardous conditions meeting the criteria as defined in OSHA Instruction STD 3-3.1, entitled "Fall Protection in Construction: 29 CFR 1926.28 and 105(a)" (copy enclosed). A recent court case involving (company A) and (company B), as outlined in the Occupational Safety and Health Reporter, supports our position that OSHA require at times the use of guardrails or safety belts in dismantling scaffolds. In summary, the Court decided that the absence of fall protection to employees working at intermediate levels of scaffolds posed a hazard capable of serious physical harm or death. Tying employees off could be achieved in a matter of seconds and the wearing of safety belts in dismantling of scaffolds was feasible and did not pose a greater hazard than not wearing them.

When the Subpart L proposal is published in the Federal Register we will encourage employers to comment on the subject proposed standard. It is possible that we may receive comments on the proposal which would require us to modify the standard. However, the August 2 memorandum mentioned in your letters clarifies our current position in this matter and will not be withdrawn at this time.

SOURCE LETTER

Sep 11, 1985

Re: Fall Protection for employees engaged in erecting or dismantling scaffolds

Several months ago I talked to Mr. W, Director, Directorate of Safety Standards Programs, about a problem the scaffold industry was having with a particular OSHA office where the Region Administrator was requiring that scaffold erectors use safety belts and lifelines while erecting scaffolds.

In the past ten years, the Courts have consistently ruled that safety belts and lifelines are not feasible, nor required, during erecting and dismantling scaffolds.

Since current scaffold standards are silent on this subject, OSHA's Office of Compliance has assisted us in the past by supporting this position when problems have arisen in the field. It was not necessary to request a written interpretation in the past. However, in order to correct the problem at the Regional level, Mr. W agreed to have Mr. M, Director, Directorate of Field Operations, send a Memorandum to all Regional Administrators.

The intent of the August 2, 1985, Memorandum (see attached copy) was to support the position taken by the Courts and the Office of Compliance and to assure the Regional Administrators that the new proposal for Subpart L - Ladders and Scaffolding will specifically include a proposal in the text that will exempt employers engaged in erecting or dismantling scaffolds from the fall protection provisions.

Unfortunately, the first paragraph of the August 2, 1985, Memorandum contains statements with which we must take issue, as follows:

1. Quoting the first sentence: "It is not the intent of the construction scaffold standards to specifically require employees who erect or dismantle scaffolds to use a safety belt and lanyard at all times."

Due to the fact that scaffold standards are silent with respect to fall protection during erection and dismantling, the first sentence is incorrect since the last three words, "at all times," imply that a safety belt and lanyard are required for some indeterminate time.

2. Quoting the second sentence: "However, employees erecting or dismantling scaffolds must wear safety belts and lanyards in performing work at a stationary location for a period of time which allows the practical use of safety belts and lanyards."

The statement "a stationary location for a period of time" is not in the Standards and, therefore, imposes a new requirement of industry which cannot be promulgated by either Memorandum or Program Directive.

Aside from the question of imposing a new rule, the suggestion of "period of time" during which a worker would be required to use belts and lanyards is not acceptable or practical to industry. Would each compliance officer determine (at his own discretion) the length of that "period of time?" Would it be a couple of minutes, ten minutes or four hours?

If the August 2, 1985, Memorandum is not rescinded or corrected, each employer's potential liability would make it impossible to stay in business. The exposure to repeated and willful violations would be constant.

The greatest hazard is to the safety of the scaffold erectors. Anyone with knowledge and experience in our industry knows that safety lines and lanyards create a tripping hazard to erectors who must have mobility when moving about with scaffold equipment such as heavy frames and braces which could easily become entangled with lines.

Suppose an accident occurred and OSHA had a requirement that the erector be tied off "at a stationary location for a period of 10 or more minutes." Who would determine at what point in time the accident occurred?

Without a stopwatch, who is to say whether the accident occurred at 9 minutes or 11 minutes? Can you imagine the field day attorneys for the plaintiff and defense would have with that?

3. Quoting the third sentence: "It is OSHA's position that requiring the constant wearing of belts and lanyards while erecting or dismantling scaffolds could be hazardous to employees."

The word "constant" creates the same problem, since it also implies some indeterminate period of time.

Until such time as the new proposed Subpart L is promulgated, this matter should be clarified so as to avoid inconsistent application of the scaffold standards. We request that the August 2, 1985, Memorandum be withdrawn and that a new Memorandum be issued containing a statement that the current standards do not contain any stipulation that employees erecting or dismantling scaffolds must wear safety belts and lanyards while performing work at a stationary location for a period of time. This is necessary in order to correct the misconception arising in the field among compliance officers as well as administrators.

The last paragraph of the following Memorandum dated 2 August, 1985 should be retained as is, or referred to Mr. M's office for correct wording.

Aug 2, 1985

MEMORANDUM

SUBJECT: Fall Protection for employees engaged in erecting or dismantling scaffolds in the Construction Industry

It is not the intent of the construction scaffold standards to specifically require employees who erect or dismantle scaffolds to use a safety belt and lanyard at all times. However, employees erecting or dismantling scaffolds must wear safety belts and lanyards in performing work at a stationary location for a period of time which allows the practical use of safety belts and lanyards. It is OSHA's position that requiring the constant wearing of belts and lanyards while erecting or dismantling scaffolds could be hazardous to employees.

The Directorate of Safety Standards Programs anticipates publishing a new proposal for Subpart L - Ladders and Scaffolding later this year. The fall protection proposed for employees erecting/dismantling scaffolds will be specifically included in that proposal and the text contains a provision which will exempt employees engaged in erecting or dismantling scaffolds from using any fall protection.

RECORD ID 1711

STANDARD NUMBER 1926.28(a)
INFORMATION DATE 840723

ABSTRACT This interpretation letter clarifies 1926.28(a) regarding whether an orange vest constitutes personal protective equipment (PPE). OSHA has reconsidered their position on whether orange vests are personal protective equipment within the meaning of 1926.28(a) and has determined that high visibility vests fall under the broad definition of Personal Protective Equipment.

INTERPRETATION 29 CFR 1926.28(a)

JUL 23, 1984

This is in response to your letter of May 25, regarding our recent clarification of 29 CFR 1926.28(a) as to whether an orange vest constitutes personal protective equipment.

We have reconsidered our position of whether orange vests are personal protective equipment within the meaning of 29 CFR 1926.28(a). Our further research has revealed several authoritative sources which we feel are noteworthy. The Accident Prevention Manual for Industrial Operations, published by the National Safety Council, under the classification of Personal Protective Equipment (PPE); Subheading, Special Clothing, lists "High visibility and night hazard clothing for construction, utility, maintenance workers ...." Other listings under this subheading include disposable clothing, leaded clothing. The National Safety Council classes high visibility clothing along with other types of protective clothing as Personal Protective Equipment.

The Safety Standards for Construction Work of (state) also address the issue. Under Part C, Personnel Protective and Life Saving Equipment, (WAC 296-155-200), General Requirements, item 5 reads: "Employees, whose duties are regularly performed in areas and under circumstances when they are exposed to the danger of moving vehicles, shall wear work vests of highly visible materials, or equivalent distinguishing apparel." Thus the (state) Standards also group high visibility vests along with other personal protective devices under the heading of Personal Protective Equipment

The ANSI Manual on Uniform Traffic Control Devices for Streets and Highways (D6.1-1971) requires that in positioning flagmen, consideration must be given to maintaining color contrast between the flagman's protective garments and his background. Thus, the ANSI Manual also appears to support the position that protective garments are personal protective equipment.

Our determination, in view of the information available to us, is that high visibility vests would fall under the broad definition of Personal Protective Equipment.

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29 CFR 1926—SUBPART D
Occupational Health and Environmental Controls

TERMINAL OBJECTIVE

Apply general industrial hygiene methods and principles in the construction workplace.

ENABLING OBJECTIVES

1. Identify the key provisions that must be met for medical services, first aid, sanitation, radiation, and asbestos, prior to construction commencement.
2. Review and utilize the occupational noise exposure charts accounting for engineering and administrative control options.
3. Explain the differences between dusts, fumes, vapors, mists and gases.
4. Explain the requirements for local exhaust ventilation in contaminated environments.
5. State and explain the requirements in the Hazard Communications Standard pertaining to a written program, the maintenance of MSDS sheets and employee training.
6. State the hazards associated with lead in construction and demolition.

DURATION

Two Hours

REFERENCES

1. U.S. Department of Labor. *29 CFR 1926, Safety and Health Regulations for Construction.*
2. U.S. Department of Labor. *29 CFR 1910, General Safety and Health Standards.*
3. ANSI. Z49.1, 1983; Z117.1, 1977; Z136.1, 1980; Z87.1-68 and Z88.1, 1980.
4. DOE Orders 5480.9, 5480.10.
5. National Safety Council. *Accident Prevention Manuals for Industrial Operations*; 9th ed., Volume I and II.

INSTRUCTOR MATERIALS

Viewgraphs
White board, markers and pointer
Slide Projector
Overhead Projector
Demonstration Models, Examples, Sampling Equipment

Terminal Objective

Apply general industrial hygiene methods and principles in the construction workplace.

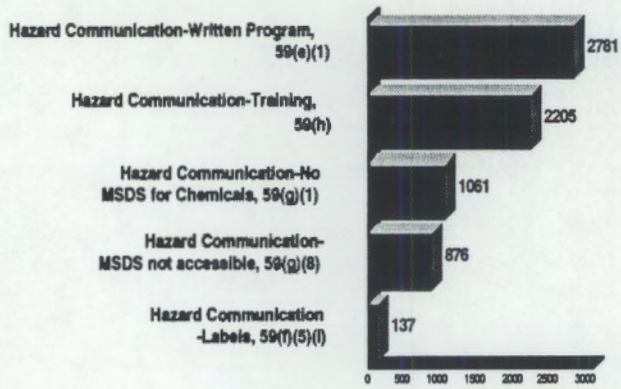
Enabling Objectives

1. Identify the key provisions that must be met for medical services, first aid, sanitation, radiation, and asbestos, prior to construction commencement.
2. Review and utilize the occupational noise exposure charts accounting for engineering and administrative control options.
3. Explain the differences between dusts, fumes, vapors, mists and gases.

Enabling Objectives

4. Explain the requirements for local exhaust ventilation in contaminated environments.
5. State and explain the requirements in the Hazard Communications Standard pertaining to a written program, the maintenance of MSDS sheets and employee training.
6. State the hazards associated with lead in construction and demolition.

Violations Most Cited in 1992



Medical Services and First Aid

1926.50 Employer shall:

(a) insure availability of medical personnel for advise and consultation

(b) acquire available prompt medical attention prior to work start-up

(c) supply trained certified first-aiders with verifiable training in absence of infirmary

Medical Services and First Aid

1926.50 Employer shall:

(d) supply physician recommended first-aid supplies at all sites

(e) supply proper equipment for prompt transportation or communication for contacting ambulance

(f) post telephone numbers

1926.51 Sanitation

(a) Potable water shall be provided
- clearly marked, sealed containers with tap
- common drinking cup prohibited

(b) No cross-connections allowed, open or potential between potable and non-potable water

(c) Toilets (number required is specified)

Number of Employees	Minimum Number of Facilities
20 or less	1
20 or more	1 toilet seat and 1 urinal per 40 workers
200 or more	1 toilet seat and 1 urinal per 50 workers

1926.51 Sanitation

(d) Food handling must meet local health laws

(e) Temporary sleeping quarters must be heated, ventilated and lighted

(f) Washing facilities required where contaminants are used

1926.52 Noise Exposure

(a) Feasible, engineering or administrative controls shall be utilized to protect employees against sound levels in excess of Table D-2

(b) If controls fail to reduce sound levels, ear protection devices shall be used

(d) When sound levels exceed Table D-2, a hearing conservation program is required

1926.54 Radiation

1926.53 Ionizing

- radioactive materials or X-rays

1926.54 Nonionizing

- lasers

1926.55 Gases, Vapors, Fumes, Dusts and Mists

(a) Exposure above the Threshold Limit Values for 1970 shall be avoided

(b) Administrative or engineering controls shall be implemented whenever feasible to comply with TLVs

- PPE as a last resort
- PPE shall be approved for each use

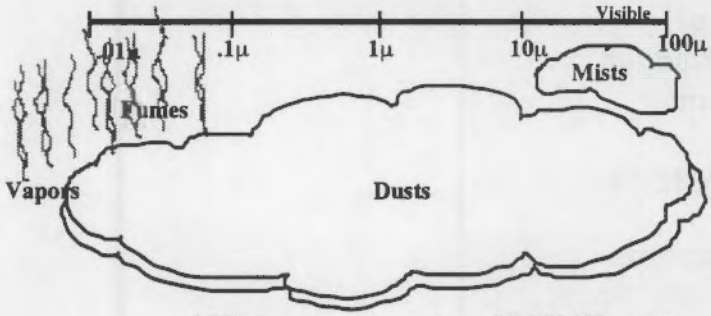
(c) Asbestos

(d) Formaldehyde

Concentrations of Contaminants—Terms

Concentrations Gas and Vapor	ppm	parts of contaminant per million parts of air by volume
Particulates	Mg/m³	milligrams of contaminant per cubic meter of air
Asbestos	fibers/cc	fibers per cubic centimeters of air
Permissible Limits	TWA	Time Weighted Average
	PEL	Permissible Exposure Limit
	TLV	Threshold Limit Value

1926.55 Particle Diameters



1 Micron = 1μ = 1/1,000,000 meter

1 Red Blood Cell = 7μ

1 Bacterium = 1μ

1926.57 Ventilation

(a) TLVs concentrations shall not be exceeded (1926.55a)

(b) Design shall not draw contaminated air through work area

(c) Volume and velocity shall be sufficient

(d) Duration of ventilation

- continually during work process
- for a time after process

1926.58 Asbestos

Any asbestos handling company must comply with this section

- Controlling Methods
- Seal (polymers, epoxy)
- Encapsulate (shrink wrap)
- Removal

Suspect asbestos, test the material first

Chief Hazards

- Inhalation of fibers

1926.59 Hazard Communication

Hazard communication requires:

(d) hazard determination by employer

(e) developing a written program

(f) labelling containers

(g) preparing and distributing MSDSs

- compiling a chemical inventory

(h) training employees about hazards and protective measures

(i) trade secrets

(j) effective dates

1926.59(h) Employee Information and Training

(1) Employers must provide employees with the following information:

- the requirements of this section
- any operations in their work area where hazardous chemicals are present
- the location and availability of the written hazard communication program, the chemical inventory, and the MSDS file

1926.59(h) Employee Information and Training

(2)(i) Employers must provide employees with the following training concerning hazardous chemicals in their work areas:

- methods used to detect the presence or release of the hazardous chemical

(ii) Physical and health hazards of hazardous chemicals

1926.59(h)(2) Employee Information and Training

(iii) Protective measures the employees can take, including:

- work practices
- emergency procedures
- personal protective equipment

(iv) Details of the hazard communication program developed by the employer

Lead Exposure

Airborne Hazards

- grinding, cutting, abrasive blasting, heating, scraping old paint
- check/sample for lead prior to performing tasks
- if lead-based, take appropriate action, such as monitoring, PPE, etc.
- review new Lead Standard (OSHA) notice of proposed rulemaking (May 1992)

References

SUPPLEMENT II—THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS FOR 1970

This is the table of "Threshold Limit Values of Airborne Contaminants for 1970" that is referenced in 29 CFR 1926.55(a). It contains administrative changes in footnotes, and it has been modified to reflect subsequent OSHA rulemakings (health standards issued pursuant to section 6(b) of the Act).

(a) Materials with names preceded by "C"—ceiling values. An employee's exposure to any material, the name of which is preceded by a "C", shall at no time exceed the ceiling value given for that material in the Table.

(b) Other materials—8-hour time weighted averages. An employee's exposure to any material, the name of which is not preceded by a "C", in any 8-hour work shift of a 40-hour work week, shall not exceed the 8-hour time weighted average given in the Table for that material computed according to the following formulae:

(1) The cumulative exposure for an 8-hour shift shall be computed as follows:

$$E=\frac{C_aT_a+C_bT_b+\ldots C_nT_n}{8}$$

where:

E is the equivalent exposure for the working shift.

C is the concentration during any period of time.

T where the concentration remains constant.

T is the duration in hours of the exposure at the concentration C.

The value of E shall not exceed the 8-hour time weighted average lioit in the Table for the material involved.

(2) In case of a mixture of air contaminants an employer shall compute the equivalent exposure as follows:

$$E_m=\frac{C_1}{L_1}+\frac{C_2}{L_2}+\ldots\frac{C_n}{L_n}$$

E_m is the equivalent exposure for the mixture.

C is the concentration of a particular contaminant.

L is the exposure limit for that contaminant.

The value of E_m shall not exceed unity (1).

	Substance	ppm (Note 1)	mg/M³ (Note 2)
	Abate		15
	Acetaldehyde	200	360
	Acetic acid	10	25
	Acetic anhydride	5	20
	Acetone	1,000	2,400
	Acetonitrile	40	70
	Acetylene (note 3)		
	Acetylene dichloride, see 1, 2-Dichloroethylene		
	Acetylene tetrabromide	1	14
	Acrolein	0.1	0.25
	Acrylamide-Skin		0.3
	Acrylonitrile—see §1910.1045		
	Aldrin-Skin		0.25
	Allyl alcohol-Skin	2	5
	Allyl chloride	1	3
C	Allyl glycidyl ether (AGE)	10	45
	Allyl propyl disulfide	2	12
	Alundum (Al_2O_3) (Note 4)		
	2-Aminoethanol, see Ethanolamine		
	2-Aminopyridine	0.5	2
	Ammonia	50	35
	Ammonium sulfamate (Ammate)		15
	n-Amyl acetate	100	525
	sec-Amyl acetate	125	650
	Aniline-Skin	5	19
	Anisidine (o,p-isomers)-Skin		0.5
	Antimony & compounds (as Sb)		0.5
	ANTU (alpha naphthyl thiourea)		0.3
	Argon (Note 3)		
	Arsenic, and inorganic arsenic compounds except Arsine.—see §1910.1018		
	Arsenic compounds, organic		0.5
	Arsine	0.05	0.2
	Azinphos-methyl-Skin		0.2
	Barium (soluble compounds)		0.5
	Benzene—see §1910.1028		
	Benzidine-Skin (Note 5)		
	p-Benzoquinone, see Quinone		
	Benzoyl peroxide		5
	Benzyl chloride	1	5
	Beryllium		0.002
	Biphenyl, see Diphenyl		
	Bisphenol A, see Diglycidyl ether		
	Boron oxide		15
	Boron tribromide	1	10
C	Boron trifluoride	1	3
	Bromine	0.1	0.7
	Bromine pentafluroide	0.1	0.7
	Bromoform-Skin	0.5	5
	Butadient (1, 3-butadiene)	1,000	2,200
	Butanethiol, see Butyl mercaptan		
	2-Butanone	200	590
	2-Butoxy ethanol (Butyl Cellosolve)-Skin	50	240

STANDARDS AND INTERPRETATIONS

Substance	ppm (Note 1)	mg/M³ (Note 2)
Butyl acetate (n-butyl acetate)	150	710
sec-Butyl acetate	200	950
tert-Butyl acetate	200	950
Butyl alcohol	100	300
sec-Butyl alcohol	150	450
tert-Butyl alcohol	100	300
C Butylamine-Skin	5	15
C tert-Butyl chromate (as CrO_3)-Skin	.....	0.1
n-Butyl glycidyl ether (BGE)	50	270
Butyl mercaptan	0.5	1.5
p-tert Butyltoluene	10	60
Cadium (Metal dust and soluble salts)	.....	0.2
C Cadmium oxide fume (as Cd)	0.1	
Calcium carbonate (Note 4)	.....	.....
Calcium arsenate—See §1910.1018	.....	.....
Calcium oxide	.....	5
Camphor (Synthetic)	2	.....
Carbaryl (Sevinr)	.....	5
Carbon black	.....	3.5
Carbon dioxide	5,000	9,000
Carbon disulfide-Skin	20	60
Carbon monoxide	50	55
Carbon tetrachloride-Skin	10	65
Cellulose (paper fiber) (Note 4)	.....	.....
Chlordan-Skin	.....	0.5
Chlorinated camphene-Skin	.....	0.5
Chlorinated diphenyl oxide	.....	0.5
Chlorine	1	3
Chlorine dioxide	0.1	0.3
C Chlorine trifluoride	0.1	0.4
C Chloroacetaldehyde	1	3
oo-Chloroacetophenone (phenacylchloride)	0.05	0.3
Chlorobenzene (monochlorobenzene)	75	350
o-Chlorobenzylidene malonoitrile (OCBM)	0.05	0.4
Chlorobromomethane	200	1,050
2-Chloro-1, 3-butadiene, see Chloroprene	.....	.....
Chlorodiphenyl (42% Chlorine)-Skin	.....	1
Chlorodiphenyl (54% Chlorine)-Skin	.....	0.5
1-Chloro, 2, 3-epoxypropane, see Epichlorhydrin	.....	.....
2-Chloroethanol, see Ethylene chlorohydrin	.....	.....
Chloroethylene—See Vinyl chloride §1910.1017	.....	.....
C Chloroform	.....	.....
richloromethane)	50	240
Chloro-1-nitropropane	20	100
ioropicrin	0.1	0.7
Chloroprene (2-chloro-1, 3-butadiene)-Skin	25	90
Chromic acid and chromates (as CrO_3)	.....	0.1
Chromium, sol. chromic, chromous salts as Cr	.....	0.5
Metal & insol. salts	.....	1
Coal tar pitch volatiles, BaP phenanthrene, acridene, chrysene	.....	.....
Cobalt, metal fume & dust	.....	0.1
Copper fume	.....	0.1
Dusts and Mists	.....	1
Corundum (Note 4)	.....	.....
Cotton dust, raw—See §1910.1043 and (Note 7)	.....	1
Crag herbicide	.....	15
Cresol (all isomers)-Skin	5	22
Crotonaldehyde	2	6
Cumene-Skin	50	245

Substance (Note 1)	ppm	mg/M³ (Note 2)
Cyanide (as CN)-Skin	.....	5
Cyanogen	10	.....
Cyclohexane	300	1,050
Cyclohexanol	50	200
Cyclohexanone	50	200
Cyclohexene	300	1,015
Cyclopentadiene	75	200
2, 4-D	.....	10
DDT-Skin	.....	1
DDVP, see Dichlorvos	.....	.....
Decaborane-Skin	0.05	0.3
Demoton-Skin	.....	0.1
Diacetone alcohol (4-dydroxy-4-methyl-2-pentanone)	50	240
1, 2-Diaminoethane, see Ethylene-diamine	.....	.....
Diazomethane	0.2	0.4
Diborane	0.1	0.1
C 1, 2-Dibromoethane (ethylene dibromide)-Skin	25	190
Dibutyl phosphate	1	5
Dibutylphthalate	.....	9
C Dichloroacetylene	0.1	0.4
C o-Dichlorobenzene	50	300
p-Dichlorobenzene	75	450
Dichlorodifluoromethane	1,000	4,950
1, 3-Dichloro-5, 5-dimethyl hydantoin	.....	0.2
1, 1-Dichloroethane	100	400
1, 2-Dichloroethane	50	200
1, 2-Dichloroethylene	200	790
C Dichloroethyl ether-Skin	15	90
Dichloromethane, see Methylene-chloride	.....	.....
Dichloromonofluoromethane	1,000	4,200
C 1, 1-dichloro-1-nitroethane	10	60
1, 2-Dichloropropane, see Propylenedichloride	.....	.....
Dichlorotetrafluoroethane	1,000	7,000
Dichlorvos (DDVP)-Skin	.....	1
Dieldrin-Skin	.....	0.25
Diethylamine	25	75
Diethylamino ethanol-Skin	10	50
C Diethylene triamine-Skin	10	42
Diethylether, see Ethyl ether	.....	.....
Difluorodibromomethane	100	860
C Diglycidyl ether (DGE)	0.5	2.8
Dihydroxybenzene, see Hydroquinone	.....	.....
Diisobutyl ketone	50	290
Diisopropylamine-Skin	5	20
Dimethoxymethane, see Methylal	.....	.....
Dimethyl acetamide-Skin	10	35
Dimethylamine	10	18
Dimethylaminobenzene, see Xylidene	.....	.....
Dimethylaniline (N-dimethylaniline)-Skin	5	25
Dimethylbenzene, see Xylene	.....	.....
Dimethyl 1, 2-dibromo-2, 2-dichloroethyl phosphate, (Dibrom)	.....	3
Dimethylformamide-Skin	10	30
2, 6-Dimethylheptanone, see Diisobutyl ketone	.....	.....
1, 1-Dimethylhydrazine-Skin	0.5	1
Dimethylphthalate	.....	5
Dimethylsulfate-Skin	1	5
Dinitrobenzene (all isomers)-Skin	.....	1
Dinitro-o-cresol-Skin	.....	0.2
Dinitrotoluene-Skin	.....	1.5
Dioxane (Diethylene dioxide-Skin	100	360
Diphenyl	0.2	1

	Substance (Note 1)	ppm	mg/M³ (Note 2)
	Diphenyl amine		10
	Diphenylmethane diisocyanate (see Methylene bisphenyl isocyanate MDI)		
	Dipropylene glycol methyl ether-Skin	100	600
	Di-sec. octyl phthalate (Di-2-ethylhexylphathalate		5
	Emery (Note 4)		
	Endosulfan (Thiodan®)-Skin		0.1
	Endrin-Skin		0.1
	Epichlorhydrin-Skin	5	19
	EPN-Skin		0.5
	1, 2-Epoxypropane, see Propylene-oxide		
	2, 3-Epoxy-1-propanol, see Glycidol		
	Ethane (Note 3)		
	Ethanethiol, see Ethylmercaptan		
	Ethanolamine	3	6
	2-Ethoxyethanol-Skin	200	740
	2-Ethoxyethylacetate (Cellosolve acetate)-Skin	100	540
	Ethyl acetate	400	1,400
	Ethyl acrylate-Skin	25	100
	Ethyl alcohol (ethanol)	1,000	1,900
	Ethylamine	10	18
	Ethyl sec-amyl ketone (5-methyl-3-heptanone)	25	130
	Ethyl benzene	100	435
	Ethyl bromide	200	890
	Ethyl butyl ketone (3-Heptanone)	50	230
	Ethyl chloride	1,000	2,600
	Ethyl ether	400	1,200
	Ethyl formate	100	300
	Ethyl mercaptan	0.5	1
	Ethyl silicate	100	850
	Ethylene (Note 3)		
	Ethylene chlorohydrin-Skin	5	16
	Ethylenediamine	10	25
	Ethylene dibromide, see 1, 2-Dibromoethane		
	Ethylene dichloride, see 1, 2-Dichloroethane		
C	Ethylene glycol dinitrate and/or Nitroglycerine-Skin (Note 8)	0.2	
	Ethylene glycol monomethyl ether acetate, see Methyl cellosolve acetate		
	Ethylene imine-Skin	0.5	1
	Ethylene oxide	50	90
	Ethylidine chloride, see 1, 1-Dichloroethane		
	N-Ethylmorpholine-Skin	2 0	94
	Ferbam		15
	Ferrovanadium dust		1
	Fibrous glass (Note 4)		
	Fluoride (as F)		2.5
	Fluorine	0.1	0.2
	Fluorotrichloromethane	1,000	5,600
C	Formaldehyde	5	6
	Formic acid	5	9
	Furfural-Skin	5	20
	Furfuryl alcohol	50	200
	Gasoline (Note 9)		
	Glycerine mist (Note 4)		
	Glycidol (2, 3-Epoxy-1-propanol)	50	150
	Glycol monoethyl ether, see 2-Ethoxyethanol		
	Graphite, (Synthetic) (Note 4)		
	Guthion, see Azinphosmethyl		
	Gypsum (Note 4)		
	Hafnium		0.5
	Helium (Note 3)		
	Heptachlor-Skin		0.5
	Heptane (n-heptane)	500	2,000
	Hexachloroethane-Skin	1	10
	Hexachloronaphthalene-Skin		0.2
	Hexane (n-hexane)	500	1,800
	2-Hexanone	100	410
	Hexone (Methyl isobutyl ketone)	100	410
	sec-Hexyl acetate	50	300
	Hydrazine-Skin	1	1.3
	Hydrogen (Note 3)		
	Hydrogen bromide	3	10
C	Hydrogen chloride	5	7
	Hydrogen cyanide-Skin	10	11
	Hydrogen fluoride	3	2
	Hydrogen peroxide	1	1.4
	Hydrogen selenide	0.05	0.2
	Hydrogen sulfide	10	15
	Hydroquinone		2
	Indene	10	45
	Indium and compounds, as In		0.1
C	Iodine	0.1	1
	Iron oxide fume		10
	Iron salts, soluble, as Fe		1
	Isoamyl acetate	100	525
	Isoamyl alcohol	100	360
	Isobuty acetate	150	700
	Isobuty alcohol	100	300
	Isophorone	25	140
	Isopropyl acetate	250	950
	Isopropyl alcohol	400	980
	Isopropylamine	5	12
	Isopropylether	500	2,100
	Isopropyl glycidyl ether (IGE)	50	240
	Kaolin (Note 4)		
	Ketene	0.5	0.9
	Lead—See §1910.1025		
	Lead arsenate—See §1910.1018		
	Limestone (Note 4)		
	Lindane-Skin		0.5
	Lithium hydride		0.025
	L.P.G. (Liquified petroleum gas)	1,000	1,800
	Magnesite (Note 4)		
	Magnesium oxide fume		15
	Malathion-Skin		15
	Maleic anhydride	0.25	1
C	Manganese and compounds, as Mn		5
	Marble (Note 4)		
	Mercury-Skin		0.1
	Mercury (organic compounds)-Skin		0.01
	Mesityl oxide	25	100
	Methane (Note 3)		
	Methanethiol, see Methyl mercaptan		
	Methoxychlor		15
	2-Methoxyethanol, see Methyl cellosolve		
	Methyl acetate	200	610
	Methyl acetylene (propyne)	1,000	1,650
	Methyl acetylene-propadiene mixture (MAPP)	1,000	1,800
	Methyl acrylate-Skin	10	35
	Methylal (dimethoxymethane)	1,000	3,100

STANDARDS AND INTERPRETATIONS

Substance	ppm (Note 1)	mg/M³ (Note 2)
Methyl alcohol (methanol)	200	260
Methylamine	10	12
Methyl amyl alcohol, see Methyl isobutyl carbinol		
Methyl isoamyl ketone	100	475
Methyl (n-amyl) ketone (2-Heptanone)	100	465
C Methyl bromide-Skin	20	80
Methyl butyl ketone, see 2-Hexanone		
Methyl cellosolve-Skin	25	80
Methyl cellosolve acetate-Skin	25	120
C Methyl chloride	100	210
Methyl chloroform	350	1,900
Methylcyclohexane	500	2,000
Methylcyclohexanol	100	470
o-Methylcyclohexanone-Skin	100	460
Methyl ethyl ketone (MEK), see 2-Butanone		
Methyl formate	100	250
Methyl iodide-Skin	5	28
Methyl isobutyl carbinol-Skin	25	100
Methyl isobutyl ketone, see Hexone		
Methyl isocyanate-Skin	0.02	0.05
Methyl mercaptan	0.5	1
Methyl methacrylate	100	410
Methyl propyl ketone, see 2-Pentanone		
C Methyl silicate	5	30
C Methyl styrene	100	480
C Methylene bisphenyl isocyanate (MDI)	0.02	0.2
Methylene chloride (dichloromethane)	500	1,740
Molybdenum (soluble compounds)		5
(insoluble compounds)		15
Monomethyl aniline-Skin	2	9
C Monomethyl hydrazine-Skin	0.2	0.36
Morpholine-Skin	20	70
Naphtha (coal tar)	100	400
Naphthalene	10	50
beta-Naphthylamine (Note 5)		
Neon (Note 3)		
Nickel carbonyl	0.001	0.007
Nickel, metal and soluble cmpds, as Ni		1
Nicotine-Skin		0.5
Nitric acid	2	5
Nitric oxide	25	30
p-Nitroaniline-Skin	1	6
Nitrobenzene-Skin	1	5
p-Nitrochlorobenzene-Skin		1
Nitroethane	100	310
Nitrogen (Note 3)		
C Nitrogen dioxide	5	9
Nitrogen trifluoride	10	29
Nitroglycerin-Skin (Note 8)	0.2	2
Nitromethane	100	250
1-Nitropropane	25	90
2-Nitropropane	25	90
N-Nitrosodimethylamine (dimethylnitrosamine)-Skin (Note 5)		
Nitrotoluene-Skin	5	30
Nitrotrichloromethane, see Chloropicrin		
Nitrous oxide (Note 3)		
Octachloronaphthalene-Skin		0.1
Octane	400	1,900
Oil mist, particulate (Note 10)		5
Oil mist, vapor (Note 11)		
Osmium tetroxide		0.002
Oxalic acid		1
Oxygen difluoride	0.05	0.1
Ozone	0.1	0.2
Paraquat-Skin		0.5
Parathion-Skin		0.1
Pentaborane	0.005	0.01
Pentachloronaphthalene-Skin		0.5
Pentachlorophenol-Skin		0.5
Pentaerythritol (Note 4)		
Pentane	500	1,500
2-Pentanone	200	700
Perchloroethylene	100	670
Perchloromethyl mercaptan	0.1	0.8
Perchloryl fluoride	3	13.5
Petroleum distillates (naphtha) (Note 11)		
Phenol-Skin	5	19
p-Phenylene diamine-Skin		0.1
Phenyl ether (vapor)	1	7
Phenyl ether-Biphenyl mixture (vapor)	1	7
Phenylethylene, see Styrene		
Phenyl glycidyl ether (PGE)	10	60
Phenylhydrazine-Skin	5	22
Phosdrin (Mevinphos®)-Skin		0.1
Phosgene (carbonyl chloride)	0.1	0.4
Phosphine	0.3	0.4
Phosphoric acid		1
Phosphorus (yellow)		0.1
Phosphorus pentachloride		1
Phosphorus pentasulfide		1
Phosphorus trichloride	0.5	3
Phthalic anhydride	2	12
Picric acid-Skin		0.1
Pival ®(2-Pivalyl-1, 3-indandione)		0.1
Plaster of Paris (Note 4)		
Platinum (Soluble Salts) as Pt		0.002
Polytetrafluoroethylene decomposition products (Note 12)		
Propane (Note 3)		
beta-Propiolactone (Note 5)		
Propargyl alcohol-Skin	1	
n-Propyl acetate	200	840
Propyl alcohol	200	500
n-Propyl nitrate	25	110
Propylene dichloride	75	350
Propylene imine-Skin	2	5
Propylene oxide	100	240
Propyne, see Methylacetylene		
Pyrethrum		5
Pyridine	5	15
Quinone	0.1	0.4
RDX-Skin		1.5
Rhodium, Metal fume and dusts, as Rh		0.1
Soluble Salts		0.001
Ronnel		10
Rotenone (commercial)		5
Rouge (Note 4)		
Selenium compounds (as Se)		0.2
Selenium hexafluoride	0.05	0.4
Silicon carbide (Note 4)		
Silver, metal and soluble compounds		0.01
Sodium fluoroacetate (1080)-Skin		0.05
Sodium hydroxide		2
Stibine	0.1	0.5
Starch (Note 4)		
Stoddard solvent	200	1,150

Substance	ppm (Note 1)	mg/M³ (Note 2)
Strychnine		0.15
C Styrene monomer (phenylethylene)	100	420
Sucrose (Note 4)		
Sulfur dioxide	5	13
Sulfur hexafluoride	1,000	6,000
Sulfuric acid		1
Sulfur monochloride	1	6
Sulfur pentafluoride	0.025	0.25
Sulfuryl fluoride	5	20
Systox, see Demeton[4]		5
2, 4, 5T		
Tantalum		5
TEDP-Skin		0.2
Teflon[4] decomposition products (Note 12)		
Tellurium		0.1
Tellurium hexafluoride	0.02	0.2
TEPP-Skin		0.05
C Terphenyls	1	9
1, 1, 1, 2-Tetrachloro-2, 2-difluoroethane	500	4,170
1, 1, 2, 2-Tetrachloro-1, 2-difluoroethane	500	4,170
1, 1, 2, 2-Tetrachloroethane-Skin	5	35
Tetrachloroethylene, see Perchloroethylene		
Tetrachloromethane, see Carbon tetrachloride		
Tetrachloronaphthalene-Skin		2
Tetraethyl lead (as Pb)-Skin (Note 13)		0.100
Tetrahydrofuran	200	590
Tetramethyl lead (as Pb)-Skin (Note 13)		0.150
Tetramethyl succinonitrile-Skin	0.5	3
Tetranitromethane	1	8
Tetryl (2, 4, 6-trinitrophenylmethylnitramine)-Skin		1.5
Thallium (soluble compounds)-Skin as Tl		0.1
Thiram		5
Tin (inorganic cmpds, except SnH_4 and SnO_2)		2
Tin (organic cmpds)		0.1
Tin oxide (Note 4)		
Titanium dioxide (Note 4)		
Toluene (toluol)	200	750
C Toluene-2, 4-diisocyanate	0.02	0.14
o-Toluidine-Skin	5	22
Toxaphene, see Chlorinated camphene		
Tributyl phosphate		5
1, 1, 1-Trichloroethane, see Methyl chloroform		
1, 1, 2-Trichloroethane-Skin	10	45
Trichloroethylene	100	535
Trichloromethane, see Chloroform		
Trichloronaphthalene-Skin		5
1, 2, 3-Trichloropropane	50	300
1, 1, 2-Trichloro 1, 2, 2-trifluoroethane	1,000	7,600
Triethylamine	25	100
Trifluoromonobromomethane	1,000	6,100
Trimethyl benzene	25	120
2, 4, 6-Trinitrophenol, see Picric acid		
2, 4, 6-Trinitrophenylmethylnitramine, see Tetryl		
Trinitrotoluene-Skin		15
Triorthocresyl phosphate		0.1
Triphenyl phosphite		3
Tungsten & compounds, as W		
Soluble		1
Insoluble		5
Turpentine	100	560
Uranium (natural) sol. & insol. compounds as U		0.2
C Vanadium (V_2O_5 dust)		
(V_2O_5 fume)		0.1
Vinyl benzene, see Styrene		
Vinyl chloride—See §1910.1017		
Vinylcyanide, see Acrylonitrile §1910.1045		
Vinyl toluene	100	480
Warfarin		0.1
Xylene (xylol)	100	435
Xylidine-Skin	5	25
Yttrium		1
Zinc chloride fume		1
Zinc oxide fume		5
Zirconium compounds (as Zr)		5

MINERAL DUSTS

Substance	m.p.p.c.f. (Note 14)
SILICA	
Crystalline	
Quartz, Threshold Limit calculated from the formula	250
	% SiO_2+5 (Note 15)
Cristobalite	
Amorphous, including natural diatomaceous earth	20
SILICATES (less than 1% crystalline silica)	
Asbestos—See §1910.1001	
Mica	20
Portland Cement	50
Soapstone	20
Talc (non-asbestiform)	20
Talc (fibrous), use asbestos limit	
Tremolite, see asbestos	
Graphite (natural	15
"Inert" or Nuisance Particulates (See note 4)	50 (or 15 mg/M³ whichever is the smaller) of total dust <1% SiO_2

STANDARDS AND INTERPRETATIONS

Conversion factors
mppcf×35.3=million particles per cubic meter
=particles per c.c.

Table Notes

(1) Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 mm. Hg pressure.

(2) Approximate milligrams of particulate per cubic meter of air.

(3) Simple asphyxiant—See 1970 Threshold Limit Value pamphlet, Preface and Appendix E.

(4) "Nuisance" or "Insert" dust—See Mineral Dusts table and 1970 Threshold Limit Value pamphlet, Preface and Appendix D.

(5) Carcinogen—See Threshold Limit Value pamphlet, Appendix A [1].

(6) Not applicable to coke oven emissions; see §1910.1029.

(7) The standard of 1 mg/m³ applies in cotton yarn manufacturing until compliance with §1910.1043 is achieved.

(8) An atmospheric concentration of not more than 0.02 ppm, or personal protection may be necessary to avoid headache.

(9) Substance has variable composition—see Threshold Limit Value pamphlet Appendix A [1] to determine Threshold that does not collect vapor.

(11) Substance has variable composition. TLV determined by composition analysis. See 1970 Threshold Limit Value pamphlet Appendix A [1].

(12) See 1970 Threshold Limit Value pamphlet Appendix A [1].

(13) For control of general room air, biologic monitoring is essential for personnel control

(14) Millions of particles per cubic foot of air, based on impinger samples counted by light-field technics.

(15) The percentage of crystalline silica in the formula is the amount determined from airborne samples, except in those instances in which other methods have been shown to be applicable.

Supplement III—List of Standards (Other Federal Agency, ANSI, NEC, NFPA, etc.) Incorporated by Reference in Part 1926 and Those Part 1910 Standards Identified as Applicable to Construction Work

Private Standards Setting Organizations

ACGIH AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS

1970 THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS

ANSI AMERICAN NATIONAL STANDARDS INSTITUTE, INC.

A10.3—1970 Explosive-Actuated Fastening Tools, Safety Requirements for
A10.4—1963 Workmen's Hoists, Safety Requirements for
A10.5—1969 Material Hoists, Safety Requirements for
A10.9—1970 Concrete Construction and Masonry Work, Safety Requirements for
A11.1—1965 (R1970) Industrial Lighting, Practices for (IES RP7-1965)
A14.1—1968 Portable Wood Ladders, Safety Code for
A14.2—1956 Portable Metal Ladders, Safety Code for
A14.3—1956 Fixed Ladders, Safety Code for
A17.1—1965 Elevators, Dumbwaiters and Moving Walks, Safety Code for
A17.1a—1967 Supplement to A17.1—1965
A17.1b—1968 Supplement to A17.1—1965 and A17.1a—1967
A17.1c—1969 Supplement to A17.1—1965, A17.1a—1967, and A17.1b—1968
A17.1d—1970 Supplement to A17.1—1965, A17.1a—1967, and A17.1b—1968 and A17.1c—1969
A17.2—1960 Elevators, Practice for the Inspection of (Inspector's Manual)
A17.2a—1965 Addenda to A17.2—1960
A17.2b—1967 Supplement to A17.2—1960
A92.2—1969 Vehicle Mounted Elevating and Rotating Work Platforms
A120.1—1970 Power-Operated Platforms Used for Exterior Building Maintenance, Safety Code for
B7.1—1970 Use, Care and Protection of abrasive Wheels, Safety Code for the
B15.1—1953 (R1958) Mechanical Power-Transmission Apparatus, Safety Code for
B20.1—1957 Conveyors, Cableways, and Related Equipment Safety Code for
B30.2.0—1967 Overhead and Gantry Cranes, Safety Code for (Partial Revision of B30.2—1943)
B30.5—1968 Crawler, Locomotive and Truck Cranes, Safety Code for (Partial Revision of B30.2—1943)
B30.5—1968 Crawler, Locomotive and Truck Cranes, Safety Code for (Partial Revision of B30.2—1943)
B30.6—1969 Derricks, Safety Code for (Partial Revision of B30.2—1943)
B56.1—1969 Powered Industrial Trucks, Safety Standards for (ISO R1074)
D6.1—1971 Manual on Uniform Traffic Control Devices for Streets and Highways
J6.6—1971 Rubber Insulating Gloves
J6.7—1935 (R1971) Rubber Matting for Use Around Electrical Apparatus
J6.4—1971 Rubber Insulating Blankets
J6.2—1950 (R1971) Rubber Insulating Hoods
J6.1—1950 (41971) Rubber Insulating Line Hose
J6.5—1971 Rubber Insulating Sleeves
O1.1—1961 Woodworking Machinery, Safety Code for
Z35.1—1968 Accident Prevention Signs, Specifications for
Z35.2—1968 Accident Prevention Tags, Specifications for

DEFINITION OF TERMS

TLV - Refers to airborne concentrations of substances and represents conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect.

ACGIH - American Conference of Governmental Industrial Hygienists publishes TLVs for chemical and physical agents. The Conference is not an official Government Agency. Membership is limited to professional personnel in government agencies or educational institutions engaged in occupational safety and health programs.

ANSI - American National Standards Institute publishes consensus standards of acceptable concentrations for chemical and physical agents.

TWA - Time-weighted averages represent airborne concentrations averaged with regard to their duration.

PEL - Permissible Exposure Limits are the legally allowed concentrations in the workplace.

CEILING - A ceiling limit is given to a substance that is relatively fast acting. It is measured by one or more brief samples, usually 15 minutes in duration. This limit should not be exceeded.

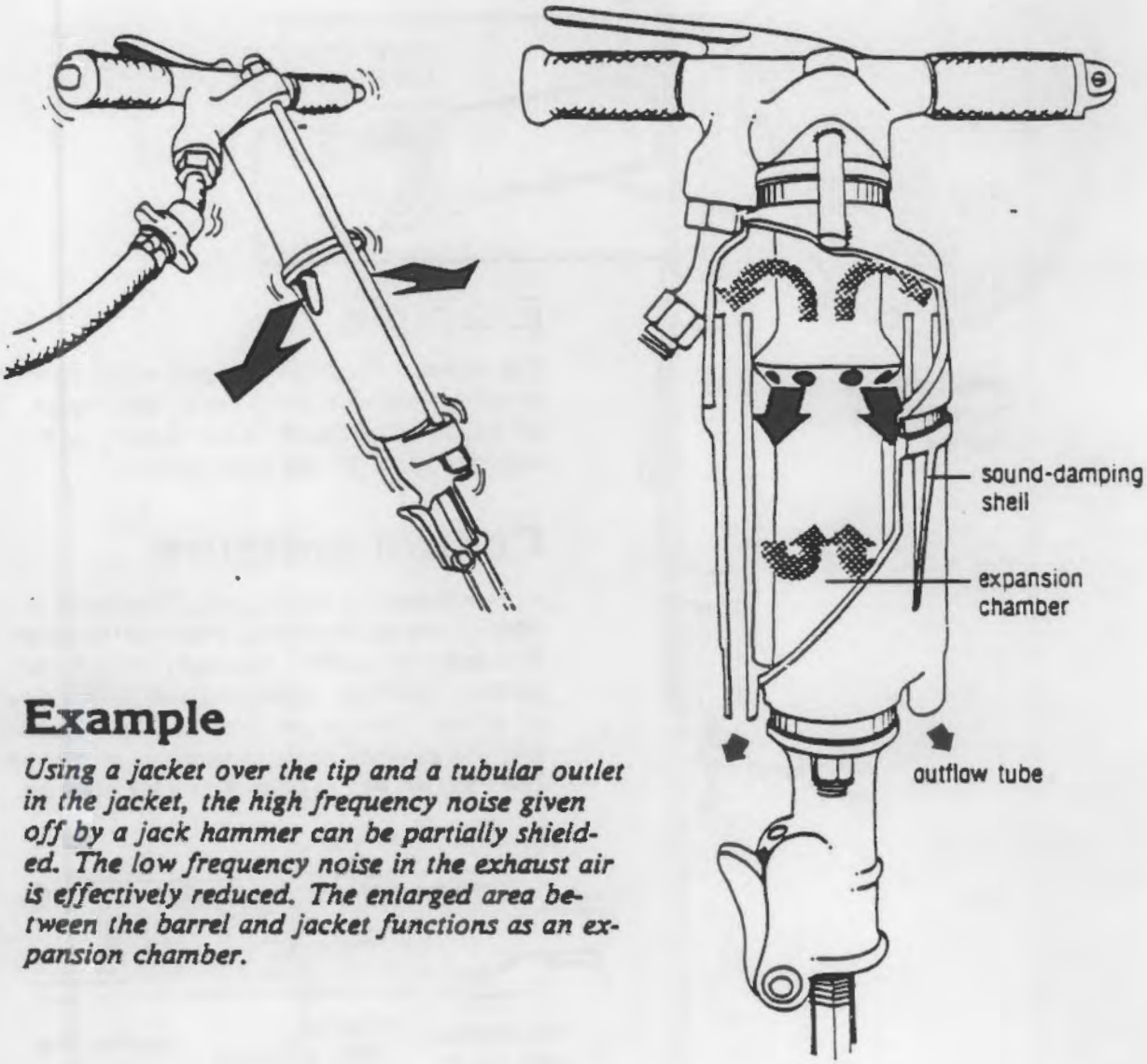
EXCURSIONS - Short exposures above a time-weighted average level. These must be compensated by levels below the TWA.

COMMON NOISES AND LEVELS

SOUND PRESSURE LEVEL (dB)	SOURCE OR EFFECT OF NOISE
140	Threshold of pain
130	Pneumatic rock drill
120	Loud automobile horn
110	Pinch press
100	Automatic lathe
90	Noisy factory
80	Passing truck
70	Noisy office
60	Conversational speech
50	Private business office
40	Average residence
30	Broadcast studio
20	Rustle of leaves
10	Average threshold of hearing
0	Acute threshold of hearing

CONSTRUCTION NOISES AND LEVELS

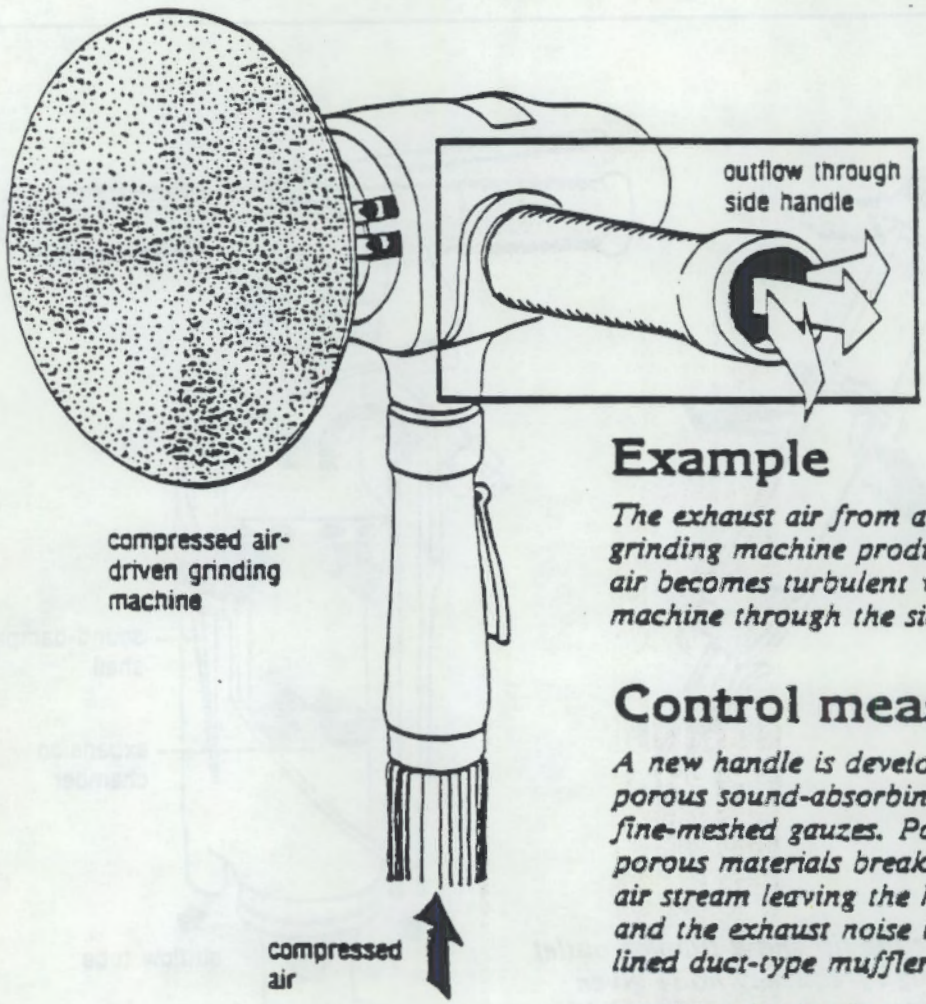
SOUND PRESSURE LEVEL (dB)	SOURCE OR EFFECT OF NOISE
114-139	Power-actuated tools (such as those for setting fasteners into concrete)
114-118	Hard rock drilling as in tunnel excavation
105-125	Riveting tools used on metal plates
98-100	Heavy truck cab
95-105	Crawler tractor
95-102	Front end loaders
90-120	Earth moving equipment
90-115	Power shovel cab
87- 89	Diesel air compressor
85- 98	Graders
65-105	Welding Equipment



Example

Using a jacket over the tip and a tubular outlet in the jacket, the high frequency noise given off by a jack hammer can be partially shielded. The low frequency noise in the exhaust air is effectively reduced. The enlarged area between the barrel and jacket functions as an expansion chamber.

Source: U.S. Department of Labor, Noise Control - A Guide for Workers and Employers, OSHA, 1980.

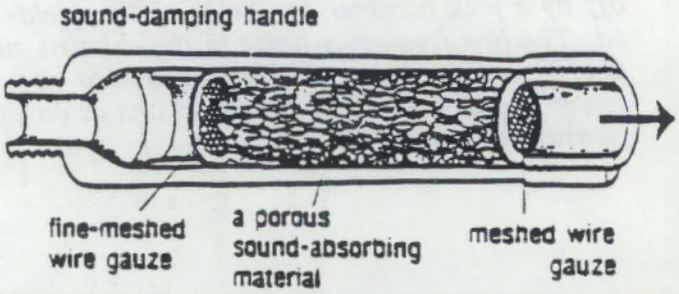


Example

The exhaust air from a compressed air-driven grinding machine produces a loud noise. The air becomes turbulent while leaving the machine through the side handle.

Control measure

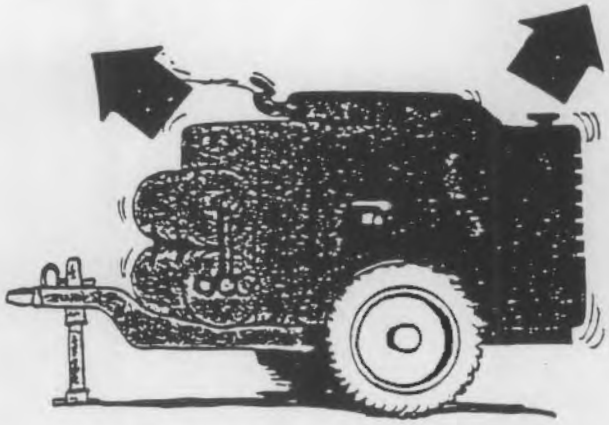
A new handle is developed, filled with a porous sound-absorbing material between two fine-meshed gauzes. Passage through the porous materials breaks up the turbulence. The air stream leaving the handle is less disturbed, and the exhaust noise is weaker. A straight lined duct-type muffler may also be used.



Source: U.S. Department of Labor, Noise Control - A Guide for Workers and Employers, OSHA, 1980.

Example

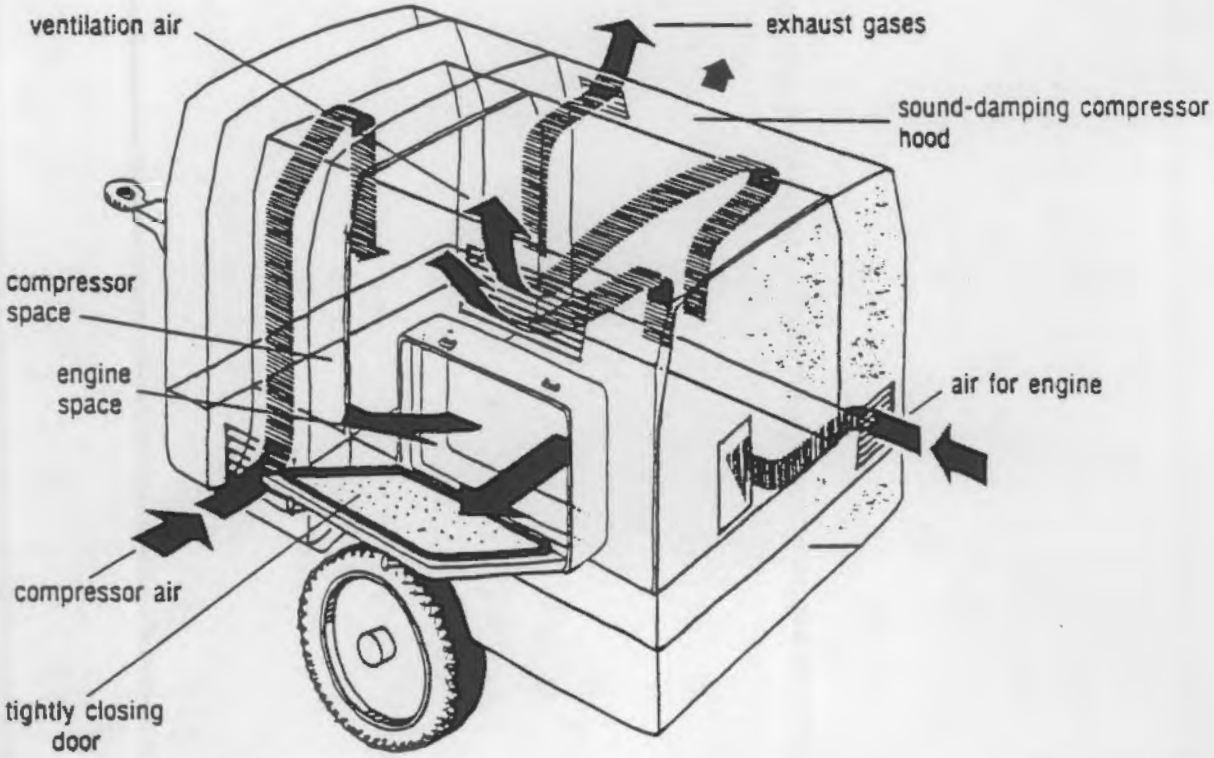
Compressors and the diesel engines inside them both may produce strong low frequency noise, even if they are provided with effective mufflers at the intake and exhaust.



non-sound controlled compressor

Control measure

A complete enclosure of damped material lined with sound absorbant will help. The air and exhaust gases must pass through mufflers which are partly made of channels with sound-absorbing walls. Doors for inspection must close tightly.



Source: U.S. Department of Labor, Noise Control - A Guide for Workers and Employers, OSHA, 1980.

"COMPETENT PERSON"

1926.58: Asbestos, Tremolite, Anthophyllite, and Actinolite

The basic concept of a competent person in the construction industry is from 29 CFR 1926, Subpart C—General Safety and Health Provisions, paragraph 1926.32(f):

> "Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

For purposes of complying with the asbestos standard 1926.58, a "competent person" is specifically defined in 1926.58(b) as

> one who is capable of identifying existing asbestos, tremolite, anthophyllite, or actinolite hazards in the workplace and who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f). The duties of the competent person include at least the following: establishing the negative-pressure enclosure, ensuring its integrity, and controlling entry to and exit from the enclosure; supervising any employee exposure monitoring required by the standard; ensuring that all employees working within such an enclosure wear the appropriate personal protective equipment, are trained in the use of appropriate methods of exposure control, and use the hygiene facilities and decontamination procedures specified in the standard; and ensuring that engineering controls in use are in proper operating condition and are functioning properly.

Other references to "competent person" in 1926.58 are

> 1926.58(e)(6)(ii) (For large-scale removal, demolition, and renovation operations):
>
> The employer shall designate a competent person to perform or supervise the following duties:
>
> (A) Set up the enclosure;
> (B) Ensure the integrity of the enclosure;
> (C) Control entry to and exit from the enclosure;
> (D) Supervise all employee exposure monitoring required by this section;
> (E) Ensure that employees working within the enclosure wear protective clothing and respirators as required by paragraphs (i) and (h) of this section and;

(F) Ensure that employees are trained in the use of engineering controls, work practices, and personal protective equipment;
(G) Ensure that employees use the hygiene facilities and observe the decontamination procedures specified in paragraph (j) of this section; and
(H) Ensure that engineering controls are functioning properly.

1926.58(e)(6)(iii):

In addition to the qualifications specified in paragraph (b) of this section, the competent person shall be trained in all aspects of asbestos, tremolite, anthophyllite, or actinolite abatement, the contents of this standard, the identification of asbestos, tremolite, anthophyllite, or actinolite and their removal procedures, and other practices for reducing the hazard. Such training shall be obtained in a comprehensive course, such as a course conducted by an EPA Asbestos Training Center, or an equivalent course.

1926.58(i)(4)(i) (Protective clothing for removal, demolition, and renovation operations):

The competent person shall periodically examine worksuits worn by employees for rips or tears that may occur during performance of work.

News United States Department of Labor

Office of Information Washington, D.C. 20210

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

USDL: 86-138

CONTACT: Susan Hall Fleming
OFFICE: (202) 523-8151
AFTER HOURS: (703) 354-1861

FOR RELEASE: Immediate
Thursday, April 3, 1986

NEW OPTIONAL MATERIAL SAFETY DATA SHEET FORM AVAILABLE FROM OSHA

In response to public requests, the Occupational Safety and Health Administration is making available a nonmandatory material safety data sheet (MSDS) form which can be used to comply with the requirements of the agency's hazard communication standard, the U.S. Labor Department announced today.

"OSHA's hazard communication standard gives chemical manufacturers and importers the freedom and flexibility to develop their own formats for providing hazard information to other employers," noted Patrick R. Tyson, acting assistant secretary of labor for occupational safety and health.

"However, many, many people have asked that we update the MSDS form (OSHA Form 20) currently required for the maritime industry so that it could be filled out to comply with the hazard communication standard. The optional form now available was developed to honor these requests."

The new sample form, or ones developed by chemical manufacturers, must be completed for all products containing hazardous chemicals in concentrations of 1 percent or greater and for all products containing 0.1 percent or more of substances identified as carcinogens. Chemical manufacturers and importers were to begin shipping MSDS's to their customers in the manufacturing sector last November 25. All covered employers are to be in full compliance with all provisions of the standard on May 25, 1986.

A single copy of the new MSDS is available from OSHA regional offices in Boston, New York, Philadelphia, Atlanta, Chicago, Dallas, Kansas City, Denver, San Francisco and Seattle or from the OSHA Publications Office, Rm. S4203, Frances Perkins Bldg., Third St. and Constitution Ave., N.W., Washington, D.C., telephone (202) 523-9667. Requestors should send a self-addressed mailing label to speed delivery. The form may be freely duplicated.

######

NOTE: A copy of the sample MSDS form is attached.

POTENTIALLY HAZARDOUS CHEMICALS COMMONLY FOUND ON CONSTRUCTION PROJECTS*

*Adapted from a list prepared by the Associated General Contractors of California, Inc. No representation is made by either the Associated General Contractors of California, Inc., or the U.S. Department of Labor, Occupational Safety and Health Administration, that these are the only hazardous chemicals found on construction projects for which a contractor must have MSDS, initiate training, etc.

Acetone
Acetylene gas
Adhesives
Aggregate
Aluminum etching agent
Ammonia
Anti-freeze
Arsenic compounds
Asbestos
Asphalt (Petroleum)
Bentonite clay
Benzene (and derivatives)
Bleaching agents
Carbon black
Carbon monoxide (in cylinders)
Caulking, sealant agents
Caustic soda (sodium hydroxide)
Cement
Chromate salts
Chromium
Cleaners
Cleaning agents
Coal tar pitch
Coatings (brush-or spray-applied)
Cobalt
Concrete curing compounds
Creosol
Cutting oil
De-emulsifier for oil
Diesel gas, diesel oil
Drywall
Enamel
Etching agents
Ethyl alcohol
Explosives
Fiberglass, mineral wool
Foam insulation and fireproofing
Form oils
Freon 20, R20 (and others)
Galvanized junction boxes, outlets, switches
Gasoline (petrol, ethyl)
Glues
Graphite
Greases
Grouts
Gypsum (calcium sulfate)
Helium (in cylinders)
Hydraulic brake fluid
Hydrochloric acid
Hydrogen (in cylinders)
Inks
Insulations (foam, roll or batt, etc.)
Iron
Kerosene
Lead
Lime (calcium oxide)
Limestone
Lubricating oils
Lye (sodium hydroxide, potassium hydroxide)
Magnesium

Masonry materials (bricks, stone, cement block, panels)
Metal conduit
Metals (aluminum, nickel, copper, zinc, cadmium, iron, etc.)
Methanol (methyl alcohol)
Methyl ethyl ketone (2-butanone)
Mortar
Motor oil additives
Muriatic acid (hydrochloric acid)
Naptha (coal tar)
Nitroglycerin
Nitrogen dioxide (in cylinders)
Oxygen (in cylinders)
Ozone
Paint remover
Paint stripper
Paints/lacquers
Particleboard
Pentachlorophenol
Photographic developers and fixers
Photogravure ink (copy machine)
Pipe (fiberglass, copper, PVC)
Pipe threading oil
Plastics
Polishes (wood, metal)
Propanol
Putty
PVC-pipe cement
Resins, epoxy/synthetics
Roofing felts (asbestos, glass-fiber, tarred, etc.)
Sealers
Shellac
Solder, flux (zinc chloride, fluorides, etc.)
Solder, soft (lead, tin)
Solvents
Sulfuric acid
Thinner, paint/lacquer
Tin
Transite
Turpentine, gum spirit, oil of turpentine
Varnishes
Waterproofing agents
Waxes
Wood alcohol (methanol)
Wood dust (hard wood, soft wood)
Wood preservative
Xylene
Zinc

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY *(As Used on Label and List)*

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name	Emergency Telephone Number
Address *(Number, Street, City, State, and ZIP Code)*	Telephone Number for Information
	Date Prepared
	Signature of Preparer *(optional)*

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% *(optional)*

Section III — Physical/Chemical Characteristics

Boiling Point		Specific Gravity (H_2O = 1)	
Vapor Pressure (mm Hg.)		Melting Point	
Vapor Density (AIR = 1)		Evaporation Rate (Butyl Acetate = 1)	

Solubility in Water

Appearance and Odor

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL

Extinguishing Media

Special Fire Fighting Procedures

Unusual Fire and Explosion Hazards

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable		

Incompatibility (*Materials to Avoid*)

Hazardous Decomposition or Byproducts

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur		

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? Skin? Ingestion?

Health Hazards (*Acute and Chronic*)

Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?

Signs and Symptoms of Exposure

Medical Conditions
Generally Aggravated by Exposure

Emergency and First Aid Procedures

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

Waste Disposal Method

Precautions to Be Taken in Handling and Storing

Other Precautions

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)

Ventilation	Local Exhaust	Special
	Mechanical (*General*)	Other

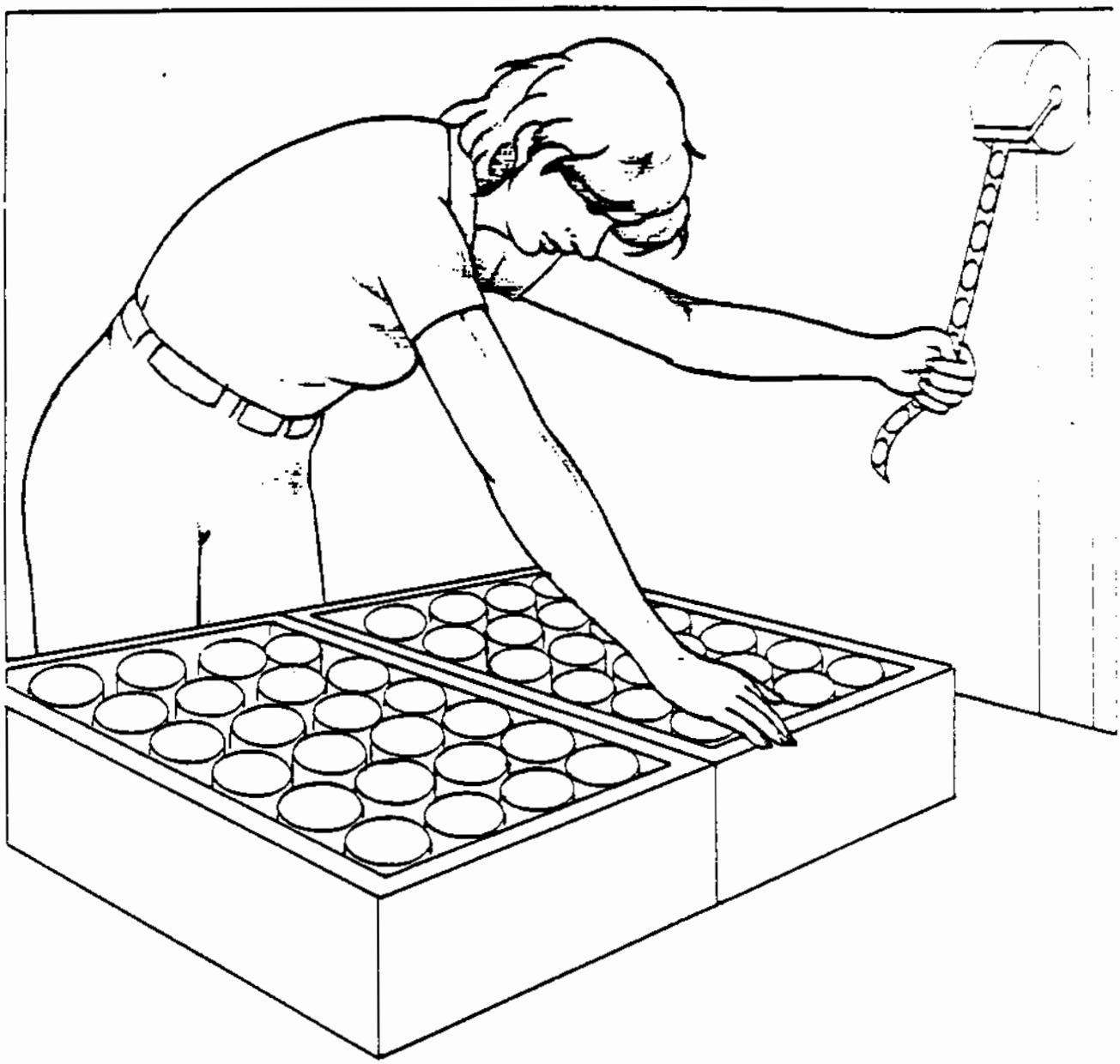
Protective Gloves	Eye Protection

Other Protective Clothing or Equipment

Work/Hygienic Practices

Your Aching Back

Poor design of the workplace contributes to innumerable back injuries each year. Back injuries are one of the leading — if not **the** — leading causes of job-related disabilities. This means both pain and suffering to workers in addition to a cost of millions of dollars to society and industry each year.



These injuries are frequently caused by working or lifting with a bent spine.

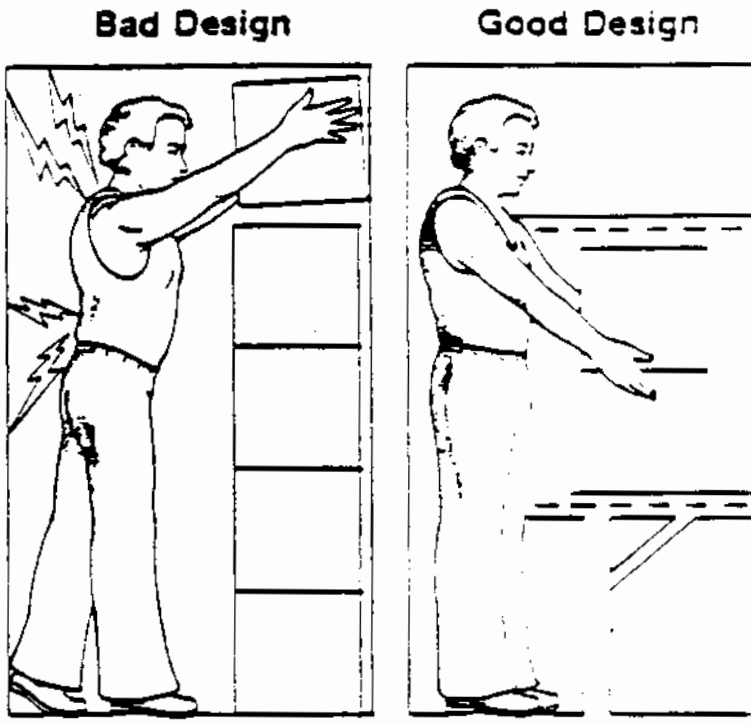
To prevent these injuries, get in the habit of noticing when you or your co-workers work with a bent spine. Then figure out a better way of doing the job.

Design Principles

Jobs should be designed to allow people to work with their backs straight. The following are eight examples.

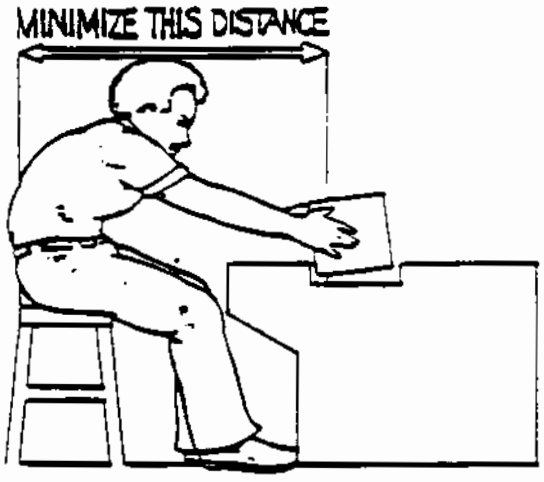
1.

A commonly recognized problem is lifting objects from the floor. But lifting objects overhead is also hazardous. It is better to build platforms to store objects off the floor (above knee height) to eliminate the need for stooping and also keep the materials below shoulder height.



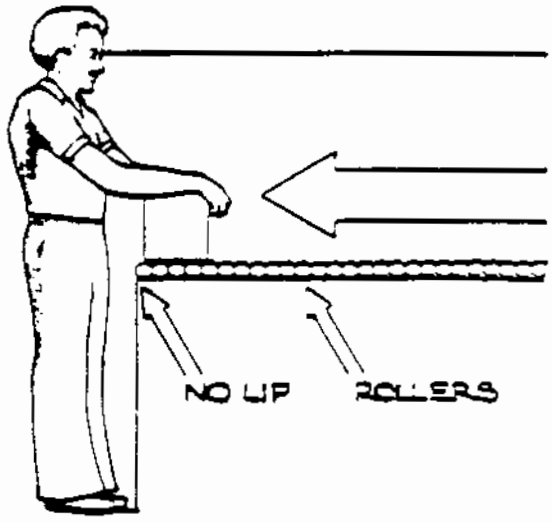
2.

The further away from your body you hold an object, the harder it is on your back. Work stations should be designed to minimize the distance between a lifted object and your body.



3.

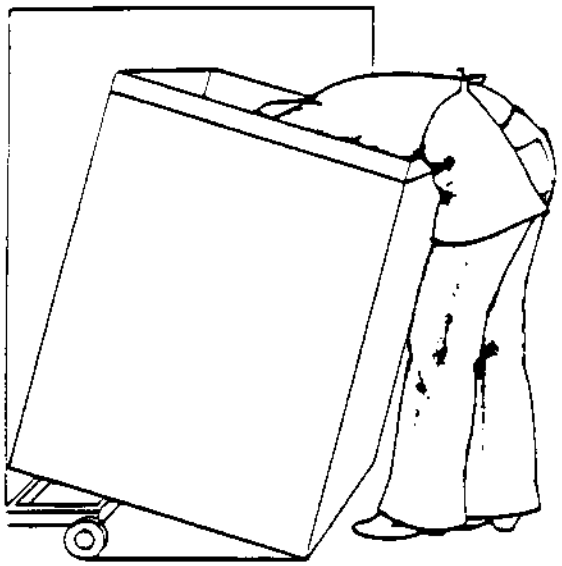
Provide shelves, supports, or roller conveyors on which objects can slide in order to eliminate unnecessary lifting.



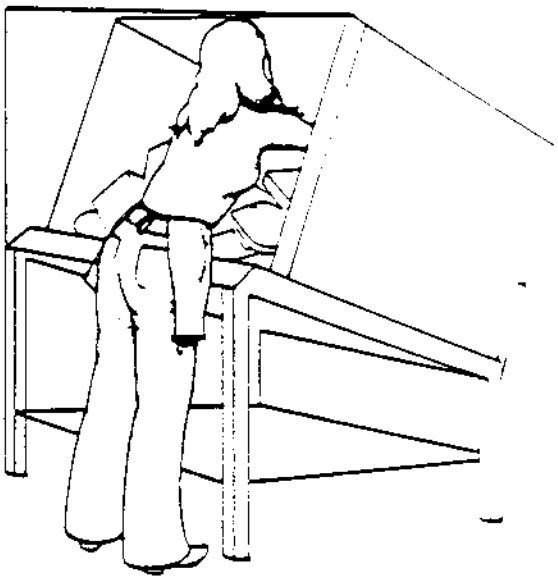
4.

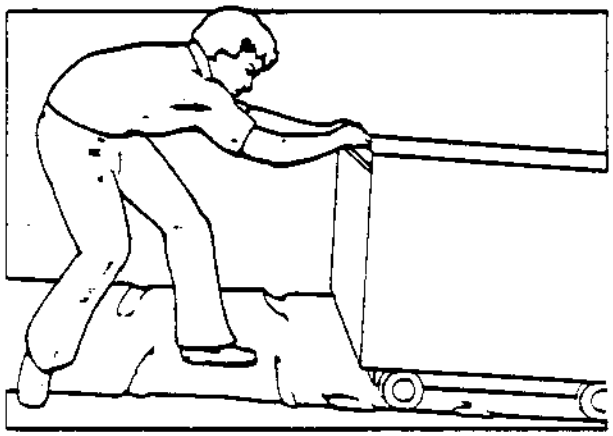
Reaching down into a bin is an example of poor workplace design. It is better to keep the bin off the floor and tilted to ease loading and unloading. A powered assist can be installed to adjust the tilt angle. Also spring loaded bins can be used, which lift the parts up as they are being unloaded.

Bad Design



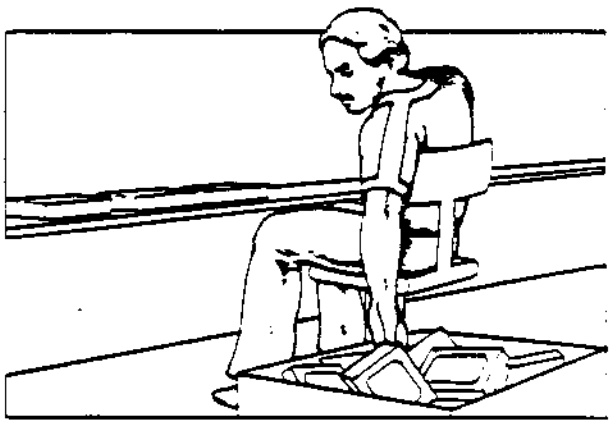
Good Design





5.

Pulling and pushing objects can also cause back injuries. Proper equipment design and maintenance can reduce these problems. In the above illustration, the floor needs repair, the wheels should be larger, and a better handle provided.



6.

Twisting, stretching or leaning with a heavy load may cause back problems. Jobs should be changed to eliminate these reaching motions.

- Move the parts closer
- Use a long tool or a "rake"
- Provide a stepping stool for standing reaches

APPENDIX A

CONFINED SPACE FOR SAFETY PROGRAM

for

CONSTRUCTION PROJECTS

STEPS	REQUIREMENTS
1. ESTABLISH A POLICY DEFINING "CONFINED SPACE".	Definition: Any piece of equipment, sump, trench, underground utility vault, sewer, etc. which must be entered through a manhole or restricted opening, having unfavorable natural ventilation which could contain or produce dangerous air contaminants, is an area in which exit during an emergency could be difficult, and is an area not intended for continuous occupancy.
2. MAKE A HAZARD ASSESSMENT	Monitor For Possible Air Contaminants • Combustible Vapors (are they detectable by use of explosion meters?) • Carbon Monoxide • Hydrogen Sulphide • Nitrogen Dioxide • Sulphur Dioxide • Other Gases, Vapors, or Toxic Agents Is there sufficient oxygen? (20.9%)
3. ITEMS ON ENTRY PERMITS	An entry permit shall be prominently displayed near the entrance of the confined space.
4. TRAINING REQUIREMENTS	Training shall include: • Task planning. • Hazard recognition and assessment. • Use and maintenance of monitoring equipment. • Use of various types of respirators and other protective equipment. • Responsibilities and outfitting of the standby watch. • Confined space rescue. • Usage of appropriate engineering controls.

5. PROGRAM EVALUATION AND ENFORCEMENT.

Periodic evaluation of the "confined space" program will assure that all elements of the program are complete and are actually working as planned. "Safety Is No Accident" is a slogan that reminds us that accident prevention must be a well planned effort. Training of employees in safe practices is mandatory.

6. SUMMARY

To be effective, the key elements of a Confined Space Entry Safety Program must be in place with:

- Effective communication.
- Enforced regulations.
- Appropriate training
- Hazard assessment of each confined space.
- Appropriate safeguards provided.
- Adequate equimpent for workers and the job.

SAMPLE EMERGENCY RESCUE PLAN FOR CONFINED SPACE

BEFORE ENTRY: Determine hazards in atmosphere (if any). Begin powered ventilation. Don safety harness and belt. Don SCBA gear and check for proper operation. Have standby personnel available. Ask for medical assistance. Ask for lifting device if needed.

UPON ENTRY: Get victim to a fresh air supply as quickly as possible e.g., blower air supply or an emergency escape respirator. Many companies provide a 5 minute escape respirator as standard equipment. These can be put on victim to supply a safe atmosphere while victim is being prepared for removal from the confined space. Get victim out of space quickly and efficiently. Exit from space and secure it. Administer first aid and CPR as necessary. Lock up space or barricade and post guard if needed. Make report of incident to safety personnel.

EXAMPLES OF RESCUE PLAN WHEN WORK HAS BEEN IN PROGRESS

PREPARE THE SCENE: Hazards should be know. Type of contaminant. How long exposed.

EQUIPMENT ON HAND: Blowers should be ventilating. SCBA should be checked and serviceable. Safety belt and harness should be on site. Testing equipment should be calibrated. Lifting gear-should be on site if required.

ACTION: Summon help and notify of emergency. Have help act as standby and have them procure medical assistance. Don SCBA gear and harness. Connect life line. Clear entrance and conduct rescue. Exit space allow no one in. Administer first aid-CPR as required.

POST ACTION: Secure space. Post and barricade. Impound tester-check for proper functioning. Make full report to safety officer or management.

APPENDIX B

QUICK CHECKLIST FOR CONFINED SPACE HAZARDS

ITEMS	HAZARD? YES	HAZARD? NO	RECOMMENDED ACTION IF "YES"
Air Quality			
Bins			
Blasting			
Bulkheads			
Caissons			
Cofferdams			
Communication Means			
Compressed Air			
Drilling			
Electrical			
Emergency Provisions			
Fire Potential			
First Aid Facilities			
Large Dia. Pipeline			
Lighting			
Medical Facilities			
Noise			
Open-Top Spaces (more than 4 feet deep) such as:			
Pits			
Tubs			
Vaults			
Vessels			
Oxy-Acetylene Cutting			
Personal Prot. Equipment			
Process Tanks			
Sanitation			
Sewers			
Shafts			

APPENDIX B (cont.) –

QUICK CHECKLIST FOR CONFINED SPACE HAZARDS

ITEMS	HAZARD? YES	HAZARD? NO	RECOMMENDED ACTION IF "YES"
Storage Tanks			
Toxic Materials			
Tunnels			
Utility Vaults			
Ventilation			
Water			
Welding			
Additional Comments:			

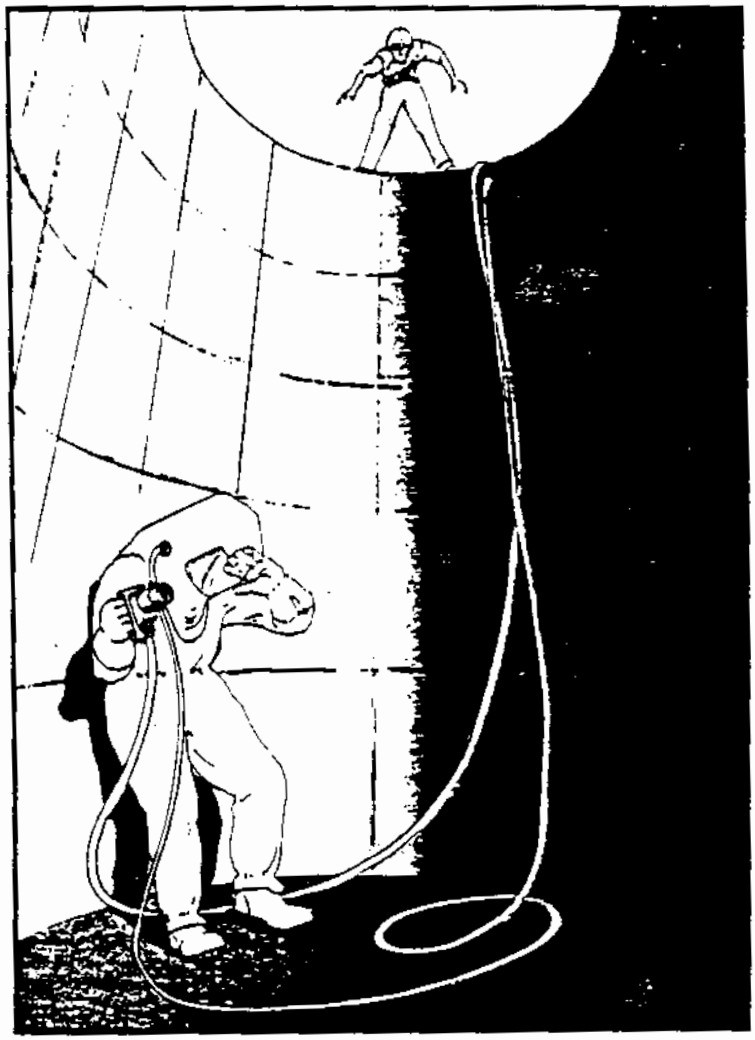
ACCIDENT REPORT FATAL FACTS

U.S. Department of Labor
Occupational Safety and
Health Administration

No. 36

ACCIDENT SUMMARY

Accident Type	Asphyxiation
Weather	Warm, partly cloudy
Type of Operation	Sandblasting/ painting contractor
Crew Size	Four
Collective Bargaining?	No
Competent Safety Monitor on Site?	Yes
Safety and Health Program in Effect?	Limited
Was the Worksite Inspected Regularly by the Employer?	Yes
Training and Education Provided?	Inadequate
Employee Job Title	Sandblaster/Painter
Age/Sex	56/M
Experience at this Type Work	5 years on a permanently assigned crew
Time on Project	45 minutes



BRIEF DESCRIPTION OF ACCIDENT

A contract employee was assigned to sandblast the inside of a reactor vessel during turnaround activities at a petrochemical refinery. Instead of relying on the contract company's own air compressors in accordance with the contractor's policy, the contract foreman connected the employee's supplied air respirator to a hose containing what he thought was plant air. Instead it was nitrogen. Both hoses were identical except for markings at the shutoff valve. The sandblaster entered the vessel, descended to the bottom, placed the respirator hood on his head and was overcome.

ACCIDENT PREVENTION RECOMMENDATIONS

1. Employers must instruct employees to recognize and avoid unsafe conditions associated with their work (29 CFR 326.21(b)(2)).

2. Contractors should follow a policy of using only their own air compressors or breathing air cylinders for their employees.

3. Middle and/or upper management personnel should routinely check first line supervisors to insure they are following established company safety policies.

SOURCES OF HELP

- Safety and Health Requirements for Working in Confined Space, a slide-tape training program including instructor's guide and class handouts, helps employees recognize potential sources of danger in confined spaces and explains how to select and use proper protective clothing and equipment. Available from the National Audio Visual Center, order No. A12793, for $90, prepaid 8700 Edgeworth Dr., Capitol Heights, MD 20743-3701, telephone (301) 763-1896

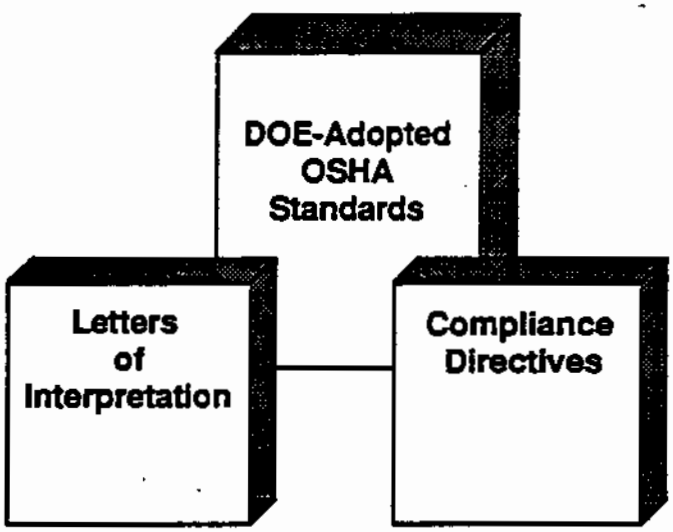
- Construction Safety and Health Standards (OSHA 2207) which contains all OSHA job safety and health rules and regulations (1926 and 1910) covering construction

- OSHA-funded free consultation services Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under U.S. Labor Department or under the state government section where states administer their own OSHA programs).

NOTE: The case here described was selected as being representative of fatalities caused by improper work practices. No special emphasis or priority is implied nor is the case necessarily a recent occurrence. The legal aspects of the incident have been resolved, and the case is now closed

DOE Interpretations Guide to OSH Standards

Standards 1926.16 - 1926.551



Volume 6

OSH Information - Building Blocks for Compliance

OSHA Instruction STD 1-8.2

March 8, 1982

Subject: 29 CFR 1910.151(c), Medical Services and First Aid; 29 CFR 1926.50 and 51, Medical Service and First Aid, and Sanitation, Respectively; Applicable to Electric Storage Battery Charging and Maintenance Areas

A. Purpose. This instruction provides guidelines regarding eye wash and body flushing facilities required for immediate emergency use in electric storage battery charging and maintenance areas.

B. Scope. This instruction applies OSHA-wide.

C. Action. OSHA Regional Administrators/Area Directors shall ensure that OSHA field staff apply the requirements the subject standards to electric storage battery charging areas as set forth in E. of this instruction.

D. 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.

3. Ensure that State designees are asked to acknowledge receipt of the Federal Program change in writing, within 30 days of notification, to the Regional Administrator. This acknowledgment should include a description either of the State's plan to implement the change or of the reasons why the change should not apply to that State.

4. Review policies, instructions and guidelines issued by the State to determine that this change has been communicated to State program personnel. Routine monitoring activities (accompanied inspections and case file reviews) shall also be used to determine if this change has been implemented in actual performance.

E. Guidelines. OSHA field staff will evaluate the potential circumstances for employee exposure to electrolyte(s) in electric storage battery handling, charging and maintenance areas.

1. The safety or health compliance officer shall document the following observations in the case file:

a. Employee use of personal protective equipment.

b. Type and chemical concentration of electrolyte(s).

c. Special guards and/or precautions intended to provide for employee protection from electrolyte exposure.

d. Based upon employee job functions, record the extent and type of probable employee exposure to electrolyte(s).

e. Note the availability and location of eye wash and body flushing equipment/facilities. (An arrangement, which includes a hose equipped with a proper face and body wash nozzle, shall also be noted.)

2. The compliance officer and Area Director shall evaluate the data documented in E.1. Where potential employee exposure to hazardous storage battery electrolyte(s) exists, the circumstances and extent of exposure shall determine the application of the following alternatives:

a. The use of effective personal protective equipment in combination with an eye wash and body flushing station in near proximity to the work area(s), shall be deemed to provide adequate minimum protection for employees.

b. In areas where the extent of possible exposure to electrolyte is small, (i.e., such as auto garages, service stations and in certain industrial and construction situations), a specially designated pressure controlled and identified water hose equipped with a proper face and body wash nozzle which will provide copious amounts of low velocity potable water, or an appropriate portable eye wash device containing not less than one gallon of potable water which is readily available and mounted for use, is considered to provide minimum employee protection when proper personal protective equipment is used.

c. In addition to emergency eye and/or face wash procedures, the employer shall ensure that adequate provisions have been established for the emergency care of employees exposed to eye or face contact with electrolytes.

d. At construction sites and in commercial and manufacturing facilities at locations where powered industrial trucks are parked for overnight storage and routine battery recharging only, no need for emergency facilities exists unless potential exposure to electrolyte is substantiated. Where exposure is possible (i.e., servicing batteries) the provisions of E.2.b and E.2.e. should be evaluated for applicability.

e. At construction sites and in commercial manufacturing facilities where batteries (such as industrial truck batteries) are serviced and handled, proper plumbed eye wash and body drenching equipment shall be available immediately adjacent to the work station(s) and within the work area regardless of the personal protective equipment required and used.

3. Where employee exposure to hazardous electric storage battery electrolyte(s) exists and minimum protection measures are not provided, citations shall be issued as appropriate for violations of:

a. 29 CFR 1910.151(b) or 29 CFR 1926.50(c), a person or persons adequately trained to render first aid shall be readily available in the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees.

b. 29 CFR 1910.151(c) and as adopted by 29 CFR 1926.51, where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

c. 29 CFR 1910.132(a) or 29 CFR 1926.28(a), personal protective equipment for eyes, face, head, and extremities, protective clothing and protective shields and barriers, shall be provided, used and maintained in a sanitary and reliable condition wherever it is necessary by reason of chemical hazards encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

F. Background. 29 CFR 1910.151 (c), Medical Services and First Aid, needs clarification regarding its applicability to the hazards of electric storage battery charging areas and the potential exposure of employees to electrolyte(s). There is a clear need to identify the extent and suitability of minimum acceptable eye wash and body quick drenching facilities which are available to potentially exposed employees.

1. The extent of potential employee exposure varies with workplace situations such as:

a. Employee functions.

b. Type of electrolyte(s) and concentration.

c. Type and size of batteries.

d. Facility layout.

e. Personal protective equipment used.

2. The need for eye wash and body quick drenching equipment varies with the factors noted in F.1. Therefore, judicious enforcement of the standard should provide for an evaluation of the contributing factors relative to the potential hazardous exposure, and should permit appropriate minimum assurances for adequate first aid and subsequent treatment.

3. Various forms of eye wash equipment are available today. Many are of the portable or self contained wall mounted type which are limited in the quantity of water available for eye wash purposes, and usually do not provide for body drenching. This equipment may be used for compliance with 29 CFR 1910.151(c) only when it is not economically feasible to provide plumbed equipment and/or where the potential employee exposure to electrolyte(s) is determined to be slight.

4. Eye wash equipment should provide copious low velocity flow of portable water at a suitable temperature, generally between 60 degrees F and 105 degrees F.

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RECORD ID 1444

STANDARD NUMBER 1926.50
INFORMATION DATE 760114

ABSTRACT In case of injury, assistance is "reasonably accessible" (1926.50(c)) if it is within 3 to 4 minutes of the scene of an accident.

INTERPRETATION 29 CFR 1926.50

January 14, 1976

This is in response to your letter dated November 13, 1975, which requests an interpretation of 29 CFR 1926.50, and confirms your telephone conversation with Mr. C of my staff.

The phrase "reasonably accessible" emphasizes the desirability of prompt assistance when an injury or illness occurs. The time frame should be within 3 to 4 minutes, as death can occur from stoppage of breathing or severe bleeding depending on the type and location of the injury.

If arrangements cannot be made to provide emergency medical service within the time frame as discussed above, then a trained first aider should be available for each shift of the operation. First aid courses are available through local American Red Cross Chapters, and Emergency Medical Technician courses are available through local community colleges. These courses are recognized as meeting the requirements of the Occupational Safety and Health standards.

If your site is located in rural areas, or is some distance from the nearest hospital or clinic, some type of emergency transportation should also be considered.

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RECORD ID 1297

STANDARD NUMBER 1926.52; 1910.95
INFORMATION DATE 830329

ABSTRACT This interpretation letter addressing the hearing conservation amendment. Standard 1910.95, does not cover construction or agriculture. The construction industry ,1926.52, is covered by its own noise standard.

INTERPRETATION 29 CFR 1926.52; 1910.95

March 29, 1983

The hearing conservation amendment to the occupational noise exposure standard, 29 CFR 1910.95, published on March 8, 1983, is applicable to all employees who work for employers who are covered by the Occupational Safety and Health Act except those engaged in construction or agriculture. This position was stated in the January 16, 1981, hearing conservation amendment and was repeated in the preamble to the August 21, 1981, hearing conservation amendment. While this statement was not repeated in the March 8, 1983, final hearing conservation amendment, OSHA's position has not changed. The construction industry is covered by its own noise standard, 29 CFR 1926.52.

RECORD ID 3205

STANDARD NUMBER 1926.52(d)(1); 1910.1000
INFORMATION DATE 900430

ABSTRACT This interpretation letter addresses the technical feasibility of engineering controls for noise and dust overexposures at a tunnel construction site on a turnpike. The only technically feasible engineering control is retrofit of jumbo rock drills with acoustical cabs. This approach would not meet Field Operations Manual criteria for economic feasibility as time-weighted exposures were less than 400% and the company has instituted a hearing conservation program. As long as the program demonstrates no occupationally-related hearing loss in the noise-exposed workers, the control would be economically infeasible. Total dust levels were within OSHA PEL after installation of a mechanical ventilation system.

INTERPRETATION 29 CFR 1926.52(d)(1); 1910.1000

APR 30, 1990

Memorandum

Subject: Technical Feasibility of Noise and Dust Controls at the Tunnel

On February 13, 1990 Dr. B of my staff in the company of Mr. W, a hygienist from your office, visited (contractor)'s at the Tunnel #2 on the Northeast Extension of the Turnpike to evaluate the feasibility of noise and ventilation engineering controls for cited noise and nuisance dust overexposures. Dr. B's conclusions follow:

The noise exposures to jumbo rock drill crew members cited as items 3(a) and 3(b) in inspection number 018224105 were respectively 330% and 350%. The only technically feasible engineering control is the retrofit of each jumbo with an acoustical cab per Figure A item 4 which would benefit only two of the six to eight crew members. Such an approach would not meet the Field Operations Manual criteria for economic feasibility given the facts that the time-weighted exposures were less than 400% and the company has instituted a hearing conservation program as comprehensive as that required in the general industry noise standard. Therefore, such a control would be economically infeasible as long as the hearing conservation program demonstrates the absence of occupationally-related hearing loss in the noise-exposed workers. Control of the drilling noise itself is not technically feasible to control at the point of origin. Since all of these jumbo units were purchased second hand and are very old and prone to frequent breakdowns, it would be advisable for (contractor) to consider retiring this equipment as soon as is practical and to replace them with modern jumbos having acoustical cabs, hydraulic and pneumatic systems manufacturer-controlled by muffling or enclosure.

The present mechanical ventilation system to remove nuisance dust from the tunnel work areas seems to be more than adequate. Pre citation dust levels were 75 mg of total dust per cubic meter of air sampled. After installation of the tunnel ventilation system, total dust levels were reduced to 3 mg per cubic meter of air, well within the current OSHA PEL of 15 mg per cubic meter time-weighted over an 8-hour shift.

NOISE CONTROL INVESTIGATION TUNNEL #2

(city), (state)

Introduction:

On February 13, 1990 the writer in the company of Mr. W, a hygienist from the (city) Area Office, visited the Tunnel Number 2 construction site of (contractor) Joint Venture Contractors located in (city), (state) on the Northeast Extension of the (state) Turnpike. The company was represented by Messrs. W, site safety coordinator, and Mr. N, loss control coordinator. The purpose of the visit was to determine the feasibility of noise control engineering on pneumatic rock drilling machines used to bore the tunnel.

Data Acquisition and Reduction:

Sound level, octave band level, and one-third octave band level measurements were made with an (product) #805B684 equipped with an IVIE IE-2P preamplifier power supply and a Bruel (product). This system can present spectral analysis of sound in real time. The IVIE meter meets IEC standards for impulse-precision sound level measurements and ANSI standards for Type 1 precision measurements. The meter's field calibration was checked before and after data acquisition at the measurement location with a (product) The calibrator has a nominal accuracy of + or - 0.5 dB and it is traceable to the National Institute of Standards and Technology reference sound pressure level. The microphone was covered by a polyurethane wind screen during data acquisition.

Observations:

A second vehicular tunnel on the northwest side of the Northeast Extension of the (state) Turnpike at Blue Mountain in (city) is undergoing construction to serve two lanes of south bound traffic. The mountain is solid rock of the first class. Tunneling is ongoing from both the north and south portals; however, the north bore is more advanced than the south bore. The basic construction procedures follow the protocol: shoot explosive charges (15 to 20 minutes), muck in 8 yard scoops (2 to 3 hours), spray shotcrete or apply rock bolts (2 to 16 hours), drill the new face with multiple jumbos (1 and 1/2 to 2 hours), then repeat this process. The duration of shotcreting is dictated by the class of rock in the bore.

All observations were made in the north portal. Initially one jumbo rock drill equipped with one boom was in operation positioning itself at the working face. A second single boom jumbo rock drill was entering the bore. The tunnel at this point was solid hard rock. About 25 feet from the face, the background sound level was 95 dBA. Figure 1 presents the octave band spectrum of this ambient tunnel noise. The heavy black line denotes the OSHA permissible exposure level (PEL) of 90 dBA time-weighted for 8-hours as a function of frequency. The octaves that fall above this line contribute to the sound level in excess of 90 dBA. The background or ambient sound level of 95 to 96 dBA was generated by the idling of four jumbos, two near the face and two to the rear plus an idling self propelled work platform and the shaft ventilation system.

All the jumbos operating in the north bore were equipped with roll over protection and full roofs but not with tight-fitting acoustical cabs. All the units are very old and break down with periodic regularity. Each unit carries one pneumatically-operated rock drilling boom, a rarity by today's tunnel engineering standards where most jumbos have from 3 to 7 booms. During drilling operations each jumbo is manned by 6 to 8 men. Two men are in the jumbo's cab whilst 4 to 6 men remain outside the cab at different locations. At 50 feet from the face the sound level was 106 dBA during rock drilling into granite. Between two operating jumbos the sound level was 110 dBA. Figure 2 presents the octave band spectrum at this location. In the cab of one of the jumbos it was 112 dBA. At the end of one of the booms the sound level was 114-115 dBA. The drills are water cooled. The peak sound pressure level (SPL) at the boom end was 120 dB and predominant pure tones about 80 Hz and 125 Hz were present. Due to extreme wetness and water spray from the rock drills sound levels at the actual working face were not obtained though they would have been the highest levels in the tunnel. Most of the high noise levels during drilling operation was due to the actual drilling of rock rather than the unmuffled pneumatics.

Discussion:

Noise generated by the jumbo rock drills is produced by the point of operation rock drill bit, unmuffled pneumatics, and general mechanical noise. From the writer's observations in the Tunnel #2, most of the excessive noise is produced by the actual rock drilling itself with the air or pneumatic and mechanical sources being secondary. Figures 3A and 3B present the generic noise controls and sources of information for jumbo drills. Retrofit of each jumbo with an acoustic cab would bring the daily noise doses for the two employees who work in the cab area of the jumbo within permissible sound levels of Table D-2 of the noise standard. However, Figure 3A demonstrates that this approach is far from inexpensive keeping in memory that these costs are in 1983 dollars. Also this approach does nothing for the 4 to 6 crew members who must work outside the acoustic cab. This writer feels that the principal source of noise exposure is the drilling of the rock itself which is inherent in the operation and technically infeasible to control. Whilst it is good practice to muffle or manifold the air exhaust as illustrated in Figure 4, control of air noise on the 4 jumbo units observed by the writer would not reduce the daily noise exposures for the drilling crew since the drilling noise was 10 to 15 dBA above the lesser sources.

Hearing Conservation:

Since being cited for the absence of a continuing effective hearing conservation program, 19 CFR 1926.52(d)(1), (contractor) has instituted a comprehensive hearing conservation program that includes fitting and enforcement of hearing protection, initial and annual training in the need, care, and use of ear protection, hazards of noise exposure, and the purpose of audiometric testing. Currently 144 employees have received their initial noise training. Except for five new hires, all company employees exposed at or above a daily noise dose of 100% or 90 dBA time-weighted for 8 hours have received their baseline audiogram. Current employees were tested via a van from Sacred Heart Hospital of (city) by certified audiometric technicians under the supervision and direction of

Dr. P., CCC-A. Baseline audiograms and otological histories were obtained at that time. New hires will receive their baseline audiogram and otologic history as part of their initial physical exam. All employees working in the tunnels are required to wear Zee NRR II foam ear plugs with a lab NRR of 35 dB. All employees who work within 100 feet of the jumbos must wear dual protection. Dr. P is the custodian of the audiometric, otologic, and calibration data.

Conclusions:

The noise exposures to jumbo rock drill crew members cited as items 3(a) and 3(b) in inspection number 018224105 were respectively 330% and 350%. The only technically feasible engineering control is the retrofit of each jumbo with an acoustical cab per Figure 3A item 4 which would benefit only two of the six to eight crew members. Such an approach would not meet the Field Operations Manual criteria for economic feasibility given the facts that the time-weighted exposures were less than 400% and the company has instituted a hearing conservation program as comprehensive as that required in the general industry noise standard. Therefore such a control is economically infeasible. Control of the drilling noise itself is not technically feasible to control at the point of origin. Since all of these jumbo units were purchased second hand and are very old and prone to frequent breakdowns, it would be advisable for (contractor) to consider retiring this equipment as soon as is practical and to replace them with modern jumbos having acoustical cabs, hydraulic, and pneumatic systems manufacturer controlled by muffling and enclosure.

11 April 1990

Document Attachments include the following Figures/illustrations:

Figure 1: Octave Band Spectrum in Real Time for Background Noise in the Tunnel when one Jumbo Unit is at Idle.

Figure 2: Octave Band Spectrum in Realtime for the Noise Level Between Two Operating Jumbo Rock Drills.

Figures 3A and 3B: Jumbo-Mounted Percussion Drills- Noise Quieting Treatments, Costs and Status.

Figure 4: Dateline: MSHA, newsletter excerpt regarding reduction of noise from pneumatic drills.

VENTILATION INVESTIGATION TUNNEL #2

(city), (state)

Introduction:

On February 13, 1990 the writer in the company of Mr. W, a hygienist from the (city) Area Office, visited the Tunnel Number 2 construction site of (contractor) joint Venture Contractors located in (city), (state) on the Northeast Extension of the (state) Turnpike. The company was represented by Messrs. Mr. W, site safety coordinator, and Mr. N, loss control coordinator. The purpose of the visit was to determine the feasibility of local mechanical ventilation to ventilate the face and bore to meet the requirements of the air contaminants standard, 29 CFR 1926.57(b).

Observations:

A second vehicular tunnel on the northwest side of the Northeast Extension of the (state) Turnpike at Blue Mountain in (city) is undergoing construction to serve two lanes of south bound traffic. The mountain

is solid rock of the first class. Tunneling is ongoing from both the north and south portals; however, the north bore is more advanced than the south bore. The basic construction procedures follow the protocol: shoot explosive charges (15 to 20 minutes), muck in 8 yard scoops (2 to 3 hours), spray shotcrete or apply rock bolts (2 to 16 hours), drill the new face (1 and 1/2 to 2 hours), then repeat the process. The duration of shotcreting is dictated by the class of rock in the bore.

During Mr. W's compliance visit on September 25, 1989 an employee sampled for a full shift was exposed to a time-weighted average nuisance dust of 75.07 mg per cubic meter of air. At the time there was no mechanical ventilation at the face or anywhere in the tunnel. Between Mr. W's inspection visit and the writer's visit, the company has installed local exhaust ventilation at both working faces. During the writer's visit only the north bore was evaluated. A large ceiling mounted circular duct extends from the north portal to within 50 feet of the working face. Substitute blowers are currently in use because the original blowers were inadvertently installed backward and blew up when initial start up was attempted.

Velometer measurements were made during the visit by Mr. W. He used an Alnor Senior sn:ANG102607 to collect data. At the face the air movement was 200 fpm and 300 feet back in the bore, the air movement was 300 to 400 fpm. At a later date Mr. W returned to do full-shift sampling. His results were 3 mg per cubic meter of air, nuisance dust - well within the OSHA permissible exposure level (PEL) of 15 mg per cubic meter. Therefore, the current local exhaust ventilation system seems to meet the OSHA standard. However, in a recent Philadelphia Inquirer article, it was noted by this writer that in the two photographs published, ambient dust levels in the bore were high, probably in excess of 15 mg for total dust. Also the article noted that the fans were not in operation that day due to maintenance problems. Care must be taken to keep the fans in good operating condition lest the air concentrations exceed OSHA PEL's.

Conclusions:

The present mechanical ventilation system to remove nuisance dust from the tunnel work areas seems to be more than adequate. Pre citation dust levels were 75 mg of total dust per cubic meter of air sampled. After installation of the tunnel ventilation system total dust levels were reduced to 3 mg per cubic meter of air, well within the current OSHA PEL of 15 mg per cubic meter time-weighted over an 8-hour shift.

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RECORD ID 3701

STANDARD NUMBER 1926.55(a);1926.59 ;1926.103; 1910.134
INFORMATION DATE 900925

ABSTRACT This memo addresses enforcement by OSHA in cases concerning employees engaged in the removal of lead-based paint from HUD public housing projects. OSHA believes that the lead exposures in question are subject to the general duty clause, Section 5(a)(1) of the OSH Act and will issue citations for work observed for which commonly known feasible precautions were not considered. The Department of Housing and Urban Development (HUD) has entered into contracts with private contractors for the removal of toxic, lead-based paint from numerous housing projects throughout the country. Before letting these contracts, HUD consulted with OSHA regarding ways in which the employees could be protected from harmful lead exposures. OSHA concluded that its existing standard was inadequate to deal with the exposures likely to occur during lead-based paint removal.

INTERPRETATION 29 CFR 1926.55(a);1926.59 ;1926.103; 1910.134

SEP 25, 1990

MEMORANDUM

SUBJECT: HUD Lead-based Paint Removal Project

This is in response to your request for legal advice concerning what requirements OSHA may enforce under the Occupational Safety and Health Act to protect employees engaged in the removal of lead-based paint from public housing projects. As we will discuss, we believe that the lead exposures in question are subject to the general duty clause, section 5(a)(1) of the OSH Act.

Background:

The Department of Housing and Urban Development (HUD) has entered into contracts with private contractors for the removal of toxic, lead-based paint from numerous housing projects throughout the country. Before letting these contracts, HUD consulted with OSHA regarding ways in which the employees of these contractors could be protected from harmful lead exposure. Reviewing the matter, OSHA concluded that its existing standard for lead exposure in construction was inadequate to deal with the exposures likely to occur during lead-based paint removal projects. Accordingly, OSHA developed for HUD a list of recommended safety precautions for lead abatement which were consistent with generally recognized industrial hygiene practices. The recommendations include provisions for work practices, protective clothing, respirators, hygiene facilities, employee training and medical surveillance. We are informed that OSHA's recommendations were subsequently included as contract requirements in all current HUD paint removal contracts.

The OSHA standard presently applicable to lead exposures in construction is the national consensus standard adopted in 1971 under Section 6(a) of the Act. That standard, adopted for construction at 29 CFR Section 1926.55(a), consists only of a permissible exposure level (PEL) of 200 ug/m^3. This PEL is widely recognized by industrial hygiene professionals as too permissive to provide adequate health protection for construction employees, and OSHA has stated its intention to reduce the lead PEL for construction as part of its ongoing PEL revision project. Additionally, the existing standard provides only an exposure limit and fails to include other protective measures such as requirements for medical surveillance and personal protective equipment. The Advisory Committee for Construction Safety and Health has recently recommended adoption of a comprehensive Section 6(b) lead standard for construction.

Enforcement of the HUD guidelines:

If in fact the OSHA guidelines have been incorporated in HUD contracts, we are aware of no reason why they could not be enforced by HUD, under general procurement law, in the same manner as any other federal contract provision. However, HUD has apparently inquired whether OSHA has any regulatory

authority which could be brought to bear on contractors who disregard these requirements. Because these guidelines are essentially a list of commonly-known, generally feasible precautions for abating the widely recognized hazards of lead paint exposure, we believe that HUD contractors who fail to implement these contract requirements could potentially be cited under the general duty clause, section 5(a)(1) of the OSH Act.

Normally, an employer cannot be cited for violating the general duty clause with respect to hazards which, like lead hazards in construction, are already addressed by existing OSHA standards. (company), 8 BNA-OSHC 2077 (1980); (company) , 1 BNA- OSHC 1263 (1973). However, a highly significant exception to this rule was recognized by the D.C. Circuit in UAW v. General Dynamics, Land Systems Div., 815 F.2d 1570 (D.C. Cir. 1987). In General Dynamics, the court ruled that if an employer knows a particular safety standard is inadequate to protect his workers against the specific hazard it purports to address, the employer has a duty to take whatever measures may be required under Section 5(a)(1), over and above those mandated by the standard, to safeguard its workers, id. at 815 F.2d 1577.

Like the Freon standard at issue in General Dynamics, the construction lead standard is an outdated Section 6(a) requirement, widely regarded by safety and health professionals as inadequately protective of employees. Like the employer in General Dynamics, HUD's paint removal contractors can be persuasively shown to have actual knowledge of the standard's inadequacies, since they have contractually obligated themselves to comply with safety procedures significantly greater than those required by the standard. Thus, we feel that a plausible case can be made under General Dynamics for the issuance of citations under the general duty clause to paint removal contractors who expose their employees to serious physical harm by violating the safety provisions of their agreements with HUD.*

It is important to note that employers can be cited under 5(a)(1) for failing to render their workplace free of the recognized hazards of exposure to dangerous concentrations of lead, not for violating the HUD safety procedures. Thus, an employer's violation of multiple guideline provisions may not give rise to multiple citation items as would be the case under a Section 6(b) standard. In every case, OSHA must prove the elements of a general duty clause violation. The HUD procedures are useful only as evidence that the employer had been put on notice of the hazard, which can be shown to be a recognized one within the lead abatement industry. Also, the contractor's acceptance of the HUD contract can be offered as proof of feasibility of the abatement measures specified in the guidelines.

We should add that, depending on the facts which may emerge in specific cases, there are OSHA standards other than 29 CFR 1926.55 which are applicable to some phases of HUD paint-removal operations, two prime examples being the construction hazard communication standard at 29 CFR 1926.59 and the respiratory protection standard at 29 CFR 1926.103. When available, such standards should of course be cited in lieu of the general duty clause.

We can predict two other likely employer defenses, both of which we feel can be overcome. Employers may argue that HUD safety requirements for its contractors preempt OSHA enforcement under Section 4(b)(1) of the OSH Act. However, mere exercise by another agency of procurement authority does not trigger Section 4(b)(1) preemption, see Ensign-Bickford Co. v. OSHRC, 717 F.2d 1419, 1421 (D.C. Cir. 1983) cert. den. 466 U.S. 937 (1984); (company), 3 BNA-OSHC 1650 (1975). It could also be argued that OSHA's use of the HUD guidelines to impose duties on employers is an impermissible end run around the Act's rulemaking requirements and an improper use of the general duty clause. But there is some precedent for the use of 5(a)(1) to provide interim employee protection while OSHA is actively considering a new standard, as is the case here. Cf. American Smelting & Refining Co. v. OSHRC, 501 F.2d 504, 511-13 (8th Cir., 1974) (affirming citations under Section 5(a)(1) prior to effective date of original lead standard).

RECORD ID 1702

STANDARD NUMBER 1926.58
INFORMATION DATE 881001

ABSTRACT The asbestos standard for construction applies when a maintenance project involves removal of asbestos-containing pipe insulation, even though the project may be located inside a manufacturing facility and "in-house" workers are used to perform the asbestos removal.

INTERPRETATION 29 CFR 1926.58

OCT 10, 1988

This is in response to your letter of July 8, regarding the applicability of the asbestos standard for construction (29 CFR 1926.58) to in-house maintenance, repair of renovation operations in manufacturing facilities. We apologize for the delay in responding to your inquiry. Your understanding is correct, that the applicability of the asbestos standards for construction and general industry are process oriented.

In 29 CFR 1926.58(a), construction is defined to include but is not limited to the following:

(1) Demolition or salvage of structures where asbestos, tremolite, anthophyllite, or actinolite is present;

(2) Removal or encapsulation of materials containing asbestos, tremolite, anthophyllite, or actinolite;

(3) Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain asbestos, tremolite, anthophyllite, or actinolite;

(4) Installation of products containing asbestos, tremolite, anthophyllite, or actinolite;

(5) Asbestos, tremolite, anthophyllite, and actinolite spill/emergency cleanup; and

(6) Transportation, disposal, storage, or containment of asbestos, tremolite, anthophyllite, or actinolite or products containing asbestos, tremolite, anthophyllite, or actinolite on the site or location at which construction activities are performed.

Thus, if a maintenance project involved removal of asbestos containing pipe insulation, the construction standard would apply even though the project may be located inside of a manufacturing facility and "in-house" workers were used to perform the asbestos removal. The scope of the asbestos standard for construction is not in any way limited by standard industrial classification (SIC) code.

The general industry standard applies when the source of asbestos exposure is related to a production process. For example, if an employee performs maintenance on machinery which produces gaskets that contain asbestos, and is exposed to airborne concentrations of asbestos in performing these duties, then this employee would be covered under the general industry asbestos standard 29 CFR 1910.1001. Thus it is possible for both standards to be applied in a single facility.

ATTACHMENT: The following interpretation (Record ID 3656) is included as supplemental information to this first instance of OSHA Standard 1926.58.

RECORD ID 3656

STANDARD NUMBER 1910.1001(i)(4); 1926.58
INFORMATION DATE 900716

ABSTRACT This interpretation provides a clarification to 1910.1001(i)(4) and 1926.58(j)(3). OSHA prohibits smoking in areas where occupational exposure to asbestos takes place. Employees who work in or near areas where asbestos abatement and renovation activity are ongoing are prohibited from smoking even though they do not disturb or handle asbestos. Employees are prohibited from smoking when small amounts of airborne fibers are being created by employees activities or are drawn from an adjacent area into the work zone.

INTERPRETATION 29 CFR 1910.1001(i)(4); 1926.58

JUL 16, 1990

This is in response to your letter of April 9, requesting guidance concerning the implementation of the new Occupational Safety and Health Administrator (OSHA) regulation on smoking and occupational exposure to asbestos. The regulations in question are 29 CFR 1910.1001(i)(4) and 29 CFR 1926.58(j)(3). OSHA is prohibiting workplace smoking in areas where occupational exposure to asbestos takes place. The answers to your three questions are as follows:

Question 1:

In a large machinery compartment on a ship undergoing repair there are approximately 30 employees working in the compartment. Only 2 of them are assigned work involving asbestos containing materials. They are conducting a small asbestos removal through the use of a glove bag. Air sample data shows the typical employee in the compartment has 8 hour time weighted average exposure of 0.05 fibers per cubic centimeter. Who in this group of 30 employees must be prohibited from smoking?

Answer:

Under the requirements of 29 CFR 1910.1001(i)(4), all 30 employees must be prohibited from smoking. "Occupational exposure" means asbestos exposure which has its source in the workplace. Thus, employees who work in or near areas where asbestos abatement and renovation activity are ongoing may be occupationally exposed even though they do not disturb or handle asbestos.

Question 2:

A group of employees are assigned work in an area where no asbestos work is being performed. The area does have asbestos insulated piping in it. The employees will work in the area for their full 8 hour shift. Air sample data shows that the typical employee exposure is 0.05 fibers per cubic centimeter. It is determined that the small amount of airborne dust is being created by the employees activities. Are they prohibited from smoking?

Answer:

All employees must be prohibited from smoking since it is determined that the small amount of airborne dust is being created by employees' activities.

Question 3:

A group of employees are assigned work in an area that is free from asbestos materials. However, air sample data shows that asbestos fibers are being drawn into the area from an adjacent area. The data shows that the typical exposure is 0.05 fibers per cubic centimeter averaged over an 8 hour period. Are these employees considered occupationally exposed and therefore prohibited from smoking?

Answer:

These employees are considered occupationally exposed and therefore must be prohibited from smoking.

All three examples involve occupational exposure to asbestos; therefore, these employees must be prohibited from smoking in these areas. We hope we have addressed your concerns adequately. If you need further assistance, please do not hesitate to contact us.

APR 27, 1990

SUBJECT: Amendments to the Asbestos Standards.

On February 5, 1990, OSHA published an amendment to the asbestos standards which included provisions concerning smoking. One of the provisions states that "the employer shall ensure that employees do not smoke in work areas where they are occupationally exposed to asbestos because of activities in that work area."

This letter is being forwarded to your office for reply due to the potential significance of the response. This office has requested an interpretation concerning this issue in a memorandum to your office dated April 9, 1990. Clarification of "occupational exposure" is needed in the field due to the great variations in interpreting this phrase.

ATTACHMENT: The following information is also included as supplemental information for this first instance of OSHA Standard 1926.58. Source information was cut from Record ID 1893, Standard 1910.1200(f), Information Date 26 July 1989.

SUBJECT: Asbestos Construction Standard, 1926.58

We have recently been reviewing the construction asbestos standard, enforcement directive and policy letters in detail, and would appreciate your thoughts on enforcement policy in the following areas:

1. What is a small - scale, short - duration operation? OSHA Instruction CPL 2-2.40 is not clear in this area. It gives four (4) different definitions: Maintenance or renovation tasks where the removal of asbestos is not the primary goal of the job, activities where exposure can be kept below the action level such as glove bags, an operation included in the employer's asbestos maintenance program and non-repetitive operations. Does this mean that an employer is exempt from negative - pressure enclosure requirements on any job if glove - bagging methods are used for removal? Or does it depend on the amount of asbestos being removed? If so, what amount? Fifty lineal feet or fifty square feet is the cut-off established by the Ohio Department of Health.

2. When is a negative - pressure enclosure required? CPL 2-2.40 says a negative - pressure enclosure is required for all removal, demolition and renovation operations (except where not feasible). In a letter to Mr. B of the Indianapolis Air Pollution Control Division, Mr. T states that negative pressure enclosures are required for all removal, demolition and renovation operations regardless of exposure levels. In a letter to Mr. R. of (Company), Mr. P. states that regulated areas are established only where asbestos concentrations exceed the PEL. The standard says that regulated areas shall be established whenever asbestos concentrations exceed or can reasonably be expected to exceed the standard, and that negative - pressure enclosures are required for all removal, demolition and renovation operations. Can you please provide some guidance in this area?

3. What standard should be cited to require employees to wear protective clothing during asbestos removal, demolition and renovation operation in cases where there are no air monitoring results showing exposure above the PEL? We have been citing 1926.58(i)(3) because 1926.58(i)(1) says that clothing must be provided only for exposure above the PEL. There is no requirement anywhere in the standard requiring protective clothing inside the negative-pressure enclosure, except where air levels are above the PEL. The preamble states that protective clothing is required for all employees working in the abatement enclosure by paragraph (i)(4) (page 22706), however (i)(4) does not state that it must be provided, but rather that it should be periodically inspected and must be repaired or replaced if damaged.

SOURCE LETTER

July 8, 1988

We would like a clarification on the applicability of the asbestos standard for construction work (1926.58) to in-house maintenance, repair, or renovation work. We understand the standard to be process-oriented, so assume that these operations may be covered by 1926.58. Thanks for your help.

Representative Monitoring

RECORD ID 1719

STANDARD NUMBER 1926.58
INFORMATION DATE 870908

ABSTRACT This interpretation letter clarifies that the construction asbestos standard requirement for representative monitoring does not preclude an employer from taking individual exposure measurements of each of his employees. There is no specific number of required samples for all situations. There is not one statistical method to determine whether exposures are below the action level.

INTERPRETATION 29 CFR 1926.58

SEP 8, 1987

This is in response to your inquiry to Mr. B requesting a clarification of the requirement for representative monitoring under the asbestos standard for the construction industry (29 CFR 1926.58). Please accept my apology for the delay in this reply.

Your specific question is how many samples are required in order that they be "representative." First, it should be noted that the requirement for representative monitoring does not preclude an employer from taking individual exposure measurements of each of his employees. Individual measurement is the ultimate indicator of an employee's exposure, however, the Occupational Safety and Health Administration (OSHA) believes that in many work situations the representative monitoring approach can be more cost-effective to accomplish the objectives of the asbestos standard.

There is no specific number of required samples for all situations. The performance monitoring approach of the standard allows employers to use any personal monitoring strategy which identifies the correct employees for inclusion in applicable asbestos standard programs such as but not limited to training, respiratory protection, medical surveillance and employee notification of exposure results.

Thus, in the scenario you described one could sample all of the employees or one could sample on or more employees reasonably expected to have the highest exposure. If representative sampling is used then the 8-hour time weighted average results of those sampled would be attributed to the appropriate remaining exposed employees for the purposes of complying with the asbestos standard.

Your final question asks what statistical method one can use to determine whether employee exposures are below the action level. Like representative monitoring this is not a mandatory requirement nor is there only one method. Please feel free to discuss any specific statistical method you are proposing with our (City) Regional Office.

Showers

RECORD ID 1750

STANDARD NUMBER 1926.58
INFORMATION DATE 870526

ABSTRACT Showers need not be provided for employees engaged in small scale, short duration operations. Employees are allowed to clean their protective clothing with a portable HEPA-equipped vacuum before leaving the area where maintenance was performed.

NOTE: There is a proposed change to small scale short duration projects published in 55 FR 29712.

INTERPRETATION 29 CFR 1926.58

MAY 26, 1987

This is in response to your letter of January 20, 1987 requesting an interpretation of the Occupational Safety and Health's (OSHA) Asbestos standard for construction. Please accept my apology for the delay in response. The overwhelming number of letters and telephone calls regarding the asbestos standard has caused unavoidable delays in responding to the public's concern.

Your interpretation is correct, showers do not have to be provided for those employees engaged in small scale, short duration operations. Employees are allowed to clean their protective clothing with a portable HEPA-equipped vacuum before leaving the area where maintenance was performed.

Air Purifying Respirators

RECORD ID 1823

STANDARD NUMBER 1926.58; 1910.1001; 1910.134; 1926.103
INFORMATION DATE 880922

ABSTRACT This interpretation addresses the use of powered air-purifying respirators (PAPR's) for asbestos removal in the construction industry. The certified requirement for PAPR's is the same as for the continuous flow supplied air respirators (SAR's). Since the PAPR's are operated under positive pressure, fit testing is not required.

INTERPRETATION 29 CFR 1926.58; 1910.1001; 1910.134; 1926.103

September 22, 1988

MEMORANDUM

SUBJECT: Powered Air-Purifying Respirators (PAPR) used in Asbestos Abatement

This is in response to your memo of August 22 concerning the use of PAPR's for asbestos removal in the Construction Industry.

A battery operated blower in the PAPR forces the filter air into the breathing some of the respirator wearer. The certified requirement for PAPR's is the same as for the continuous flow supplied air respirators (SAR's). The term "positive pressure" could be defined as higher than the ambient pressure. Facepiece pressures inside the inlet covering of PAPR's vary over a range of + 0.2 to + 0.8 inch water pressure during inhalation. On the contrary, the pressure inside the facepiece of the non-powered air-purifying respirator is on the negative side during inhalation.

It is true that the PAPR's can go negative pressure under heavy work load. However, it could also happen to the pressure demand SAR's and the positive-pressure self-contained breathing apparatus (SCBA) which have been recommended by the National Institute for Occupational Safety and Health (NIOSH) as the only recommended respirators for asbestos abatement work.

Since the PAPR's are operated under positive pressure, fit testing is not required as far as the OSHA asbestos standards for general and construction industry, 29 CFR 1910.1001 and 1926.58 is concerned.

SOURCE LETTER

August 22,1988

MEMORANDUM

SUBJECT: Powered Air Purifying Respirators Used in Asbestos Abatement

A clarification is requested on the classification (negative pressure or positive pressure respirator) of the PAPR when used in the asbestos abatement industry. The attached letters from OSHA and NIOSH concerning PAPR's contradict each other.

Attachment

January 6, 1988

NIOSH does not consider powered air purifying respirators (PAPR) to be positive pressure respirators. This is reflected in the assigned protection factors listed in the NIOSH Respirator Decision Logic (copy enclosed) of 25 for loose fitting PAPR and 50 for tight fitting PAPR. I am also enclosing a copy of A Guide to Respiratory Protection for the Asbestos Abatement Industry which states the only respirators recommended by NIOSH for asbestos are pressure demand self contained breathing apparatus or a

combination Type C supplied air respirator with full facepiece operated in the pressure demand mode with an emergency backup pressure demand SCBA.

Enclosure

February 23, 1980

I am responding to your letter dated February 5, 1988, in which you asked if a powered air-purifying respirator is considered a negative-pressure respirator. A powered air-purifying respirator is considered a positive-pressure respirator in the context of the fit testing requirement of 29 CFR 1926.58 (h)(4)(ii). Therefore, qualitative or quantitative face fit testing is not required.

February 5, 1988

Re: Clarification of the Construction Industry Standard 29 CFR 1926.58.

I am writing requesting additional clarification of a portion of the Construction Industry Standard for Asbestos regarding respiratory protection.

Is a powered air-purifying respirator considered a negative-pressure respirator? If not, is quantitative or qualitative fit testing required by the Standard?

Competent Person Training

RECORD ID 1863

STANDARD NUMBER 1926.58
INFORMATION DATE 870717

ABSTRACT The training required for designation as a "competent person" under 29 CFR 1926.58 is the successful completion of an EPA Asbestos Training Center course or of a course that is essentially similar in length and content to the EPA course.

INTERPRETATION 29 CFR 1926.58

JUL 17, 1987

This is in response to your letter of October 29, 1986 regarding the Occupational Safety and Health Administration's asbestos standard for the construction industry 29 CFR 1926.58. We apologize for the delay in responding to your letter.

Specifically, you ask if an approved training course required by Maryland State regulation COMAR 10.18.23.04C satisfies the requirements for designating a "competent person" under 29 CFR 1926.58. We have contacted the State of Maryland but thus far have been unable to obtain a copy of their regulations.

In general, however, the training requirements for a competent person is the successful completion of an Environmental Protection Agency (EPA) Asbestos Training Center course or of a course that is essentially similar in length and content to the EPA courses.

It should be noted that, once the EPA accreditation procedures come into effect, the requirements for competent person training will be successful completion of an EPA accredited course for Asbestos Abatement Contractors and Supervisors.

Respirator fit testing

RECORD ID 1365

STANDARD NUMBER 1926.58; 1910.1001; 1910.134; 1926.103
INFORMATION DATE 870727

ABSTRACT This interpretation under the construction asbestos standard, 1926.58, addresses requirements for respirator qualitative fit testing, medical surveillance required when negative pressure respirators are worn for asbestos work, qualifications necessary for individuals administering medical questionnaires, and the definition of a fiber.

INTERPRETATION 29 CFR 1926.58; 1910.1001; 1910.134; 1926.103

JUL 27, 1987

This is response to your recent letter concerning the Occupational Safety and Health Administration's (OSHA) asbestos standard for the construction industry. We apologize for the delay in responding to your letter.

Your first question deals with qualitative fit tests required by 29 CFR 1926.58 (h)(4)(ii). OSHA has interpreted this section to mean that qualitative fit tests may be used for any level of respiratory protection selected provided that the employee exposures will not exceed 2 fiber/cc.

Your second question concerns paragraph 29 CFR 1926.58(m)(l)(i), medical surveillance. This paragraph means that whenever employees are required to wear negative pressure respirators when performing asbestos work that medical surveillance is required regardless of the exposure levels to asbestos, tremolite, actinolite or anthophyllite. If the employer upgraded the respiratory protection to powered air purifying respirator with high efficiency filters, then medical examination pursuant to the asbestos standard would only be required when employee exposures were at or above the action level for thirty or more days per year. It should be noted, however, that 29 CFR 1910.134(b)(10) requires that:

> (10) Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The local physician shall determine what health and physical conditions are pertinent. The respirator user's medical status should be reviewed periodically (for instance, annually).

Your third question relates to 29 CFR 1926.58, Appendix D. Specifically, you ask, "what qualifications are necessary for the individual who administers medical questionnaires ...?" There are no specific qualifications required by the standard for individuals who administer the medical questionnaire contained in Appendix D.

Your final question deals with the change in the definition of a fiber. The definition of a fiber was changed to mean ..."a particulate form of asbestos, tremolite, anthophyllite or actinolite, 5 micrometers or longer..." in order to be consistent with the new OSHA analytical procedures. If the microscopic analysis of a sample is capable of distinguishing between asbestos, tremolite, anthophyllite or actinolite fibers from fibers of other substances, than it is proper to do so.

Training

RECORD ID 1866

STANDARD NUMBER 1926.58
INFORMATION DATE 870727

ABSTRACT This interpretation letter addresses OSHA's approach for evaluating asbestos training programs. OSHA does not review and approve individual asbestos training courses. In general, OSHA considers a course to be equivalent to an EPA Asbestos Training Center course, if the curriculum of the course is essentially similar in length and content to the EPA Asbestos Training Center course.

INTERPRETATION 29 CFR 1926.58

JUL 27, 1987

This is in response to your letter dated October 23, 1986 to Mr. J of the Occupational Safety and Health Administration's (OSHA) (City) Regional Office. We apologize for the delay in responding to your inquiry. Your letter was referred to the OSHA National Office in Washington, D.C. for response.

Your letter concerns an asbestos training program that I.P.C. (City), Inc. offers. Specifically, whether or not your course can be considered to be equivalent to an EPA Asbestos Training Center course pursuant to 29 CFR 1926.58(e)(6)(iii).

Resource limitations prevents OSHA from reviewing and approving individual asbestos training courses. In general, OSHA considers a course to be equivalent to an EPA Asbestos Training Center course, if the curriculum of the course is essentially similar in length and content to the EPA Asbestos Training Center course.

It should be noted, however, that the EPA is required under the Asbestos Hazard Emergency Response Act (AHERA) to develop procedures for the accreditation of asbestos training courses. Once these regulations are in effect, the training requirements for a competent person will be successful completion of an EPA accredited course for Asbestos Abatement Contractors and supervisors.

Eng - Engineering Controls

RECORD ID 3096

STANDARD NUMBER 1926.58; 1910.1001
INFORMATION DATE 890829

ABSTRACT The asbestos construction standard requires employers to institute engineering and work practice controls to reduce employee exposures to or below the PEL's of 0.2 f/cc expressed as an 8-hour TWA, and 1.0 f/cc as a 30-minute STEL. The engineering control described in the Brand "Decontamination System" is consistent with OSHA's traditional policy regarding the hierarchy of controls. If the Brand System is capable of reducing employee exposures to or below the PEL's, the employer may elect to use it to reduce employee exposures.

INTERPRETATION 29 CFR 1926.58; 1910.1001

AUG 29, 1989

This is in response to your letter of June 10, to the OSHA Regional Office in (City), requesting clarification as to whether the Brand "Decontamination System" meets the intent of the occupational safety and health requirements at 29 CFR 1926.58.

The Occupational Safety and Health Administration (OSHA) does not approve or certify equipment or processes for use in the workplace. However, when we are provided with adequate information concerning a control method, we do offer an opinion regarding its efficiency in achieving compliance with our requirements for employee safety and health. Therefore, this letter is not an approval or a certification of the Brand System, but is an interpretation of our standards as they apply to the use of this system in United States workplaces.

The asbestos construction standard requires employers to institute engineering and work practice controls to reduce employee exposures to or below the permissible exposure limits (PEL's) of 0.2 f/cc expressed as an 8-hour TWA, and 1.0 f/cc as a 30-minute STEL. Negative-pressure enclosures are the primary engineering control utilized during asbestos abatement work. The engineering control which is described in United States Statutory Invention Registration H460 (Brand "Decontamination System"), is consistent with OSHA's traditional policy regarding the hierarchy of controls. This hierarchy specifies that engineering and work practice controls be used in preference to respiratory protection. Engineering controls are the preferred means of compliance since they reduce exposure hazards in the workplace environment by removing the airborne contaminant.

If the Brand System is indeed capable of reducing employee exposures to or below the PEL's, which appears to be the case, we believe it can be considered among the controls the employer may elect to use to reduce employee exposures.

As you are aware, the performance of a device or process and its success in meeting the intent of OSHA's standards can only be determined by the safety and/or health professional observing it in actual use under specific circumstances.

glove bags

RECORD ID 3346

STANDARD NUMBER 1926.58
INFORMATION DATE 900517

ABSTRACT This interpretation addresses the use of glove bags in accordance with 1926.58. Questions discussed are the definition for regulated areas, requirements for negative-pressure enclosures based on the activity regardless of the airborne levels of asbestos, airborne concentrations as applied to paragraph (e)(6), glove bags as a method for controlling exposures, and definition of small-scale, short-duration job as applied to removal of asbestos on pipes.

INTERPRETATION 29 CFR 1926.58

MAY 17, 1990

Thank you for your letter of February 27, regarding the use of glove bags in accordance to the Occupational Safety and Health Administration's (OSHA) asbestos standard for construction, 29 CFR 1926.58. Your questions concerned regulated areas, negative-pressure enclosure requirements, airborne concentrations as applied to paragraph (e)(6), glove bags, and definition of small-scale, short-duration job as applied to removal of asbestos on pipes. The answers to your questions are as follows:

Section (e) specifically addresses regulated areas. Regulated areas required by the standard may take two forms. For asbestos work operations that do not involve asbestos removal, demolition, or renovation, such an area may consist simply of an area demarcated by posted signs that limit the number of employees entering the area. Paragraphs (e)(1) through (e)(5) contain OSHA's requirements for these regulated areas.

Employers engaged in asbestos removal, demolition, renovation projects are required to establish a negative-pressure enclosure, which is the second type of regulated area. The requirement for a negative-pressure enclosure is stated in paragraph (e)(6) and is triggered by the type of activity regardless of airborne levels of asbestos. Paragraph (e)(6) addresses specifically asbestos removal, demolition, and renovation projects and is not dependent upon (e)(1).

If a job is not small scale, short-duration, then it is considered a large scale job. All large scale jobs involving asbestos removal, demolition, and renovation must establish a negative-pressure enclosure, wherever feasible, regardless of the fiber release. During such construction activities, the exposure levels can be quite high and are also variable and unpredictable.

Glove bags are one method specified in 29 CFR 1926.58 (g)(1) for controlling exposures. Paragraph (g) describes control methods for achieving compliance with the permissible exposure limits as prescribed in section (c) and paragraph (g)(1)(D) specifically mentions "enclosure or isolation of the process producing asbestos." Glove bags are one method for enclosing or isolating the process. Workers in the regulated areas have to use those methods to keep their exposure levels low.

Appendix G describes the removal of asbestos-containing insulation on pipes as a small-scale, short-duration activity, but it fails to specify the length of pipe or the quantity of asbestos removed. It is implicit in the standard however, that the removal involves only a small amount of pipe insulation as part of pipe repair work or valve replacement.

We hope we have adequately addressed your concerns. If you need further assistance, please do not hesitate to contact us again. Also, please note that (State) is a State-Plan-State, which handles its own safety and health programs and is not under Federal OSHA's jurisdiction. Its standards have to be at least as effective as the federal ones; however, they can be stricter. You may wish to contact the state for further information.

SOURCE LETTER

February 27, 1990

Subject: Memorandum - Use of Glove Bags

This letter is in response to your memorandum which addresses the above subject matter. The verbiage in the 2nd paragraph states:

> "As you know, OSHA's position is that the requirements to establish negative-pressure enclosures pursuant to 29 CFR 1926.58 (e)(6) is a specification standard which is predicated upon the type of job being performed and not the employee exposure levels."

Concerning this, I have the following questions:

Does not section (e) Regulated areas of 29 CFR 1926.58 specifically address only regulated areas?

Is not a negative-pressure enclosure as listed in 29 CFR 1926.58 (e)(6) considered a regulated area whereas it is in this section (e) Regulated areas and specifically addressed, as such, in 29 CFR 1926.58 (b) Definitions?

Is not the requirements of (e)(6) based on whether airborne concentrations of asbestos, tremolite, anthophyllite, actinolite, or a combination of these minerals exceed or can be reasonably expected to exceed the PEL as in enumerated in (e)(1)?

Why do you state that the (e)(6) is a specification requirement and not based on employer exposure when section (e)(1) specifically addresses the PEL as indicated in (c) of 29 CFR 1926.58?

I cannot find any language in 29 CFR 1926.58 where the language LARGE-SCALE is addressed. Is it the US DOL's position that if a job is not small scale-short duration then it must be a large-scale project? Is this memo saying that all jobs, if not a small scale-short duration, must have a negative-pressure enclosure irrespective of what the fiber release may be?

The last sentence of paragraph 2 states: "Glove bags are one method specified in 29 CFR 1926.58 (g)(1) for controlling exposure within the negative-pressure enclosure." I see no reference in this section to glove bags within negative-pressure enclosures. Does not this section specifically deal with methods to achieve compliance with the PEL as prescribed in 29 CFR 1926.58 (c) that would in turn activate the requirements of section (e)?

Further, your memorandum states that in order for a project to qualify as a small scale-short duration operation all four (4) items, as listed would need to apply. In a review of Appendix G of 29 CFR 1926.58 it is noted that the removal of pipe with asbestos remaining on the system itself is considered a small scale-short duration operation irrespective of the length.

RECORD ID 3624

STANDARD NUMBER 1926.58
INFORMATION DATE 900904

ABSTRACT This interpretation responds to a request that OSHA review and comment on a procedure to remove asbestos-containing floor tiles. OSHA has consistently expressed its position that negative-pressure enclosure requirements do not apply to the removal during the replacement of asbestos-containing resilient floor covering materials. OSHA published a proposed revision of its asbestos standards on July 20, 1990 (55 FR 29712). According to OSHA technical information, the final rule is not expected until sometime in 1992. Therein, OSHA re-examines its regulatory policy concerning the continuation and/or expansion of effective methods for removal of asbestos-containing floor tile.

INTERPRETATION 29 CFR 1926.58

SEP 4, 1990

This is in response to your letter of August 29, requesting that the Occupational Safety and Health Administration (OSHA) review and comment on your procedure to remove asbestos-containing floor tiles.

OSHA has consistently expressed its position that negative-pressure enclosure requirements do not apply to the removal during the replacement of asbestos-containing resilient floor covering materials.

Although OSHA does not approve or certify equipment or processes for use in the workplace, when we are provided with adequate information concerning a new process, we do offer an opinion regarding its efficacy in achieving compliance with our requirements for employee safety and health. Therefore, this letter is not an approval or certification of your method, but is an interpretation of standard 29 CFR 1926.58 as it applies to the use of your procedure in United States workplaces.

Based on the limited data you have submitted, it appears that the use of your procedure, by employees trained pursuant to that specified in your submission, can prevent a release of significant asbestos contamination. Please be aware that the effectiveness of your method can only be determined by the health and safety professional observing it in actual use under specific circumstances.

As requested in your letter, we have addressed from a health standpoint employee exposure to asbestos only. No attempt has been made to analyze potential employee exposure to solvent vapors that can result during mastic removal operations.

Also note that OSHA has published a proposed revision of its asbestos standards on July 20, 1990 (55 FR 29712), a copy of which is enclosed. Therein, OSHA is re-examining its regulatory policy concerning the continuation and/or expansion of effective methods for removal of asbestos-containing floor tile. Since the rulemaking is likely to impact upon your procedure, we recommend that you participate in the upcoming rulemaking.

RECORD ID 3741

STANDARD NUMBER 1926.58
INFORMATION DATE 900608

ABSTRACT This interpretation addresses the removal of asbestos-containing roofing materials. 29 CFR 1926.58 (e)(6) states, "Wherever feasible, the employer shall establish negative-pressure enclosures before commencing removal, demolition, and renovation operations." The purpose of the negative-pressure enclosure is to prevent the spread of asbestos contamination beyond the work area. The roofing industry generally contends that potentially hazardous working conditions may result from using a negative-pressure enclosure system on a roof. Negative-pressure enclosure systems, where not feasible, may create significant hazards. OSHA agrees that the potential release of fibers is best controlled by applying proper removal procedures at the source. The point of determining "feasibility" shall be discussed on a case by case basis.

INTERPRETATION 29 CFR 1926.58

JUN 8, 1990

This is in response to your letter of April 12 to the Occupational Safety and Health Administration (OSHA) Regional Office, concerning procedures for removal of asbestos-containing roofing materials. Your letter has been forwarded to our office for a reply.

As stated in paragraph (e)(6) of 29 CFR 1926.58, OSHA's asbestos standard for construction, "Wherever feasible, the employer shall establish negative-pressure enclosures before commencing removal, demolition, and renovation operations."

The purpose of the negative-pressure enclosure is to prevent the spread of asbestos contamination beyond the work area. The negative-pressure enclosure would not be feasible in cases where it would create a greater hazard to the employees.

We agree with you that the potential release of fibers is best controlled by applying proper removal procedures at the source. In the event that the construction of the negative-pressure enclosure is infeasible, the procedures you outlined for asbestos roof removal seem adequate. However please note that OSHA cannot and does not approve or endorse any equipment or work processes. The effectiveness of your work procedures and the feasibility of establishing a negative-pressure enclosure must be decided on a case-by-case basis by the local Area Office, whose compliance staff would have first-hand knowledge of your work conditions.

OSHA is proposing supplemental rulemaking on its asbestos regulations. The proposal is planned for publication in the Federal Register around July 12. We welcome comments from the public. Please send your comments in quadruplicate to the:

Docket Office, Room N2625
Docket H-033e
Occupational Safety and Health Administration
200 Constitution Ave. N.W.
Washington, D.C. 20210

MAY 2, 1990

MEMORANDA

SUBJECT: Removal of Asbestos-Containing Roofing Materials - 29 CFR 1926.58(e)

The attached request dated April 12, 1990, is forwarded for your review and response.

Copies of correspondence relative to clarification of subject standard were mailed to Mr. K. However, he maintains that there are special and unique problems for the roofing industry in compliance with this standard.

Mr. K made reference in his letter to consideration by the Agency for the roofing industry similar to that shown to the floor tile removal industry.

Please furnish a copy of your response to Mr. J, Assistant Regional Administrator for Technical Support.

Attachments

May 2, 1990

This will acknowledge receipt of your letter of April 12, 1990, addressed to Mr. R of my staff.

Your request for interpretation/clarification concerning the applicability of 29 CFR 1926.58(e) to the roofing industry has been referred to our National Office in Washington, D.C. for response. You should hear from that office soon.

SOURCE LETTER

April 12, 1990

Per our recent telephone conversation, Company X is currently advising several clients in the (City), (State) area on the proper procedures for the removal of asbestos-containing roofing materials. Per our discussion, Company X is concerned with the removal of a typical 3 or 4-ply built-up roof system, applied on a flat commercial facility, such as a warehouse, office building, hotel, apartment building or shopping center.

It is generally held by the roofing industry that potentially hazardous working conditions may result from using a negative-pressure enclosure system on a roof. Negative-pressure enclosure systems may create significant hazards including:

1. The imminent danger of high winds blowing over or destroying the enclosure system.

2. The possibility of heat stress caused by the excessive hot and humid conditions created inside the enclosure system.

Experience has show that the use of proper removal procedures by the asbestos abatement contractor will result in a minimal fiber release, where fiber concentration levels are maintained below 0.01 fibers per cubic centimeter (f/cc) in the work area. Company X proposes that the following procedures be considered for asbestos roof removal.

1. The abatement contractor's workers will perform all roofing removal while wearing two sets of protective clothing and using proper respiratory protection.

2. The abatement contractor will construct a decontamination enclosure system either adjacent and contiguous to the work area; or at a location remote to the work area, depending on site conditions.

   a. All workers are required to don two sets of clean protective disposable clothing and proper respiratory protection before entering the work area through the decontamination enclosure system. A "clean room" shall be provided within the decontamination enclosure system to allow for changing and storage of worker's street clothes.

   b. Each time a worker leaves the work area, workers shall clean any debris (using a HEPA vacuum cleaner) from the outside layer of protective clothing and remove and dispose of the outside layer of protective clothing before leaving the work area and entering the decontamination enclosure system. Respiratory protection may only be removed and cleaned once the worker is inside the decontamination enclosure system. Worker shall

remove and dispose of the remaining set of protective clothing and wash themselves in a staging area provided in the decontamination enclosure system.

c. All contaminated items will be disposed of in accordance with OSHA and EPA requirements.

3. Contractor shall isolate the work area from the building interior.

4. Workers shall be fully protected with respirators and protective clothing from the time of first disturbance of asbestos-containing roofing material until final clean-up is completed.

5. Only the asbestos abatement contractor's workers and the environmental consultant's air monitoring technicians will be allowed on the roof during the removal of the asbestos-containing roofing materials. All personnel will be required to wear proper respiratory protection during removal activities.

6. The environmental consultant will continuously conduct air monitoring adjacent to the work area. If air monitoring indicates consistent fiber concentration levels greater than 0.10 fibers per cubic centimeter (f/cc), full negative-pressure enclosures will be required to continue the removal of roofing materials. Once the cause of the elevated fiber concentration levels is determined, proper controls will be implemented. If subsequent air monitoring inside the enclosed work area indicates that the fiber concentration levels have again been controlled below 0.10 f/cc, the abatement contractor will again be allowed to perform further removal without the enclosure system as long as the additional controls are used and previous steps are followed.

7. All roofing materials to be removed are to be wetted. The application of water shall continue during removal, but quantities shall be restricted to prevent water damage to other parts of the building.

8. All roofing materials shall be removed in easily manageable sections, bagged or wrapped and sealed in two layers of 6 mil polyethylene before the material can dry.

9. Wrapped and sealed materials will be properly labeled, wet sponged and lowered from the roof to an acceptable container or transporter on the ground. Wrapped and sealed materials shall not be allowed to drop more than 3 feet. No drop chutes will be allowed.

It is Company X's opinion that the potential release of fibers during removal of built-up roof systems is best controlled by applying proper removal procedures at the source.

Several of our client's have scheduled re-roofing projects in the very near future which may require the removal of 3 or 4 ply flat built- up roof systems composed of asbestos-containing materials. Accordingly, a response concerning our proposed methodology will be appreciated at your earliest convenience.

1. On the pre-abatement notification you are required to state your abatement procedures. Shall a contractor stipulate that he is utilizing a vacuum system to transport ACM from the work area to a bagging station outside of the work area?

2. Is the bagging station an extension of the work area?

3. If the bagging station is an extension of the work area, shall it have the same protective factors as the area from whence it came? That is, a secured area consisting of a ceiling, walls, floor, air tight and under negative pressure complete with decon chamber.

Re: Ownership of ACM from general to disposal in an approved landfill.

1. Once the ACM has been removed from the premises, does the generator of the material (owner) share with the asbestos contractor in the liability for that material until it has been properly disposed of?

2. On a pre-abatement notification, the contractor must stipulate the disposal site. If the contractor does not alter or amend that notification, can he warehouse the material and dispose of same, at a site not listed on the notification at a later date?

December 30, 1989

In response to your letter dated December 27, 1989, I wish to provide answers to the questions proposed.

1. If you are at the bagging station of a vacuum system, must the bagging station (containment area) have a floor, walls, roofs, sealed air-tight and under negative pressure, same as the area from which it originated (the work area)?

Title 178, Chapter 22, Section 002.19 of the Asbestos Control Program Regulations defines "containment area" to be "a negative pressure enclosure containing the asbestos project work area and decontamination facility, and configured so as to isolate asbestos project activities from areas which are to remain uncontaminated." The process of hanging asbestos materials generally would have to be done in such a containment area or a waiver could be requested.

2. If a vacuum system is to be used, shall it be reported on the pre-abatement notice given to the state?

Yes.

RECORD ID 4177

STANDARD NUMBER 1926.58; 1910.1001
INFORMATION DATE 910313

ABSTRACT This interpretation letter addresses exposure monitoring for asbestos pursuant to 1926.58. If an employee works less than 8 hours, the remaining hours up to 8 are assumed to result in no additional exposure. If a worker works more than 8 hours, air sampling is to be done during anticipated peak exposures. All activities related to actual asbestos removal require monitoring. Workers inside the regulated areas are to be monitored daily unless equipped with supplied-air respirators. Employees working outside the regulated areas are to be monitored initially unless the employer has objective or historical data demonstrating that the employee exposures will not exceed the action level or excursion limit.

INTERPRETATION 29 CFR 1926.58; 1910.1001

MAR 13, 1991

Thank you for your letter of February 8, regarding exposure monitoring of asbestos pursuant to 29 CFR 1926.58. We are providing the response to your questions as follows:

1. If a worker only works 4 hours a day during asbestos removal and then goes home, do we assume 0 exposure for the additional 4 hours that the employees did not work to calculate the 8 hour exposure?

You can assume 0 exposure for the period that the worker is no longer at the job site and not engaged in any work activity which may involve asbestos-containing materials.

2. If the employee works 6 hours, do we assume 2 hours 0 exposure to calculate an 8-hour TWA?

Please refer to the above response.

3. What is the cut-off point between actual hours worked and assumptions of hours of 0 exposure in order to arrive at the total 8 hour exposure in order to report asbestos exposure as an 8 hour TWA?

Please refer to our response to question #1. One must exercise professional judgment as to when a worker is no longer considered occupationally exposed to asbestos.

4. If an employee works 10 or 12 hours a day, how is the 8-hour TWA arrived at for this situation?

The standard makes no adjustment for 10- or 12-hour workdays. One must sample for eight hours covering the peak exposures during the entire workday.

5a. What worker activities must be monitored under 29 CFR 1926.58(f)(2) Initial Monitoring and for how long?

As stated in paragraph (f) of the standard, each employer who has a work place or work operation covered by the standard shall perform initial monitoring unless the employer has objective or historical data to satisfy the monitoring requirements. The scope of activities covered by the standard is described in 29 CFR 1926.58(a): Scope and Application. Initial monitoring implies monitoring the first day of each work operation.

5b. Is preparation work such as constructing the containment barriers and decon units covered or only actual asbestos removal?

All activities related to the actual asbestos removal would require monitoring.

7. 29 CFR 1926.58(f)(3) require periodic monitoring within regulated areas. Am I to assume that employees working outside the regulated area such as workers carrying out filled bags of asbestos waste to a truck or dumpster do not need to be monitored?

Workers inside the regulated areas are to be monitored daily unless equipped with supplied-air respirators. Employees working outside the regulated areas are to be monitored initially unless the employer has objective or historical data demonstrating that the employee exposures would not exceed the action level or excursion limit.

RECORD ID 2432

STANDARD NUMBER 1926.58(a); 1910.1001
INFORMATION DATE 860819

ABSTRACT A clarification is given of the scope of the new asbestos standards to the construction industry. Construction related activities involving asbestos in a general industry establishment are regulated under 29 CFR 1926.58. Maintenance activities involving asbestos in a general industry establishment, where the maintenance is related to the operation itself, are regulated under 29 CFR 1910.1001.

INTERPRETATION 29 CFR 1926.58(a); 1910.1001

AUG 19, 1986

MEMORANDUM

SUBJECT: Clarification of New Asbestos Standard for Construction (29 CFR 1926.58)

This is in response to your memo of July 24 requesting clarification of the scope of the new standard for asbestos, tremolite, anthophyllite, and actinolite as it applies to the construction industry.

The new standard, 29 CFR 1926.58, applies to all construction related activities whether conducted at a construction site or performed by a maintenance care of plant personnel in a general industry establishment. Construction related activities as defined in 1926.58(a) includes demolition, salvage, removal, encapsulation of materials containing asbestos, alteration, repair, and installation of products containing asbestos.

In general, it should be noted that any of the above activities related to a building, structure, or plant process equipment (such as pipe, process vessel and boiler insulation) fall under the scope of the asbestos standard for construction (1926.58). However, maintenance activities which involve the operation itself, such as repairing an asbestos impregnated conveyer belt or repairing duct work or a blower system that exhausts or conveys asbestos dust, would be considered under the scope of the general industry standard (1910.1001).

SOURCE LETTER

MEMORANDUM

SUBJECT: Clarification of New Asbestos Standard (29 CFR 1926.58) for Construction

This is to request clarification of the new asbestos standard (29 CFR 1926.58) as it applies to the construction industry.

Under paragraph 29 CFR 1926.58(a), the scope and application of the standard is discussed. It is stated that the standard applies to all construction work including demolition and salvage of structures where asbestos is present, and removal or encapsulation of materials containing asbestos.

I have received several requests for clarification of the scope of this standard. Construction in the 29 CFR 1926.58 asbestos standard is not defined by any SIC codes but is defined by the type of activity; i.e., removal, demolition, repair, etc. In a general industry establishment where removal or repair is taking place and these activities are being conducted by a maintenance crew (not contractors), does the 29 CFR 1926.58 standard apply where those activities described in its scope; i.e., removal, repair, demolition, are taking place?

RECORD ID 4057

STANDARD NUMBER 1926.58(a)(3)
INFORMATION DATE 901015

ABSTRACT This interpretation letter addresses the asbestos construction standard and its application to trenching and excavating operations where asbestos-containing soil is involved. As used in 1926.58(a)(3), the word "substrates" refers to soil. Where asbestos-containing soil is commonly known to be present, a contractor must exercise reasonable diligence to test the soil for asbestos content prior to construction activities. In the absence of testing, the soil should be assumed to contain asbestos, and air monitoring is required. All other precautionary measures shall also be followed in accordance with the standard.

INTERPRETATION 29 CFR 1926.58(a)(3)

OCT 15, 1990

MEMORANDUM

SUBJECT: Interpretation of 29 CFR 1926.58(a)(3)

This is in response to your memorandum of September 14, regarding the applicability of the asbestos standard to excavating activity. Please accept our apology for the delay in response. Our office had not received the earlier memorandum, dated April 23, from your office.

The asbestos standard for construction does apply to trenching and excavating operations where asbestos-containing soil is involved. The word "substrates" as used in 1926.58(a)(3) refers to soil.

Where asbestos-containing soil is commonly known to be present, a contractor must exercise reasonable diligence to test the soil for asbestos content prior to construction activities in these areas. General knowledge of the presence of asbestos shall be established from published information, such as geological surveys, or media coverage of the presence of naturally occurring asbestos in the vicinity of the worksites. In absence of testing, the soil should be assumed to contain asbestos and air monitoring is required. All other precautionary measures shall also be followed in accordance with the standard.

SOURCE LETTER

September 14, 1990

MEMORANDUM

SUBJECT: Interpretation of 1926.58(a)(3)

During the process of promulgating their asbestos and excavation standards, Cal/OSHA has been heavily engaged in discussions with the Associated General Contractors (AGC) regarding the applicability of the asbestos standard to excavating activity.

We had previously requested an interpretation (copy attached) but have not received a response as of this date.

Attachment

August 24, 1990

Two items of concern:

1. Are the training hours for the Hazardous Waste Emergency Response Standard, 29 CFR 1910.120, cumulative. That is, if you have 8 hours of first responder training, can you add an additional 24 hours of appropriate training and make that person a Technician?

2. We haven't received the response to the inquiry concerning the application of the asbestos construction standard, 29 CFR 1926.58 to excavation. Please advise.

April 23, 1990

MEMORANDUM

SUBJECT: 1926.58(a)(3), "Substrates"

This memo is to request an interpretation of the word "substrates" as used in paragraph 1926.58(a)(3). Substrates is, of course, substratum or soil.

Because the term substrates or substratum refers to soil, the questions arise. Is a contractor required to test soil for asbestos content prior to performing trenching or excavating operations? Further, is a contractor required to conduct air monitoring per 1926.58(f) for asbestos fiber levels during trenching or excavating operations?

Please provide an interpretation as to whether or not OSHA must cite contractors for not testing the soil for asbestos content and for not conducting air monitoring for asbestos.

RECORD ID 3923

STANDARD NUMBER 1926.58 ; 1910.1025; 1910.134; 1910.1001
INFORMATION DATE 880208

ABSTRACT This interpretation letter responds to questions regarding respiratory protection under the asbestos, lead, and respiratory protection standards. Questions addressed are requirements for quantitative fit testing, conditions under which the employer must institute a respirator program, the employer's obligation for supplying powered air purifying respirators when there is no exposure, and bearded employees wearing a respirator when there is no potential for exposure above the PEL.

INTERPRETATION 29 CFR 1926.58 ; 1910.1025; 1910.134; 1910.1001

Feb 8, 1988

This is in response to your letter of November 24, 1987, regarding respiratory protection under the Occupational Safety and Health Administration's (OSHA's) asbestos, lead, and respiratory protection standards (29 CFR 1926.58, 29 CFR 1910.1025, and 29 CFR 1910.134, respectively) and some general questions. We apologize for the delay in responding to your inquiry.

Question 1:

Must an employer, with a workplace where anticipated concentrations of toxic substances would not require a respirator to have a protection factor greater than 10 to protect employees, perform quantitative fit testing on employees wearing full facepiece respirators?

Answer:

If a respirator which is more protective than a half-mask negative pressure respirator is used in areas where exposure levels do not exceed the maximum levels specified in a specific standard for used of a half-mask negative pressure respirators, then qualitative fit testing may be performed in lieu of quantitative fit testing.

Question 2:

Must an employer, with workplace conditions as described in (1) above, choosing to use full facepiece respirators and do quantitative fit testing, perform three qualitative fit tests as required in Appendix C?

Answer:

Either the qualitative or quantitative protocol presented in 29 CFR 1926.58, Appendix C, shall be followed in its entirety. This does not however, preclude the employer form conduction a single quantitative fit test to augment qualitative fit testing.

Question 3:

If an individual is allowed to wear a respirator voluntarily in a workplace where there are no exposures to concentrations of toxic substances at or above the PEL, must the employer institute a respirator program for that individual or be in violation of OSHA regulations?

Answer:

If there is a potential for exposure of the employee who voluntarily wears a respirator to an airborne concentration at or above the PEL of a toxic substance, then the employer must institute a respirator program.

Question 4:

If an individual in a workplace where there are no exposures to concentrations of toxic substances at or above the PEL voluntarily asks to wear a respirator, and the employer supplies the respirator, is the employer then required by OSHA regulations to supply a powered air purifying respirator if the employee so requests?

Answer:

If there is truly no potential for an over exposure to a toxic substance, and an employee voluntarily wishes to use a respirator, then the employer is not required to provide powered air purifying respirators.

SOURCE LETTER

November 24,1987

I would like to ask for clarification of certain requirements regarding the use of respirators for OSHA's Lead Standard 1910.1025, and the OSHA Asbestos Standard for Construction 1926.58.

The Asbestos Standard, Section (h)(4)(ii) Respiratory Protection, Respirator fit testing, reads as follows:

> "Employers shall perform either quantitative or qualitative face fit tests at the time of initial fitting and at least every 6 months thereafter for each employee wearing a negative-pressure respirator. The qualitative fit tests may be used only for testing the fit of half-mask respirators where they are permitted to be worn, and shall be conducted in accordance with Appendix C."

On Friday, November 12, 1982, (FR 47 5110) OSHA published an amendment to 29 CFR 1910.1025(f)(3) governing the fit testing of respirators used to meet the requirements of that standard. Section (f)(3)(ii) reads as follows:

> "Employers shall perform either quantitative or qualitative face fit tests at the time of initial fitting and at least every six months thereafter for each employee wearing negative pressure respirator. The qualitative fit tests may be used only for testing the fit of half-mask respirators where they are permitted to be worn, and shall be conducted in accordance with Appendix D."

ORC strongly supports mandatory fit testing requirements where respirators are used to protect employees against potential exposure to airborne toxic substances. It is also important that employers be allowed the flexibility to use their qualitative or quantitative fit testing as appropriate for the protection factor required.

The two sections quoted and underlined above mandate that qualitative fit testing may be used only for half-mask respirators. If an employer wishes to use a full facepiece respirator, regardless of the protection factor required, then quantitative fit testing must be accomplished.

An employer wishing to furnish employees with full facepiece respirators even though a protection factor of ten or less is all that is required, must conduct three (3) quantitative fit tests as required by 1926.58, Appendix C, Quantitative Fit Test Procedures, Section 8, Interpretation of Test Results, which requires that:

> "The fit factor measure by the quantitative fit testing shall be the lowest of the three protection factors resulting from three independent tests."

Quantitative fit testing is an expensive proceoure; it becomes even more so, when it must be repeated three times. Most employers will avoid using a respirator that requires quantitative fit testing to be performed. Thus, many employees are denied the use of potentially more effective respirators because of the much greater cost and trouble of quantitative fit testing.

RECORD ID 3798

STANDARD NUMBER 1926.58; 1910.1001
INFORMATION DATE 900810

ABSTRACT This interpretation addresses a trailer mounted vacuum system and bagging station used in asbestos abatement. Although the bagging station is an extension of the work area, bagging is separate from asbestos removal, demolition, or renovation; therefore, a negative-pressure enclosure and decontamination chamber is not required. This work area is the type of regulated area requiring demarcation, limitation of access to authorized persons, and prohibition of smoking, drinking, eating, chewing tobacco or gum, and applying cosmetics. Respirators are to be supplied and selected based on employee exposure levels that exist in the workplace.

INTERPRETATION 29 CFR 1926.58; 1910.1001

AUG 10, 1990

This is in response to your letters of April 16, to the Occupational Safety and Health Administration (OSHA) regarding a trailer mounted vacuum system and bagging station used in asbestos abatement. Your letter to OSHA's regional office as well as a copy sent to OSHA's Docket Office in Washington, D.C. have been forwarded to our office for response. In accordance with a recent telephone conversation with our staff member, we are providing a response to question 3 of your letter, as you indicated your other concerns were previously addressed by the Environmental Protection Agency.

Question 3 states: "If the bagging station is an extension of the work area, shall it have the same protective factors as the area from whence it came? That is, a secured area consisting of a ceiling, walls, floor, air and under negative pressure complete with a decon chamber."

Although the bagging station is an extension of the work area in the circumstances shown in your submission, bagging is separate from asbestos removal, demolition, or renovation; therefore, 29 CFR 1926.58 (e)(6) would not apply and a negative-pressure enclosure and decon chamber would not be required. This work area is to be considered as the type of regulated area where paragraphs (e)(1) - (e)(5) of the asbestos standard would apply, requiring demarcation of the area, limiting access to authorized persons, and prohibition of smoking, drinking, eating, chewing tobacco or gum, or applying cosmetics. Respirators are to be supplied and selected in accordance with paragraph (h)(2) based on employee exposure levels that exist in the work place.

SOURCE LETTERS

April 16, 1990

Attention: OSHA Docket Office

For quick reference, I am enclosing a letter dated 2-13-90 and subsequent correspondence. I direct your attention to question number 3, in that letter and ask you to respond.

Enclosure:

April 6, 1990

This is in response to your letter of March 13, 1990, requesting that the Occupational Safety and Health Administration (OSHA) render an opinion of the vacuum systems represented in your letter, as an asbestos abatement procedure as it relates to the workers and the consuming public.

Since your question may have national significance, I would suggest that you submit it to the OSHA Docket for consideration with the Notice of Proposed Rulemaking on asbestos remand issues. The address for the OSHA Docket Office is: U.S. Department of Labor, 200 Constitution Avenue, N.W., Room

N2625, Washington, D.C. 20210. Their phone number is (202) 523-7075. I am, however, forwarding your letter along with attachments to our National Office for their consideration as it relates to the current asbestos standard. You can expect to receive a written response directly from them on this issue.

Your interest in safety and health is appreciated. If you have any further questions, please feel free to contact Mr. T of my staff.

March 13, 1990

At the request of Mr. G, I have sent this letter to you. Enclosed you will find a copy of U.S. EPA letter dated 3-06-90. I will draw your attention to Q3 and ask you to respond. I have also enclosed some pictures of representative vacuum systems. You are not being asked to approve or disapprove of the vacuum systems, rather, to give an opinion on an asbestos abatement procedure as it relates to the workers and the consuming public.

MAR 6, 1990

The following information is in response to your February 13, 1990 letter requesting interpretation of AHERA, NESHAP and OSHA asbestos regulations:

Q1. Is the abatement contractor required to "stipulate that he is utilizing a vacuum system to transport ACM from the work area to a bagging station outside of the work area." The vacuum system as you describe it should be identified in the notification to EPA.

The NESHAP regulation, 40 C.F.R. 61, Subpart M, specifically 61.146(c)(7), requires the owner/operator to identify "Procedures to be used to comply with the requirements of this Subpart." Since the use of a vacuum system is a significant work practice procedure, it should be included as a work practice in a notification.

Q2. "Is the bagging station an extension of the work area."

Yes. The bagging station is considered an extension of the work area. To comply with the NESHAP regulations, the materials must be adequately wet until collected for disposal, shall be placed in leak-tight containers, no visible emissions shall be emitted to the outside air through this operation and the asbestos containing wastes deposited in an approved landfill.

Q3. "If the bagging station is an extension of the work area, shall it have the same protective factors as the area from whence it came? That is, a secured area consisting of a ceiling, walls, floor, air tight and under negative pressure complete with a decon chamber."

Please contact Mr. G of OSHA at (816) 426-5861. He can explain the OSHA requirements.

You also requested information regarding disposal of asbestos wastes.

1. The owner and operator of renovation and demolition operations are responsible for proper disposal of the asbestos waste materials.

2. The NESHAP regulations allow a owner/operator to temporarily store asbestos wastes as long as the materials are maintained in a wet condition in leak-tight containers. If the disposal site is changed, the owner/operator is required to amend the notification to reflect the new disposal site.

I have forward a copy of your letter to the Regional Administrator for the Occupational Safety and Health Administration in this region.

February 13, 1990

Re: Verification of, and/or interpretation or Federal regulations for asbestos abatement procedures, utilizing vacuum systems for transporting ACM from the work area to the vacuum bagging station.

The following questions can be directed to all agencies including AHERA, NESHAPS, and OSHA.

ORC's questions are as follows:

(1) Must an employer, with a workplace where anticipated concentrations of toxic substances would not requires a respirator to have a protection factor greater than 10 to protect employees, perform quantitative fit testing on employees wearing full facepiece respirators?

(2) Must an employer, with workplace conditions as described in (1) above, choosing to use full facepiece respirators and do quantitative fit testing, perform three quantitative fit tests as required in Appendix C?

ORC is also concerned with the applicability of OSHA respirator regulations to individuals who voluntarily chose to wear respirators in a workplace where there are not exposures to airborne concentrations of toxic substances at or above Permissible Exposure Limits (PEL).

(3) If an individual is allowed to voluntarily wear a respirator in a workplace where there are no exposures to concentrations of toxic substances at or above the PEL, must the employer institute a respirator program for that individual or be in violation of OSHA regulations?

(4) If an individual in a workplace where there are no exposures to concentrations of toxic substances at or above the PEL, voluntarily asks to wear a respirator, and the employer supplies the respirator, is the employer then required by OSHA regulations to supply a powered air purifying respirator if the employee so requests?

(5) If a bearded individual in a workplace where there are no exposures to concentrations of toxic substances at or above the PEL, voluntarily chooses to wear a respirator, over his beard, is the employer in violation of OSHA respirator regulations requiring a face-seal area-free of impediments to a good seal?

RECORD ID 1760

STANDARD NUMBER 1926.58(e)(6)
INFORMATION DATE 870629

ABSTRACT An employer claiming the small-scale, short duration exemption does not have to comply with 1926.58(e)(6). However, the employer must follow the provisions outlined in Appendix G of the standard.

(NOTE: The definition of small-scale, short duration has changed since the 1987 letter. The proposed change was published in 55 FR 29712. The final rule is not expected until sometime in 1992 (according to OSHA technical information).)

INTERPRETATION 29 CFR 1926.58(e)(6)

JUN 29, 1987

Your letter of January 23, 1987, has been referred to the Office of Health Compliance Assistance for response. Please accept my apology for the delay in response. The overwhelming number of letters and telephone calls regarding the asbestos standard has caused unavoidable delays in responding to the public's opinion.

In your letter you specifically requested the following interpretation of 29 CFR 1926.58(e)(6):

> "Does a small-scale, short duration operation have to comply with sections (e)(6)(i) through (e)(6)(iii) of the standard?"

If an employer claims the small-scale, short duration exemption they do not have to comply with section (e)(6). However, they must follow the provisions outlined in Appendix G of the standard when performing small-scale, short duration renovation or maintenance activities.

RECORD ID 3207

STANDARD NUMBER 1926.58(e)(6)
INFORMATION DATE 900503

ABSTRACT This interpretation letter provides OSHA's opinion on the Red Baron Negative Air Enclosure System. OSHA does not approve or endorse any products or work processes and, therefore, has not endorsed the "Red Baron" negative air enclosure system. OSHA rendered an opinion that the "Red Baron" system constitutes a negative-pressure enclosure. The opinion notes, however, that compliance with OSHA regulations on a particular worksite depends on proper usage and meeting all other provisions of the asbestos standard.

INTERPRETATION 29 CFR 1926.58(e)(6)

MAY 3, 1990

This is in response to your letter of April 2, regarding the "Red Baron" negative air enclosure system. Enclosed is a copy of the letter sent to Global Consumer Services on February 9, by the Occupational Safety and Health Administration (OSHA).

As you can see, our previous letter to Global Consumer Services, Inc., did not approve or endorse the product. As our letter states "the Agency does not approve or endorse any products or work processes. However, when provided with adequate information, we can offer an opinion as to whether or not the use of a certain piece of equipment or process will meet the intent of the regulations."

The asbestos standard is a performance standard. As such, it does not specify the size or shape of the negative-pressure enclosure required by 29 CFR 1926.58(e)(6). The purpose of the enclosure is to prevent the spread of asbestos contamination to the outside work areas. The "Red Baron" system does constitute a negative-pressure enclosure. Compliance with OSHA regulations on a particular worksite, however, depends on proper usage and meeting all other provisions of the asbestos standard, such as air monitoring, establishment of a regulated area, etc.

Enclosure

FEB 9, 1990

This is in response to your letter of February 1 to Ms. H of my staff, requesting the Occupational Safety and Health Administration (OSHA) to provide an opinion on your "Red Baron" negative air enclosure system for asbestos removal.

As you are aware, the Agency does not approve or endorse any products or work processes. However, when provided with adequate information, we can offer an opinion as to whether or not the use of a certain piece of equipment or process will meet the intent of the regulations.

It is the Agency's opinion that the use of your system meets the intent of 29 CFR 1926.58 (e)(6) when all other provisions of the asbestos standard are met, such as air monitoring, establishment of a regulated area, designation of a competent person, etc.

However, please be aware that the effectiveness of your system can only be determined by the health and safety professional observing it in actual use under specific circumstances.

SOURCE LETTER

April 2, 1990

Re: "Red Baron" Negative Air Enclosure System

Thank you for your correspondence of March 23, 1990, responding to my FOIA request of February 26, 1990, with respect to the above-captioned system.

It is being represented in articles and advertisements (sample enclosed) that:

1. OSHA has "accepted" the "Red Baron" system (implying "approval"); and

2. OSHA has stated that the "Red Baron" system complies with OSHA Regulations.

I would appreciate it if you would provide me with a copy of the OSHA "acceptance"/"approval" letter.

Furthermore, can you please explain the statement contained in your February 9, 1990 letter (to Global Consumer Services, Inc.) that " the use of your system meets the intent of 29 CFR 1926.58(e)(6)...." The central question is whether or not the "system" does or does not comply with OSHA Regulations.

Enc.

GCS NEWS BULLETIN

GLOBAL CONSUMER SERVICES, INC., 3607 W. PACIFIC AVENUE, BURBANK CALIFORNIA 91505

BID SPECS REQUIRING NATALE PATENT CONSTITUTES MISUSE OF PATENT IN VIOLATION OF FEDERAL LAW

BURBANK, CA - "No contractor is compelled to use a patented enclosure system, if an accepted no-fee, public domain system is available," Mr. C. President of (company), manufacturers of the RED BARON line of asbestos removal equipment, said today. "Many consulting firms, writing asbestos removal specifications, are unaware of their obligation to make spec bidding available to all qualified contractors, regardless of the demands of the GPAC/Natale group to have their patent included in specifications." Conrad added. Harpman & Harpman, patent attorneys, representing Global Consumer Services, Inc., stated "If bid specifications require a license under the Natale patent, those promulgating the bid specifications are essentially refusing to deal with otherwise qualified bidders. This is an unfair trade practice under federal law. Also it interferes with the perspective advantage of an otherwise qualified bidder in violation of the law of most states and constitutes misuse of the patent in violation of federal law. Contractors using the Natale/GPAC system are required to pay a license fee to GPAC, Inc., of Pennsauken, New Jersey. Contractors using the new OSHA accepted RED BARON HEPA-VENT system are not required to pay any license fees of any kind. The RED BARON HEPA-VENT system has been filed under public domain with the U.S. Patent Office, which in essence permits anyone to use their system without any agreed to license fees. Prior to the availability of the HEPA-VENT system, contractors were denied the right to bid on jobs if they did not have a GPAC/Natale license. With the availability of the new patent pending RED BARON HEPA-VENT, contractors have the choice of using the OSHA accepted RED BARON HEPA-VENT with no license fees, or they can purchase a license from GPAC/Natale, and use their enclosure system. "With the accepted technology inherent in the new RED BARON HEPA-VENT, the asbestos removal industry is not burdened with excessive patent fees. Previously, the building owner, as well as the contractor bore the cost of these patent fees, which meant that private as well as government buildings were paying a higher cost for asbestos removal." Conrad said.

RECORD ID 3209

STANDARD NUMBER 1926.58(e)(6)
INFORMATION DATE 900404

ABSTRACT This interpretation letter provides OSHA's opinion on The Glove Box, manufactured by Pro/Control Products, Inc., and proposed for use in removal of asbestos-containing pipe insulation. The system appears to OSHA to meet the intent of 1926.58(e)(6) when all other provisions of the asbestos standard are met, such as air monitoring, establishment of a regulated area, designation of a competent person, etc. However, the effectiveness of the system can only be determined by the health and safety professional observing it in actual use under specific circumstances.

INTERPRETATION 29 CFR 1926.58(e)(6)

APR 4, 1990

This is in response to your letter of March 7, requesting an official opinion as to whether The Glove Box manufactured by Pro/Control Products, Inc., which you propose to use for the removal of asbestos-containing pipe insulation, meets the intent of the occupational safety and health requirements at 29 CFR 1926.58(e)(6).

The Occupational Safety and Health Administration (OSHA) does not approve or certify equipment or processes for use in the workplace. However, when we are provided with adequate information concerning a control method, we do offer an opinion regarding its effectiveness in achieving compliance with our requirements for employee safety and health. Therefore, this letter is not an approval or a certification of The Glove Box, but is an interpretation of our standards as they apply to the use of this system in United States workplaces.

It appears that the use of your system meets the intent of 29 CFR 1926.58(e)(6) when all other provisions of the asbestos standard are met, such as air monitoring, establishment of a regulated area, designation of a competent person, etc. However, please be aware that the effectiveness of your system can only be determined by the health and safety professional observing it in actual use under specific circumstances.

RECORD ID 3549

STANDARD NUMBER 1926.58(e)(6)
INFORMATION DATE 900823

ABSTRACT This clarification letter addresses the use of Portam Process asbestos abatement equipment produced by Hydrous Dust Control Systems, Inc. OSHA does not approve or certify equipment or processes used in the workplace. Based on data submitted, it appears that the use of the Portam Process system for the removal of asbestos-containing pipe insulation can prevent a release of significant asbestos contamination. The intent of OSHA's negative pressure enclosure requirement in 1926.58(e)(6) for large scale removal operations is to confine the asbestos being generated to the area within the enclosure. Because the purpose of performing removal work within negative pressure enclosures would be met by the use of this system (which is not a negative pressure system), OSHA is of the opinion that a negative pressure enclosure is not necessary if specifically listed conditions are met.

INTERPRETATION 29 CFR 1926.58(e)(6)

AUG 23, 1990

This is in response to your letter of May 31, requesting an official opinion as to whether the Portam Process asbestos abatement equipment, which you propose to use for the removal of asbestos-containing pipe insulation, meets the intent of the occupational safety and health requirements at 29 CFR 1926.58(e)(6).

The Occupational Safety and Health Administration (OSHA) does not approve or certify equipment or processes for use in the workplace. However, when we are provided with adequate information concerning a control method, we do offer an opinion regarding its effectiveness in achieving compliance with our requirements for employee safety and health. Therefore, this letter is not an approval or a certification of the Portam Process, but is an interpretation of our standards as they apply to the use of this system in United States workplaces.

The intent of OSHA's negative pressure enclosure requirement in paragraph (e)(6) for large scale removal operations is primarily to confine the asbestos being generated to the area within the enclosure and thus protect other employees and bystanders on the site from exposure to excessive levels of asbestos. Based on the data you have submitted, it appears that the use of your system, by employees trained pursuant to your training program, can prevent a release of significant asbestos contamination, thereby minimizing asbestos exposure of bystander employees.

Because the purpose of performing removal work within negative pressure enclosures would be met by the use of your system, OSHA does not consider that such enclosures are necessary if the following conditions are met:

1) All other provisions of OSHA's asbestos standard for construction must be complied with.

2) Employees operating the system must be trained pursuant to the training program described in your submission.

3) Regulated areas pursuant to 29 CFR 1926.58 (e)(1) through (5) must be demarcated and posted around the areas subject to removal with your system.

4) Air monitoring must be conducted at each job site during and after the removal to assess the level of asbestos exposure to employees performing the removal and to those immediately outside the regulated area. Such monitoring would be essential for evaluating the effectiveness of the Portam system.

Please be aware that the effectiveness of your system can only be determined by the health and safety professional observing it in actual use under specific circumstances.

Also note that OSHA has published a proposed revision of its asbestos standards on July 20, 1990 (55 FR 29712), a copy of which is enclosed. Therein, OSHA is re-examining its regulatory policy concerning the continuation and/or expansion of negative pressure enclosure requirements for removal work. New technology, explicitly your system, is discussed on page 29717 of the Federal Register notice. OSHA indicates that it "will consider providing for new technology in the final standard to the extent supported by the record developed in this rulemaking."

The data you have submitted is now in the rulemaking record. We encourage you to submit further data to the rulemaking record and to participate in that proceeding.

This letter of interpretation will be superseded by a subsequent evaluation developed by the Agency based on a review of the entire rulemaking record developed in the pending asbestos rulemaking proceeding.

RECORD ID 3578

STANDARD NUMBER 1926.58(e)(6)
INFORMATION DATE 890705

ABSTRACT The use of "Negative Air Bags" meets the requirement for establishing a negative-pressure enclosure pursuant to 1926.58(e)(6), provided that all of the other provisions of the construction asbestos standard are met. The use of glove bags to remove specific quantities of pipe insulation under continuous negative pressure and with all other provisions of the standard in operation, meets both the letter and the intent of the standard with regard to removal practices and procedures.

INTERPRETATION 29 CFR 1926.58(e)(6)

Nov 17, 1989

MEMORANDUM FOR: ALL REGIONAL ADMINISTRATORS

SUBJECT: The Use of Glove Bags Pursuant to 29 CFR 1926.58

Recent asbestos abatement industry trade journals and newsletters have reported that OSHA has "banned" the use of glove bags. These stories are the result of several cases where employers were cited for performing large-scale asbestos removal operations via glove bagging, without establishing a negative-pressure enclosure in accordance with 29 CFR 926.58(e)(6).

This memorandum is not a change in policy but a reiteration of OSHA's position. As you know, OSHA's position is that the requirements to establish negative-pressure enclosures pursuant to 29 CFR 1926.58 (e)(6) is a specification standard which is predicated upon the type of job being performed and not the employee exposure levels. Thus, for large-scale removal of asbestos from pipes the employer must first establish a negative-pressure enclosure. Once the containment is established, the employer has an obligation to ensure that his/her employees' exposures remain below the PEL of 0.2 fiber/cc. Glove bags are one method specified in 29 CFR 1926.58 (g)(1) for controlling exposures within the negative pressure enclosure.

A recent study of glove bag methods of asbestos removal conducted by the National Institute for Occupational Safety and Health (NIOSH) in conjunction with the Environmental Protection Agency (EPA) showed that 58% of the employees tested were exposed above the OSHA's action level of 0.1 f/cc when engaged in multiple glove bag operations. To reduce worker exposure, proper glove bag procedures are essential, as outlined in appendix G, Glove bags are permitted for use in small-scale, short duration jobs, which OSHA Instruction CPL 2-2.40 defined in paragraph H.3.c [(1)-(4)] as follows:

(1) Maintenance or renovation tasks, where the removal of asbestos-containing materials is not the primary goal of the job (e.g., repairing a valve which entails the removal of asbestos, installing electrical conduit which must be fastened to asbestos-cement siding, etc.)

(2) Activities where employees' exposures to asbestos can be kept below the action level via worker isolation techniques, such as glove bags or other methods described in Appendix G.

(3) An operation which has been included in the employer's asbestos maintenance program (as required in Appendix G) of all employers who are claiming an exemption from the requirements of 29 CFR 1925.58 (e)(6)).

(4) Non-repetitive operations (viz.: not a series of small-scale jobs, which if performed at one time would have resulted in a large-scale removal).

All of the requirements in paragraphs (1) through (4) above must be met in order for a job to be considered a small-scale, short duration operation. If the small-scale, short duration exemption is claimed, Appendix G of the standard must be followed.

OSHA has also considered EPA's interpretation in Appendix B to subpart E of their standard, 40 CFR Part 763 in which small-scale, short duration is defined as:

- removal of asbestos-containing thermal system insulation not to exceed amounts greater than those which can be contained in a single glove bag, or

- repairs, involving encapsulation, enclosure or removal, to small amounts of friable asbestos-containing material only if required in the performance of emergency or routine maintenance activity and not intended solely as asbestos abatement. Such work may not exceed amounts greater than those which can be contained in a single prefabricated mini-enclosure.

An example of where glove bags may be used is in a building with several rooms, each room having a few feet of asbestos pipe insulation to be removed. Negative-pressure enclosures are not required if each room needs only a single glove bag (fixed location) to contain the removed asbestos-containing materials (ACM).

OSHA has considered one type of glove bag known as the Negative Air Bag and also rigid glove bags to meet the intent of the standard with regard to large-scale removal practices and procedures, when used in the following manner:

1. Glove bags are modified in such a way as to maintain continuous negative pressure inside the bags. The integrity of the negative pressure system shall be demonstrated by smoke testing.

2. The area to be worked on must be established as a regulated area with barrier tape and appropriate warning signs, and all employers within the immediate vicinity must have been notified of the abatement project. Respirators and protective clothing shall be provided and worn.

3. The area of insulation to be removed shall be wet-wiped and encapsulated prior to removal.

4. The bag shall be attached to the pipe using approved methods. If the size of the pipe warrants it, a small, rigid plastic collar is inserted into the bag to insure that the bag does not collapse when negative pressure is created. All of the necessary tools and equipment shall be inserted into the bag prior to its being sealed.

5. The worker shall begin the removal process, using all of the normal engineering controls, including amended water. During the removal process, personal sampling shall be conducted in accordance to air monitoring requirements.

6. When the removal of the insulation has been completed, the glove bag shall be removed by the approved method and then treated as asbestos waste. The removal process must be thorough and shall include encapsulant being sprayed onto the open ends of the pipe.

7. When the removal of the asbestos-containing materials has been completed, the workers are required to undergo complete decontamination in the decontamination unit set up nearby. Using glove bags to remove pipe insulation in this manner, under continuous negative pressure and with all other provisions of the standard in operation, meets both the letter and the intent of the standard with regard to removal practices and procedures.

OSHA is presently under court order to clarify the definition of small-scale, short duration operations. The asbestos directive, CPL 2-2.40, published on September 1, 1987, will be updated to include current interpretations.

JUL 5, 1989

This is in response to your letter of May 3, regarding the use of a "Negative Air Bag" in the removal of asbestos pipe insulation. It is the opinion of the Occupational Safety and Health Administration (OSHA) that the use of "Negative Air Bags" as described in your letter meets the requirement for establishing a negative-pressure enclosure pursuant to 29 CFR 1926.58(e)(6), provided that all of the other provisions of the construction asbestos standard are met.

RECORD ID 3862

Negative Pressure Enclosures

STANDARD NUMBER 1926.58(e)(6)
INFORMATION DATE 901015

ABSTRACT The Agency is presently proposing to clarify the negative-pressure enclosure requirement and the definition of small-scale, short-duration operations through amended rulemaking procedures as published 20 July 1990 (55FR 29712). OSHA is proposing to apply the requirement for employers to establish negative-pressure enclosures before commencing any asbestos removal, demolition, and renovation operation, regardless of the exposure level, unless specifically exempted. In the interim, the OSHA policy is to enforce the negative-pressure enclosure requirement in all cases involving asbestos removal, demolition, and renovation projects where the erection of an enclosure is feasible, except for small-scale, short duration operations.

INTERPRETATION 29 CFR 1926.58(e)(6)

OCT 15, 1990

MEMORANDUM FOR: ALL REGIONAL ADMINISTRATORS

SUBJECT: Enforcement Policy Regarding Negative Pressure Enclosures and Related Issues

Pursuant to 29 CFR 1926.58(e)(6), wherever feasible, the employer shall establish negative pressure enclosures before commencing asbestos removal, demolition, and renovation operations. The purpose of the negative-pressure enclosures is to restrict the spread of asbestos dust that may be generated when large amounts of asbestos-containing material are handled during asbestos removal, renovation, and demolition operations.

In a recent case in Region V, Secretary of Labor v. Nimco, Inc. (OSHRC Docket No. 89-136 and 89-1703), the Occupational Safety and Health Review Commission administrative law judge (ALJ) found that "a reasonable person reading the standard would assume that paragraph (e) addresses regulated areas, and subparagraphs (e)(1) - (6) address specific aspects of the general subject." In other words, paragraphs (e)(1) - (e)(6) must be regarded as a whole and the establishment of the regulated area or a negative-pressure enclosure is dependent upon whether or not the airborne concentration of asbestos would exceed or reasonably be expected to exceed the permissible exposure limits. In the Nimco case, the judge found that fiber levels monitored by the employer were shown to be below the permissible exposure levels; therefore, the judge ruled that a negative-pressure enclosure and decontamination facilities were not required. The judge also found that Nimco's removal of asbestos-containing materials from pipes using the glove bag method qualified for the small-scale, short-duration operation exemption under 1926.58(e)(6)(iv), and therefore, neither negative-pressure enclosure nor decontamination facilities was required.

Although we disagree with the judge's ruling, there is little basis upon which a successful appeal of the decision could be sustained. As interpreted by the judge, the plain meaning of the standard requires the showing of an overexposure or a reasonable expectation of an overexposure as a precondition to establishing a regulated area. Although the preamble states that the standard has a two-tiered approach in recognition of the wide diversity of construction projects, the standard itself does not contain such explicit language. The preamble states that paragraphs (e)(1) through (e)(5) contain OSHA's requirements for regulated areas on construction projects other than removal, demolition and renovation operations, while paragraph (e)(6) specifies the more extensive and stringent requirements for the enclosed negative- pressure regulated areas required for removal, demolition, and renovation operations. The standard's lack of distinction of the different requirements for two types of regulated areas has been a recurring problem in other legal cases involving asbestos abatement.

The Agency is presently proposing to clarify the negative-pressure enclosure requirement and the definition of small-scale, short-duration operations through amended rulemaking procedures. OSHA is proposing to apply the requirement for employers to establish negative-pressure enclosures before commencing any asbestos removal, demolition, and renovation operation, regardless of the exposure level, unless specifically exempted. The proposed revisions to the current asbestos regulations were published in the July 20, 1990, Federal Register (55FR29712).

In the interim, our policy is to enforce the negative-pressure enclosure requirement in all cases involving asbestos removal, demolition, renovation projects where the erection of an enclosure is feasible, except for small-scale, short duration operations, in which case the requirements of Appendix G of the standard must be met. Employers claiming the exemption for small-scale, short-duration operations while performing asbestos removal via glove bags must follow proper glove bagging procedures prescribed in Appendix G.

Before issuing a citation for not establishing a regulated area or a negative-pressure enclosure, a compliance officer must document the likelihood or potential of an operation exceeding the permissible exposure levels (8-hour TWA or 30-minute excursion limit). The standard as written compels the Agency to carry the burden of proving that the employer exposed employees or potentially could have exposed employees to airborne concentrations of asbestos above the permissible exposure limits (PEL's) before any of the provisions of 1926.58 (e)(1) through (e)(6) may be cited. In absence of any exposure or initial monitoring by the employer, or monitoring data collected by the CSHO, the CSHO shall cite 1926.58(f)(1)(i) or (f)(2)(i), where the Agency has no way of proving that workplace airborne asbestos levels were in excess of the PEL's. Without such a showing, OSHA cannot sustain the burden of proving worksite conditions which would trigger the employer's duty to establish a regulated area pursuant to 1926.58(e)(1) through (e)(6). In cases where the employer relies on exposure data compiled from previous jobs in lieu of performing initial monitoring, the employer must demonstrate that the previous data was obtained during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations. (See 1926.58(f)(2)(iii)). The CSHO shall also verify the validity of the employer's air sampling method and document any unpredictable variability of levels to rebut the employer's claim that the establishment of a regulated area was not warranted.

The negative-pressure enclosure requirement also applies to roofing operations, unless the construction of the enclosure is infeasible due to physical obstruction or that the enclosure would create a more immediate health or safety hazard to employees, i.e. heat stress or confined toxic gasses. Where the employer has instituted engineering and work practice controls that restrict the spread of asbestos and protect bystanders during the entire work process, the intent of requiring the negative-pressure enclosure under 1926.58 (e)(6) would be met. The effectiveness of the controls must be supported by employer's exposure data.

Regarding the definition of small-scale, short-duration operations, OSHA's proposed standard's language differs from our current interpretation. For example, our current interpretation considers three linear feet or one glove bag as small-scale, short-duration; the proposed standard is considering 21 linear feet. However, the proposed standard also requires a specifically trained competent person to oversee the operations. Therefore, our interim policy is to classify as de minimis, per FOH instruction, potential violations involving operations which are not in accord with OSHA's current interpretation of small-scale short-duration but meet all the requirements for small-scale short-duration projects as outlined in the proposed standard. This policy, of course, will change pending the completion of amended rulemaking proceedings. If you need further assistance, please contact the Office of Health Compliance Assistance.

RECORD ID 4079

STANDARD NUMBER 1926.58(e)(6)
INFORMATION DATE 901031

ABSTRACT This interpretation addresses the need to have negative-pressure enclosure for roofing operations involving removal of asbestos-containing shingles. Removal of asbestos-containing roof shingles is considered an asbestos removal project; therefore, the 1910.58(e)(6) requirement to establish a negative-pressure enclosure applies. If an employer can demonstrate via past monitoring data that the engineering and work practice controls used are as effective as the negative pressure enclosure in limiting the spread of asbestos to the work area, the intent of paragraph (e)(6) is considered to be met.

INTERPRETATION 29 CFR 1926.58(e)(6)

OCT 31, 1990

MEMORANDUM

SUBJECT: Asbestos Enclosure for Roofing Operations

This is in response to your memorandum of February 8, concerning the need to have a negative-pressure enclosure for roofing operations involving removal of asbestos-containing shingles. Our current asbestos standard, 29 CFR 1925.58, requires the employer to establish a negative-pressure enclosure for asbestos removal, renovation, demolition operations, wherever feasible. Removal of asbestos-containing roof shingles is considered an asbestos removal project; therefore paragraph (e)(6) of 29 CFR 1926.58 does apply.

Further guidance to the field regarding the application of 29 CFR 1910.58(e)(6) is provided in our memorandum of October 15, 1990 to all Regional Administrators on the subject of Enforcement Policy Regarding Negative Pressure Enclosures and Related Issues. A copy is attached for your information.

Roofing work has not been considered comparable to floor tile work because roof shingles are more susceptible to deterioration due to exposure to the elements. However, OSHA is reconsidering the roofing issue in the proposed rulemaking revisions published in the July 20, 1990, Federal Register. Presently, 29 CFR 1926.58 (e)(6) is still applicable to removal of asbestos- containing shingles. However, if an employer can demonstrate via past monitoring data that the engineering and work practice controls used are as effective as the negative pressure enclosure in limiting the spread of asbestos to the work area, the intent of paragraph (e)(6) is considered to be met. I trust this guidance adequately responds to the issues you raised.

OCT 15, 1990

MEMORANDUM

SUBJECT: Enforcement Policy Regarding Negative Pressure Enclosures and Related Issues

Pursuant to 29 CFR 1926.58(e)(6), wherever feasible, the employer shall establish negative pressure enclosures before commencing asbestos removal, demolition, and renovation operations. The purpose of the negative-pressure enclosures is to restrict the spread of asbestos dust that may be generated when large amounts of asbestos-containing material are handled during asbestos removal, renovation, and demolition operations.

In a recent case in Region V, Secretary of Labor v. Nimco, Inc. (OSHRC Docket No. 89-136 and 89-1703), the Occupational Safety and Health Review Commission administrative law judge (ALJ) found that "a reasonable person reading the standard would assume that paragraph (e) addresses regulated areas, and subparagraphs (e)(1) - (6) address specific aspects of the general subject." In other words, paragraphs (e)(1) - (e)(6) must be regarded as a whole and the establishment of the regulated area or a negative-

pressure enclosure is dependent upon whether or not the airborne concentration of asbestos would exceed or reasonably be expected to exceed the permissible exposure limits. In the Nimco case, the judge found that fiber levels monitored by the employer were shown to be below the permissible exposure levels; therefore, the judge ruled that a negative-pressure enclosure and decontamination facilities were not required. The judge also found that Nimco's removal of asbestos-containing materials from pipes using the glove bag method qualified for the small-scale, short-duration operation exemption under 1926.58(e)(6)(iv), and therefore, neither negative-pressure enclosure nor decontamination facilities was required.

Although we disagree with the judge's ruling, there is little basis upon which a successful appeal of the decision could be sustained. As interpreted by the judge, the plain meaning of the standard requires the showing of an overexposure or a reasonable expectation of an overexposure as a precondition to establishing a regulated area. Although the preamble states that the standard has a two-tiered approach in recognition of the wide diversity of construction projects, the standard itself does not contain such explicit language. The preamble states that paragraphs (e)(1) through (e)(5) contain OSHA's requirements for regulated areas on construction projects other than removal, demolition and renovation operations, while paragraph (e)(6) specifies the more extensive and stringent requirements for the enclosed negative- pressure regulated areas required for removal, demolition, and renovation operations. The standard's lack of distinction of the different requirements for two types of regulated areas has been a recurring problem in other legal cases involving asbestos abatement.

The Agency is presently proposing to clarify the negative-pressure enclosure requirement and the definition of small-scale, short-duration operations through amended rulemaking procedures. OSHA is proposing to apply the requirement for employers to establish negative-pressure enclosures before commencing any asbestos removal, demolition, and renovation operation, regardless of the exposure level, unless specifically exempted. The proposed revisions to the current asbestos regulations were published in the July 20, 1990, Federal Register (55FR29712).

In the interim, our policy is to enforce the negative-pressure enclosure requirement in all cases involving asbestos removal, demolition, renovation projects where the erection of an enclosure is feasible, except for small-scale, short duration operations, in which case the requirements of Appendix G of the standard must be met. Employers claiming the exemption for small-scale, short-duration operations while performing asbestos removal via glove bags must follow proper glove bagging procedures prescribed in Appendix G.

Before issuing a citation for not establishing a regulated area or a negative-pressure enclosure, a compliance officer must document the likelihood or potential of an operation exceeding the permissible exposure levels (8-hour TWA or 30-minute excursion limit). The standard as written compels the Agency to carry the burden of proving that the employer exposed employees or potentially could have exposed employees to airborne concentrations of asbestos above the permissible exposure limits (PEL's) before any of the provisions of 1926.58 (e)(1) through (e)(6) may be cited. In absence of any exposure or initial monitoring by the employer, or monitoring data collected by the CSHO, the CSHO shall cite 1926.58(f)(1)(i) or (f)(2)(i), where the Agency has no way of proving that workplace airborne asbestos levels were in excess of the PEL's. Without such a showing, OSHA cannot sustain the burden of proving worksite conditions which would trigger the employer's duty to establish a regulated area pursuant to 1926.58(e)(1) through (e)(6). In cases where the employer relies on exposure data compiled from previous jobs in lieu of performing initial monitoring, the employer must demonstrate that the previous data was obtained during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations. (See 1926.58(f)(2)(iii)). The CSHO shall also verify the validity of the employer's air sampling method and document any unpredictable variability of levels to rebut the employer's claim that the establishment of a regulated area was not warranted.

The negative-pressure enclosure requirement also applies to roofing operations, unless the construction of the enclosure is infeasible due to physical obstruction or that the enclosure would create a more immediate health or safety hazard to employees, i.e., heat stress or confined toxic gasses. Where the employer has instituted engineering and work practice controls that restrict the spread of asbestos and protect bystanders during the entire work process, the intent of requiring the negative-pressure enclosure under 1926.58 (e)(6) would be met. The effectiveness of the controls must be supported by employer's exposure data.

Regarding the definition of small-scale, short-duration operations, OSHA's proposed standard's language differs from our current interpretation. For example, our current interpretation considers three linear feet or one glove bag as small-scale, short-duration; the proposed standard is considering 21 linear feet. However, the proposed standard also requires a specifically trained competent person to oversee the operations. Therefore, our interim policy is to classify as de minimis, per FOM instruction, potential violations involving operations which are not in accord with OSHA's current interpretation of small-scale short-duration but meet all the requirements for small-scale short-duration projects as outlined in the proposed standard. This policy, of course, will change pending the completion of amended rulemaking proceedings. If you need further assistance, please contact the Office of Health Compliance Assistance.

SOURCE LETTER

February 8, 1990

MEMORANDUM

SUBJECT: Asbestos Enclosures for Roofing Operations

This is to request guidance concerning the need to have a negative pressure enclosure for roofing operations involving removal of asbestos containing shingles. This office has received verbal guidance in the past which stated that such roofing operations were to be done in negative pressure enclosures when feasible since the operations would be covered under by 29 CFR 1926.58(e)(6). It appears, however, that such roofing operations may actually not be intended to be covered by paragraph (e)(6) but by paragraph (e)(1) of the standard which would only require that a regulated area be established if asbestos levels exceeded the PEL and then would require that the regulated area be demarcated in some manner as detailed in paragraph (e)(2) of the standard. This appears to be the intention of the standard as referenced in the preamble's description of the term "removal" as a high exposure operation involving friable asbestos (Federal Register, Vol. 51, No. 119, page 22708). Removal of roof shingles typically results in levels of asbestos below the action level and involves non-friable asbestos. In addition, CPL 2-2.40 states on page 6 that "employers performing general" construction operations, such as the cutting of asbestos-cement sheets, the lathing of asbestos-cement pipes or the removal of asbestos-containing floor tiles, are required to establish regulated areas in accordance with 29 CFR 1926.58 (e)(1) and demarcated in accordance with 29 CFR 1926.58 (e)(2)." The exposures generated during the removal of asbestos shingles would be comparable to exposures encountered during the removal of floor tile.

This issue has raised significant concern in the roofing industry, therefore an expedited response is requested. Please contact Mr. J of my staff if there are any questions.

RECORD ID 4061

STANDARD NUMBER 1926.58(e)(6)(i)
INFORMATION DATE 901029

ABSTRACT OSHA's current policy is to enforce the negative-pressure requirement in all cases involving asbestos removal, demolition, and renovation projects where feasible except for small-scale, short-duration operations. Because the Agency bears the burden of proving a health hazard, the CSHO must be able to demonstrate that exposure levels exceed or can be reasonably expected to exceed the 8-hour time-weighted-average or the 30 minute excursion limits.

INTERPRETATION 29 CFR 1926.58(e)(6)(i)

OCT 29, 1990

MEMORANDUM

SUBJECT: Enforcement Policy Regarding Negative- Pressure Enclosures. This is in response to your memorandum of July 27, regarding your letter to the (State) Department of Labor concerning negative-pressure enclosures and other asbestos issues. You requested our review and concurrence on your response number 1.

We concur with your statements that negative-pressure enclosures are required, where feasible, for all asbestos removal, demolition and renovation jobs except for small-scale, short-duration operations and that the burden of proving a health hazard is upon the agency. Our current policy is to enforce the negative-pressure requirement in all cases involving asbestos removal, demolition, renovation projects where feasible except for small-scale, short-duration operations.

However, since the Agency bears the burden of proving a health hazard, the CSHO must be able to demonstrate that exposure levels exceed or can be reasonably exceed the 8-hour time-weighted-average or the 30 minute excursion limits. Enclosed is a copy of our most recent enforcement policy regarding negative-pressure enclosures. If we can be of further assistance, please do not hesitate to contact us again.

Enclosure

OCT 15, 1990

MEMORANDUM FOR: ALL REGIONAL ADMINISTRATORS

SUBJECT: Enforcement Policy Regarding Negative Pressure Enclosures and Related Issues

Pursuant to 29 CFR 1926.58(e)(6), wherever feasible, the employer shall establish negative pressure enclosures before commencing asbestos removal, demolition, and renovation operations. The purpose of the negative-pressure enclosures is to restrict the spread of asbestos dust that may be generated when large amounts of asbestos-containing material are handled during asbestos removal, renovation, and demolition operations.

In a recent case in Region V, Secretary of Labor v. Nimco, Inc. (OSHRC Docket No. 89-136 and 89-1703), the Occupational Safety and Health Review Commission administrative law judge (ALJ) found that "a reasonable person reading the standard would assume that paragraph (e) addresses regulated areas, and subparagraphs (e)(1) - (6) address specific aspects of the general subject." In other words, paragraphs (e)(1) - (e)(6) must be regarded as a whole and the establishment of the regulated area or a negative-pressure enclosure is dependent upon whether or not the airborne concentration of asbestos would exceed or reasonably be expected to exceed the permissible exposure limits. In the Nimco case, the judge found that fiber levels monitored by the employer were shown to be below the permissible exposure levels; therefore, the judge ruled that a negative-pressure enclosure and decontamination facilities were not required. The judge also found that Nimco's removal of asbestos-containing materia

from pipes using the glove bag method qualified for the small-scale, short-duration operation exemption under 1926.58(e)(6)(iv), and therefore, neither negative-pressure enclosure nor decontamination facilities was required.

Although we disagree with the judge's ruling, there is little basis upon which a successful appeal of the decision could be sustained. As interpreted by the judge, the plain meaning of the standard requires the showing of an overexposure or a reasonable expectation of an overexposure as a precondition to establishing a regulated area. Although the preamble states that the standard has a two-tiered approach in recognition of the wide diversity of construction projects, the standard itself does not contain such explicit language. The preamble states that paragraphs (e)(1) through (e)(5) contain OSHA's requirements for regulated areas on construction projects other than removal, demolition and renovation operations, while paragraph (e)(6) specifies the more extensive and stringent requirements for the enclosed negative- pressure regulated areas required for removal, demolition, and renovation operations. The standard's lack of distinction of the different requirements for two types of regulated areas has been a recurring problem in other legal cases involving asbestos abatement.

The Agency is presently proposing to clarify the negative- pressure enclosure requirement and the definition of small-scale, short-duration operations through amended rulemaking procedures. OSHA is proposing to apply the requirement for employers to establish negative-pressure enclosures before commencing any asbestos removal, demolition, and renovation operation, regardless of the exposure level, unless specifically exempted. The proposed revisions to the current asbestos regulations were published in the July 20, 1990, Federal Register (55FR29712).

In the interim, our policy is to enforce the negative-pressure enclosure requirement in all cases involving asbestos removal, demolition, renovation projects where the erection of an enclosure is feasible, except for small-scale, short duration operations, in which case the requirements of Appendix G of the standard must be met. Employers claiming the exemption for small-scale, short-duration operations while performing asbestos removal via glove bags must follow proper glove bagging procedures prescribed in Appendix G.

Before issuing a citation for not establishing a regulated area or a negative-pressure enclosure, a compliance officer must document the likelihood or potential of an operation exceeding the permissible exposure levels (8-hour TWA or 30-minute excursion limit). The standard as written compels the Agency to carry the burden of proving that the employer exposed employees or potentially could have exposed employees to airborne concentrations of asbestos above the permissible exposure limits (PEL's) before any of the provisions of 1926.58(e)(1) through (e)(6) may be cited. In absence of any exposure or initial monitoring by the employer, or monitoring data collected by the CSHO, the CSHO shall cite 1926.58(f)(1)(i) or (f)(2)(i), where the Agency has no way of proving that workplace airborne asbestos levels were in excess of the PEL's. Without such a showing, OSHA cannot sustain the burden of proving worksite conditions which would trigger the employer's duty to establish a regulated area pursuant to 1926.58(e)(1) through (e)(6). In cases where the employer relies on exposure data compiled from previous jobs in lieu of performing initial monitoring, the employer must demonstrate that the previous data was obtained during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations. (See 1926.58(f)(2)(iii)). The CSHO shall also verify the validity of the employer's air sampling method and document any unpredictable variability of levels to rebut the employer's claim that the establishment of a regulated area was not warranted.

The negative-pressure enclosure requirement also applies to roofing operations, unless the construction of the enclosure is infeasible due to physical obstruction or that the enclosure would create a more immediate health or safety hazard to employees, i.e. heat stress or confined toxic gasses. Where the employer has instituted engineering and work practice controls that restrict the spread of asbestos and protect bystanders during the entire work process, the intent of requiring the negative-pressure enclosure under 1926.58(e)(6) would be met. The effectiveness of the controls must be supported by employer's exposure data.

Regarding the definition of small-scale, short-duration operations, OSHA's proposed standard's language differs from our current interpretation. For example, our current interpretation considers three linear feet or one glove bag as small-scale, short-duration; the proposed standard is considering 21 linear feet. However, the proposed standard also requires a specifically trained competent person to oversee the operations. Therefore, our interim policy is to classify as de minimis, per FOM instruction, potential violations involving operations which are not in accord with OSHA's current interpretation of small-scale

short-duration but meet all the requirements for small-scale short-duration projects as outlined in the proposed standard. This policy, of course, will change pending the completion of amended rulemaking proceedings. If you need further assistance, please contact the Office of Health Compliance Assistance.

SOURCE LETTERS

JUL 27, 1990

MEMORANDUM

SUBJECT: Enforcement Policy Regarding Negative-Pressure Enclosures

The enclosed OSHA letter to the (State) Department of Labor (NC-DOL) reflects Region IV's enforcement policy regarding negative- pressure enclosures and other issues raised in the enclosed June 26 letter from XX-DOL. Your review and concurrence on the policy issue addressed in our response number 1 to (State) issues 1 and 2 is requested.

Enclosures

JUL 27, 1990

In response to your letter dated June 26 requesting clarification of enforcement policy related to 29 CFR 1926.58, the following information is provided:

1. Regarding items 1 and 2, the regional policy for 1926.58(e)(6) is to require negative-pressure enclosures, where feasible, for all asbestos removal, demolitions, and similar jobs, except for small-scale, short-duration operations as defined in 1926.58(e)(6)(iv). The purpose of this policy is to protect workers not directly involved in the removal from exposure to asbestos. The negative-pressure enclosures restrict the spread of asbestos dust that may be generated when large amounts of asbestos containing material are handled during asbestos removal. The preamble to the asbestos standard states that negative pressure enclosures will prevent the exposure of these workers to concentration of asbestos fibers that exceed the action level. Even though the burden of proving a hazard is upon the agency, this region has not received any adverse judicial decisions regarding this enforcement policy. we are aware that cases where exposures to asbestos are not likely to exceed the action level may pose problems in demonstrating an inhalation hazard. Because of these concerns, we will ask the national office to review this policy for concurrence.

2. Regarding items 3 and 4, the exception in Paragraph (e)(6)(iv) is limited only to exempting the employer from the other requirements of Paragraph (e)(6). Thus, all other provisions of the standard are applicable to small-scale, short-duration operations, including the monitoring requirements.

3. Regarding item 5, OSHA Instruction CPL 2.45B, the Revised Field Operation Manual, (Chapter III, page 54, Paragraph D.8.b.(4)) governs the collection of samples and the evaluation of the results for work schedules other than the usual 8-hour work shift.

June 26, 1990

RE: Clarification of Enforcement Policy: 29 CFR 1926.58

This letter will document a formal request by the (State) Division of Occupational Safety and Health, for assistance in clarifying federal OSHA's compliance/enforcement policy regarding the following items from the asbestos construction standard at 29 CFR 1926.58, and the air contaminant standard at 1910.1000:

1. Must employers establish negative-reassure enclosures for all jobs (where feasible) before commencing any asbestos removal, demolition, and/or renovation operation except for small-scale, short-duration operations as per 1926.58(e)(6)(iv), no matter what the employee exposure level?

2. What is OSHA's record of citations with regard to the establishment of negative-pressure enclosures for tasks where the Permissible Exposure Levels, Excursion Levels, and/or Action Levels are not met or exceeded.

3. In order to qualify for the exception provision of 1926.58(e)(6)(iv), does a facility that has asbestos-containing materials need to have a complete asbestos assessment or can the employer assume all areas that have not been assessed do contain asbestos, and act accordingly?

4. Is exposure-monitoring required for small-scale, short-duration operations. at 1926.58(e)(6)(iv)?

5. Is there any provision for adjustment of the PEL's for air contaminants in Table Z-1-A of 29 CFR 1910.1000 for periods greater than an 8-hour work shift and/or a 40-hour week? If so, what are the source documents?

RECORD ID 1751

STANDARD NUMBER 1926.58(e)(6)(ii)
INFORMATION DATE 870526

ABSTRACT This interpretation letter clarifies the requirements for presence of a "competent person" at a job site. Under 1926.58(e)(6)(ii), a competent person is required to be at the job site at all times when supervising the abatement process.

INTERPRETATION 29 CFR 1926.58(e)(6)(ii)

MAY 26, 1987

This is in response to your letter of January 20, 1987 requesting an interpretation of the Occupational Safety and Health Administration's (OSHA) Asbestos standard for construction, 29 CFR 1926.58. Please accept my apology for the delay in response. The overwhelming number of letters and telephone calls regarding the asbestos standard has caused unavoidable delays in responding to the public's concern.

Your letter specifically refers to 29 CFR 1926.58(e)(6)(ii) where you asked the following question:

> Is a competent person required to be at the job site at all times when supervising the abatement process?

Yes, a competent person is required to be at the job site at all times when supervising the abatement process.

RECORD ID 1747

STANDARD NUMBER 1926.58(f)
INFORMATION DATE 870421

ABSTRACT This interpretation of 1926.58(f) addresses an employer's monitoring obligation when the initial exposure monitoring indicates that employee exposures are between the action level and the permissible exposure limit. The standard implies that daily air monitoring is to continue until exposures are reliably documented to be below the action level.

INTERPRETATION 29 CFR 1926.58(f)

APR 21, 1987

MEMORANDUM

SUBJECT: Request for Interpretation of 29 CFR 1926.58(f)

This is in response to your letter of December 24, 1986, regarding the above captioned subject. Specifically, your question is: "What is an employee's monitoring obligation when the initial exposure monitoring indicates that employee exposures are between the action level and the permissible exposure limit?"

As you mention in your letter, 29 CFR 1926.58(f)(4) states: "If the periodic monitoring required by paragraph (f)(3) of this section reveals that employee exposures, as indicated by statistically reliable measurements; are below the action level, the employer may discontinue monitoring for those employees whose exposures are represented by such monitoring."

The standard, under paragraph 29 CFR 1926.58(f)(4), clearly places emphasis on the need to utilize sampling methodologies and strategies that will result in an accurate representation of employee exposure. Because of the narrow limits of exposure between the action level and the PEL, credible substantiation of exposures within this range will be difficult. In most cases, this will require multiple samples and careful observation of work practices and the effects of variation of those practices on exposure levels. Because of the difficulties mentioned above it is appropriate to conclude that the standard implicitly intended daily monitoring to continue until exposures are reliably documented to be below the action level. For compliance purposes citations shall be issued for violations of appropriate sections of 29 CFR 1926.58(f) whenever employers are relying on sampling data that does not adequately represent employee exposure.

When evaluating the obligations of the employer to perform additional sampling in accordance with paragraph (f)(2)(i), the following criteria should be considered:

* How much monitoring data does the employer have for the job in question?
* Is the operation one for which the employee exposures would be expected to be below the action level?
* Is the operation one in which employee exposures are likely to fluctuate?

If, after a thorough examination of the data, it is concluded that the monitoring results do accurately portray the employees' exposures and the monitoring results are below the action level, then additional sampling would only be required when there is a change in operations of conditions that would effect employee exposures.

SOURCE LETTER

DEC 24, 1986

MEMORANDUM

SUBJECT: 29 CFR 1926.58(f) - Clarification Request

Attached is a request for clarification of 29 CFR 1926.58(f) concerning monitoring provisions of the asbestos standard for construction. Due to the significance of the response, the request is being transmitted to you for your consideration.

Please respond to this office. You should contact Mr. J if there are any questions.

Attachment

December 18, 1986

MEMORANDUM

SUBJECT: Request for Interpretation Concerning 1926.58(f) Exposure Monitoring

In reviewing employers' monitoring requirements as delineated in 1926.58(f), there appears to be a "gray area" in which any requirements for additional monitoring are not clear. According to (f)(2)(i), the employer is required to conduct representative initial monitoring to determine employees' exposure to airborne asbestos (unless objective and/or historical monitoring data is utilized to demonstrate representative exposures are below the action level, AL). If the results of the initial monitoring reliably show that exposures are below the AL, the employer may terminate monitoring per (f)(4). If these data demonstrate levels that exceed or may exceed the PEL (0.2 f/cc) - i.e., the area meets the definition of a "regulated area" - the employer shall conduct daily monitoring (unless supplied air respirators are used) per (f)(3). These situations appear to be clearly defined and addressed.

The problem area, however, is the situation where the employer's initial monitoring demonstrates that employee's exposures are at or above the AL but less than the PEL. Section (f)(4) implies that further (e.g. periodic) monitoring is to be conducted unless levels are below 0.1 f/cc (8-hr. TWA) it is, therefore, requested that a clarification on this issue be provided, specifically: what is an employer's monitoring obligation when initial exposure monitoring indicates employees exposures are between the AL and the PEL?

RECORD ID 3036

STANDARD NUMBER 1926.58(f)(2)(i)
INFORMATION DATE 900207

ABSTRACT This interpretation letter responds to a request from Walter D. Anderson, Resilient Floor Covering Institute, for exemption from the initial monitoring provision of OSHA's asbestos standard,1926.58(f)(2)(i) when employees remove resilient floor tile. Claims for an exemption from initial monitoring requirements are evaluated by the compliance officer on a case by case basis. Sampling results may be considered historic data if they are representative of prevailing work conditions and work practices and if the air monitoring was conducted and analyzed appropriately. Contractors may be responsible for initial monitoring during preparation of sub-flooring subsequent to floor covering removal.

INTERPRETATION 29 CFR 1926.58(f)(2)(i)

FEB 7, 1990

This is in response to your letter of January 26, regarding your request for exemption from the initial monitoring provision in the Occupational Safety and Health Administration's (OSHA) asbestos standard, 29 CFR 1926.58(f)(2)(i).

Along with your letter, you submitted a summary of a study by (Company) for OSHA's consideration and confirmation that this study constitutes historical data for the determination of employee exposure to asbestos when removing resilient floor tile, in accordance with the industry's recommended work practices that were the basis for the study.

As communicated to you during our previous meetings, your data can be considered as historical data, when they are representative of your prevailing work conditions and work practices. OSHA is not in a position to validate your data or attest to the effectiveness of your recommended work practices. The local OSHA Area Office would evaluate the claim of exemption from initial monitoring on a case by case basis, when the compliance officer determines that the (Company) sampling results represent the actual work conditions and that the recommended work practices are strictly followed.

We appreciate your efforts in gathering the data and would suggest that you provide your employees or contractors these data along with your recommended work practices for use as historical data to claim exemption from the initial monitoring requirement. However, if data from other sources including OSHA's field data show that these results are not reproducible, OSHA reserves the right to notify the Resilient Floor Covering Institute and other relevant parties that an exemption based on ENVIRON study would not be possible.

Your data covered the period of asbestos tile removal and floor clean-up but did not extend to initial preparations, installation of new resilient floor covering not containing asbestos or other work activities subsequent to the removal itself. Therefore, the contractors may still be responsible for initial monitoring during activities subsequent to the removal that may subject employees to asbestos exposure.

Please note that the asbestos standard is subject to change and that future changes of the standard may affect the provision for exemption from initial air monitoring.

February 6, 1990

We are forwarding to you a copy of the final letter sent by OSHA to Mr. W of Company A dated October 27, 1989.

In addition, we are forwarding a copy of the letter received by me today. On it I have marked the differences between this letter and that of Mr. King. The three deletions and one change of wording were made in an earlier draft and, as you can see, were not contained in the final letter.

The changes are as follows:

1. Paragraph 2: delete "previously submitted to OSHA as objective data..."

2. Paragraph 3: delete "and if the air monitoring was conducted and analyzed appropriately in accordance to OSHA's Reference Method."

3. Paragraph 5.: This should read, as it does in Mr. King's letter, as follows:

   Your data covered the period of asbestos tile removal and floor clean-up but did not extend to initial preparations, installation of new resilient floor covering not containing asbestos or other work activities subsequent to the removal itself. Therefore, the contractors may still be responsible for initial monitoring during activities subsequent to the removal that may subject employees to asbestos exposure.

4. Paragraph 6: delete "It should be noted that the employers/contractors must still satisfy the standard's requirement for periodic monitoring, 29 CFR 1926.58(f)(3)."

These changes would bring our letter into conformity with the final letter from OSHA to Mr. W.

We truly appreciate your great help in working with us on obtaining our copy of this very important letter. Anything that you can do to see that this is sent by FAX to us today would be "above and beyond" so that I would have this for our Board of Directors meeting tomorrow in (State).

SOURCE LETTERS

January 26, 1990

Re: Historical Data Letter Regarding Floor Tile Removal

As we discussed, the Resilient Floor Covering Institute ("RFCI") hereby requests that OSHA issue to RFCI, as addressee, the same letter sent to Mr. W of Company A, dated October 27, 1989, regarding our request that OSHA consider the ENVIRON report as historical data. As you know, Armstrong and RFCI jointly requested this determination to support an exemption from initial monitoring requirements under the asbestos standard for floor tile removals using the recommended work practices. Although we have orally requested in past, through our consultant Grover Wrenn, that OSHA issue this letter to RFCI, you asked that we submit this request in writing which we do hereby.

You informed us that OSHA would be able to issue the October 27, 1989 letter to RFCI, as addressee, by February 5, 1990. I would greatly appreciate receiving the letter by that date so I can distribute it during an RFCI Board of Directors meeting scheduled for that week.

OCT 27, 1989

This is in response to your letter of April 3, regarding your request for exemption from the initial monitoring provision in the Occupational Safety and Health Administration's (OSHA) asbestos standard, 29 CFR 1926.58(f)(2)(i).

Along with your letter, you submitted a summary of a study by ENVIRON, previously submitted to OSHA as objective data, for OSHA's consideration and confirmation that this study constitutes historical data for the determination of employee exposure to asbestos when removing resilient floor tile, in accordance with the industry's recommended work practices that were the basis for the study.

As communicated to you during our previous meetings, your data can be considered as historical data, when they are representative of your prevailing work conditions and work practices and if the air monitoring was conducted and analyzed appropriately in accordance to OSHA's Reference Method. OSHA is not in a position to validate your data or attest to the effectiveness of your recommended work practices. The local OSHA Area Office would evaluate the claim of exemption from initial monitoring on a case by case basis, when the compliance officer determines that the ENVIRON sampling results represent the actual work conditions and that the recommended work practices are strictly followed.

We appreciate your efforts in gathering the data and would suggest that you provide your employees or contractors these data along with your recommended work practices for use as historical data to claim exemption from the initial monitoring requirement. However, if data from other sources including OSHA's field data show that these results are not reproducible, OSHA reserves the right to notify the Resilient Floor Covering Institute and other relevant parties that an exemption based on ENVIRON study would not be possible.

Your data covered the period of asbestos tile removal and floor clean-up but did not extend to initial preparations, installation of new resilient floor covering not containing asbestos or other work activities subsequent to the removal itself. Therefore, the contractors may still be responsible for initial monitoring during activities subsequent to the removal that may subject employees to asbestos exposure.

Please note that the asbestos standard is subject to change and that future changes of the standard may affect the provision for exemption from initial air monitoring.

RECORD ID 3037

STANDARD NUMBER 1926.58(f)(2)(i)
INFORMATION DATE 891204

ABSTRACT This memorandum to Regional Administrators concerning Vinyl Asbestos Floor Tile Removal, advises that a study conducted by Company X can be considered historical data to be used in requests for exemption from the initial monitoring provision of 29 CFR 1926.58(f)(2)(i). Area Office Compliance Officers are instructed to ensure that work practices recommended by Company Y and RFCI are being strictly followed when they consider granting an exemption, and that OSHA field data confirm Company X's sample results. Employers may still be responsible for initial monitoring during activities subsequent to tile removal.

INTERPRETATION 29 CFR 1926.58(f)(2)(i)

DEC 4, 1989

MEMORANDUM

SUBJECT: Vinyl Asbestos Floor Tile Removal - Historical Data

Enclosed is a copy of a letter to Mr. W of Company A Industries dated October 27, informing him and the representatives of the Resilient Floor Covering Institute (RFCI) that their data, collected by Company X Corporation, can be considered historical data to be used in their request for exemption from the initial monitoring provision, 29 CFR 1926.58(f)(2)(i).

The Company X study analyzed asbestos fiber exposures to floor mechanics and supervisory personnel during the floor tile removal conducted pursuant to work practices recommended by the Company Y and RFCI. The study reported that based on a total of 21 exposures measured according to procedures specified by OSHA, the average TWA is approximately 0.031 f/cc. The report further stated that, with 95% confidence, the excursion limit also would not be exceeded. The data covered the period of asbestos tile removal and floor clean-up but did not extend to initial preparations, installation of new resilient floor covering not containing asbestos or other work activities subsequent to the removal itself. Therefore, the employer may still be responsible for initial monitoring during activities subsequent to the removal that may subject employees to asbestos exposure.

We are enclosing for your distribution to the Area Offices copies of the "Recommended Work Practices for Removal of Resilient Floor Coverings" and "Recommended Work Procedures for Resilient Floor Coverings" by Company Y and RFCI, respectively.

In considering granting exemption from initial monitoring for vinyl asbestos tile (ONLY) removal, the compliance officer shall ensure that the recommended work practices are strictly followed and that OSHA field data confirm the Company X sample results in demonstrating exposure levels below the action level of 0.1 f/cc as well as the 30-minute excursion limit of 1 f/cc.

In cases where employers followed the recommended work practice but OSHA sampling results exceed the Company X data, please notify Ms L of the Office of Health Compliance Assistance, so that we can take appropriate actions.

Attachments

Attachment 1: Recommended Work Procedures for Resilient Floor Coverings, issued by Resilient Floor Covering Institute.
Attachment 2: Company Y Tip Sheet - Recommended Work Practices for Removal of Resilient Floor Coverings

SOURCE LETTER

OCT 27, 1989

This is in response to your letter of January 26, regarding your request for exemption from the initial monitoring provision in the Occupational Safety and Health Administration's (OSHA) asbestos standard, 29 CFR 1926.58(f)(2)(i).

Along with your letter, you submitted a summary of a study by Company X for OSHA's consideration and confirmation that this study constitutes historical data for the determination of employee exposure to asbestos when removing resilient floor tile, in accordance with the industry's recommended work practices that were the basis for the study.

As communicated to you during our previous meetings, your data can be considered as historical data, when they are representative of your prevailing work conditions and work practices. OSHA is not in a position to validate your data or attest to the effectiveness of your recommended work practices. The local OSHA Area Office would evaluate the claim of exemption from initial monitoring on a case by case basis, when the compliance officer determines that the Company X sampling results represent the actual work conditions and that the recommended work practices are strictly followed.

We appreciate your efforts in gathering the data and would suggest that you provide your employees or contractors these data along with your recommended work practices for use as historical data to claim exemption from the initial monitoring requirement. However, if data from other sources including OSHA's field data show that these results are not reproducible, OSHA reserves the right to notify the Resilient Floor Covering Institute and other relevant parties that an exemption based on Company X study would not be possible.

Your data covered the period of asbestos tile removal and floor clean-up but did not extend to initial preparations, installation of new resilient floor covering not containing asbestos or other work activities subsequent to the removal itself. Therefore, the contractors may still be responsible for initial monitoring during activities subsequent to the removal that may subject employees to asbestos exposure.

Please note that the asbestos standard is subject to change and that future changes of the standard may affect the provision for exemption from initial air monitoring.

RECORD ID 1694

STANDARD NUMBER 1926.58(f)(2)(ii); 1926.58(f)(2)(iii)
INFORMATION DATE 871123

ABSTRACT This interpretation deals with the standards applicable to the removal of sheet vinyl and vinyl floor tile containing asbestos. An interpretation is given for the criteria of collecting and evaluating objective monitoring data.

INTERPRETATION 29 CFR 1926.58(f)(2)(ii); 1926.58(f)(2)(iii)

NOV 23, 1987

This is in response to your letter of November 4, regarding the Occupational Safety and Health Administration's (OSHA) standard for Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite for the construction industry, 29 CFR 1926.58. Specifically, you are requesting a determination as to whether or not data from studies conducted by SRI, Inc., and Dunnigan and LeBel concerning removal of sheet vinyl, and vinyl floor tile, can be used as objective data pursuant to 29 CFR 1926.58(f)(2)(ii). Paragraph 29 CFR 1926.58(f)(2)(ii) states:

(ii) The employer may demonstrate that employee exposures are below the action level by means of objective data demonstrating that the product or material containing asbestos, tremolite, anthophyllite, actinolite, or a combination of these minerals cannot release airborne fibers in concentrations exceeding the action level under those work conditions having the greatest potential for releasing asbestos, tremolite, anthophyllite, or actinolite.

It is apparent from the data submitted to the Docket Office that there are certain work conditions involving the removal of sheet vinyl, and vinyl asbestos floor tiles where the worker's exposure to airborne concentrations of asbestos fibers could exceed the 0.1 fiber/cubic centimeter (f/cc) action level. Consequently, the studies do not meet the requirements for use as objective data.

However, the data contained in the studies may be useful as historical data pursuant to 29 CFR 1926.58(f)(2)(iii), which states:

(iii) Where the employer has monitored each asbestos, tremolite, anthophyllite, or actinolite job, and the data were obtained during work operations conducted under workplace conditions closely resembling the processes type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results to satisfy the requirements of paragraph (f)(2)(i) of this section.

In order to use such data as historical data, the employer must demonstrate that:

(1) The data upon which judgments are based are scientifically sound and collected using methods that are sufficiently accurate and precise.

(2) The processes and work practices in use when the historical data were obtained are essentially the same as those to be used during the job for which initial monitoring will not be performed.

(3) The characteristics of the asbestos containing material being handled when the historical data were obtained are the same as those on the job for which initial monitoring will not be performed.

(4) Environmental conditions prevailing when the historical data were obtained are the same as for the job for which initial monitoring will not be performed.

Where the data in the studies demonstrates that the employees' exposures would be less than the action level for the particular jobs being performed, and the four requirements above are satisfied, the employer may use the studies lieu of performing the initial monitoring required by 29 CFR 1926.58(f)(2)(i).

SOURCE LETTER

November 4, 1987

RE: Occupational Safety and Health Administration (OSHA); Asbestos Occupational Exposure Standard Construction Industry (29 CFR 1926.58)

Company A Industries, Inc. is primarily a manufacturer and marketer of interior furnishings including resilient floor coverings (e.g., vinyl composition floor tile and sheet vinyl products). While our current floor coverings do not contain asbestos, that raw material was formerly used in certain of these products and those applications are the subject of this correspondence.

Company A and other members of the resilient floor covering manufacturing industry have supported a specific set of work practices which we urge the professional floor installation trade and lay persons to follow in connection with the removal of an existing resilient floor covering structure which may or is assumed to contain asbestos.

These work practices (hereinafter "Recommended Work Practices") were tested extensively by the SRI, Inc., as a project sponsored by the Resilient Floor Covering Institute, Inc.* The SRI, Inc. studies were submitted to OSHA for its consideration in connection with asbestos-related rulemaking.

We are seeking a finding or determination from OSHA that the SRI, Inc., and the Dunnigan and LeBel data will support a general employer exemption from initial exposure monitoring (29 CFR 1926.58 (f)(2)(ii)) when the Recommended Work Practices are followed in connection with the removal of resilient floor covering which contains or is assumed to contain asbestos. This aspect of the application of, OSHA's Asbestos Occupational Safety and Health Standard for the Construction Industry (29 CFR 1926.58) to the resilient floor covering trades and others whose construction requirements require the removal of existing (in-place) resilient floor covering which may contain asbestos requires clarification.

It is our belief that the professional floor covering trade and others who follow the Recommended Work Practices should be entitled to the exemption from the initial monitoring of employee exposure as cited above, by reference to data that OSHA previously used in its Rulemaking (SRI, Inc. and Dunnigan and LeBel). We believe that the data produced in the SRI, Inc., and Dunnigan and LeBel studies of the Recommended Work Practices, which OSHA used as a basis to declare the feasibility of compliance with the 0.2 f/cc PEL during removal, ("Thus, OSHA determined it is feasible to comply with the 0.2 f/cc PEL during the removal and installation of vinyl/asbestos flooring." June 20, 1086, 51 FR 22663) will also support a finding that the Action level (0.1 f/cc) will not be exceeded when those Recommended Work Practices are followed in the removal of existing resilient floor coverings. This application of the data meets OSHA's concept of employer use of manufacturers data as a basis for an exemption for the need to conduct initial monitoring of construction activities ("OSHA believes that employers may be able to obtain data from the manufacturers of asbestos-containing products that demonstrate that these materials will not release asbestos at levels that exceed the action level, even under worst case conditions." June 20, 1986, 51 FR 22713).

As your staff is aware from our previous contacts and correspondence, the former manufacturers of asbestos-containing resilient floor covering products continue to emphasize in our product literature and in specialized publications addressed to the floor covering trade and others who may occasionally engage in the removal process, the need to follow the Recommended Work Practices. It is our position that by following those work practices, the actual exposures if any, should be presumed to be below the action level. Our industry is anxious to continue its past efforts to increase the floor trades and occasional users knowledge of work practices that comply with OSHA's philosophy in enforcing the Asbestos Occupational Standard for the construction industry. To accomplish this objective, we believe that it is essential for OSHA to issue a determination that implementation of the recommended work practices will limit asbestos

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* Company A is not a member of the Resilient Floor Covering, Institute, Inc. The Institute maintains offices at 966 Hungerford Drive, Suite 12-B, Rockville, MD 20850.

exposures during floor covering removal to below the action level of 0.1 f/cc. Such a determination would make clear that this objective data can be utilized by employers in order to dispense with the need for initial exposure monitoring.

If the finding or determination requested is not possible, we would ask that OSHA's headquarters include in the guidance that it provides to its field compliance officers, a cite or recognition of the data discussed above as qualifying objective data for employers to declare for the exemption from initial exposure monitoring.

As a matter of additional information, the basic Recommended Work Practices have been revised in one material aspect which does not require their re-testing as its application will only lower the levels achieved under the previous practice. This change involves the designation of HEPA vacuums as, the appropriate device when removal is conducted.

If the desired finding or determination as requested cannot be provided, we request that OSHA immediately initiate rulemaking or through administrative declaration define a procedure which would avoid inconsistent field interpretations or applications of objective data.

RECORD ID 1767

STANDARD NUMBER 1926.58(f)(4)
INFORMATION DATE 870820

ABSTRACT In the context of 1926.58(f)(4), "statistically reliable measurements" means application of accepted statistical procedures to the daily monitoring data in order to demonstrate that employee exposures are not likely to be equal to or greater than the action level. If the periodic air monitoring shows statistically reliable measurements below the action level, then the employer may discontinue daily air monitoring. The number of air samples required to show that employee exposures will not exceed the action level is dependent on the variability of the data; and, therefore, must be determined on a case by case basis.

INTERPRETATION 29 CFR 1926.58(f)(4)

AUG 20, 1987

This is in response to you recent letter regarding the Occupational Safety and Health Administration's (OSHA) asbestos standard for the construction industry, 29 CFR 1926.58. We apologize for the delay in responding to your inquiry.

Your first question concerns the definition of the term "statistically reliable measurements" as used in paragraph 29 CFR 1926.58(f)(4). Paragraph 29 CFR 1926.58(f)(4) states:

(4) Termination of monitoring. If the periodic monitoring required by paragraph (f)(3) of this section reveals that employee exposures, as indicated by statistically reliable measurements, are below the action level, the employer may discontinue monitoring for those employees whose exposures are represented by such monitoring

In the context of this paragraph "statistically reliable measurements" means that accepted statistical procedures must be applied to the daily monitoring data in order to demonstrate that employee exposures are not likely to be equal to or greater than the action level, and thus, that the daily monitoring can be suspended.

Your second question is, whether or not three days of sampling is enough to demonstrate that employee exposures will not exceed the action level. A standard number of samples required to show that employee exposures will not exceed the action level cannot be established.

The number of samples required is dependent on the variability of the data, and therefore must be determined on a case by case basis.

RECORD ID 2444

STANDARD NUMBER 1926.58(h)(2)(i); 1926.58(h)(2)(iii); 1910.1001
INFORMATION DATE 860826

ABSTRACT This interpretation letter addresses the employer's responsibility for providing respiratory protection and the options employee's have in choosing respiratory protection.

INTERPRETATION 29 CFR 1926.58(h)(2)(i); 1926.58(h)(2)(iii); 1910.1001

AUG 26, 1986

This is in response to your letter of July 24, referencing a respirator provision 29 CFR 1926.58(h)(2)(iii) of the new standard for exposure to asbestos, tremolite, anthophyllite, and actinolite in the construction industry. Specifically, 29 CFR 1926.58(h)(2)(iii) states:

> "The employer shall provide a powered, air-purifying respirator in lieu of any negative-pressure respirator specified in Table D-4 whenever:
>
> (A) An employee chooses to use this type of respirator; and
>
> (B) This respirator will provide adequate protection to the employee."

You inquired as to whether the words "shall provide," imply that the respirator must be provided at no cost to the employee. In addition, you wanted to know whether, when a powered, air purifying respirator is provided to the employee, the employer could request a deposit to ensure that the respirator is returned when the employee finds other employment.

The standard stipulates that respirators required for protection from exposure to asbestos fibers shall be provided at no cost to the employee (1926.58(h)(2)(i). Due to the unreliability and physiological distress associated with negative pressure respirators, OSHA has required employers to provide, powered, air purifying (positive pressure) respirators, at no cost, to those employees who request one, so long as it will provide adequate protection at the level of protection required.

Powered, air-purifying respirators, operated in positive-pressure mode, provide greater protection to individuals (especially those who cannot obtain a good face fit on a negative pressure respirator) and will provide greater comfort when a respirator must be worn for long periods of time. OSHA believes employees will have a greater incentive to wear respirators if discomfort is minimized. As with any OSHA required safety equipment, a "deposit" cannot be requested by an employer to ensure that a PAPR is returned at the end of employment. This would reduce the incentive of an employee to request and use this type of respiratory protection.

SOURCE LETTER

July 24, 1986

Recently, a question was raised at our institute regarding an interpretation of a specific section of the New OSHA regulation, 29 CFR 1926.58. I spoke with Mr. I of the OSHA Standards Office, and he suggested that I write directly to you.

The specific section in question is on page 22758, (h) "Respiratory Protection", (2) "Respirator Selection", (iii) "The employer shall provide a powered, air-purifying respirator in lieu of any negative-pressure respirator specified in Table D-4 whenever:

> (A) An employee chooses to use this type of respirator; and
>
> (B) This respirator will provide adequate protection to the employee."

RECORD ID 4068

STANDARD NUMBER 1926.58(h)(4)(ii); 1910.134; 1910.1001; 1926.103
INFORMATION DATE 901209

ABSTRACT OSHA regulations require neither quantitative nor qualitative fit testing of full facepiece PAPR's or supplied-air respirators that will be used for egressing from an area containing airborne asbestos in the event of respirator failure. Assuring and documenting proper fit testing would increase employee protection from asbestos and is commendable, but the asbestos standard does not address the use of PAPR's or supplied-air respirators in a negative pressure mode for egress upon failure of the positive pressure mode. OSHA has concluded that it cannot interpret its regulations to require employers voluntarily using such respirators for such purpose to fit test the respirators in their negative pressure mode.

INTERPRETATION 29 CFR 1926.58(h)(4)(ii); 1910.134; 1910.1001; 1926.103

DEC 9, 1990

Thank you for your letter of October 18, concerning the fit testing of respirators. You enclosed for our comments a copy of some correspondence you received from a state asbestos control division. You also asked if a quantitative fit test must be performed on a full facepiece positive air pressure respirator (PAPR) or supplied-air respirator (SAR) that will be used as a negative pressure respirator for egress in the event of battery or supplied-air system failure.

The correspondence you received from the state seems to make two basic contentions: (1) Qualitative fit testing of full facepiece respirators is permitted under 29 CFR 1926.58(h)(4) of the asbestos standard and (2) a PAPR or a supplied-air respirator does not become a negative pressure respirator when its battery or supplied-air system fails. Our comments are:

(1) Qualitative fit testing of full facepiece negative pressure respirators is permitted provided they will be used only in environments where the airborne asbestos concentration does not exceed 10 times either of the asbestos permissible exposure limits.

(2) In OSHA's view, a PAPR or a supplied-air respirator with air-purifying filters becomes a negative pressure respirator when its battery or supplied-air system fails. However, for use other than egress when the power fails, OSHA would only allow its use in the negative pressure mode if it has been approved as a negative pressure respirator by NIOSH. NIOSH currently has not approved any of these respirators for use in the negative pressure mode.

In answer to your specific question, we do not interpret any Occupational Safety and Health Administration (OSHA) regulations to require either quantitative or a qualitative fit testing of full facepiece PAPR's or supplied-air respirators that will be used for egressing from an area containing airborne asbestos in the event of respirators failure. Such fit testing would increase employee protection from asbestos and hence is commendable, but the asbestos standard does not address the use of PAPR's or supplied-air respirators in a negative pressure mode for egress upon failure of the positive pressure mode. Since OSHA has no regulations requiring employers to use PAPR's or supplied-air respirators that revert to the negative pressure mode in order to provide employees some protection while egressing from the area should the positive pressure mode fail, OSHA has concluded that it cannot interpret its regulations to require employers voluntarily using such respirators for such purpose to fit test the respirators in their negative pressure mode.

The question is this: If an employer provides (at no cost to the employee), the minimum required respirator protection (in this case a half-mask, air-purifying respirator with a HEPA filter) to an employee, and the employee permitted to require payment for the requested respirator?

Do the words "shall provide" imply that the respirator then must be "provided" to the employee "at no cost"? Another question asked was by a contractor, suggesting the following:

The respirators cost in the area of $450 to $500 each. If I "provide at no cost to the employee" one unit, am I permitted to request a "deposit" to insure the respirators return? The deposit would be returned if and when the employee finds other employment.

An official interpretation on this issue would be greatly appreciated.

SOURCE LETTER

March 15, 1990

This letter concerns Material Safety Data Sheets (MSDS's), and the uncertainty that many construction contractors are experiencing as to who bears the responsibility for maintaining these to ensure worker access to them.

A construction site usually consists of a general contractor and any number of subcontractors. As required by OSHA's Hazard Communication Standard (HCS), a subcontractor must have MSDS's for the hazardous substances he uses. These must be available not only to his own employees, but to any others on the site who might be exposed to those chemicals. I have been informed by the general contractor on a job that exposure to empty containers still constitutes exposure and, since he maintains a trash bin used by everyone on the site, that he must have a copy of everyone's MSDS's. It has always been my understanding that a subcontractor need only have one set of MSDS's. However, the general contractor may have several jobs going at once and, if he leaves the site and locks his office trailer, where the MSDS's for everyone are kept, then any subcontractor could be cited for their absence. This leaves us uncertain as to whether a subcontractor must maintain two sets of MSDS's, particularly in light of the erratic enforcement to which the construction industry has been subjected since the HCS was expanded. I would appreciate hearing your comments on this situation, so that Company XX can keep its members properly informed on their responsibilities under HazCom.

("FOM") in Chapter V, sections F.1. and 2. If an exposing employer meets all the conditions set forth in section F.2., then that employer would not be cited. A copy of these sections of the FOM is enclosed for your information and review.

The intent of OSHA's HCS is met on a multi-employer worksite when information on the hazards of chemical substances at the worksite is transmitted to or shared with all affected employers and their employees, and that information is readily accessible to employees when they are in their work areas. The ultimate goal of all OSHA policies and any resultant enforcement actions is to ensure safe and healthful workplaces by the most efficient means known. I can assure you that this is the Agency's intent behind any and all enforcement actions taken by OSHA personnel at the workplaces we inspect. The HCS, being a "performance-oriented" standard, gives employers the flexibility to adapt the rule to the needs of the workplace situation, instead of having to follow specific, rigid requirements. Employers will, therefore, have to exercise more judgement in implementing an appropriate and effective program in order to meet the intent of the standard.

Attch:

OSHA Instruction CPL 2.45B
JUN 15, 1989

F. Multi-Employer Worksites.

1. Issuance of Citation. On multi-employer worksites, citations shall be issued to employers whose employees are exposed to hazards, unless such an employer meets all of the conditions for a legitimate defense set forth at F.2.

   a. Additionally when a more expeditious abatement of the hazard can be thus obtained. the employer with responsibility for creating and/or correcting the hazard shall also be cited.

   b. If employees of more than one employer are exposed to a hazard, however, citations shall normally be issued to each of the exposing employers as well as to the employer responsible for correcting or for ensuring the the correction of the condition (the controlling employer) and/or the employer causing the condition.

2. Legitimate Defense. Prior to issuing citations to an employer with employees exposed to a hazard, it must first be determined whether the exposing employer(s) has a legitimate defense to the citation, as set forth below:

   a. The employer did not create the hazard;

   b. The employer did not have the authority or the ability to correct the hazard;

   c. The employer specifically requested the controlling employer and/or the hazard-creating employer to correct the hazard to which his/her employees were exposed and made a reasonable effort to persuade the responsible employer to correct the hazard;

   d. The employer has instructed and, where necessary, informed employees how to avoid or minimize the dangers associated with the hazardous conditions and, where feasible, has taken alternative means of protecting employees from the hazard short of walking off the job (except when special circumstances require such extreme action).

NOTE: All of these items must be documented in the case file.

RECORD ID 3544

STANDARD NUMBER 1926.59
INFORMATION DATE 900516

ABSTRACT This interpretation letter addresses the availability of MSDS's on construction sites. Each contractor has a responsibility to ensure that his employees have ready access to MSDS's for each hazardous chemical in the workplace during each work shift. If the contractor chooses to share his MSDS's at a central location, where a copy of all the employer's MSDS's will be kept, the employees must have access to them at all times they are working on the site. If the party who has agreed to maintain all MSDS's at a central location does not provide for access to MSDS's at all times that employees are on-site, then that party would normally be cited for violation of 29 CFR 1926.59(g)(8). However, if the MSDS's are not available because the contractor failed to provide them, then that contractor would normally be cited.

INTERPRETATION 29 CFR 1926.59

MAY 16, 1990

Thank you for your letter of March 15, regarding the availability of material safety data sheets (MSDS's) on construction sites, as required under the Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard (HCS), 29 CFR 1926.59. I apologize for the delay in this response.

As you are aware, the HCS "Multi-employer workplaces" provision at 29 CFR 1926.59(e)(2) states that employers who use or store hazardous chemicals at a worksite in such a way that the employees of other employers may be exposed are required to incorporate additional elements into their hazard communication program. On a multi-employer worksite, each employer's hazard communication program must specify the method that the employer will use to provide the other employers with copies of his MSDS's, or the method he will use to make them available at a central location. The number of MSDS's that a contractor must have depends on the method used on the site to provide information to other employers.

If MSDS's are not maintained at a central location, each contractor must provide MSDS's to the other employers for each hazardous chemical the other employers' employees may be exposed to while working. Although a contractor does not actually have to physically give another employer the MSDS, he must make it available at the worksite for review. In some circumstances, a contractor may prefer to distribute copies of MSDS to other employers rather than provide continual access to those MSDS's.

If the contractor chooses to rely on a method of sharing his MSDS's at a central location, where a copy of all the employers' MSDS's will be kept, the method must also provide for access to them at all times employees are working on the site. If the party who has agreed to maintain all MSDS's at a central location does not provide for access to MSDS's at all times that employees are on-site, then that party would normally be cited for a violation of 29 CFR 1926.59(g)(8). However, if the MSDS's are not available because the contractor failed to provide them, then that contractor would normally be cited.

Each contractor has a responsibility to ensure that his employees have ready access to MSDS's for each hazardous chemical in the workplace during each work shift. If a contractor relies on another employer to maintain his MSDS's, and the MSDS's are unavailable to that contractor's employees, the contractor could be cited under 1926.59(g)(8), unless it is determined that he has a legitimate defense to a citation. OSHA's compliance and enforcement policies at multi-employer worksites, including legitimate defense, are set forth in the Agency's Field Operations Manual

Does the new 1910 Subpart S amendments cover painting, decorating and paper hanging, and electrical work related to supply (as opposed to electrical work on equipment/machines beyond the supply interface)?

2. I note that OSHA has issued citations to employers for failure to produce their written Hazard Communication program at the time of the inspection. These citations have been issued in General Industry and in Construction.

   I note in 1910.1200 and 1926.59, paragraph (e)(4), that "the employer shall make the written hazard communication program available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director, in accordance with the requirements of 29 CFR 1910.20(e)." (Underlining added for emphasis.)

   29 CFR 1910.20(e) provides that "...the employer shall assure that access is provided in a reasonable time, place, and manner, but in no event later than fifteen (15) days after the request for access is made". (Underlining added for emphasis.)

   29 CFR 1910.1200 and 1926.59, paragraph (e)(1) states that "Employees shall develop, implement, and maintain at the workplace, a written hazard communication program..." (Underlining added for emphasis.)

   Paragraph (e)(1) would seem to conflict with 1910.20(e)(4) in that "maintain" could mean that it must be present at all times at the work site, rather than meaning the maintenance of such a program. However, since 1910.20(e)(4) is specific to the time frame required to produce such a document, it would seem that the specific overrules the general if "maintain" means "present".

   While I would agree that it is good safety practice to have such a document "present" at each work site, please inform me if employers must have their written program at the work site at all times to be in compliance with either 1910.1200 or 1926.59.

Response:

In responding to your question, the key concept which must be considered is the distinction between maintenance and repair. These activities are often very close and may require a case-by- case determination based on actual circumstances at the worksite. In general the following observations are pertinent. If the project involves only a change of color or wallcovering, or maintenance on existing wiring or circuitry, the work would be covered under the General Industry Standards, 29 CFR Part 1910, and the new amendments would apply. On the other hand, if the project involves structural remodeling or repair, and includes painting, hanging wallpaper, or installation of new electrical supply wiring and components, the construction standards, 29 CFR Part 1926, would apply. Electrical work on equipment/machines other than supply components would be covered under the new amendments.

Question 2:

I note that OSHA has issued citations to employers for failure to produce their written Hazard Communication program at the time of the inspection. These citations have been issued in General Industry and in Construction....

While I would agree that it is good safety practice to have such a document "present" at each work site, please inform me if employers must have their written program at the work site at all times to be in compliance with either 1910.1200 or 1926.59.

Response:

This question regarding the requirement for on- site availability of the written hazard communication program ("HCP") is an issue that has arisen often in OSHA enforcement of the provisions at section (e)(1) and (e)(2) of the standard, and has caused the Agency to reconsider its compliance policy on the issue.

There is no question that the written HCP must be maintained on-site at fixed worksites or establishments. However, an exception to the requirement that the written hazard communication (HCP) be kept on-site may be allowed on multi- employer worksites and in situations where an employee(s) travels between workplaces yet who at times reports to a primary workplace facility where the written HCP is maintained. The standard sets forth, at (e)(1), a positive requirement for the written program to be maintained "at the workplace." OSHA previously interpreted this requirement to mean that the written program must be kept on-site at all times or even in the truck of employees who travel between worksites.

The Agency proposed, however, in the 1988 Notice of Proposed Rulemaking, to add a new subparagraph to the paragraph (e) requirements which allows the written program to be maintained at a "central location at the primary workplace facility" for employees who travel between workplaces during a workshift (proposed new paragraph (e)(5)). The final rule presently allows MSDSs to be maintained at the central workplace for employees who travel between workplaces during a workshift (paragraph (g)(9)). The (g)(9) provisions also require that employees have immediate access to MSDS information in the event of an emergency.

Unlike MSDS information which may be necessary to assure the safety of employees in the event of an emergency, the information contained in an employer's written HCP is mainly procedural and the presence of a written document on the worksite may not have a direct or immediate relationship to employee safety or health. This is especially true in situations where employers are implementing an effective overall HCP and whose employees have already received the required hazard communication training. The need for the program to be on-site, therefore, in situations where employees travel or are dispatched from a primary workplace location (e. g. , administrative offices) where the written program is maintained to a multi-employer worksite may bear no immediate relationship to safety and health and may, in the professional judgement of the Compliance Safety and Health Officer (CSHO) and Area

Director, be considered a "de minimis" violation of section (e)(1) (see OSHA's Field Operation Manual, (FOM), Chapter IV, B.6., pages IV 30-31).

This policy also applies in situations where the employee does not return to the primary workplace during the workshift as long as the employee(s) is aware of the content of the program and the methods the program contains that affect the sharing of the hazard communication information required at (e)(2)(i-iii). Stated in another way, if hazard communication information (accessibility of MSDSs, the employer's labeling system, etc.) is not being shared with other on-site employers and the employees are unaware of the methods outlined in the program which have been developed to accomplish this intent, then the need for the program to be on-site would bear a direct relationship to safety and health and the absence of the program on-site would not be a "de minimis" violation.

This change in citation policy will be communicated to Agency Regional staff by copy of this correspondence, and incorporation into new program guidance presently under development in the form of an updated compliance directive on inspection procedures for the Hazard Communication Standard.

At fixed worksite locations, the requirement for the written hazard communication program to be maintained on-site and readily accessible to employees remains.

SEP 3, 1990

This is an interim response to your letter of August 13, concerning the Occupational Safety and Health Administration's (OSHA) new final rule amending Subpart S, Electrical, Section 1910.331 and .332, and OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

SOURCE LETTER

AUG 13, 1990

I have the following two questions. One concerns the new final rule concerning the amendments to Subpart S, Electrical, Section 1910.331 and 1910.332. The other concerns the Hazard Communication Standard, 29 CFR 1910.1200.

1. The preamble to the Subpart S Electrical amendment suggests that painters and paper hangers are covered by the new rule (see 55 FR 32012; Table 7 - Occupations Requiring Training) as well as electricians.

   Also 29 CFR 1910.332, Training, Table S-4 refers to the above occupations.

   The authority noted for Subpart S of part 1910 is Sections 4, 6, 8 of the OSH Act of 1970.

   According to the Standard Industrial Classification Manual (1972), Painting, Paper Hanging and Decorating (SIC 172) and Electrical Work (SIC 173) are classified as Special Trade Contractors.

   Under 29 CFR 1926, Subpart C - General Safety & Health Provision, (authority, Section's. 4, 6, 8 of the OSH Act of 1970) section 1926.20 notes contractor requirements and sets out the scope of coverage for "construction, alteration, and/or repair, including painting and decorating...." (Underlining added for emphasis.)

   In my experience, it has been OSHA's policy to include painting and decorating as a construction activity. In addition, when electricians in General Industry install new service, or repair existing service, OSHA has considered that activity to be construction.

develop a "generic" MSDS for "asbestos" for use in their overall hazard communication program, but they cannot be required to do so.

As discussed with Mr. J of your staff, we question the validity of the employer's assertion that "no other chemicals" (besides asbestos itself) are "used" during asbestos removal operations. We understand that this is the employer's defense for not having a written hazard communication program. Usually these types of removal operations involve the use and application of certain surfactants and wetting agents which would themselves be subject to the provision of the HCS and for which a written hazard communication program would need to have been developed. In any event, the multi-employer requirements of section (e) of the HCS obligates the employer on a multi-employer worksite who may be exposing the employees of another employer to hazardous chemicals, (in this situation the asbestos he is causing exposure to through his removal operations), to develop a written hazard communication program which includes the methods that will be used to inform the other employers of the potential hazards.

ATTACHMENT: The following interpretation (Record ID 3749) is included as supplemental information for the first instance of OSHA Standard 1926.59.

RECORD ID 3749

STANDARD NUMBER 1910.1200(e); 1910.331; 1910.332; 1926.59
INFORMATION DATE 901018

ABSTRACT An interpretation letter discussing the applicability of the Hazard Communication Program on site and standard covering electrical installation, maintenance or repair. Responses to questions concerning the new final rule amending Subpart S, Electrical, Section 1910.331 and 1910.332, and the Hazard Communication Standard requirements.

The new 1910 Subpart S amendments cover painting, decorating and paper hanging, and electrical work related to supply if the project involves only a change of color or wallcovering, or maintenance on existing wiring or circuitry. If the project involves structural remodeling or repair, the construction standards would apply.

An exception to the requirement that the written hazard communication program (HCP) be kept on-site may be allowed on multi-employer worksites where an employee(s) travels between workplaces yet who at times reports to a primary workplace where the written HCP is maintained.

INTERPRETATION 29 CFR 1910.1200(e); 1910.331; 1910.332; 1926.59

OCT 18, 1990

This is in further response to your letter of August 13, to the Occupational Safety and Health Administration (OSHA) , in which you requested a response to two questions. One of the questions concerned OSHA's new final rule concerning the amendments to Subpart S, Electrical, Sections 1910.331 and 1910.332, and the other question concerned the requirement for the employer to maintain the written hazard communication program on-site, as per 1910.1200 and 1926.59(e)(1).

Question 1:

> Do the new 1910 Subpart S amendments cover painting, decorating and paper hanging and electrical work related to supply (as opposed to electrical work on equipment/machines beyond the supply interface)?

RECORD ID 2947

STANDARD NUMBER 1926.59; 1910.1001; 1926.58
INFORMATION DATE 891226

ABSTRACT Employers may be encouraged to obtain or develop a "generic" MSDS for "asbestos" for use in their overall hazard communication program, but they cannot be required to do so. The multi-employer requirements of 1926.59(e) obligate the employer on a multi-employer worksite who may be exposing the employees of another employer to hazardous chemicals (such as asbestos exposure through removal operations) to develop a written hazard communication program which includes the methods that will be used to inform the other employers of the potential hazards.

INTERPRETATION 29 CFR 1926.59; 1910.1001; 1926.58

DEC 26, 1989

MEMORANDUM

SUBJECT: Asbestos and the Hazard Communication Standard

This is in response to your memo of November 7 regarding the requirement of the Hazard Communication Standard (HCS) under 1926.59(e) for employers involved in asbestos removal to develop and implement a written hazard communication program specific to the hazard of asbestos exposure.

The scope and application section (b) of the HCS requires "all employers to provide information to their employees about the hazardous chemicals to which they are exposed by means of a hazard communication program..." etc. Further, the HCS at section (e), requires employers to develop, implement and maintain a written hazard communication program which includes (among other things) a list of the hazardous chemicals known to be present and a description of how the company will comply with sections (f),(g) and (h) of the standard. Section (e)(2) additionally requires employers on a multi-employer worksite who "produce, use or store hazardous chemicals" to develop a written hazard communication program. The HCS defines "use" as packaging, handling, reacting or transferring. The employees at an asbestos removal operation certainly are "handling" the hazardous chemical asbestos. Employers of employees involved in asbestos removal would therefore be required to develop a written hazard communication program not only to protect their employees, but also for the employees of other employers who may be exposed to the hazard of asbestos that is being created by the removal operations. Again, we believe these requirements are triggered by the scope and application section (b), the written program requirements at section (e), and the definitions section (c) (see definitions for "employee", "employer", "exposure" and "use").

You mentioned that the construction asbestos standard, 1926.58 does not require a MSDS for asbestos. We agree with the argument put forth in your memorandum that since 1926.58 does not specifically require that a written hazard communication program be developed for the hazards of asbestos exposure during removal operations, the more general requirement of 29 CFR 1926.59(e) applies to the situation. While we believe that 1926.59(e) of the HCS applies as set forth above to the hazards of asbestos-exposed employees during asbestos removal, we also acknowledge that a MSDS for "asbestos" cannot be required under 1926.59. It is the responsibility of the chemical manufacturer to develop the MSDS and send it to the downstream employer(s) for their information and use in their hazard communication programs. Obviously, asbestos-removal contractors have no way of obtaining the MSDS for the specific asbestos-containing materials they are removing. Employers may be encouraged, however, to obtain or

We believe the scenario outlined above is not unique to the (XX) Corporation, but would also be similar for many other employers with the potential for multiple hazardous substances exposures. Therefore, we are requesting OSHA to reexamine the wisdom of limiting the physician's response to the employer regarding the results of an individual employee's physical examination. Please advise me of your action in this matter.

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RECORD ID 3376

STANDARD NUMBER 1926.58(m)(1)(i); 1910.1001
INFORMATION DATE 900523

ABSTRACT This interpretation letter discusses the requirements for medical surveillance under 29 CFR 1926.58(m)(1)(i). There are two separate requirements for medical surveillance under the standard. One requirement is triggered when employees are exposed at or above the action level and/or excursion limit for 30 or more days per year as measured with 8 hour time-weighted average air monitoring. At this length and level of exposure, medical surveillance is required irrespective of the type of respirator used. Medical surveillance is also mandated when employees are required to wear negative pressure respirators. If an employee exposure exceeds either the 8 hour time-weighted average limit or the excursion limit, and negative pressure respirators are worn; medical surveillance is required. One exposure is sufficient to activate this requirement.

INTERPRETATION 29 CFR 1926.58(m)(1)(i); 1910.1001

MAY 23, 1990

This is in response to your letter of March 12, to the Occupational Safety and Health Administration's (OSHA) Regional office in (State). Your letter was forwarded to us for response to your request for interpretation of the requirements for medical surveillance under the OSHA Asbestos Standard for construction, 29 CFR 1926.58, paragraph (m)(1)(i).

There are two separate requirements for medical surveillance under the standard. One requirement for medical surveillance is triggered when employees are exposed at or above the action level and/or excursion limit for 30 or more days per year. This would include exposures above the 8 hour time-weighted average limit. At this length and level of exposure, medical surveillance is required irrespective of the type of respirator used.

Medical surveillance is also mandated when employees are required to wear negative pressure respirators. This requirement is not dependent on the length of exposure. If employee exposure exceeds either the 8 hour time-weighted average limit or the excursion limit, and negative pressure respirators are worn, medical surveillance is required. One exposure is sufficient to activate this requirement.

In your letter you assume that negative pressure respirators are required to be used when exposures exceed or can reasonably be expected to exceed the permissible exposure limits (8 hour time-weighted average limit and/or excursion limit). Your interpretation is not completely accurate. Although respirators are required, they do not have to be negative-pressure respirators. Employers may supply positive-pressure respirators, and thus the medical surveillance requirement for negative-pressure respirators would not be applicable (unless exposure occurs for 30 days or more per year).

The intent of the asbestos regulations is to require employers to implement proper engineering and work practice controls to minimize employee exposures so that the use of respiratory protection alone would not be necessary.

March 22, 1990

MEMORANDUM

SUBJECT: Request for Interpretation/Clarification of 29 CFR 1926.58(m)(1)(i)

The attached request dated March 12, 1990, from Mr. J, Occupational Health and Hygiene Corporation of America, is forwarded for your review and clarification of subject standard.

The standard seems to indicate that a medical surveillance program is instituted by the exposure of an employee to levels above the excursion limit for at least 30 days out of the year. It also states that it is

instituted by the requirement of an employee to wear a negative pressure respirator. Since such a respirator is required by a single instance of an employee being exposed to a level above the excursion limit, there seems to be a conflict within this section of the standard.

March 22, 1990

This will acknowledge receipt of your letter of March 12, 1990.

Your request for an interpretation/clarification concerning 29 CFR 1926.58 (m)(1)(i) has been referred to our National Office in Washington, D.C. for response.

SOURCE LETTERS

March 12, 1990

On July 7, 1989, you sent us a letter in response to several questions we had presented which needed clarification regarding OSHA's asbestos regulations. I have enclosed copies of both letters for your reference.

After having reviewed your reply to one of these questions, we are still uncertain as to the correct interpretation of the regulations. Therefore, I would appreciate a response to the following inquiry, which is our original question #1 re-stated for clarification:

1. Re: 1926.58(m)(1)(i)

   Medical Surveillance, General, Employees Covered:

   One of the two criteria must be met to be included in medical surveillance. These criteria are:

   A. Engaged in work involving levels of asbestos at or above the action level and/or excursion limit for 30 or more days per year, or

   B. Required by this section to wear negative pressure respirators.

With regard to the above, we interpret this to mean that medical surveillance is required when the following conditions are met:

I. When engaged in work involving levels of asbestos at or above the action level for 30 or more days per year.

II. When engaged in work involving levels of asbestos at or above the excursion limit for 30 or more days per year.

III. When required to wear negative pressure respirators.

Since negative pressure respirators are required to be used when exposures exceed or can reasonably be expected to exceed the permissible exposure limits (8 hour TWA and/or excursion limit), then the medical surveillance requirement applies when exposures exceed the permissible exposure limits. And the permissible exposure limits only have to be exceeded on one occasion to activate the medical surveillance requirements.

Our questions are as follows:

Question #1: As stated above, is condition "III" a correct interpretation of the regulations and OSHA's enforcement policy?

If not, please provide the correct interpretation.

Question #2: If condition "III" above is correct, then when exposures exceed the excursion limit, does it take 30 or more days at or above the excursion limit (as stated in condition "II") or one occasion (as stated in condition "III") to activate the medical surveillance requirements?

July 7, 1989

This is in response to your letter dated June 28, 1989. The questions posed in your inquiry are restated below, with the answer immediately following each question.

1. Re: 1926.58(m)(1)(i)

   Medical Surveillance, General, Employees Covered:

   One of two criteria must be met to be included in medical surveillance. These criteria are:

   A. Engaged in work involving levels of asbestos at or above the action level and/or excursion limit for 30 or more days per years or;

   B. Required by this section to wear negative pressure respirators.

   With regard to "B" above, we interpret this to mean employees with asbestos exposures above the permissible exposure limits (TWA limit or excursion limit).

Your interpretation is correct.

Question #1: Is medical surveillance required for employees exposed above the permissible exposure limits after one event (one TWA or excursion above the limits) or after 30 or are days per calendar year above the limits?

After one event, as defined in your question.

Question 2: If exposures are maintained below the action level, is medical surveillance required?

2. Re: 1926.58(m)(2)(i)(c)

   Medical Surveillance, Medical Examinations and Consultations, Frequency.

   Item "C" of this paragraph reads, "And at least annually thereafter."

   Question #3: How is item "C" interpreted? Does it mean that once an employee is covered by the medical surveillance provisions, the medical examination and consultations must be made available each and every year thereafter?

If a termination of exposure examination is given an employee, it is unnecessary to provide further examinations unless the employee is again exposed as defined under 29 CFR 1926.58(m)(1)(i).

3. Re: 1926.58(f)(3)

   OSHA regulations do not require periodic monitoring within regulated areas if all employees within a regulated area are equipped with supplied-air respirators operated in the positive-pressure mode.

   Question #4: If all employees within regulated areas are equipped with supplied-air respirators operated in the positive-pressure mode, can the employee dispense with the annual medical surveillance required by 1926.58(m)(1) and 1926.58(m)(2)?

No, it is still necessary to provide annual medical surveillance.

4. Re: 1926.58(h)(2)

   In table D-4, respirator selection is based on airborne concentration of asbestos as compared to the permissible exposure limit (PEL), specifically the TWA limit.

   Question #5: Since OSHA has adopted a permissible exposure excursion limit, how is table D-4 interpreted and respirators selected for exposures which exceed the excursion limit?

Respirators can be selected from table D-4 by protection factor; i.e., 10 x excursion limit for a half-mask air-purifying respirator with high efficiency filters. Fiber-count ceilings for TWA should be ignored.

June 28, 1989

I am writing to you on behalf of one of our clients, a major corporation in the (City) area. We have been assisting them with the management and control of asbestos exposures in the workplace.

In reviewing OSHA's asbestos regulations, specifically 29 CFR 1926.58, several questions have been identified with regard to OSHA's interpretation of these regulations. These questions are:

1. Re: 1926.58 (m)(1)(i)

   Medical Surveillance, General, Employees Covered:

   One of two criteria must be met to be included in medical surveillance. These criteria are:

   A. Engaged in work involving levels of asbestos at or above the action level and/or excursion limit for 30 or more days per year, or

   B. Required by this section to wear negative pressure respirators.

      With regard to "B" above, we interpret this to mean employees with asbestos exposures above the permissible exposure limits (TWA limit or excursion limit).

   Question #1: Is medical surveillance required for employees exposed above the permissible exposure limits after one event (one TWA or excursion above the limits) or after 30 or more days per calendar year above the limits?

   Question #2: If exposures are maintained below the action level, is medical surveillance required?

2. Re: 1926.58 (m)(2)(i)(c)

   Medical Surveillance, Medical Examinations and Consultations, Frequency.

   Item "C" of this paragraph reads "And at least annually thereafter."

   Question #3: How is item "C" interpreted? Does it mean that once an employee is covered by the medical surveillance provisions, the medical examination and consultations must be made available each and every year thereafter?

3. Re: 1926.58 (f)(3)

   OSHA regulations do not require periodic monitoring within regulated areas if all employees within a regulated area are equipped with supplied-air respirators operated in the positive-pressure mode.

   Question #4: If all employees within regulated areas are equipped with supplied-air respirators operated in the positive-pressure mode, can the employer dispense with the annual medical surveillance required by 1926.58 (m)(1) and 1926.58 (m)(2)?

4. Re: 1925.58 (h)(2)

   In table D-4, respirator selection is based on airborne concentration of asbestos as compared to the permissible exposure limit (TWA), specifically the TWA limit.

   Question #5: Since OSHA has adopted a permissible exposure excursion limit, how is table D-4 interpreted and respirators selected for exposures which exceed the excursion limit?

RECORD ID 3816

STANDARD NUMBER 1926.58(m)(2)
INFORMATION DATE 900816

ABSTRACT This interpretation letter specifies that the physical examination required by 1926.58(m)(2) means a "hands-on" exam and not just a review and comment on various test and reports. The review and comment on the diagnostic results from the pulmonary function tests, the chest roentgenogram/ILO report, the blood pressure recording, and the OSHA medical questionnaire are also required.

INTERPRETATION 29 CFR 1926.58(m)(2)

AUG 16, 1990

MEMORANDUM

SUBJECT: Requirement for Physical Examination Pursuant to the Medical Surveillance Requirements of the Asbestos Construction Standard, 29 CFR 1926.58

This is in response to your memorandum of July 11, concerning the medical surveillance requirements of the construction asbestos standard 29 CFR 1926.58. We asked Dr. R, medical officer in the Directorate of Technical Support, to provide guidance in this area. Enclosed is a copy of his response; essentially a physical examination required by 29 CFR 1926.58 (m)(2) means a "hands-on" exam and not just a review and comment on various test and reports. If you require additional information on medical testing and review, please contact the Office of Occupational Medicine directly.

SOURCE LETTER

July 11, 1990

MEMORANDUM

SUBJECT: Requirement for Physical Examination Pursuant to the Medical Surveillance Requirement of the Asbestos Construction Standard, 29 CFR 1926.58

Region VII recently received a request from an industrial health services company, to evaluate the adequacy of their medical testing protocol in relation to the medical surveillance requirements of the construction asbestos standard 29 CFR 1926.58.

While the company testing protocol appears to address most of the required areas under paragraph (m) of the Standard, the protocol is deficient in that there is no provision for a "hands-on" physical examination directed to the pulmonary and
gastrointestinal system, (in addition to the pulmonary function tests and discretionary chest roentgenogram),as called for in Paragraph (m)(2)(ii)(C) of 29 CFR 1926.58. While the physician's role in this case is to only review and count on the diagnostic results from the pulmonary function tests, the chest roentgenogram/ILO report, the blood pressure recording, and the OSHA medical questionnaire, we believe that the standard, in requiring a "physical examination," intended for this examination to be a "hands-on" exam and not just a review and comment on various test results and reports.

RECORD ID 1723

STANDARD NUMBER 1926.58(m)(4)(ii)
INFORMATION DATE 870824

ABSTRACT The intent of 1926.58(m) is not to require duplicative medical examinations of written opinions for different substances an employee is exposed to on an ongoing basis. Thus, medical opinions required in 1926.58(m) may include information concerning an employee's occupational exposure to substances other than asbestos.

INTERPRETATION 29 CFR 1926.58(m)(4)(ii)

AUG 24, 1987

This is in response to your inquiry requesting a clarification of paragraph (m)(4)(ii) of 29 CFR 1926.58 Asbestos, Tremolite, Anthophyllite, and Actinolite when employees may be exposed to a variety of hazardous substances. Please accept my apology for the delay in our response.

Paragraph (m)(4)(ii) states:

> The employer shall instruct the physician not to reveal in the written opinion given to the employer specific findings or diagnosis unrelated to occupational exposure to asbestos, tremolite, anthophyllite, or actinolite.

The purpose of this paragraph is to protect worker confidentiality of findings or diagnosis unrelated to occupational exposure. It is not the intent to require duplicative medical examinations of written opinions for different substances an employee is exposed to on an ongoing basis. Thus, medical opinions required in 1926.58(m) may include information concerning an employee's occupational exposure to other substances in addition to asbestos.

SOURCE LETTER

January 8, 1986

(XX) Corporation is an environmental management company providing a comprehensive range of environmental services including decontamination and remedial services.

We would like to request clarification of paragraph (m)(4)(ii) Physician's Written Opinion of Section (m) Medical Surveillance of Standard 29 CFR 1926.58 Asbestos, Tremolite, Anthophyllite, and Actinolite.

Paragraph (m)(4)(ii) states:

> The employer shall instruct the physician not to reveal in the written opinion given to the employer specific findings or diagnoses unrelated to occupational exposure to asbestos, tremolite, anthophyllite, or actinolite.

In performing the decontamination and remedial services, our employees are involved in handling a variety of hazardous substances on an ongoing basis. Examples of these hazardous substances include PCB's, dioxin, lead, chlorinated hydrocarbons, mineral acids, gasoline, jet fuel, asbestos, etc. In view of the potential for exposures to such substances, our employee medical examination program is very thorough so that any employee (or potential new hire) is not placed at increased risk because of some preexisting (or newly found) medical condition. Thus, it is important for us as an employer to have complete medical information on our employees before their assignment to any job with a potential for exposure to hazardous substances. For these reasons, we cannot segregate an "asbestos" medical examination from other examinations because our employees are not involved exclusively with asbestos exposures.

29 CFR 1926—SUBPART E
Personal Protective and Lifesaving Equipment

TERMINAL OBJECTIVE
Apply the minimum safety and health requirements for the issuance of, care and maintenance of personal protective equipment (PPE).

ENABLING OBJECTIVES
1. State and explain the methods and training requirements for the selection and use of PPE.
2. Identify the common types of head and hearing protection, and their proper use.
3. Identify common types of eye and face protection and explain proper applications.
4. Identify the considerations necessary in the selection of personal respirators.
5. State and explain where safety belts, lifelines, lanyards, and nets are required.
6. Identify the requirements for working over or near water.

REFERENCES
1. U.S. Department of Labor. *29 CFR 1926 Safety and Health Regulations for Construction.*
2. U.S. Department of Labor. *29 CFR 1910* General Safety and Health Standards.
3. American National Standards Institute (ANSI) applicable standards.
4. OSHA. *Personal Protective Equipment* (proposed standard).
5. OSHA. Pamphlet on Respirator Use for Employers and Employees.

DURATION
30 Minutes

INSTRUCTOR MATERIALS
Course manual with instructor notes
Viewgraphs
White board, markers and pointer
Slide Projector
VCR, TV
VHS Video
Overhead Projector
Sample PPE/Sample Equipment based on availability

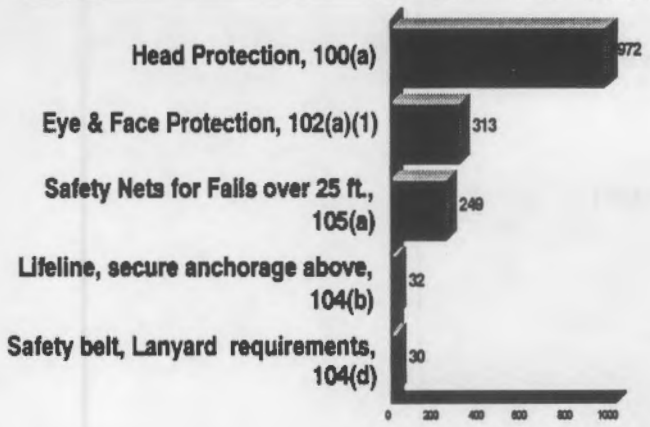
Terminal Objective

Apply the minimum safety and health requirements for the issuance of, care and maintenance of personal protective equipment (PPE).

Enabling Objectives

1. State and explain the methods and training requirements for the selection and use of PPE.
2. Identify the common types of head and hearing protection, and their proper use.
3. Identify common types of eye and face protection and explain proper applications.
4. Identify the considerations necessary in the selection of personal respirators.
5. State and explain where safety belts, lifelines, lanyards, and nets are required.
6. Identify the requirements for working over or near water.

Violations Most Cited in 1992



Personal Protective and Lifesaving Equipment

1926.100 Head Protection
.101 Hearing Protection
.102 Eye and Face Protection
.103 Respiratory Protection
.104 Safety Belts, Lifelines and Lanyards
.105 Safety Nets
.106 Working Over or Near Water
.107 Definitions

Employer Considerations

Prior to corrective action and use of PPE, employer shall consider
(1) engineering controls
(2) administrative controls

.100 Head Protection

(a) Overhead hazards-protective helmets required
(b) Comply with ANSI Z89.1
(c) Exposure to high voltage must comply with ANSI Z89.2

.101 Hearing Protection/8-hour TWA Exposure

(a) Table D-2-Page 24 (29 CFR 1926) or
Page 20 (OSHA 2207)
Table D-2 Permissible Noise Exposure

Duration per day, hours	Sound Level dBA slow reponse
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

.101 Hearing Protection/8-hour TWA Exposure

(a) Table D-2 (cont)
- 85 dBA-Hearing protection optional
- optional program (see: 1910.95 for example)
- 90 dBA-Hearing protection required

(b) Competent person shall fit employees

(c) Plain cotton is not acceptable

Types of Hearing Protection

Types	Example	Mfg.
Plugs	foam and molded	EAR/NORTH
Muffs	oil, foam and air-filled pads	AO
Outer ear cap and tension headband		QB-2 MAX
Enclosures	Helmet	Astronauts helmet

.102 Eye and Face Protection

(a) General-Eye and Face Protection

(1) Shall be provided/physical, chemical, radiation

(2) Shall meet ANSI Z87.1 standards

(3) Corrective lenses

- prescription safety glasses
- goggles
- combination of both

(4) Optical defects

(5) Table E-1, Page 102—Applications Selection Guide

.102 Eye and Face Protection

(b) Protection against Radiant Energy

(1) Selection of shade numbers

- Table E-2/Page 103 (29 CFR 1926)

.102 Eye and Face Protection

(2) Laser Protection

- optical density
- must be labeled

(3) ANSI Z 136.1 and Z 136.3

.103 Respiratory Protection

(a) General

(1) Exposures based on Z-tables due to failure of engineering or administrative controls
- mandatory usage in emergencies

(2) Approvals
- MSHA (Mine Safety and Health Administrations)
- NIOSH (National Institute of Safety and Health)

.103 Respiratory Protection

(b) Personal Respirator Selection Considerations

(1) Chemical and physical properties of the contaminant

(2) Contaminant toxicity
- Concentration of hazardous material
- The nature and extent of the hazard
- Work requirements and conditions
- Respirator limitations, size and characteristics

(3) Table E-4/Page 105 (29 CFR 1926)/Page 102 (OSHA 2207)

.103 Respiratory Protection

(a) Selection Issuance, Use and Care of Respirators—General

(b) Respirator Selection—3 factors
- toxicity of chemicals
- concentration of chemicals
- chemical and physical properties of the contaminant

.103 Respiratory Protection

IDLH (Immediately Dangerous to Life and Health)

- Self-contained breathing apparatus (SCBA)
- Airline respirator with auxiliary self-contained cylinder
- Gas mask canisters
- Hose mask with blower

.103 Respiratory Protection

NON-IDLH/Poisonous to Employees

- Supplied air respirator
- Dust, fume, mist respirator
- Chemical-cartridge respirators

(2) Additional factors to consider:

- nature and extent of hazard
- work requirements and conditions
- limitations and characteristics of the available respirators

(3) Table E-4—Page 103 and 104

.103 Respiratory Protection

(c) Selection, issuance use, and care of respirators

(1) Training required in respirator uses and limitations

(2) Regular inspection and good maintenance required

(3) Cleaned and disinfected prior to reissuance

- Emergency rescue equipment which has been used shall be cleared and disinfected immediately after each use.

Subpart E—Personal Protective and Lifesaving Equipment

.104 Safety Belts, Lifelines and Lanyards

(a) Used only for employee safeguarding
- Removed from services after any fall
- Minimum specifications listed

(b) Secured above point of operation to 5400lbs. dead weight capacity anchor

(c) Life Lines subjected to damage must be protected

Subpart E—Personal Protective and Lifesaving Equipment

.104 Safety Belts, Lifelines and Lanyards

(d) Lanyard-1/2 inch nylon or equivalent
- 6 ft. maximum fall arrest
- nominal breaking strength-5400 lbs

(e) Hardware-drop forged or pressed steel

(f) Hardware except rivets-tensile loading 4000 lbs without failure

Subpart E—Personal Protective and Lifesaving Equipment

.105 Safety Nets

(a) Safety nets required when workers are more than 25 feet above surface or water, and lifelines, belts or scaffolds are impractical

(b) No work until net is in place
- Nets must be hung no more than 25 ft. below working employees

.105 Safety Nets

(c) Minimum net extension from a work surface edge is 8 ft.

- Must be hung so as to prevent falling employees from contacting building parts or surfaces
- Impact load tests are required to determine clearness
- Maximum fall distance-25 ft. or less

.105 Safety Nets

(d) Mesh size-< 6" X 6"

- minimum impact resistance
- 17,500 foot pounds
- must be manufacturer certified
- edge ropes

(e) All hardware should be forged steel and safety hooks

(f) Connections-develop full strength of net

.106 Working Over or Near Water

(a) Where a drowning danger exists employees shall be provided

- U.S. Coast Guard-approved life jackets, OR
- Buoyant work vests

(b) Prior to and after each use

- Jackets and vests must be inspected for defects. Defective vests shall not be used.

.106 Working Over or Near Water

(c) Ring buoys with a minimum of 90 feet of line shall be provided and be readily available in an emergency.

- Maximum distance between buoys is 200 feet.

(d) At least one lifesaving skiff shall be immediately available. Where employees are working over or adjacent to water.

References

Selection Chart for Eye and Face Protectors for Use in Industry, Schools, and Colleges

This Selection Chart offers general recommendations only. Final selection of eye and face protective devices is the responsibility of management and safety specialists. (For laser protection, refer to American National Standard for Safe Use of Lasers, ANSI Z136.1-1976.)

1. GOGGLES, Flexible Fitting, Regular Ventilation
2. GOGGLES, Flexible Fitting, Hooded Ventilation
3. GOGGLES, Cushioned Fitting, Rigid Body
*4. SPECTACLES, without Sideshields
5. SPECTACLES, Eyecup Type Sideshields
6. SPECTACLES, Semi-/Flat-Fold Sideshields
**7. WELDING GOGGLES, Eyecup Type, Tinted Lenses (Illustrated)

7A. CHIPPING GOGGLES, Eyecup Type, Clear Safety Lenses (Not Illustrated)
**8. WELDING GOGGLES, Coverspec Type, Tinted Lenses (Illustrated)
8A. CHIPPING GOGGLES, Coverspec Type, Clear Safety Lenses (Not Illustrated)
**9. WELDING GOGGLES, Coverspec Type, Tinted Plate Lens
10. FACE SHIELD, Plastic or Mesh Window (see caution note)
* 11. WELDING HELMET

*Non-sideshield spectacles are available for limited hazard use requiring only frontal protection.
**See Table A1, "Selection of Shade Numbers for Welding Filters," in Section A2 of the Appendix.

APPLICATIONS

OPERATION	HAZARDS	PROTECTORS
ACETYLENE–BURNING ACETYLENE–CUTTING ACETYLENE–WELDING	SPARKS, HARMFUL RAYS, MOLTEN METAL, FLYING PARTICLES	7, 8, 9
CHEMICAL HANDLING	SPLASH, ACID BURNS, FUMES	2 (For severe exposure add 10)
CHIPPING	FLYING PARTICLES	1, 3, 4, 5, 6, 7A, 8A
ELECTRIC (ARC) WELDING	SPARKS, INTENSE RAYS, MOLTEN METAL	11 (In combination with 4, 5, 6, in tinted lenses, advisable)
FURNACE OPERATIONS	GLARE, HEAT, MOLTEN METAL	7, 8, 9 (For severe exposure add 10)
GRINDING–LIGHT	FLYING PARTICLES	1, 3, 5, 6 (For severe exposure add 10)
GRINDING–HEAVY	FLYING PARTICLES	1, 3, 7A, 8A (For severe exposure add 10)
LABORATORY	CHEMICAL SPLASH, GLASS BREAKAGE	2 (10 when in combination with 5, 6)
MACHINING	FLYING PARTICLES	1, 3, 5, 6 (For severe exposure add 10)
MOLTEN METALS	HEAT, GLARE, SPARKS, SPLASH	7, 8 (10 in combination with 5, 6, in tinted lenses)
SPOT WELDING	FLYING PARTICLES, SPARKS	1, 3, 4, 5, 6 (Tinted lenses advisable; for severe exposure add 10)

CAUTION:
- Face shields alone do not provide adequate protection.
- Plastic lenses are advised for protection against molten metal splash.
- Contact lenses, of themselves, do not provide eye protection in the industrial sense and shall not be worn in a hazardous environment without appropriate covering safety eyewear.

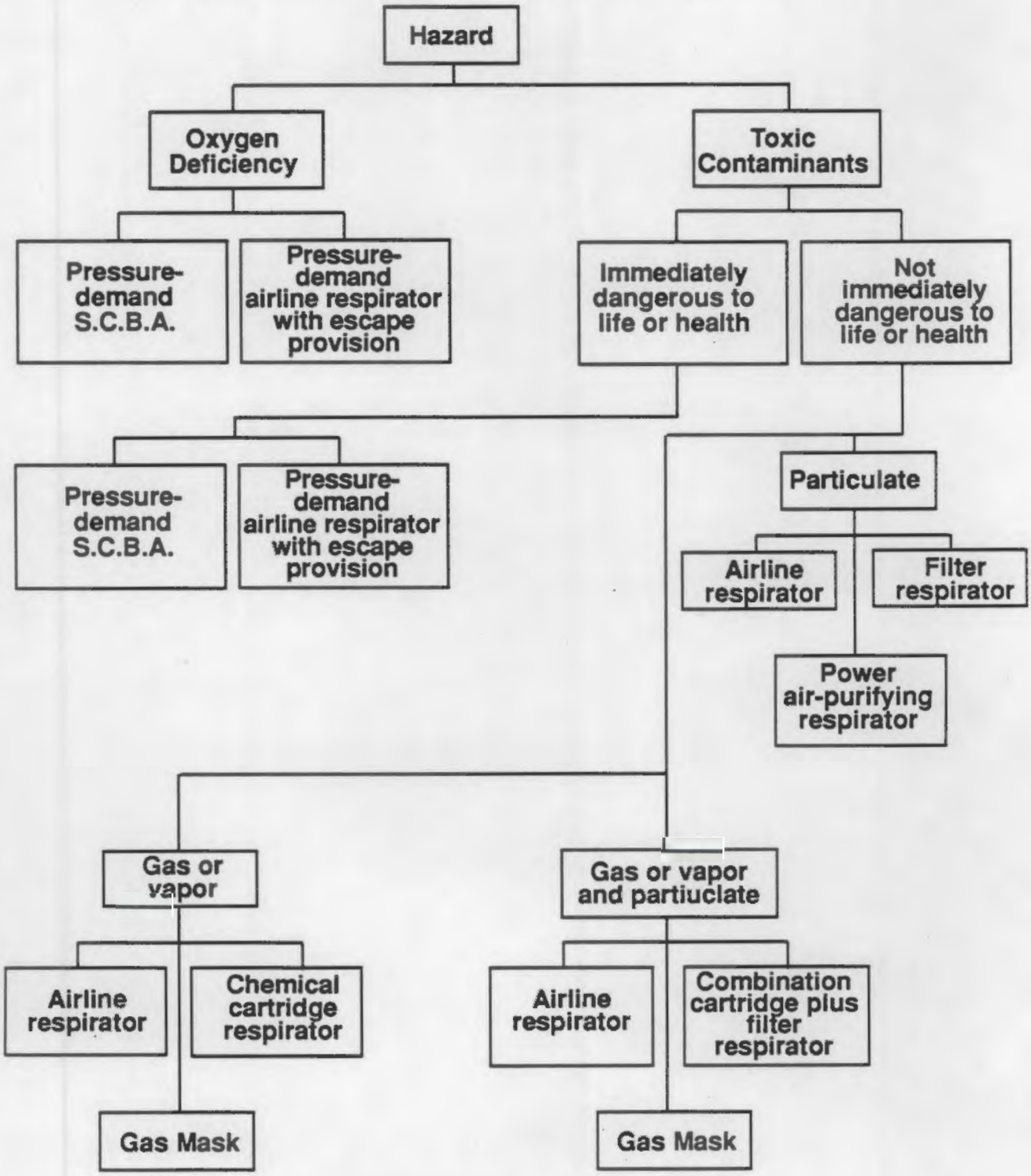
FILTER LENS SHADE NUMBER FOR EYE PROTECTION

Welding Operation	Shade Number
Shielded metal-arc welding 1/16-, 3/32-, 5/32-inch diameter elctrodes	10
Gas-shielded arc welding (nonferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	11
Gas-shielded arc welding (ferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	12
Shielded metal-arc welding 3/16-, 7/32-, 1/4-inch electrodes	12
5/16-, 3/8-inch diameter electrodes	14
Atmoic hydrogen welding	10-14
Carbon-arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Gas welding (light), up to 1/8-inch	4 or 5
Gas welding (medium), 1/8 inche to 1/2 inch	5 or 6
Gas welding (heavy), over 1/2-inch	6 or 8

Reprinted from General Industry OSHA Safety and Health Standards (29 CFR 1910.252a), U.S. Department of Labor, November 1978, p. 448.

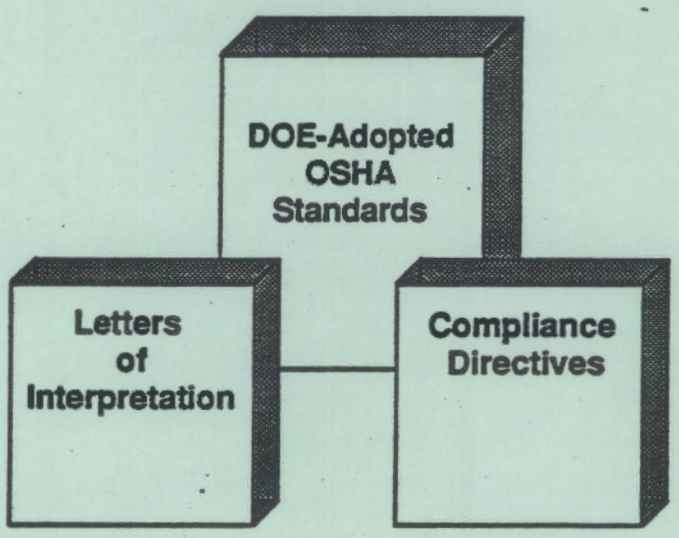
RETYPED FROM
OSHA Instruction CPL 2-2.20A
March 30 1984
Office of Health Compliance Assistance

Figure V-1
Respiratory Selection for Routine Use of Respirators



DOE Interpretations Guide to OSH Standards

Standards 1926.16 - 1926.551



Volume 6

OSH Information - Building Blocks for Compliance

RECORD ID 1467

STANDARD NUMBER 1926.100; 1910.132; 1910.135
INFORMATION DATE 830823

ABSTRACT This interpretation letter addresses standards for head protection. Employees working in areas where there is possible danger of head injury from impact, from falling or flying objects, or from electrical shock and burns shall be protected by protective helmets. Protective equipment shall be provided for the workers by the employer by the employer.

(NOTE: This standard has not been amended since issuance.)

INTERPRETATION 29 CFR 1926.100; 1910.132; 1910.135

August 23, 1983

This is in response to your letter of July 29, 1983, on behalf of Mr.L concerning OSHA's regulations for the wearing of hard hats.

The OSHA standards 29 CFR 1926.100 for construction and 29 CFR 1910.132 and 1910.135 for general industry (copies enclosed) outline the requirements for head protection. The standards require that head protection be used whenever it is necessary by reason of hazard of processes or environment that could cause head injuries.

The employer must determine which employees are exposed to possible head injury hazards, and assure that they wear appropriate head protection. Where employees are not exposed to possible head injuries, head protection is not required by OSHA standards. An employer may choose to require the wearing of head protection by certain employees or in certain activities at all times as a precautionary measure, although this may be a matter subject to labor/management negotiation.

OSHA has no exhaustive guidelines for determining whether head protection is required, this must be done on a case-by-case basis, depending on the specific operation, worksite, potential hazards, and other circumstances.

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RECORD ID 1442

STANDARD NUMBER 1926.103; 1926.956; 1910.134
INFORMATION DATE 750310

ABSTRACT This interpretation letter addresses the use of respirators for work in manholes. Presence of emergency respiratory equipment during underground lines work is not necessary unless toxic gases and vapors may be present.

INTERPRETATION 29 CFR 1926.103; 1926.956; 1910.134

March 10, 1975

This is in response to your letter of February 18, 1975, with reference to work in manholes.

The rules quoted in your letter; i.e., 1926.956(a)(3)(i), (ii), and (iii), do not require the presence of emergency respiratory equipment in the immediate vicinity when work is being performed on underground lines.

However, 1926.103, which also applies to this type of work, states: "In emergencies, or when controls required by Subpart D of this Part either fail or are inadequate to prevent harmful exposure to employees, appropriate respiratory protective devices shall be provided by the employer and shall be used."

It is important to remember that, although Subpart V of the Construction Standards is specific for power transmission and distribution lines, other parts of Part 1926, the Construction Standards, may also apply. In this instance, the rules for toxic gases and vapors (not mentioned in Subpart V) and emergency respiratory equipment contained in Subpart D and E are applicable.

ATTACHMENT: The following interpretation (Record ID 3353) is included as supplemental information for this first instance of OSHA Standard 1926.103.

RECORD ID 3353

STANDARD NUMBER 1910.134(e)(3)(i); 1915.94; 1915.35; 1915.36; 1926.103
INFORMATION DATE 900430

ABSTRACT This interpretation letter addresses a request for expedited approval to issue a citation under 1910.134(e)(3)(i) for maritime, shipbuilding operations. Shipyard is in violation of standards relating to hazards from conducting spray painting in a confined space during shipbuilding. Based on review of the facts and discussing this situation with SOL's Counsel for Trial and OSHRC Litigation, citing this shipbuilding employer for an alleged violation of 29 CFR 1910.134(e)(3)(i) can not be recommended. The application of 29 CFR 1915.35, .36 and .94 in this situation addresses these same hazards more specifically when they occur in a shipyard. Also 5(a)(1) should be considered.

INTERPRETATION 29 CFR 1910.134(e)(3)(i); 1915.94; 1915.35; 1915.36; 1926.103

APR 30, 1990

MEMORANDUM

SUBJECT: Request for Expedited Approval to Issue a Citation Under 1910.134 (e)(3) (i) for Maritime, Shipbuilding Operations

Your April 16, 1990, memorandum requested approval as required by OSHA Instruction STD 2 Paragraph D.2, to issue a citation to the shipyard for an alleged violation of 29 CFR 1910.134(e)(3) (i).

Per phone discussions conducted during April 18 through April 20, between Mr. B and Mr. J ((city) Area Office) the following principal facts pertain to this subject citation:

1. An employee working alone was conducting spray painting operations within confined spaces during the construction of a new vessel (Shipbuilding).

2. Entry into each confined space involved consisted of one entry way with limited and difficult access and egress.

3. Per the Material Safety Data Sheets provided by the employer, the flash point of the paint being used was 99 degrees Fahrenheit. Therefore, the paint used is considered a flammable liquid.

4. The employee was wearing a respirator of the cartridge and filter type.

5. The employee was not assigned a designated tender.

6. No fire equipment was stationed or immediately available for use outside the confined spaces.

7. No rescue equipment was available at the confined spaces during the spray painting operations.

8. No means for extracting the employee from the confined space were considered or available.

9. The paint being sprayed was determined to have been mixed with toxic solvents.

10. No competent person was assigned to monitor atmospheric conditions within the space.

After reviewing the facts and discussing this situation with SOL's Counsel for Trial and OSHRC Litigation, citing this shipbuilding employer for an alleged violation of 29 CFR subsection 1910.134(e)(3)(i) can not be recommended. A research of all existing OSHA records pertaining to this specific general industry standard and the current shipyard standards related to the type of hazards involved, indicates that the application of 1910.134(e)(3)(i) in this situation would be highly questionable in light of the fact that a more specific standard addresses these same hazards when they occur in a shipyard (i.e., 29 CFR subsection 1915.94). It is recognized that the requirements for having an additional worker available for emergencies is not as strict under this more specific standard. However, citing this more general standard would be contrary to the requirements that specific standards prevail over any applicable general standard covering the same hazardous situation. However, we can recommend that the following standards be cited with respect to this situation which involves: working in a confined space, with limited and difficult access, in a potentially flammable atmosphere, on a new construction vessel:

-- 29 CFR 1915.35(a) (1) (i); "In confined spaces, employees continuously exposed to such spraying shall be protected by air line respirators in accordance with the requirements of 1915.152(a)."

-- 29 CFR 1915.36(a) (2); "Ventilation shall be provided in sufficient quantities to keep the concentration of vapors below ten (10) percent of their lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration."

-- 29 CFR 1915.36(a) (6); "Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for immediate use."

-- 29 CFR 1915.94; "When an employee is working alone in an isolated location, frequent checks shall be made to ensure the safety of the employee."

-- 29 CFR 1910.134 (e) (1); "Standard procedures shall be developed for respirator use. These should include all information and guidance necessary for their proper selection, use, and care. Possible emergency and routine uses of respirator should be anticipated and planned for." (Note: Should also consider citing 5(a)(1) in the alternative)

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RECORD ID 1216

STANDARD NUMBER 1926.104
INFORMATION DATE 790326

ABSTRACT This interpretation letter addresses the evaluation of automatic fall protection devices. 29 CFR 1926.104(d) requires rope with a 5400 lb. break strength. Automatic fall protection devices are not specifically required or regulated by OSHA. However, the device described here, if used as an automatic taut lifeline, appears to meet the intent of the standard.

(NOTE: This standard has not been amended since issuance.)

INTERPRETATION 29 CFR 1926.104

March 26, 1979

This is in response to your recent request for an official interpretation of the intent of 29CFR 1926.104. You have also requested that this office evaluate your (company) products against the above standard and any applicable general industry standards. This National Office interpretation supersedes the Regional response dated February 28, 1979, concerning the same subject.

As indicated in your letter, the (company) 30 rope break strength is approximately 4000 lbs. and the (Company) 50 cable break strength is approximately 3000 lbs. Both of the above lifelines fail to comply with the 5400 lbs. strength requirement contained in 29 CFR 1926.104. However, your retracting reel locking type system is more sophisticated, in that the disc brake attached to the lock acts to cushion a fall to less than six inches for a 350 lb. drop weight as verified by (City) Testing Laboratory reports.

Automatic fall protection devices such as the (Company) products, are not specifically regulated in our General Industry or Construction Standards. Employees using the (company) products as automatic taut lifeline's installed to prevent a free fall of an employee to less than six inches appear to comply with the intent of OSHA's personal protective and life saving equipment requirements, provided the devices function at all times as indicated by the (City)Testing Laboratory reports.

A copy of this interpretation will be mailed to all OSHA Regional Administrators. The development of an instruction to the OSHA field staff regarding personal lifelines of the retracting reel locking type as they apply to existing lifeline standards does not appear necessary at this time.

RECORD ID 2070

STANDARD NUMBER 1926.104
INFORMATION DATE 840612

ABSTRACT This interpretation letter addresses the evaluation of fall protection equipment. (Product) protection equipment meets the intent of 29 CFR. Although the lifeline has a break strength of only 3000 lbs instead of 5400 lbs as required by the standard, the device reduces any free-fall to a few inches.

(NOTE: This standard has not been amended since issuance.)

INTERPRETATION 29 CFR 1926.104

June 19, 1984

This is in response to your letter of May 24, 1984, requesting consideration of your (product) as meeting the intent of the Occupational Safety and Health Administration (OSHA) Fall Protection Standards.

OSHA's standard 29 CFR 1926.104 calls for 5400-pound and 3/4- inch manila or l/2 inch nylon lifelines where free falls of six feet are anticipated. However, you state that the (product) is designed to limit falls to inches, thereby avoiding the severe shock-loading of a six-foot fall impact.

Assuming that the device will function as indicated in your University Test Report dated August 5, 1982, a lifeline break strength of 3000 pounds would be satisfactory for the units. The units, when used according to the manufacturer's 1983 revised instructions, do meet the intent of OSHA's regulations.

SOURCE LETTERS

(No date provided.)

Retracting Lifeline Fall Arrest Devices Meeting the Intent of the OSHA Act.

Based on a recent refusal by the (State) Department of Labor, Bureau of Safety and Regulation, to accept Mr. B's letter of 1/17/83 (attached) concerning our (product) devices, I am requesting that you can determine and state that these devices do specifically meet the intent of the Occupational Safety and Health Act.

Although Mr. B's letter was accepted by the f (state) and led to (state) approval along with our test report, the lack of acceptance in (state) has caused and is causing us severe problems in our interstate commerce with (state) resulting in rejection of many pieces of RTC equipment from at least one major employer in the State.

I can also state that since marketing this particular equipment from 1980, many hundreds of devices have been sold and used in all the States for the purpose of fall protection in lieu of 3/4" manila lifelines which often cannot meet the 5400 lb. strength requirement when a six-foot free fall is anticipated. The specific advantage of the (product) is the self-containment and taut lifeline which can reduce free falls to a few inches, thus requiring a lifeline strength of only 3000 lbs.

A particularly popular application has been the dual use as a confined entry lifeline and retrieval system for tanks and shafts which allows a buddy worker to lift his incapacitated co- worker without having to enter the confined area and thereby endanger himself.

These units have been successfully used in Europe since the mid-1950s for general industry and construction work. No problem to our knowledge has been found by our supplier or ourselves with regard to the reliability of the locking mechanism under diverse usage conditions including extreme cold at -30°C. (company) is responsible for these devices in the USA and changes are made to designs as required and (company) has been familiar with the characteristics of retracting lifeline devices since 1973.

(company) is responsible for quality control on the equipment when it is accepted from our supplier and when we recondition the devices. Our procedure is enclosed. The proper self-reeling of the equipment, efficient locking and absence of damage to any parts are important checks on the suitability of the devices for their intended purpose.

I have enclosed information on the testing of the (product) from University for your review.

Our instruction package #590 dated 6/83 is enclosed and is revised from time to time as new information becomes available.

For the purpose of inspection, it is our intention to add an inspection marker to the lower end of the cable signifying to the CSHO whether exposure to a heavy load stress has occurred even though the equipment can take many heavy drops without loss of arresting efficiency. We also currently ask for return of equipment annually (after the second year) for the purpose of (company) inspection and cable replacement if necessary.

This equipment we feel is necessary and useful for the purpose of fall protection and based on the 15-year experience of (company) in the field of fall arrest devices, we are vitally concerned with its proper use and maintenance and reliability for employee safety.

Therefore, after studying this information, we request that you consider the draft letter reply which I have enclosed for your consideration so that signed copy can be presented to the State of (state) for the purpose of their permitting a de minimis citation which will grant us relief from the present out-of- date standards confusion in (state) and resulting disruption to our interstate business.

January 17, 1983

This is in response to your recent inquiry requesting an interpretation of 29 CFR 1926.104.

29 CFR 1926.104 requirements for life-lines do not specifically regulate the manufacture of equipment such as your (product). However, section 1926.104 does regulate the installation and use of lanyard equipment.

The units, when used in accordance with the manufacturer's 1982 revised instructions, appear to meet the intent of the Occupational Safety and Health Act.

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F

29 CFR 1926—SUBPART F
Fire Protection and Prevention

TERMINAL OBJECTIVE
Explain the basic concepts of fire protection and prevention methods.

ENABLING OBJECTIVES
1. Describe and explain the employer's responsibilities toward employees with regard to fire protection.
2. State and explain the four classifications of fire extinguishers.
3. Identify the requirements for fire prevention on construction sites.
4. Identify the requirements for the storage and handling of flammable and combustible liquids at the construction site.
5. Define the terms: Lower Explosive Limit (LEL) and Upper Explosive Limit (UEL).
6. Identify the requirements for storage and handling of Liquefied Petroleum Gas (LPG).
7. Identify the requirements for the use of temporary heating devices.

REFERENCES

1. U.S. Department of Labor. *29 CFR 1910, General Safety and Health Standards.*
2. U.S. Department of Labor. *29 CFR 1926, Safety and Health Regulations for Construction.*
3. DOE Order 5480.7, DOE/EV-0043 and 5483.1B
4. National Fire Protection Association Codes 1, 30, 70, 101 & 241.
5. National Fire Protection Association. *NFPA Fire Protection Handbook*
6. National Fire Protection Association. *Hazardous Materials Handbook*
7. National Safety Council. *NSC Accident Prevention Manual for Industrial Operations*; 9th ed., Volume I and II.
8. OSHA Training Institute Courses 100-10 and 180

DURATION
One Hour

INSTRUCTOR MATERIALS
Course manual with instructor notes
Viewgraphs
White board, markers and pointer
Slide Projector
VCR, TV: Flame Propagation (Demo Tape)
VHS Video
Overhead Projector

Terminal Objective

Explain the basic concepts of fire protection and prevention methods.

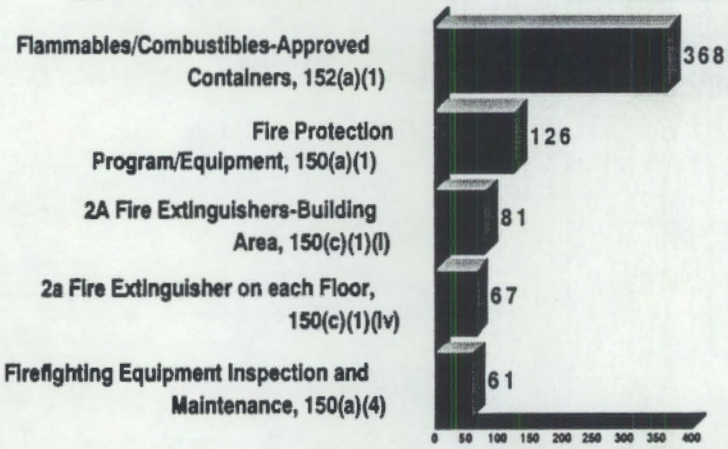
Enabling Objectives

1. **Describe and explain the employer's responsibilities toward employees with regard to fire protection.**
2. **State and explain the four classifications of fire extinguishers.**
3. **Identify the requirements for fire prevention on construction sites.**

Enabling Objectives

4. **Identify the requirements for the storage and handling of flammable and combustible liquids at the construction site.**
5. **Define the terms: Lower Explosive Limit (LEL) and Upper Explosive Limit (UEL).**
6. **Identify the requirements for storage and handling of Liquefied Petroleum Gas (LPG).**
7. **Identify the requirements for the use of temporary heating devices.**

Violations Most Cited in 1992



1926.150

(a) Fire Protection Program

The employer shall

(1) be responsible throughout entire project duration for fire protection equipment provided and maintained, without delay

Equipment shall be

(2) easily accessible at all times

(3) conspicuously located

(4) periodically inspected

(5) may require a fire brigade

1926.150

(b) Water Supply

(1) sufficient to supply fire fighting equipment

(2) underground mains shall be complete as soon as possible

Extinguisher Classification

Type A: Ordinary combustibles including wood, paper, cloth, rubber (drench)

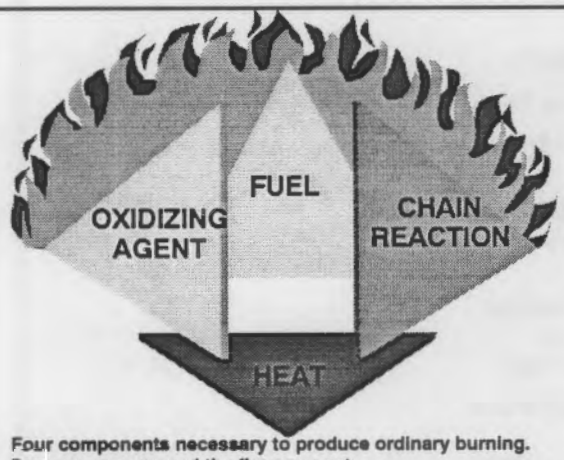
Type B: Flammable liquids, gases, grease and oil, tar, paint (smother, interrupt chain)

Type C: Electrical

Type D: Burning metals, such as magnesium, sodium (sand, special agents)

Objective 2

Fire Tetrahedron



Four components necessary to produce ordinary burning.
Remove any one and the fire goes out.

Objective 3

1926.150

(c) Portable Firefighting Equipment

(1) Fire extinguishers and small hose lines

(i) Type 2A or larger required for:

- 3000 sq. ft. protected area or major fraction there of
- <100 ft. travel distance minimum from work area to extinguisher

Subpart F—Fire Protection and Prevention

1926.150

(ii) 55 gallon drum with water with 2 fire pails may be substituted for extinguisher
- protect from freezing

(iii) 1/2-inch garden-type hose
- not to exceed 100 feet with nozzle

(iv) One 2 ft. or equivalent per floor
- mounted on rack

Subpart F—Fire Protection and Prevention

1926.150

(c) Portable Fire Fighting Equipment

(1) Fire extinguishers and small hose lines

(vi) Type 10B extinguisher shall be provided:
- within 50 ft. of where flammable or combustible liquids or gases are being USED
- see 1926.152(d) for requirements for areas where flammable or combustible liquids are STORED

(vii) Carbon tetrachloride extinguishers prohibited

Subpart F—Fire Protection and Prevention

1926.150

(c) Portable Fire Fighting Equipment

(2) Fire hose and connections may be substituted for 2A fire extinguisher in designated area provided hose line can reach all corners.

(i) 1-1/2 inch hose
- <100 ft.
- equipped with nozzle capable of discharging 25 gallons or more/minute

(ii) Compatible hose connections

(iii) Demolition operation

Subpart F—Fire Protection and Prevention

1926.150

(d) Fixed Firefighting Equipment

(1) Sprinkler protection

(I) automatic sprinkler protection

- shall closely follow construction
- in service as soon as possible

(II) maintained during demolition as long as reasonable

- valves to be operated by authorized personnel only
- check valves daily at close of work to maintain workability

Subpart F—Fire Protection and Prevention

1926.150

(d) Fixed Firefighting Equipment

(2) Standpipes

- maintained as construction progresses
- brought up as soon as possible

Subpart F—Fire Protection and Prevention

1926.150

(e) Fire Alarm Devices

(1) fire department notification via alarm system

- telephone
- siren, etc.

(2) post emergency numbers conspicuously

1926.150

(f) Fire Cutoffs (Walls and Exit Stairways)

(1) give construction priority
- fire walls
- exit stairways
- fire doors with automatic closing devices

(2) maintain during demolition or alterations
- fire cutoffs

1926.151—Fire Protection

(a) Ignition Hazards

(1) Electrical wiring for light heat and power shall be installed in accordance with Subpart K

(2) Internal combustion engine exhausts located away from vapors/gases

(3) Smoking prohibited and posted

(4) Battery-powered lighting equipment shall be approved for the atmosphere

(5) Bonding of air nozzles
- when cleaning or ventilating of tanks or vessels
- do not attach or detach if hazardous concentrations of flammable gases or vapors exist

1926.151—Fire Protection

(b) Temporary Buildings

(1) Shall not block means of exit from main buiding

(2) Located within other buildings
- noncombustible construction required
- combustible construction rated at 1 hour fire rating or more

(3) Not less than 10 ft. from other buildings if not used for flammable or combustible liquids, gases, explosives or blasting agents

1926.151—Fire Prevention

(c) Open Yard Storage

(1) Stable piles not more than 20 ft. high

(2) Driveways between piles at least 15 feet wide

(3) Housekeeping and vegetation under control

(4) Underground fire potential—no storage area above

(5) No storage within 10 ft. of buildings or structure

(6) Portable fire fighting equipment

1926.151—Fire Prevention

(d) Indoor Storage

(1) Do not block exits

(2) Take into account the fire load potential when storing

(3) Separation of noncompatible materials

(5) - (7) Clearance from building components

1926.152 Flammable and Combustible Liquids

(a) General Requirements

(1) Approved containers only

- Original containers OK for less than one gallon

(2) No storage of containers in:

- exitways
- stairways
- passageways
- or areas normally used for safe passage of people

1926.152
Flammable and Combustible Liquids

EXPLOSIVE LIMITS

	LEL	UEL
Gasoline	1.4%	7.6%
Kerosene	0.5	5.0
Acetylene	2.0	80.0
Methane	5.0	15.0
Hydrogen	4.0	75.0

1926.152
Flammable and Combustible Liquids

(b) Indoor Storage

(1) 25 gallon max outside storage cabinet in a room

(2) Over 25 gallon requires a storage cabinet
- 1" wood construction cabinet approved if it meets the required fabrication in the standards
- approved metal storage cabinet
- conspicuous "Flammable—Keep Fire Away" signage required

(3) 60 gallons flammable or 120 gallons combustible max/cabinet
- 3 cabinets max/storage area

1926.152
Flammable and Combustible Liquids

(b) Indoor Storage

(4) Inside storage rooms shall

(i) be fire resistive per NFPA 251-1969

(ii) automatic extinguishing system designed and installed in an approved manner in a storage room with raised sills or ramps at openings (four inches)
- have liquid tight wall/floor joints
- drainage to a safe location

1926.152
Flammable and Combustible Liquids

(b) Indoor Storage

(4) Inside storage rooms shall

(iii) No water reactive materials stored in some room

(iv) See Table F-2 for storage inside room

(v) Class I, Division 1 wiring

(vi) Gravity or mechanical exhaust system

1926.152
Flammable and Combustible Liquids

(b)(4) Indoor Storage

(vii) 3-foot aisle shall be maintained

- No stacking of drums (30 gallons or more in capacity)

(viii) Excess stored outside buildings

1926.152
Flammable and Combustible Liquids

(c) Storage Outside Buildings

(1) Containers 60 gallon max each

- 1100 gallon max/pile or area
- 5 ft. clearance between piles or groups of containers
- 20 ft. clearance to buildings for piles or groups

(2) Within 200 feet of each pile

- 12-foot wide access way for fire equipment required

(3) Graded storage area to divert liquids away from buildings or other exposures.

- drains shall terminate at safe locations

Subpart F—Fire Protection and Prevention

1926.152
Flammable and Combustible Liquids

(c) Storage Outside Buildings

(4) 20 feet from buildings

- 5-foot clear area between 2 tanks with greater than 2,200 gallons
- Some for individuals tanks exceeding 1100 gallons
- Within 200 feet of tank—12 foot wide fire truck access to tank

Subpart F—Fire Protection and Prevention

1926.152
Flammable and Combustible Liquids

(c) Storage Outside Buildings

(5) free of weeds, debris and other combustibles

(6) 660 gallon tanks or less—required emergency venting and other devices

(7) 660 gallon tanks or more—venting required in accordance with NFPA 30-1969, Chapters 2 and 3

Subpart F—Fire Protection and Prevention

1926.152
Flammable and Combustible Liquids

(d) Fire Control for Flammable and Combustible Liquid Storage

(1) One 20-B extinguisher within 10 ft. of storage room

(2) One 20-B extinguisher 25-75 ft. from outside storage

(3) Sprinklers if provided must comply with NFPA 13-1969

(4) One 20-B on vehicles used to transport liquids

1926.152
Flammable and Combustible Liquids

(e) Dispensing Liquids

(1) Transferring 5 gallon or more requires 25 ft. clearance from other operations
- Drainage for spill control
- Ventilation

(2) Containers bonded together

1926.152
Flammable and Combustible Liquids

(e) Dispensing Liquids

(3) Transfer within buildings, from safety cons, requires:
- or outside closed piping systems
- draw through top of containers
- approved self closing valves
- air pressure transfer prohibited

(4) Protect dispensing units against collision damage

(5) Dispensing devices and nozzels—an approved type

1926.152
Flammable and Combustible Liquids

(f) Handling Liquids at Point of Final Use

(1) Closed containers when not in use

(2) Prompt disposal of spills

(3) 50 ft. minimum clearance to source of ignition

1926.152
Flammable and Combustible Liquids

(g) Service and Refueling Areas

(1) Storage in approved closed containers

(2) Tank trucks shall comply with NFPA No. 385-1966, Standard for Tank Vehicles for Flammable and Combustible Liquids

(3) Approved dispensing hose

(4) Dispensing nozzle shall be an approved automatic—closing type without a latch open device

(5) Underground tanks shall not be abandoned

1926.152
Flammable and Combustible Liquids

(g) Service and Refueling Areas

(6) Remote emergency power shut-off

(7) Approved heating equipment
- may be installed lubrication and service areas
- no dispensing or transfer of flammable liquids
- minimum 18 inches from floor
- if liquids dispensed
  - approved heating equipment
  - minimum 8 ft. from floor

1926.152
Flammable and Combustible Liquids

(g) Service and Refueling Areas

(8) No smoking or open flames in refueling areas

(9) No smoking signs conspicuous and legible

(10) Engines off during refueling

(11) One 20-B extinguisher within 75 ft. (minimum)

1926.153 Liquefied Petroleum Gas (LPG)

(a) Approval of equipment and systems

- All containers shall meet Department of Transportation (DOT) shipping container specifications, 49 CFR Part 178

(b) Welding on LPG containers is prohibited

(c) Container Valves and Accessories

- Shut off valves located as close to the container as practicable

1926.153 Liquefied Petroleum Gas (LPG)

(d) Safety Devices

(1) Safety relief valves
- one or more required for container

(2) Shutoff valves shall be installed between the safety relief device ant the container

(3) Safety relief device and regulator vents located ≤ five feet in any direction from air openings

1926.153 Liquefied Petroleum Gas (LPG)

(e) Dispensing

(1) Trucks or motor vehicles
- Not less than 25 feet from nearest building

(2) Portable containers
- Not less than 50 feet from building

(f) Appliances

(1) Use only approved types

(2) Use only properly converted, adopted, and tested appliances that previously were run on other fuels.

1926.153 Liquefied Petroleum Gas (LPG)

(g) Containers and Equipment Outside of Buildings

Upright upon firm foundations

(h) Containers and Equipment Inside of Buildings

(1) Containers inside only if

- In use
- location outside is impractical

(2) "In use" defined as connected for use

1926.153 Liquefied Petroleum Gas (LPG)

(i) Multiple container systems—valves in system shall be designed to preven system flow shutoff when changing containers (no automatic change over devices)

(j) Storage of LPG containers inside is prohibited

(k) Storage Outside Buildings must comply with Table F-3

(l) At Least One 20 B:C Extinguisher for Storage Locations

1926.154 Temporary Heating Devices

(a) Ventilation—fresh air in sufficient quantities to maintain employee health and safety

(b) Clearance from building components and combustible storage (see Table F-4, page 114) (1926)

(c) Stability—set at horizontal level unless permitted by manufacturer recommendations

1926.154 Temporary Heating Devices

(d) Solid fuel salamanders are prohibited

(e) Oil-Fired Heaters

- require safety control to stop fuel supply in the event of flame failure

References

NFPA 241

Standard for Safeguarding Construction, Alteration and Demolition Operations

SCOPE:	The standard applies to structures in the course of construction, alteration, or demolition including underground construction.
2-1.1	Temporary offices, trailer, sheds, within a building shall be of noncombustible construction.
2-3.1	Internal combustion engines shall discharge away from combustible material.
2-3.2	Internal combustion engines shall be allowed to cool to room temperature before filling with fuel.
2.4-1	Combustible waste material, dust, and debris shall be removed from the building at the end of shift or more frequently as necessary.
3-5.1.2	Storage of class I and II liquids shall not exceed 60 gallons within 50 feet of the structure.
5-3	There shall be a readily available public fire alarm box near the premise or a telephone service to a fire/police department.
6-2.1	Combustible forms or form lumber shall be removed from the structure when stripping is complete.
6-2.2	During forming and stripping operations, portable extinguisher or hose line shall be provided to protect against additional combustible loading.
6-4.2.2	A lid shall be provided on all roofing kettles.
6-4.2.4	Kettles shall be in constant attendance while in operation.
6-4.3.2	The flame of the roofing torch shall not come in contact with wood nailers or mental flashing.
6-4.3.5	Protective clothing shall be worn by roofing installers to protect against hot trowels and hand torches.
6-4.3.6	Proper equipment shall be provided to heat roofing membranes. Torches shall be equipped with pilot adjustment, flame height adjustment, and a minimum of 25 feet of hose to a maximum of 50 feet. Pressure gauge and regulator shall be provided.
6-4.3.11	A fire watch shall be conducted for 1 hour after torches have been extinguished.
6-4.4.1	One F.E. rated 20 B:C shall be provided within 30 feet of every roofing kettle.

Table F-1 FIRE EXTINGUISHERS DATA

KNOW YOUR FIRE EXTINGUISHERS

	WATER TYPE				FOAM	CARBON DIOXIDE	DRY CHEMICAL			
							SODIUM OR POTASSIUM BICARBONATE		MULTI-PURPOSE ABC	
	STORED PRESSURE	CARTRIDGE OPERATED	WATER PUMP TANK	SODA ACID	FOAM	CO_2	CARTRIDGE OPERATED	STORED PRESSURE	STORED PRESSURE	CARTRIDGE OPERATED
CLASS A FIRES — WOOD, PAPER, TRASH HAVING GLOWING EMBERS	YES	~~YES~~	YES	~~YES~~	~~YES~~	NO (BUT WILL CONTROL SMALL SURFACE FIRES)	NO (BUT WILL CONTROL SMALL SURFACE FIRES)	NO (BUT WILL CONTROL SMALL SURFACE FIRES)	YES	YES
CLASS B FIRES — FLAMMABLE LIQUIDS, GASOLINE, OIL, PAINTS, GREASE, ETC.	NO	NO	NO	NO	~~YES~~	YES	YES	YES	YES	YES
CLASS C FIRES — ELECTRICAL EQUIPMENT	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
CLASS D FIRES — COMBUSTIBLE METALS	SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING LABORATORIES									
METHOD OF OPERATION	PULL PIN-SQUEEZE HANDLE	TURN UPSIDE DOWN AND BUMP	PUMP HANDLE	TURN UPSIDE DOWN	TURN UPSIDE DOWN	PULL PIN-SQUEEZE LEVER	RUPTURE CARTRIDGE-SQUEEZE LEVER	PULL PIN SQUEEZE HANDLE	PULL PIN-SQUEEZE HANDLE	RUPTURE CARTRIDGE-SQUEEZE LEVER
RANGE	30' - 40'	30' - 40'	30' - 40'	30' - 40'	30' - 40'	3' - 8'	5' - 20'	5' - 20'	5' - 20'	5' - 20'
MAINTENANCE	CHECK AIR PRESSURE GAUGE MONTHLY	WEIGH GAS CARTRIDGE ADD WATER IF REQUIRED ANNUALLY	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY RECHARGE	WEIGH SEMI ANNUALLY	WEIGH GAS CARTRIDGE CHECK CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	WEIGH GAS CARTRIDGE CHECK CONDITION OF DRY CHEMICAL ANNUALLY

FLAMMABLE AND COMBUSTIBLE LIQUIDS — 1910.106(a)

(18) Combustible liquid means any liquid having a flashpoint at or above 100°F (37.8°C).

Combustible liquids shall be divided into two classes as follows:

(i) "Class II liquids" shall include those with flashpoints at or above 100°F (37.8°C) and below 140°F (60°C), except any mixture having components with flashpoints of 200°F (93.3°C) or higher, the volume of which make up 99 percent or more of the total volume of the mixture.

(ii) "Class III liquids" shall include those with flashpoints at or above 140°F (60°C). Class III liquids are subdivided into two subclasses:

(a) "Class IIIA liquids" shall include those with flashpoints at or above 140°F (60°C) and below 200°F (93.3°C), except any mixture having components with flashpoints of 200°F (93.3°C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

(b) "Class IIIB liquids" shall include those with flashpoints at or above 200°F (93.3°C).

(19) Flammable liquid means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent or more of the total volume of the mixture. Flammable liquids shall be known as Class I liquids.

Class I liquids are divided into three classes as follows:

(i) Class IA shall include liquids having flashpoints below 73°F (22.8°C) and having a boiling point below 100°F (37.8°C).

(ii) Class IB shall include liquids having flashpoints below 73°F (22.8°C) and having a boiling point at or above 100°F (37.8°C).

(iii) Class IC shall include liquids having flashpoints at or above 73°F (22.8°C) and below 100°F (37.8°C).

(See Figure F-1)

FLASH POINT — the lowest temperature at which a flammable liquid will give off enough vapors to form an ignitable mixture with the air above the surface of the liquid or within its container.

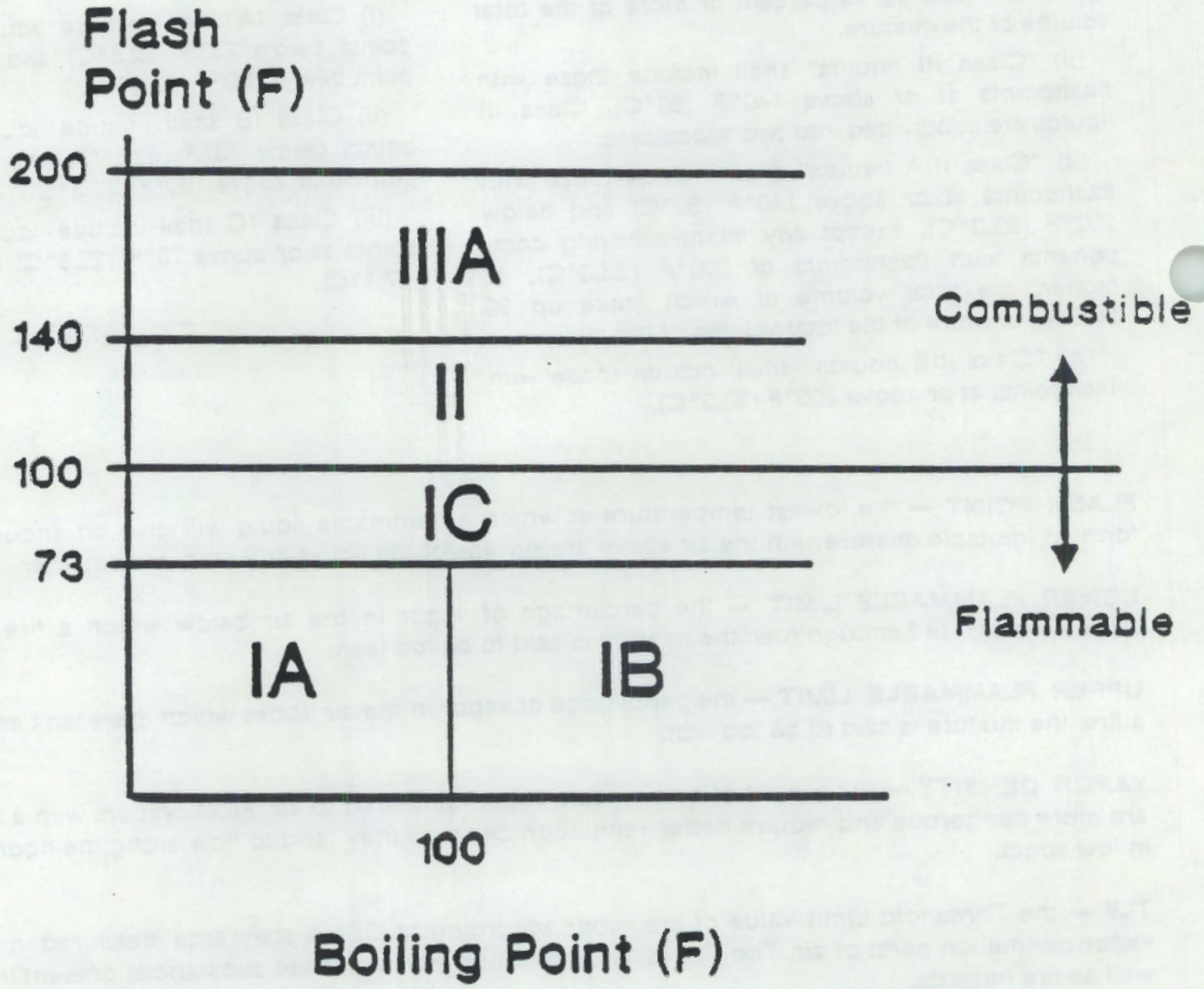
LOWER FLAMMABLE LIMIT — the percentage of vapor in the air below which a fire can't occur because there isn't enough fuel: the mixture is said to be too lean.

UPPER FLAMMABLE LIMIT — the percentage of vapor in the air above which there isn't enough air for a fire: the mixture is said to be too rich.

VAPOR DENSITY — the weight of a flammable vapor compared to air. Air=1. Vapors with a high density are more dangerous and require better ventilation because they tend to flow along the floor and collect in low spots.

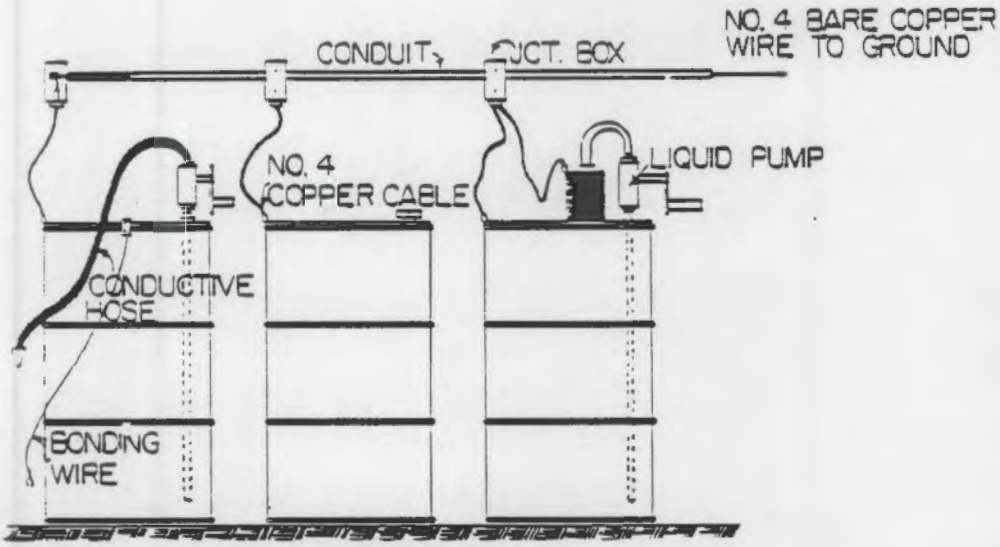
TLV — the Threshold Limit Value of the vapor according to OSHA standards measured in parts of the vapor per million parts of air. The TLV is listed because many of these substances present inhalation as well as fire hazards.

Classes of Flammable and Combustible Liquids as defined by 29 CFR 1910.106



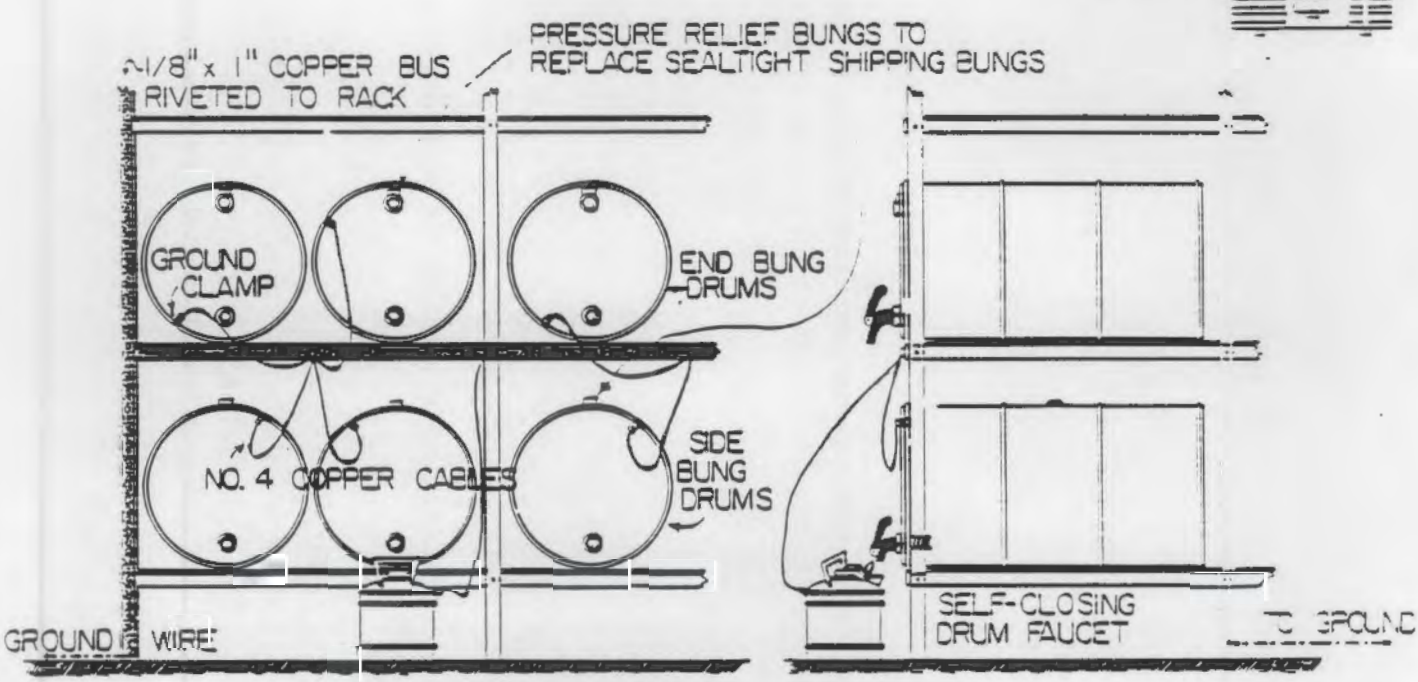
(FIGURE F-1)

HANDLING OF FLAMMABLE LIQUIDS CAN CREATE STATIC SPARKS THAT MUST BE NEUTRALIZED



DRUM DISPENSING
FIGURE 1

FIGURE 2



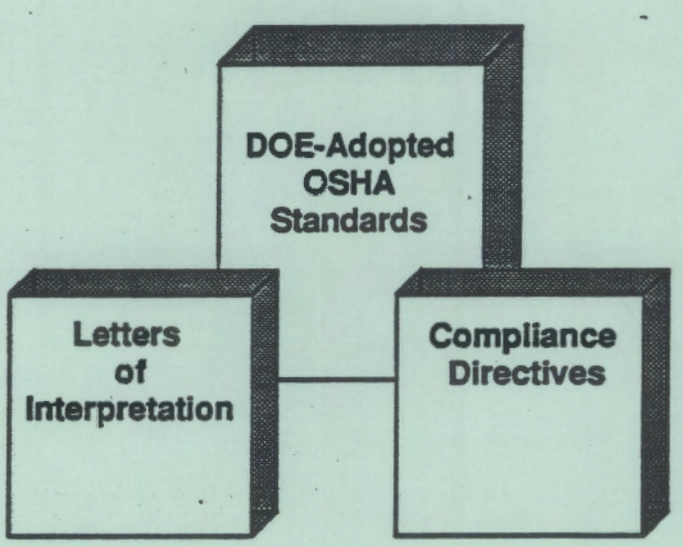
DRUM RACK STORAGE

FIGURE 3

BONDING, GROUNDING AND PRESSURE RELIEF	NOT TO SCALE	LPP-81

DOE Interpretations Guide to OSH Standards

Standards 1926.16 - 1926.551



Volume 6

OSH Information - Building Blocks for Compliance

G

29 CFR 1926—SUBPART G
Signs, Signals and Barricades
(Optional Subpart)

TERMINAL OBJECTIVE

Recognize and explain the uses for common visual signs, tags, signals and barricading devices, in the construction worksite.

ENABLING OBJECTIVES

1. Identify and select the most appropriate signs, signals and barricades for a given construction site.
2. State and explain the safety requirements for safety signs and tags used for the following: Danger, Caution, Do Not Operate, Out of Order.

REFERENCES

1. U.S. Department of Labor. *29 CFR 1910, General Safety and Health Standards.*
2. U.S. Department of Labor. *29 CFR 1926, Safety and Health Regulations for Construction.*
3. ANSI. ASME B30.5-1982, *Mobile and Locomotive Truck Cranes.*
4. ANSI. D6.1-1971, *Manual of Uniform Traffic Control Devices for Streets and Highways.*
5. ANSI. Z35.1 and Z35.2-1968, *Specifications for Accident Prevention Signs and Tags.*
6. DOE Order 5480.9 and 5483.1B (draft).
7. National Safety Council. *NSC Accident Prevention Manual for Industrial Operations*; 9th ed., Volume I and II.
8. OSHA Training Institute Course #500

DURATION

30 Minutes

INSTRUCTOR MATERIALS

Course manual with instructor notes
Viewgraphs
White board, markers and pointer
Slide Projector
Overhead Projector
Demonstration Models, Examples, Sampling Equipment

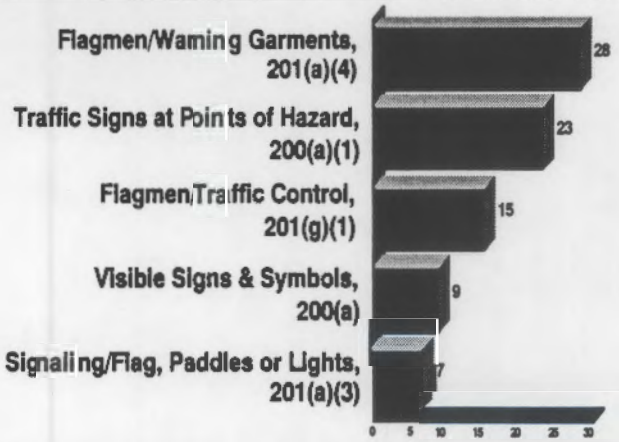
Terminal Objective

Recognize and explain the uses for common visual signs, tags, signals and barricading devices, in the construction worksite.

Enabling Objectives

1. **Identify and select the most appropriate signs, signals and barricades for a given construction site.**
2. **State and explain the safety requirements for safety signs and tags used for the following: Danger, Caution, Do Not Operate, Out of Order.**

Violations Most Cited in 1992



Subpart G—Signs, Signals and Barricades

1926.200 Accident Prevention Signs and Tags

(a) Accident Prevention Signs and Tags

- Shall be visible at all times
- Shall be removed once the hazard has passed

Subpart G—Signs, Signals and Barricades

1926.200 Accident Prevention Signs and Tags

(b) Danger Signs

- Immediate hazard exists
- Red

(c) Caution Signs

- Potential hazards
- Unsafe practices
- Yellow

Subpart G—Signs, Signals and Barricades

1926.200 Accident Prevention Signs and Tags

(d) Exit Signs

(e) Safety Instruction

(f) Directional

(g) Traffic

- ANSI D6.1

1926.200 Accident Prevention Signs and Tags

(h) Accident Prevention Tags

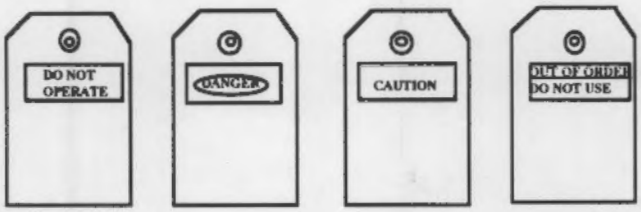
(1) Temporary means of warning

- Not a substitute for signs

(2) Specifications

1926.200 Accident Prevention Signs and Tags

Table G-1



Basic Stock (background)	Safety Colors (ink)	Copy Specification (letters)
White	Red	Do Not Operate
White	Black and Red	Danger
Yellow	Black	Caution
White	Black	Out of Order Do Not Use

1926.201 Signaling

(a) Flagmen

(1) Shall be provided when signs don't offer enough protection for workers

(2) Signaling to conform to ANSI D6.1-1971 manual on Uniform traffic Control Devices for streets and highways

1926.201 Signaling

(a) Flagmen

(1) Flagmen required when signs, signals and barricades are ineffective

(2) Signalign directions—ANSI D6.1-1971 manual on Uniform Traffic Control Devices for streets and highways

(3) Hand Signaling

- daylight: 18" square flags or paddles
- darkness: red lights

(4) Flagging PPE: vest or other similar garment of red or orange

- darkness: garment must be reflectorized

1926.201 Signaling

(a) Flagmen

(b) Crane and Hoist Signals

In accordance with applicable ANSI Standards

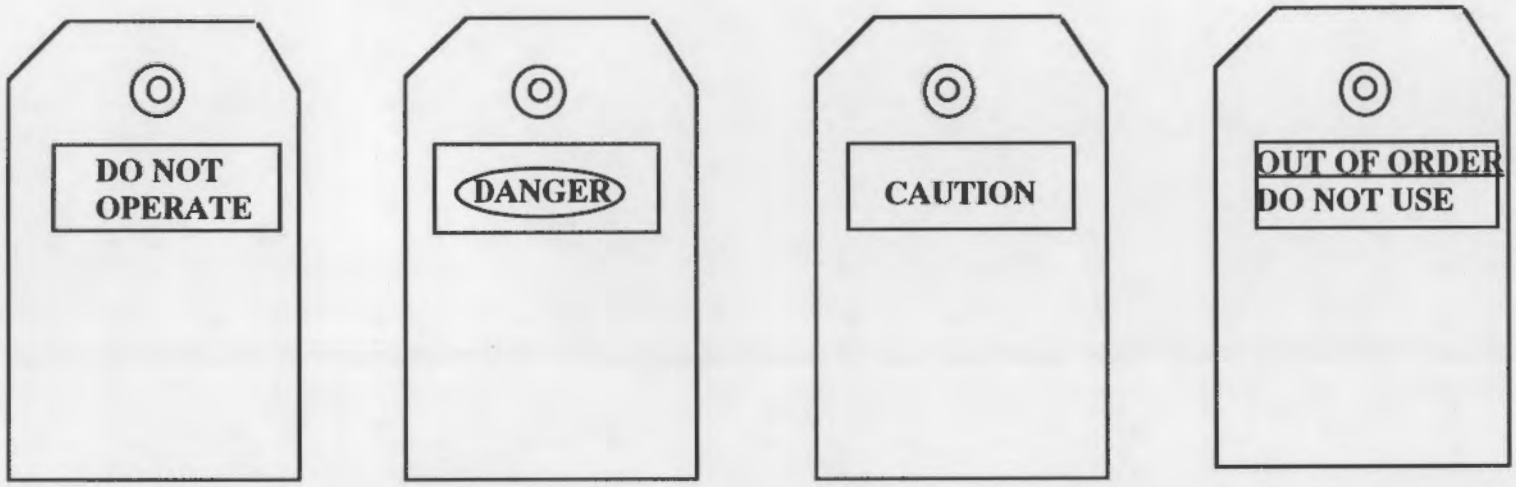
1926.202 Barricades

- For protection of employees in accordance with ANSI D6.1 1971 Manual on Uniform Traffic Control Devices for Streets and Highways

References

1926.200 Accident Prevention Signs and Tags

Table G-1



Basic Stock (background)	Safety Colors (ink)	Copy Specification (letters)
White	Red	Do Not Operate
White	Black and Red	Danger
Yellow	Black	Caution
White	Black	Out of Order Do Not Use

Objective 2

ANSI D6.1 - 1971

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS

Cited in 1926.200(g) and 1926.201(a)(2)

This summary considers only some requirements of Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations.

6A Scope and Application
This part presents basic principles and prescribes standards for the design, application, installation, and maintenance of traffic control devices required for road or street construction, maintenance, and utility work.

Minimum standards are set forth to meet the most common situations. Additional protection must be provided when special conditions require them.

6A.5 General Requirements
Traffic control devices shall be installed at the start of construction or maintenance operations, and shall be properly maintained and/or operated while in use. Such devices shall remain in place only as long as they are needed and shall be immediately removed thereafter. Signs which don't apply to existing conditions shall be removed, covered, or turned so as not to be readable by oncoming traffic.

6B.1 Design of Signs
Warning signs in construction areas shall have a black legend on an orange background.

6B.2 Illumination and Reflectorization
All signs meant to be used during hours of darkness shall be reflectorized or illuminated.

6B.3 Position of Signs
Signs shall be placed in positions where they will convey their messages most effectively. Placement must be accommodated to highway design and alignment. Signs shall be so placed that the driver will have adequate time for response.

6B.7 Application
If construction or maintenance operations require regulatory measures other than those normally in effect, the existing permanent regulatory devices shall be removed or covered and superseded by the appropriate temporary sign.

6B.13 Warning Signs
Warning signs for construction shall be diamond shaped, having a black symbol or message on an orange background.

6B.28 Signs for Blasting Areas

Since sources of radio-frequency energy can cause the premature firing of electric blasting caps used in construction operations, the public must be warned of such conditions and advised to turn off mobile radio transmitters.

The BLASTING ZONE (1,000 Feet) sign is meant for use in advance of any site where explosives are being used. The TURN OFF 2-WAY RADIO and END BLASTING ZONE signs must be used in sequence with this sign. Provision shall be made for covering or removing these signs when there are no explosives in the area or the site is otherwise secured.

The turn off 2-Way Radio sign is to be used in sequence with the BLASTING ZONE (1,000 Feet) and END BLASTING ZONE signs and at least 1,000 feet from the beginning of the blasting zone. These signs shall be the prominently displayed.

The End Blasting Zone sign, used to denote the end of the danger zone, shall be placed a minimum of 1,000 feet from the blasting zone, either with or before the End Construction sign.

6E.2 Hand Signaling Devices
Flags used for signaling purposes shall be a minimum of 24 by 24 inches in size and be made of a good grade of red material securely fastened to a staff about 3 feet in length.

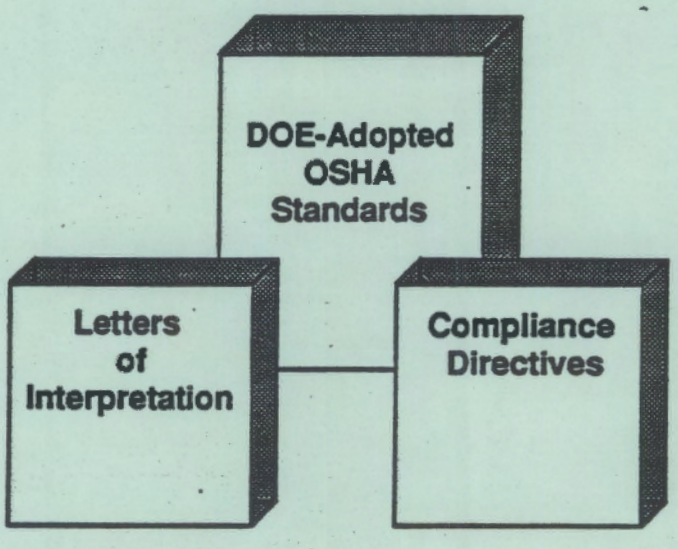
6E.3 Flaggers
The use of an orange vest and/or orange cap is required for flaggers. For nighttime conditions, similar outside garments shall be reflectorized.

Flaggers must, at all times, be clearly visible to oncoming traffic for a distance sufficient to allow proper response by the driver to flagging instructions, and to permit traffic to reduce speed before entering the worksite.

6E.5 Flagman Stations
Flagger stations shall be located far enough ahead of the worksite so that approaching traffic will have sufficient distance to reduce speed before entering the project. 200-300 feet is desirable.

DOE Interpretations Guide to OSH Standards

Standards 1926.16 - 1926.551



Volume 6

OSH Information - Building Blocks for Compliance

H

29 CFR 1926—SUBPART H
Materials Handling, Storage, Use and Disposal

TERMINAL OBJECTIVE

Explain the general applications for storage and the rigging equipment typically utilized on the construction site.

ENABLING OBJECTIVES

1. State and explain the general requirements for the storage of construction materials.
2. Identify the various types of equipment and associated safety requirements for Rigging used in material handling.
3. Select and use the proper table(s), in Subpart H, to determine the safe working load of various types of rigging equipment.
4. Identify the requirements for the disposal of construction waste material.

REFERENCES

1. U.S. Department of Labor. *29 CFR 1926, Safety and Health Regulations for Construction.*
2. *DOE Rigging Manual*
3. *IPT's Crane and Rigging Handbook*, 1991Garby, Ronald G.; 1st edition

DURATION

One Hour

INSTRUCTORS MATERIALS

Course manual with instructor notes
Viewgraphs
White board, markers and pointer
Slide Projector
Overhead Projector
Demonstration Models, Examples, Sampling Equipment
IPT Crane and Rigging Handbook

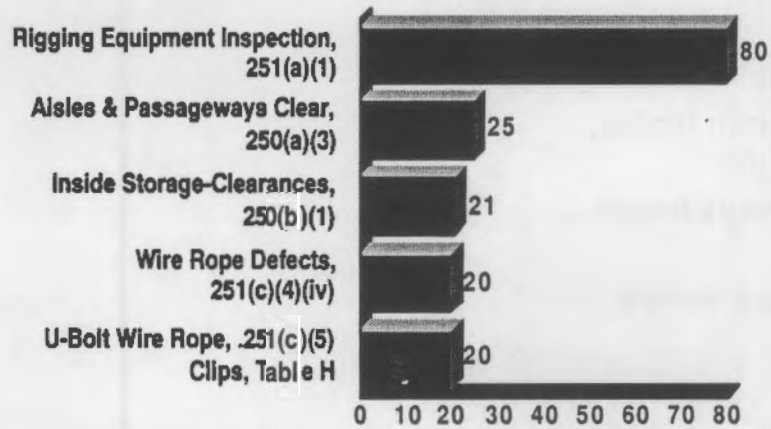
Terminal Objective

Explain the general applications for storage and the rigging equipment typically utilized on the construction site.

Objective

1. State and explain the general requirements for the storage of construction materials.
2. Identify the various types of equipment and associated safety requirements for Rigging used in material handling.
3. Select and use the proper table(s), in Subpart H, to determine the safe working load of various types of rigging equipment.
4. Identify the requirements for the disposal of construction waste material.

Violations Most Cited in 1992



1926.250 General Requirements for Storage

(a) General

(1) Secure stacking

(2) Posting of floor load limits in storage areas (conspicuously) (p.s.f)

(3) Aisles and passageways clear and maintained

(4) Difference in working or road levels

1926.250 General Requirements for Storage

(b) Material Storage

(1) No storage near inside floor openings or exteriors

(3) Segregation of noncompatible materials

(4) Bagged material—step back layers and crosskey every 10 bags high

(5) Storage on scaffolds or runways

- Stacking of specific materials

1926.250 General Requirements for Storage

(6) Brick stacks—maximum 7' high = 4'high, taper back 2 inches

(7) Masonary blocks—6' high or higher, taper back 1/2 block per tier

(8) Lumber—used (remove nails before restacking

(9) Cylindrical material—stack/secure

1926.251 Rigging Equipment for Material Handling

- Section 1926.251 applies to rope used for slings. Rope used as crane running gear is addressed in Subpart N.
- Parts of 1910.184 have been incorporated into 1926.251.

1926.251 Rigging Equipment for Material Handling

(a) General

(1) Inspection prior to each shift use and removal from service

(2) Recommended safe working loads—Tables H-1 to H-20

(3) Remove from immediate work are when not in use

(4) Custom designed lifting accessories tested to 125% safe working load of their rated load.

1926.251 Rigging Equipment for Material Handling

(b) Alloy Steel Chain

(1) Permanently affixed ID tag

(2) Safe working load of attachments > than Safe working load of chain

(3) No job-made hooks, links or fasteners

(4) Safe working load (Table H-1, page 118)

(5) Chain-link wear (Table H-2, page 119)

- Additional requirements in 1910.184(e)(3)(i) and (ii)

1926.251 Rigging Equipment for Material Handling

(c) Wire Rope

(1) Safe Working Load Tables H-3 to H-14 (Page 119-124)

(2) Seizing of protruding ends

(3) No knots

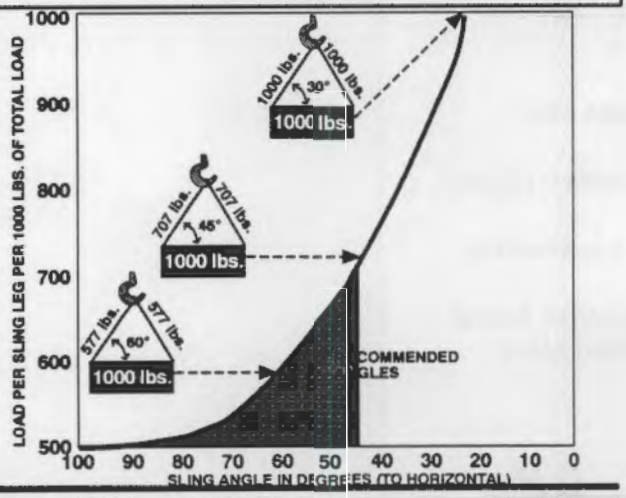
(4) Limitations in using wire rope slings

- (i) and (ii) Eye splices
- (iii) No wire rope clips
- (iv) Broken wires and wear

(5) U-bolts to form eyes use Table H-20 to determine number and spacing

"Never Saddle a Dead Horse"

Effect of Sling Angle on Sling Load



1926.251 Rigging Equipment for Material Handling

(d) Natural Rope and Synthetic Fiber

(1) SWL's in Tables H-15 to H-18 (Page 125-127)

(2) Splices (eye, 3 full tucks; short, 6 full tucks)

- Additional requirements in 1910.184(h)(2) to (5)

1926.251 Rigging Equipment for Material Handling

(e) Synthetic Webbing

(1) Marked to identify manufacturer, SWL, and type of material

- Additional requirements in 1910.184(l)

(f) Shackles and Hooks

(1) SWL's in Table H-19 (Page 128)

(2) Manufacturer's recommendations

TABLE H-8—RATED CAPACITIES FOR 2-LEG AND 3-LEG BRIDLE SLINGS*
6x19 and 6x37 Classification Improved Plow Steel Grade Rope with Independent Wire Rope Core (WRC)

Rope		Rated capacities, tons (2,000 lb.)											
		2-leg bridle slings						3-leg bridle slings					
Dia.	Constr.	30° (60°)[1]		45° angle		60° (30°)[2]		30°[1]	60[2]	45° angle		60°(30°)[2]	
inches		HT	MS	HT	MS	HT	MS	HT	MS	HT	MS	HT	MS
1/4	6X19	0.92	0.97	0.75	0.79	0.53	0.56	1.4	1.4	1.1	1.2	0.79	0.84
5/16	6x19	1.4	1.5	1.1	1.2	1.81	0.87	2.1	2.3	1.7	1.8	1.2	1.3
3/8	6x19	2.0	2.1	1.6	1.8	1.1	1.2	3.0	3.2	2.4	2.6	1.7	1.9
7/16	6x19	2.7	2.9	2.2	2.4	1.5	1.7	4.0	4.4	3.3	3.6	2.3	2.5
1/2	6x19	3.4	3.8	2.8	3.1	2.0	2.2	5.1	5.7	4.2	4.6	3.0	3.3
9/16	6x19	4.3	4.8	3.5	3.9	2.5	2.7	6.4	7.1	5.2	5.8	3.7	4.1
5/8	6x19	5.2	5.9	4.2	4.8	3.0	3.4	7.8	8.8	6.4	7.2	4.5	5.1
3/4	6x19	7.5	8.4	5.9	6.9	4.2	4.9	11.0	13.0	8.9	10.0	6.3	7.3
7/8	6x19	9.6	11.0	7.8	9.3	5.6	6.6	14.0	17.0	12.0	14.0	8.3	9.9
1	6x19	12.0	15.0	10.0	12.0	7.2	8.5	19.0	22.0	15.0	18.0	11.0	13.0
1-1/8	6x19	16.0	18.0	13.0	15.0	9.0	10.0	23.0	27.0	19.0	22.0	13.0	16.0
1-1/4	6x37	18.0	21.0	15.0	17.0	10.0	12.0	27.0	32.0	22.0	26.0	16.0	18.0
1-3/8	6x37	22.0	25.0	18.0	21.0	13.0	15.0	33.0	38.0	27.0	31.0	19.0	22.0
1-1/2	6x37	26.0	30.0	21.0	25.0	15.0	17.0	39.0	45.0	32.0	37.0	23.0	26.0
1-5/8	6x37	31.0	35.0	25.0	29.0	18.0	20.0	46.0	53.0	38.0	43.0	27.0	31.0
1-3/4	6x37	35.0	41.0	29.0	33.0	20.0	24.0	53.0	61.0	43.0	50.0	31.0	35.0
2	6x37	46.0	53.0	37.0	43.0	26.0	30.0	68.0	79.0	56.0	66.0	40.0	46.0

HT=Hand Tucked Splice MS=Mechanical Splice
[1]Vertical angles [2]Horizontal Angles

1926.252 Disposal of Waste Material

(a) Enclosed Chute for Material Dropped >20 Ft. Outside Walls

(b) Drop Through Interior Floor Holes

- 42" barricaded at bottom floor
- Barricade 6 ft. from projected edge of hole

1926.252 Disposal of Waste Material

(c) Removal of Scrap and Waste as Work Progresses

(d) Burning IAW Local Fire Regulations

(e) Flammables, Oily Rags, etc., Kept in Covered Containers

- Disposal applicable to demolition operations addressed in Subpart T

References

TABLE H-8—RATED CAPACITIES FOR 2-LEG AND 3-LEG BRIDLE SLINGS*

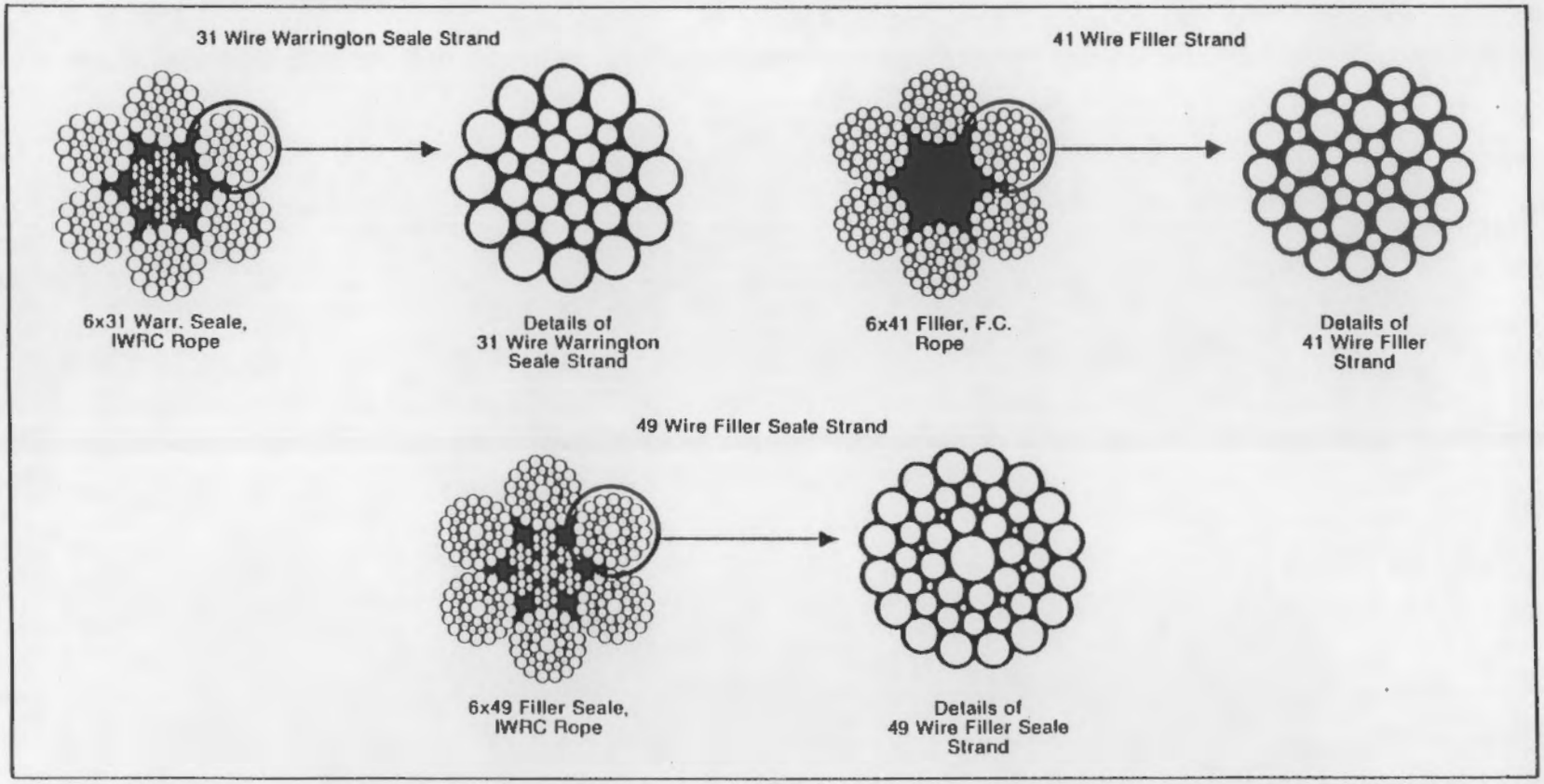
6x19 and 6x37 Classification Improved Plow Steel Grade Rope with Independent Wire Rope Core (WRC)

Rope		Rated capacities, tons (2,000 lb.)											
		2-leg bridle slings						3-leg bridle slings					
Dia.	Constr.	30° (60°)		45° angle		60°[1] (30°)[2]		30°[1] (60)[2]		45° angle		60°[1] (30°)[2]	
inches		HT	MS	HT	MS	HT	MS	HT	MS	HT	MS	HT	MS
1/4	6X19	0.92	0.97	0.75	0.79	0.53	0.56	1.4	1.4	1.1	1.2	0.79	0.84
5/16	6x19	1.4	1.5	1.1	1.2	1.81	0.87	2.1	2.3	1.7	1.8	1.2	1.3
3/8	6x19	2.0	2.1	1.6	1.8	1.1	1.2	3.0	3.2	2.4	2.6	1.7	1.9
7/16	6x19	2.7	2.9	2.2	2.4	1.5	1.7	4.0	4.4	3.3	3.6	2.3	2.5
1/2	6x19	3.4	3.8	2.8	3.1	2.0	2.2	5.1	5.7	4.2	4.6	3.0	3.3
9/16	6x19	4.3	4.8	3.5	3.9	2.5	2.7	6.4	7.1	5.2	5.8	3.7	4.1
5/8	6x19	5.2	5.9	4.2	4.8	3.0	3.4	7.8	8.8	6.4	7.2	4.5	5.1
3/4	6x19	7.3	8.4	5.9	6.9	4.2	4.9	11.0	13.0	8.9	10.0	6.3	7.3
7/8	6x19	9.6	11.0	7.8	9.3	5.6	6.6	14.0	17.0	12.0	14.0	8.3	9.9
1	6x19	12.0	15.0	10.0	12.0	7.2	8.5	19.0	22.0	15.0	18.0	11.0	13.0
1-1/8	6x19	16.0	18.0	13.0	15.0	9.0	10.0	23.0	27.0	19.0	22.0	13.0	16.0
1-1/4	6x37	18.0	21.0	15.0	17.0	10.0	12.0	27.0	32.0	22.0	26.0	16.0	18.0
1-3/8	6x37	22.0	25.0	18.0	21.0	13.0	15.0	33.0	38.0	27.0	31.0	19.0	22.0
1-1/2	6x37	26.0	30.0	21.0	25.0	15.0	17.0	39.0	45.0	32.0	37.0	23.0	26.0
1-5/8	6x37	31.0	35.0	25.0	29.0	18.0	20.0	46.0	53.0	38.0	43.0	27.0	31.0
1-3/4	6x37	35.0	41.0	29.0	33.0	20.0	24.0	53.0	61.0	43.0	50.0	31.0	35.0
2	6x37	46.0	53.0	37.0	43.0	26.0	30.0	68.0	79.0	56.0	65.0	40.0	46.0

HT=Hand Tucked Splice MS=Mechanical Splice

[1]Vertical angles [2]Horizontal Angles

Fig. 1.5 Basic 37 Wire Strands



SLING INSPECTION PROGRAM

A good sling chain inspection program should provide more than a physical check of the chains' condition. It should be a complete recorded history of each unit.

If conditions and time make it impossible to write such a history, the following two requirements are minimum essentials in any type of inspection program.

1. Positive identification of the chain as to the material from which it is made.

2. Evaluation of the condition of the chain.

After identification of chain is completed, a proper procedure for inspection can be conducted in the following manner:

1. A dirty chain should be cleaned so that defects may be detected more easily.

2. Hang chain in a vertical position for preliminary inspection and to measure length. When this is not possible, stretch chain out on level floor with all twist removed.

3. Record the serial number, current measured length, size, type and grade of material on your work sheet. If no serial number is available, an I.D. tag should be attached that shows the size, grade, reach, rated capacity and sling manufacturer.

4. Compare the new measured length with the length shown on the original I.D. tag. An increase in length may be due to stretch or wear, or a combination of both. If the new measurement is more than the original it should be analyzed as follows:
   a. Check for localized stretch or wear.
   b. Lift each link from its seat and check for grooving.
   c. Also during this point of inspection look for:
      1. Twisted and bent links.
      2. Cracks and welded areas or other portions
      3. Gouges or other marks.
      4. Corrosion pits.
      5. Burned links caused by welding "stings", buss bar or group contacts.
   d. Check master link and hooks for any of the above faults. Hooks should be removed from service if they have been opened more than 15% of the normal throat opening, measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook.

In recent years some manufacturers have identified their chain links with appropriate marking to help you. Some alloy slings will have the letter "A" stamped on the hook(s), or three welded dots on the top coupling link(s).

<u>STRETCH OR WEAR?</u> It is important that an inspector realize the difference between stretch and wear. A chain with long service and frequent use will increase in length even if not overloaded. This increased length caused by wear

should not be confused with stretch. It is also possible to get increased length due to stretch with little or no wear. At times there will be a combination of both conditions.

Remember that increased length due to wear is normal for a chain that has been in service for a long period of time. However, increased length due to stretch, with little or no wear, indicates a serious error in the lifting procedure.

An accurate manner to check stretch or elongation is to measure the inside length of the link(s). Deduct the wear (difference between original wire size and measured wire size) from the bearing points divide this amount by the original length of the link.

EXAMPLE 1/2" alloy (when new) inside length .55

Measure link length 1-11/16" or 1.68
Measured bearing point wear 1/32"x2=1/16" or .06
Deducted from measured link length and take result,
1.62" divided by 1.55"=1.05, or
approximately 5% stretch

Although this method will provide you with the most accurate results, difficulties may be encountered because all manufacturers vary slightly in their link lengths. This method of computation should be followed only where the original link length is known. Therefore, when establishing you original inspection record cards, link lengths should be recorded after measurement for all new chains put into service. A similar procedures should be conducted on any chain added after it has bee repaired.

normally wear will occur primarily at the bearing points, the inside ends of the links where the adjoining links are seated. Where wear is evident, measure the cross section of the link(s) at each end. If the amount of wear reduces the diameter below the following figures, the chain should be removed from service.

Gauges can easily be made showing these minimum figures. These gauges should be made so that they may be inserted at the bearing points. Gauges that will not fit into these areas will be of little value.

Chain size inches	Maximum allowable wear, inch	Chain size, inches	Maximum allowable wear, inch
1/3	3/64"	1	3/16"
3/8	5/64"	1-1/3	7/32"
1/2	6/64"	1-1/4	1/4"
5/8	9/64"	1-3/8	9/32"
3/4	5/32"	1-1/2	5/16"
7/8	11/64"	1-3/4	11/32"

Chains that show signs of stretch or wear can be divided into four categories:

1. Stretch throughout the entire length of chain
2. Localized stretch
3. Combination of stretch and wear
4. Wear only

STRETCH THROUGHOUT THE ENTIRE LENGTH OF CHAIN can only be cause by overload. If chain is multi-legged, there is the possibility that extremely low angle lifts caused overload. If at all possible, angle between the chain branch and the horizontal of less than 30 degrees should not be used in making lifts. Check applicable lifts vs. working load figures for corresponding angles. Chances are that by increasing the size of your sling by one size you will be able to correct this problem.

LOCALIZED STRETCH differs from stretch throughout the entire length of chain inasmuch as in all probability the initial load was below the weight which would cause permanent deformation. This condition is after caused by either chocking a load at low angles or using wrapped loads on sharp corners without proper padding or means of chain protection. Chains wrapped around sharp corners can cause stress to be applied to one or very few links rather than the entire length of chain. Here too, the angles of lift should be checked with applicable working load figures. Efforts should be made to protect chain on sharp corners.

WEAR ONLY should be investigated on the basis of severity of service, time in service and size of sling. For very severe applications including wear, it is after more economical to change to a sling made from large material diameter or to consult your chain manufacturer concerning the advisability of changing heat treatment to provide a more abrasion resistant product.

COMBINATION OF STRETCH AND WEAR-Prime attention when considering the worn portion of the chain should be given to the length of time the sling has been in service. If usage has been over a prolonged period of time, worn portions are probably normal and stretched links should be investigated as stated in previous paragraphs.

GOUGES AND NICKS are serious, but their location on a chain link is also important. A gouged or nick which runs across a link is more serious than one which runs parallel to the length of the link. Damage is most serious in the areas located on the inside and outside ends of a chain link. Sharp transverse nicks should be ground-out with a hand grinder. When the depth of the nick or gouge is greater than 15% of the chain link wire diameter, the chain should be removed from service.

CHAINS THAT HAVE BEEN REJECTED BECAUSE OF GOUGES OR NICKS should be evaluated as in "LOCALIZED STRETCH". There are possibilities that the chains were used on sharp corners and that padding or other means of chain protection would help. The hardness of the chain should also be checked.

CHECK MASTER LINKS for wear and correct style. If a pear shaped master link is used on a large crane hook it may not seat properly if inverted. The pear shaped master link is normally used only with a single sling chain. In most instances an oblong master link is desirable with multi-legged slings.

ALLOY STEEL CHAINS and chain slings shall not be heated above 600 degrees after being received from the manufacturer.

Should you have a problem where elevated temperatures are encountered, contact your chain manufacturer. There is a possibility that chains drawn at a higher temperature will help with your particular requirement.

UPON COMPLETION OF YOUR INSPECTION the inspection record cards should be reviewed. Information should now be available that could help reduce the number of future rejections.

STORAGE OF CHAINS - Chains should be hung on racks in the shop. If a survey reveals that there are excessive chains in a certain area, they should be removed to the storeroom or considered for usage in other parts of the plant. Good storage facilities will impress workers that chains must be given proper care at all times.

AND FINALLY, DO IT NOW! Don't allow chains with defects to lie around plant upon completion of the inspection. Workers will be impressed with your surveys and their importance if you take immediate action.

dent steel wire cored ropes should be used to prevent crushing. They can also occur if the hoist rope becomes slack and cross-coiled on the drum or trapped in the machinery. No further operations should be carried out until the rope has been payed out, examined for possible damage by a competent person and correctly re-spooled.

10) **High Stranding and Unlaying:** (Fig. 1.51) Replace the rope or renew the end connection to reset the rope lay. In cases such as this, excessive wear and crushing take place and the other strands become overloaded.

11) **Bird Caging:** (Fig. 1.52) Replace the rope or the affected section of the rope.

12) **Kinks:** (Fig. 1.53) Replace the rope or the affected section of the rope. They are usually caused by faulty handling or reeving. The strands become dog-legged and where running on sheaves are subject to excessive wear at the kink.

13) **Bulges in Rope:** Replace the rope, particularly if it is of a non-rotating construction. This is indicative of core slippage or "turns" being put into or taken out of the rope.

14) **Gaps or Excessive Clearance Between Strands:** Replace the rope.

15) **Core Protrusion:** (Fig. 1.54) Replace the rope.

16) **Unbalanced Severely Worn Areas:** (Fig. 1.55) Remove the affected section.

17) **Heat Damage, Torch Burns, Electric Arc Strikes:** Remove either the affected area or the rope.

When inspecting a rope remember that the rope speed has a bearing on the life of a rope. The life expectancy of a high speed rope, due to increased impact effects at sheaves and drums, friction and abrasion, is less than a slow speed rope. Due consideration must be given to this aspect and inspections made accordingly.

If the rope being inspected comprises multi-layers of strands, open it up and examine the inner strands. (Fig. 1.56)

Particular attention should be paid to those areas close to the terminal fittings. Where multi-layer drums are used, examine not only that part of the rope which is in constant use, but also the rope which may remain spooled and inoperative on the drum. Examine all

Fig. 1.51 High Stranding

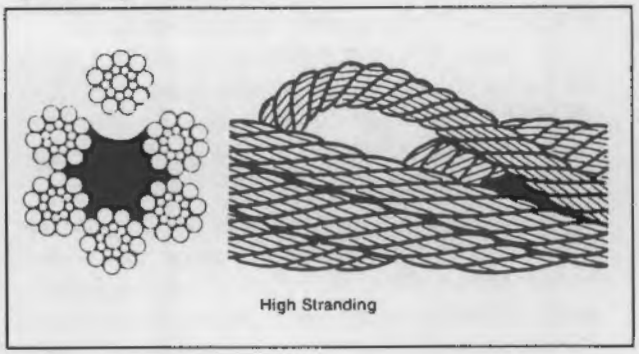
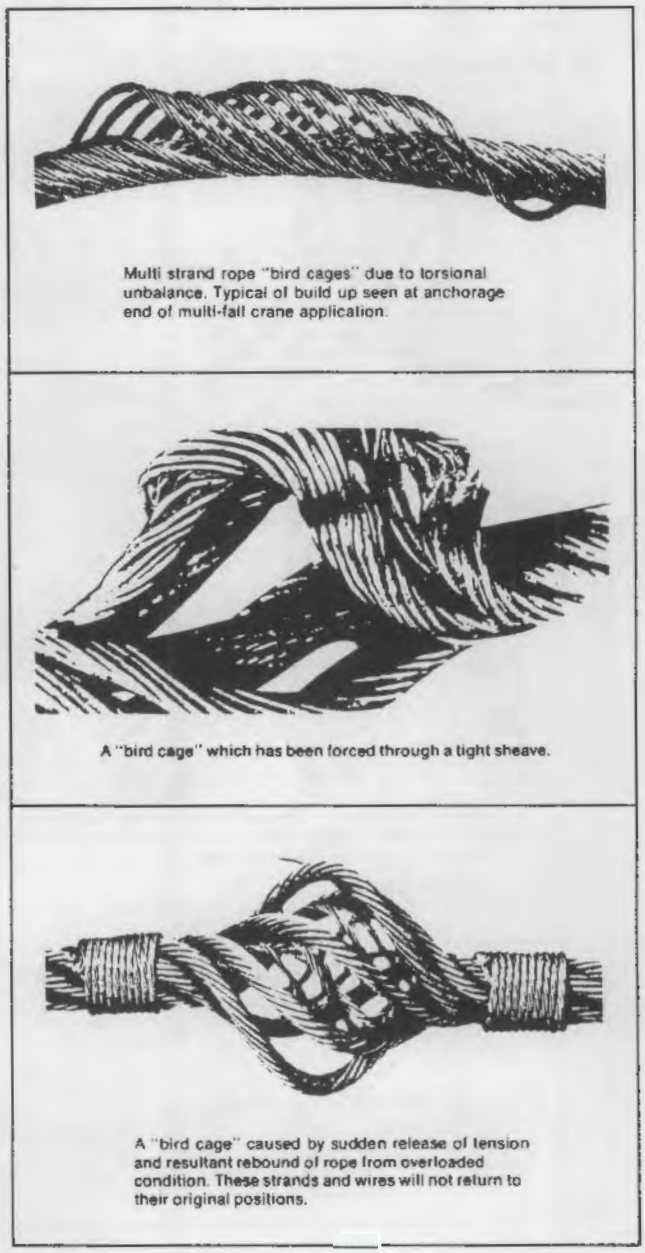


Fig. 1.52 "Bird Cages"



ropes, including standing ropes, for possible defects caused by corrosion, abrasive dust, and erection and dismantling procedures.

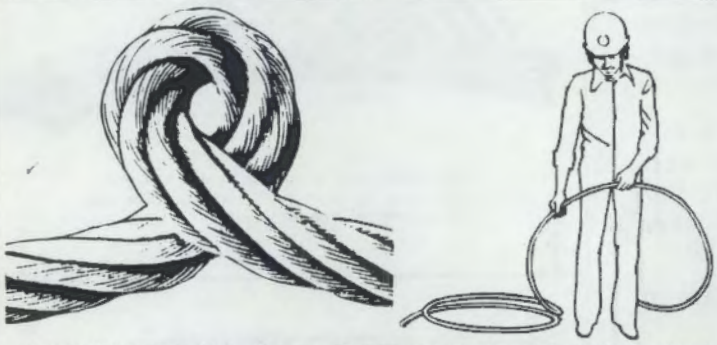
Permanent damage and deformation such as kinks, crushed, flattened, and distorted strands and unbalanced wear locations are the conditions which make a rope extremely susceptible to failure.

When replacing a rope, make certain that the replacement rope is of the correct size and construction. One of the most useful aids in selecting the proper wire rope is to examine the worn ropes that are to be replaced. Knowing what caused the deterioration of the old rope may indicate a direction of change. Table 1.9 and Fig. 1.57 may aid in this determination.

The manner in which the individual wires of a rope break can also give an indication of the probable cause of failure. (Fig. 1.58)

Like a chain, the weakest part of a rope determines the strength of the rope. This weak point may be where the rope is badly worn, where it has a number of broken wires, where the stresses are unequal in the strands, where the local stresses due to bending the rope over a sheave are excessive, or where the rope is attached to the equipment upon which it is used. It is only by inspection that potential hazards can be detected — and accidents avoided.

Fig. 1.53 Rope Kinks



An open kink such as this is often caused by improper handling and uncoiling as shown.

These ropes show the severe damage that results when kinked ropes are used. Local wear, distortion, misplaced wires and early failure are inevitable.

Fig. 1.54 Core Protrusion

Core protrusion as a result of torsional unbalance created by shock loading.

Protrusion of IWRC resulting from shock loading.

Fig. 1.55 Unbalanced Severely Worn Areas

Fatigued wires in one section of the rope only. Remainder shows relatively good condition.

Localized wear over an equalizing sheave. The danger of this type wear is that it is not visible during operation of the rope. This emphasizes the need of regular inspection of this portion of an operating rope.

Localized wear due to abrasion on supporting structure. Vibration of rope between drum and jib head sheave.

Fig. 1.56 Proper Method of Opening up a Rope

To open a rope, insert marlin spike beneath two strands and rotate to lift strands and provide view of interior.

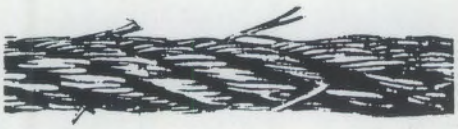
Fig. 1.57 Typical Rope Damage

Narrow path of wear resulting in fatigue fractures, caused by working in a grossly oversize groove, or over small support rollers.

Break up of IWRC resulting from high stress application. Note nicking of wires in outer strands.

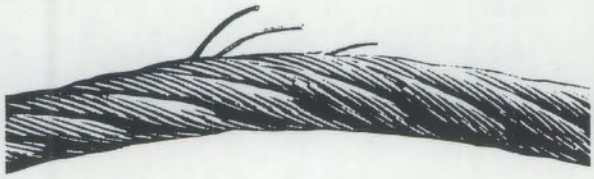
Two parallel paths of broken wires indicative of bending through an undersize groove in the sheave.

Wire fractures at the strand, or core interface, as distinct from crown fractures, caused by failure of core support.



An example of fatigue failure of a wire rope which has been subjected to heavy loads over small sheaves. The usual crown breaks are accompanied by breaks in the valleys of the strands, these breaks being caused by strand nicking resulting from the heavy loads.

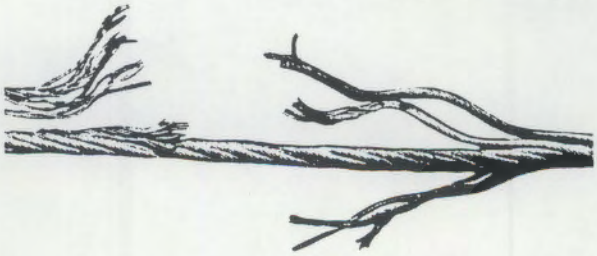
Wire rope that shows severe wear & fatigue from operating over small sheaves with heavy load and severe abrasion



A rope failing from fatigue after bending over small sheaves.

A wire rope which has jumped a sheave. The rope itself is deformed into a "curl" as if bent around a round shaft. Close examination of the wires show two types of breaks — normal tensile "cup and cone" breaks and shear breaks which give the appearance of having been cut on an angle with a cold chisel.

Mechanical damage due to rope movement over sharp edge projection while under load.



Rope break due to excessive strain.

ENVIRONMENT, SAFETY & HEALTH

SAFETY ACTION

Assistant Secretary for Environment, Safety & Health • U.S. Department of Energy • Washington, D.C. 20585

DOE/EH-0155 Issue No. 90-4 September 1990

COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS FOR HOISTING, RIGGING, AND OTHER MATERIAL HANDLING ACTIVITIES

COMPLIANCE

Recent incidents, as well as findings by DOE Tiger Teams, indicate that several DOE contractors are not complying with OSHA standards for hoisting, rigging, and other material handling activities. These standards are found in the Code of Federal Regulations, Title 29, Part 1910 (29 CFR 1910) Subpart N. Compliance with these standards is required by DOE Order 5483.1A.

Slings

More than half a dozen incidents at DOE facilities involved improper use of slings. Slings are often the final means of attachment and support in the rigging system used to hoist, lift, and move materials and equipment. Therefore, slings must be in good condition and used properly to avoid accidents similar to the ones described below:

1. On June 25, 1990, a nylon sling/strap used to hold two shipping containers onto a forklift broke with a noticeable "popping" sound. The forklift operator, startled by the sound, suddenly applied the brakes causing one of the containers to shift forward off the forklift tines onto the floor. The container, which held radioactive material, buckled slightly upon impact. Fortunately, no contamination was released.

   Post-incident analysis indicates that the unsecured end of the excessively long sling was run over by the wheel of the forklift, causing the sling to break. A careful inspection of the load should have revealed the potential problem.

2. A Tiger Team found the following violations of OSHA standards (29 CFR 1910.184) at another facility:

   - A nylon sling whose red internal marker was exposed.
   - A nylon sling that was badly worn and frayed.
   - Synthetic slings that were not tagged with the manufacturer's name, the rated capacity, or the type of material the sling was made of.
   - A wire rope sling that had numerous broken wires, had a nail driven between the strands, and was rusted over its entire length.

3. Another incident involved dropping a converter shell from a crane when old,

defective slings were used. Damage to the hood and air breather of the 20-ton crane was $1,565.

Noncompliance with OSHA standards for slings/straps used for hoisting and rigging caused these incidents, which had the potential to seriously injure workers or cause property or environmental damage. Regulation 29 CFR 1910.184 (on slings, which includes straps that are used to stabilize loads) states:

> Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects . . . . Damaged or defective slings shall be immediately removed from service.

Cranes

In addition to slings, cranes were found to be out of compliance with OSHA standards (29 CFR 1910.179) at several DOE facilities. Tiger Team findings showed that load-test records for at least 46 cranes were inadequate when measured against OSHA standards. These cranes were removed from service and placed under engineering evaluation. Other findings at one facility follow:

- o Crane and derrick machinery was not inspected before and during use to make sure it was safe. Violations included the following:
  - Hooks of an unknown size and rating were used.
  - Blocks with unknown ratings were available for use.
  - Load charts for crane setup were not available for operator use.
  - Length of boom, length of jib, offset of jib, and size of the hoist ropes were unknown.
  - Window in the cab was cracked.
- o Competent people were not designated by the employer to inspect all cranes and derricks.
- o Written, dated, and signed inspection reports and records for critical items such as brakes, crane hooks, and ropes were not kept on a monthly basis for a crane.
- o Rated load capacities, recommended operating speeds, and special hazard warnings and instructions were not conspicuously posted on a crane.
- o Wire ropes were not taken out of service when kinking resulted in distortion of the rope structure.

CORRECTIVE ACTIONS

DOE line, program, and operating contractor managers must ensure that their operations comply with OSHA standards found in 29 CFR 1910.184 for straps and slings and 29 CFR 1910.179 for cranes. Compliance with these standards includes, but is not limited to, the following:

- o Inspect slings, straps, and their fastenings for damage or defects each day before use. Remove damaged or defective items from service.
- o Ensure slings and straps are repaired, when necessary, only by the manufacturer or equivalent entity. Note: Proof-test each new, repaired, or reconditioned sling and strap.
- o Ensure that slings and straps are not loaded beyond their rated capacities.
- o Protect straps and slings from the sharp edges of loads.
- o Prohibit the shortening of straps or slings through the use of knots, bolts, or other makeshift devices.
- o Ensure that straps and slings are tagged with the manufacturer's name, the rated capacity, and the materials used to make the strap or sling.
- o Ensure that no sudden acceleration or deceleration occurs and that the load does not come in contact with any obstructions when hoisting a load.

- Provide the following inspections of cranes for wear, deterioration, and malfunction (dependent upon intervals and/or extent of use):

  - Frequent inspections--daily to monthly intervals.

  - Periodic inspections--1- to 12-month intervals.

Refer to the DOE Hoisting and Rigging Manual for more detailed guidance on how to comply with OSHA standards on these subjects. Also, refer to American National Standards Institute/American Society of Mechanical Engineers Standard B 30.9 (1984), Safety Code for Slings, for specific guidance on slings.

For more information or additional copies, contact Eleanor Crampton, Performance Assessment Division, Assistant Secretary for Environment, Safety & Health, U.S. Department of Energy, Washington, DC 20545; Telephone FTS 233-3732, Commercial (301) 353-3732.

_____ Plant

Sling Inspection Report (Wire Rope)

Location_____ Serial No._____

Type_____ Size_____ Reach_____ Load Limit_____

WIRE ROPE

Randomly distributed broken wires in one rope lay (10) . . . . . _____

Broken wires in one strand in one rope lay (5) . . . . . _____

Wear or scraping of outside individual wires . . . . . _____
(one-third original diameter)

Kinking . . . . . _____

Crushing . . . . . _____

Bird Caging . . . . . _____

Distortion of Structure . . . . . _____

Heat Damage . . . . . _____

Corrosion . . . . . _____

END ATTACHMENTS

Cracked . . . . . _____

Deformed . . . . . _____

Worn . . . . . _____

Corrosion . . . . . _____

SLING HOOKS

Check throat opening (15%) . . . . . _____

Check twist (10°) . . . . . _____

A Check Mark (✓) indicates -- no fault

Signature of Inspector_____ Date_____

_____ Plant

Sling Inspection Report (Chain)

Location_____ Serial No._____

Type_____ Size_____ Reach_____ Load Limit_____

CHAIN

Localized stretch or wear . . . . . _____

Grooving . . . . . _____

Twisted or bent links . . . . . _____

Cracks . . . . . _____

Gouges . . . . . _____

Corrosion pits . . . . . _____

Burns . . . . . _____

MASTER LINKS AND HOOKS

Check master links and hooks for any of the above faults . . . . . _____

Check hook throat opening (15%) . . . . . _____

Check hook twist (10°) . . . . . _____

A check Mark ( ) indicates -- no fault

Date of last inspection_____

Date of this inspection_____

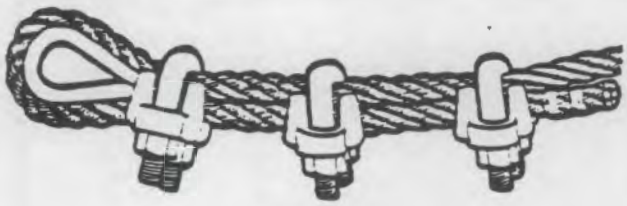
Signature of inspector_____

INSTALLATION OF CABLE CLIPS

Right and Wrong Ways of Using Cable Clips

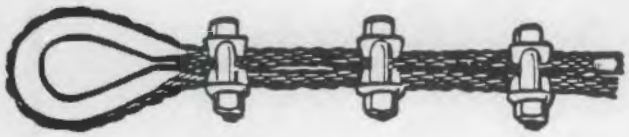
Correct
U-Bolt of all clips on dead end of rope

Incorrect
Do not stagger clips



Incorrect
U-Bolt of all clips on live end of rope

Double Saddle Clips (Fist Grip Clips)



Proper Method of Installing Cable Clips

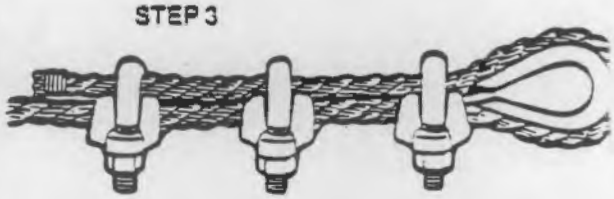
STEP 1

APPLY FIRST CLIP—one base width from dead end of wire rope—U-Bolt over dead end—live er rests in clip saddle. Tighten nuts evenly to recommended torque.

STEP 2

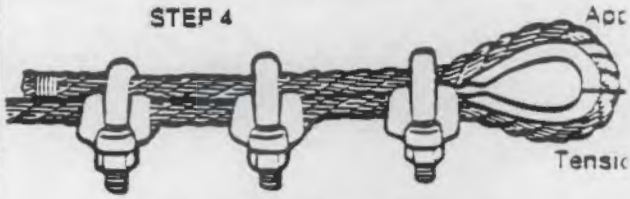
APPLY SECOND CLIP—nearest loop as possibl U-Bolt over dead end—turn on nuts firm but DO NOT TIGHTEN.

STEP 3



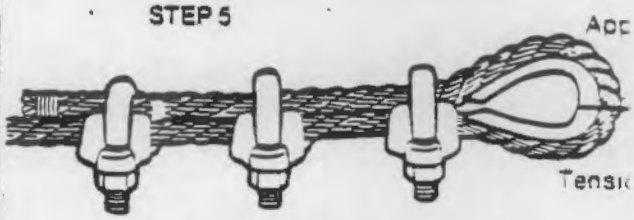
ALL OTHER CLIPS—Space equally between first two.

STEP 4



Apply tension and tighten all nuts to recommended torque.

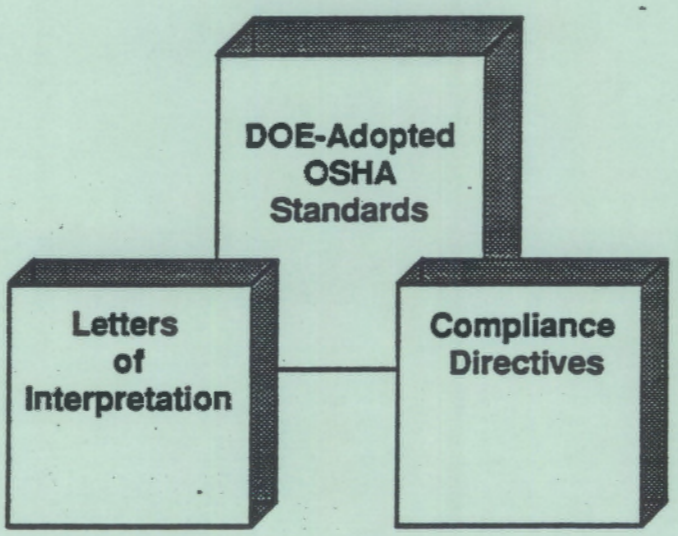
STEP 5



Recheck nut torque after rope has been in operation.

DOE Interpretations Guide to OSH Standards

Standards 1926.16 - 1926.551



Volume 6

OSH Information - Building Blocks for Compliance

OSHA INSTRUCTION STD 3-6.1
OCTOBER 30, 1978

OSHA PROGRAM DIRECTIVE #100-77

Subject: 29 CFR 1926.250(b)(1), Material Storage--As Related to Interim Storage of Temporary Flooring Used in Steel Erection

1. Purpose

The purpose of this directive is to clarify the application of 29 CFR 1926.250(b)(1), Material storage, as related to temporary flooring.

2. Documentation Affected

This directive supersedes Field Information Memorandum #74-85 dated October 22, 1974.

3. Background

Contractors have been cited under 29 CFR 1926.250(b)(1), when temporary flooring, in use during skeleton steel construction in tiered buildings, is bundled and placed over the edge of outer periphery while waiting to be picked up by a crane or derrick for movement to another tier.

4. Action

a.The temporary flooring is, in fact, in-process equipment--not stored material, covered under the provisions of Subpart R--Steel Erection, 29 CFR 1926.750. Temporary flooring not actually in use and placed in an area on the jobsite for an indefinite time would be considered as stored material, 29 CFR 1926.250(b)(1).

b.The temporary flooring, when not in use as a floor, shall be properly bundled and braced to prevent movement until ready for use at the next tier.

c.While process temporary flooring is being bundled, braced, picked or placed, all other applicable standards for employee protection shall be enforced.

5. Effective Date

This directive is effective immediately and will remain in effect until canceled or superseded.

OSHA Instruction STD 3-6.2
October 30, 1978

Jan. 31, 1978

OSHA PROGRAM DIRECTIVE #100-78

Subject: 29 CFR 1926.250(b)(1), Material Storage--As Related To interim Storage of concrete Forms and Shoring Between Placements

1. Purpose

The purpose of this directive is to clarify the application of 29 CFR 1926.250(b)(1), Material storage, as elated to concrete forms and shoring.

2. Documentation Affected

This directive supersedes Field Information of the National Office #74-86 dated October 22, 1974.

3. Background

It has been brought to the attention of the National Office that contractors have been cited under 29 CFR 1926.250(b)(1) when lumber normally used as concrete forms and shoring is bundled and stockpiled within 10 feet of an exterior wall which does not extend above the top of the material stored.

4. Action

a.The equipment used for shoring of newly placed concrete (forms, shoring jacks, clamps, steel rods or pipes, base plates and other items that are in use) is "equipment" subject to the standards contained in Subpart Q, 29 CFR 1926.700, 701 and 702. "Material storage" as defined in 29 CFR 1926.250(b)(1) does not apply except in a static situation.

b.When stripped forms and shoring are bundled and placed within close proximity to an open-sided floor (in order to preclude a "sidepick" by a crane), for movement to another tier for placement, it must be considered as in-process equipment. During routine operations, all normal safety precautions shall be taken. When the bundles are to be left overnight or for a longer period of time, they shall be anchored and braced in such a manner to prevent displacement in any direction. All periphery guards shall be in place except when the bundles are actually being removed through the opening.

c.Equipment of this type, not actually in use as process equipment and positioned on the jobsite for an indefinite period of time, would be covered under 29 CFR 1926.250(b)(1), Material storage .

d.The application of these standards depends on the specific conditions, as stated in the preceding paragraphs, found by the CSHO at the time of the inspection.

5. Effective Date

This directive is effective immediately and will remain in effect until canceled or superseded.

I

29 CFR 1926—SUBPART I
Tools—Hand and Power

TERMINAL OBJECTIVE
Identify hazards associated with the selection and use of portable hand and power tools.

ENABLING OBJECTIVES
1. Identify the general requirements for hand and power tools.
2. Identify the requirements for the care and use of hand tools.
3. Identify hazards associated with power operated hand tools.
4. Identify the safety measures necessary when using powder-actuated tools.
5. Describe the guarding requirements for abrasive wheel use.
6. Describe the safety requirements for using wood working tools.
7. Identify the requirements for safe jack use.

REFERENCES

1. U.S. Department of Labor. *29 CFR 1926, Safety and Health Regulations for Construction.*
2. American National Standards Institute. Standard B7.1, *Safety Requirements for the Use, Care, and Protection of Abrasive Wheels.*
3. ANSI B15.1, Safety Code for Mechanical Power Transmission Apparatus.
4. ANSI 01.1, Safety Code for Woodworking Machinery.

DURATION
One Hour

INSTRUCTOR MATERIALS
Course manual with instructor notes
Viewgraphs
White board, markers and pointer
Slide Projector
Overhead Projector

Terminal Objective

Identify hazards associated with the selection and use of portable hand and power tools.

Enabling Objectives

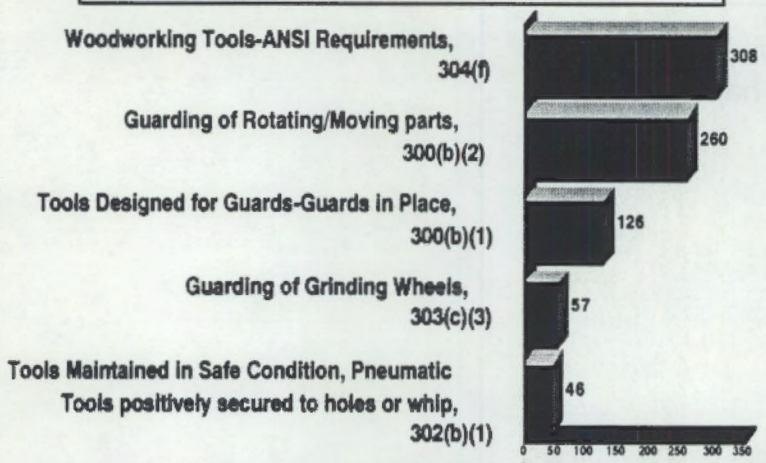
1. **Identify the general requirements for hand and power tools.**
2. **Identify the requirements for the care and use of hand tools.**
3. **Identify hazards associated with power operated hand tools.**
4. **Identify the safety measures necessary when using powder-actuated tools.**

Enabling Objectives

5. **Describe the guarding requirements for abrasive wheel use.**
6. **Describe the safety requirements for using wood working tools.**
7. **Identify the requirements for safe jack use.**

Subpart I—Tools Hand & Power

Violations Most Cited in 1992



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Subpart I—Tools Hand & Power Hand & Power

1926.300 General Requirements

(a) Maintained in safe condition

(b) Guarding-1910.212

(c) PPE provided as necessary

(d) Switches

- (1) Positive "on-off" control
- (2) Momentary contact with lock on control
- (3) Constant pressure

Objective 1

5

Subpart I—Tools Hand & Power

1926.301 Hand Tools

(a) Unsafe tools shall not be issued or used

(b) Wrenches shall not be used if the jaws are slipping

(c) Impact tools with mushroomed heads shall be dressed

(d) Tool handles shall be tight, sound, and free from splinters and cracks

Objective 2

6

1926.302 Power Operated Hand Tools

(a) Electric power in accordance with Subpart K

(b) Pneumatic power

(1) Secured to hose or whip

(3) Safety device in muzzle to prevent ejection of fasteners as missiles

(4) Compressed air used for cleaning

- 30 psi
- Chip guarding
- PPE

(8) Safety devices for spray guns

1926.302 Power Operated Hand Tools

(c) Fuel Power

(1) Fuel handling in accordance with Subpart F

(2) Use in enclosed spaces in accordance with Subpart D

(d) Hydraulic power

(1) Use fire resistant fluids, as per Schedule 30, U.S. Bureau of Mines, that meet rigid temperature extremes

(2) Shall not exceed manufacturers safe operating pressures.

1926.302 Power Operated Hand Tools

(e) Powder-actuated tool use

(1) Confined to employees trained on a particular tool

(2) Test tool daily before loading

(5) Load tools just before firing time

Defects or jamming requires immediate removal from service

1926.302 Power Operated Hand Tools

(e) Powder-actuated tool use

- DO NOT:
  - leave loaded tools unattended
  - drive into brittle or very hard metals (cast iron, live rock, face brick)
  - drive into easily penetrated materials without sufficient backing to prevent fastener penetration and misseling
  - drive into a spalled area (chipped)
  - use in explosive or flammable atmosphere

1926.303 Abrasive Wheels and Tools

(b) Guarding in accordance with ANSI B7.1

(c) (1) Floor and bench mounted wheels, safety hoods (90° maximum opening)

(2) Work rest 1/8" from wheel

(6) Flanges

(7) Ring testing

(3) Guarding cup-type wheels

(4) Internal grinding

(9) PPE in accordance with Subpart E

1926.304 Woodworking Tools

(a) All fixed power driven tools shall have electrical disconnects

Disconnect switch must be capable of being locked out and tagged in the off position

1926.304 Woodworking Tools

(d) Guarding powered circular saws

- Fixed upper guard
- Retractable lower guard
- Lower guard shall automatically and instantly return to covering position when removed from work

(f) ANSI O1.1

1926.305 Jacks

(a) (1) Capacity from manufacturer must be clearly marked

(2) Positive stop required to prevent over travel

(c) Blocking/cribbing to provide a firm foundation and better distribution of weight

References

ANSI A10.3-1970
SAFETY REQUIREMENTS FOR EXPLOSIVE - ACTUATED FASTENING TOOLS

A Summary

This summary is intended solely as an introduction to ANSI A10.3-1970. It cannot replace a thorough knowledge of the standard.

Scope

ANSI A 10.3-1970 provides safety requirements for a tool or machine which, actuated by explosives or any similar means, propels a stud, pin, fastener, or other object for the purpose of affixing it by penetration to any other object. This standard does not apply to devices designed for attaching objects to soft construction materials or to stud welding equipment.

3 Design Requirements

3.1 High Velocity Tools

The muzzle end of the toll shall have a protective shield or guard no less than 3½ inches in diameter, mounted perpendicular to and concentric with the barrel, and designed to confine any flying fragments or particles which otherwise might create a hazard.

The tool shall be designed so that it cannot be fired unless equipped with a standard protective shield or guard, or a special shield, guard, fixture, or jig.

The firing mechanism shall be designed so that the tool cannot fire during loading or preparation to fire, or if the tool is dropped. Tool firing shall be dependent on at least two separate and distinct operations of the operator, with the final firing movement being separate from the

operation of bringing the tool into firing position.

The tool is to be designed so as not to be operable other than against the work surface, and unless the tool is held against the work surface with a force at least five pounds greater than the total weight of the tool.

The tool shall be so designed that positive means of varying the power are available or can be made available to the operator in order for the operator to select an appropriate power level for the work to be done.

The tool shall be designed so that all breaching parts will be reasonably visible to allow a check for any foreign matter that may be present.

3.2 Low Velocity Piston Tools

The muzzle end of the tool shall be designed so that appropriate protective shields, guards, jigs, or fixtures, designed and built be the tool manufacturer, can be mounted perpendicular to the barrel. A standard spall shield must be supplied with each shield.

Other requirement are the same as for high velocity tools.

3.3 Hammer Operated Piston Tools

Tools of this type shall have the characteristics stated above.

4 Requirements for Loads and Fasteners

There shall be a standard method of identifying the power level of loads used in tools. Such identification shall consist of a uniform code of colors and numbers. Colors and printed descriptions must be strikingly printed on the container to provide a visual identification of the power level of the load.

Fasteners used in tools must be those specifically manufactured for use in such tools.

5. Approvals

Each approved tool must bear a permanent and unique manufacturer's serial number.

U.S. Department of Labor

Occupational Safety and Health Administration
Washington, D.C. 20210

Reply to the Attention of:

OSHA Instruction STD 1-13.2A
DEC 9 - 1985
Directorate of Field Operations

Subject: Explosive Actuated Fastening Tools

A. Purpose. This instruction provides specific interpretation as to when magazine-fed, explosive power operated hand tools are loaded.

B. Scope. This Instruction applies OSHA-wide.

C. Cancellation. OSHA Instruction STD 1-13.2, October 30, 1978, is canceled.

D. Action. OSHA Regional Administrators and Area Directors shall ensure that when magazine-fed tools covered by these standards are inspected, the tool is not considered loaded until the magazine feeds the tool, even though the magazine is in the tool. The operator's instructions shall provide for removing the magazine when the tool is left unattended.

E. Federal Program Change. This instruction describes a Federal program change which affects State programs. Each Regional Administrator shall:

1. Ensure that this change is promptly forwarded to each State designee.

2. Explain the technical content of this change to the State designee as requested.

3. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing, within 30 days of notification, to the Regional Administrator. This acknowledgment should include a description either of the State's plan to implement the change or of the reasons why the change should not apply to that State.

4. Review policies, instructions, and guidelines issued by the State to determine that this

change has been communicated to State program personnel. Routine monitoring shall also be used to determine if this change has been implemented in actual performance.

F. Application. For the General Industry, Construction and Maritime industries, the following standards shall apply:

- General Industry, 29 CFR 1910.243(d)(4)(iv).
- Construction, 29 CFR 1926.302(e)(5) and (6).
- Maritime, 29 CFR 1915.135(c)(3).

G. Explanation. In developing and promulgating the standards, the magazine or clip-fed explosive power load was not considered. The magazine contains several explosive power loads and single loads are fed into the ram (firing chamber) as needed. Until such time as single loads are fed into the ram, explosive power loads are not a part of the firing cycle. A separate operation on the part of the operator has to be made to place the load into the firing position.

John B. Miles Jr.

John B. Miles, Jr., Director
Directorate of Field Operations

DISTRIBUTION: National, Regional and Area Offices
Compliance Officers
State Designees
7(c)(1) Project Managers
NIOSH Regional Program Directors

ACCIDENT REPORT
FATAL FACTS

U.S. Department of Labor
Occupational Safety and
Health Administration
1986
No. 2

SUMMARY

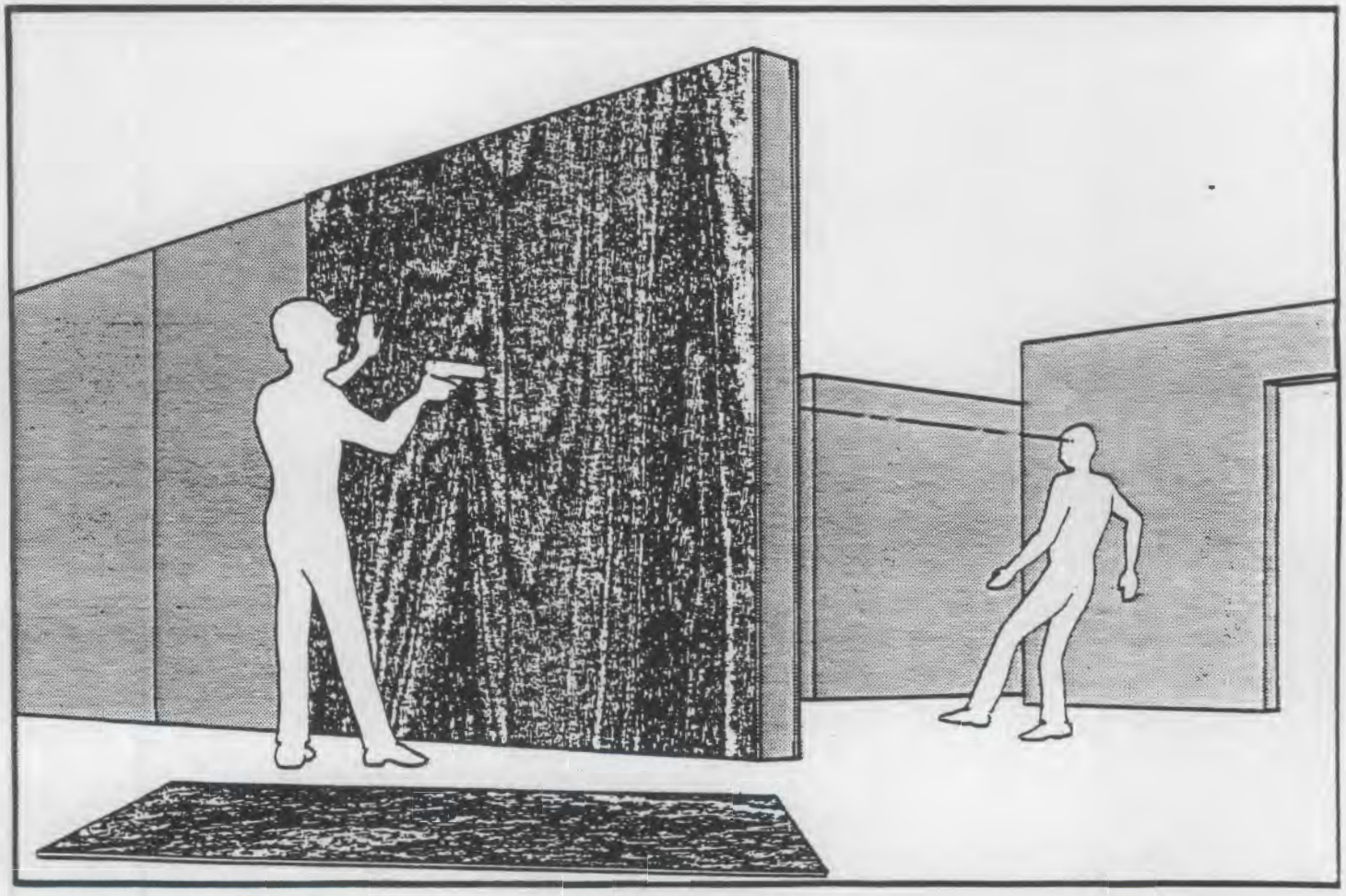
Accident Type:	Struck By Nail
Weather Conditions:	N/A
Type of Company:	General Contractors
Size of Work Crew:	17
Union or Non-Union:	Union
Worksite Inspection:	No
Designated Competent Person on Site:	No
Employer Safety and Health Program:	No
Training and Education for Employees:	No
Craft of Deceased Employee:	Carpenter
Age/Sex:	22; Male
Time of the Job:	3:00 PM
Time at the Task:	Unknown

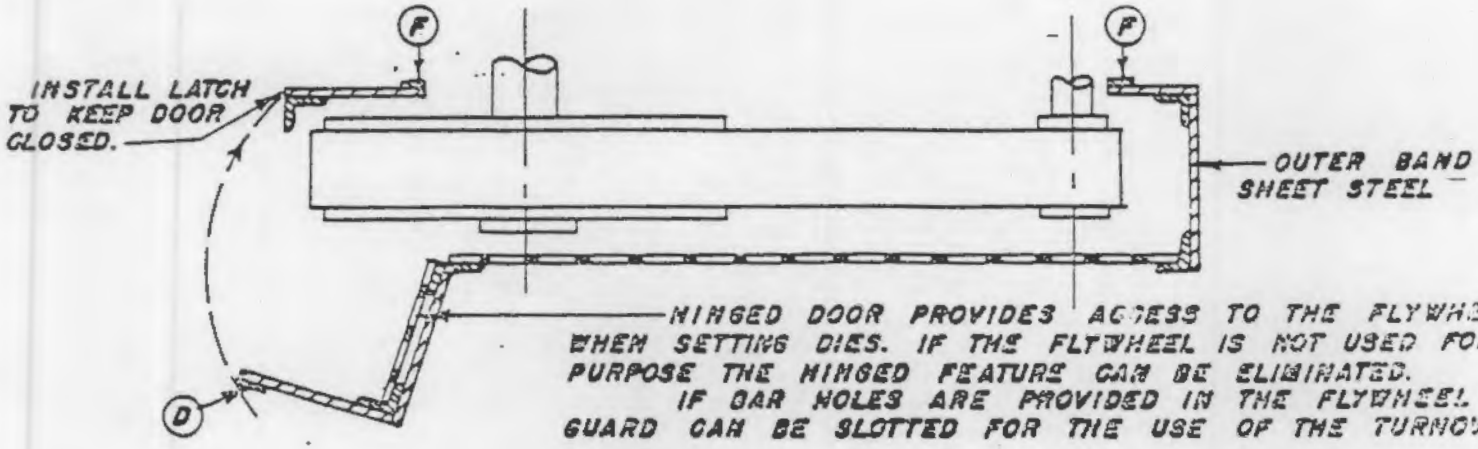
ACCIDENT DESCRIPTION

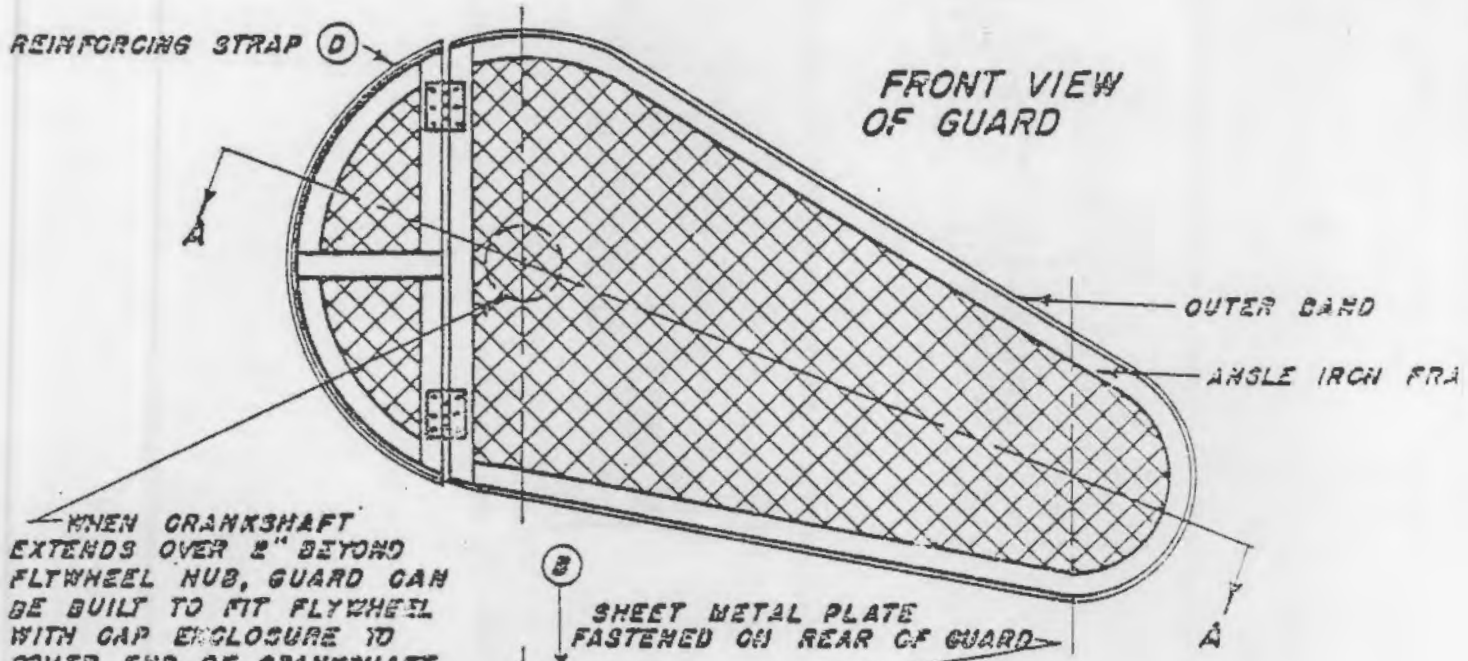
A carpenter apprentice was killed when he was struck in the head by a nail that was fired from a powder actuated tool. The tool operator, while attempting to anchor a plywood form in preparation for pouring a concrete wall, fired the gun causing the nail to pass through the hollow wall. The nail travelled some twenty-seven feet before striking the victim. The tool operator had never received training in the proper use of the tool, and none of the employees in the area were wearing personal protective equipment.

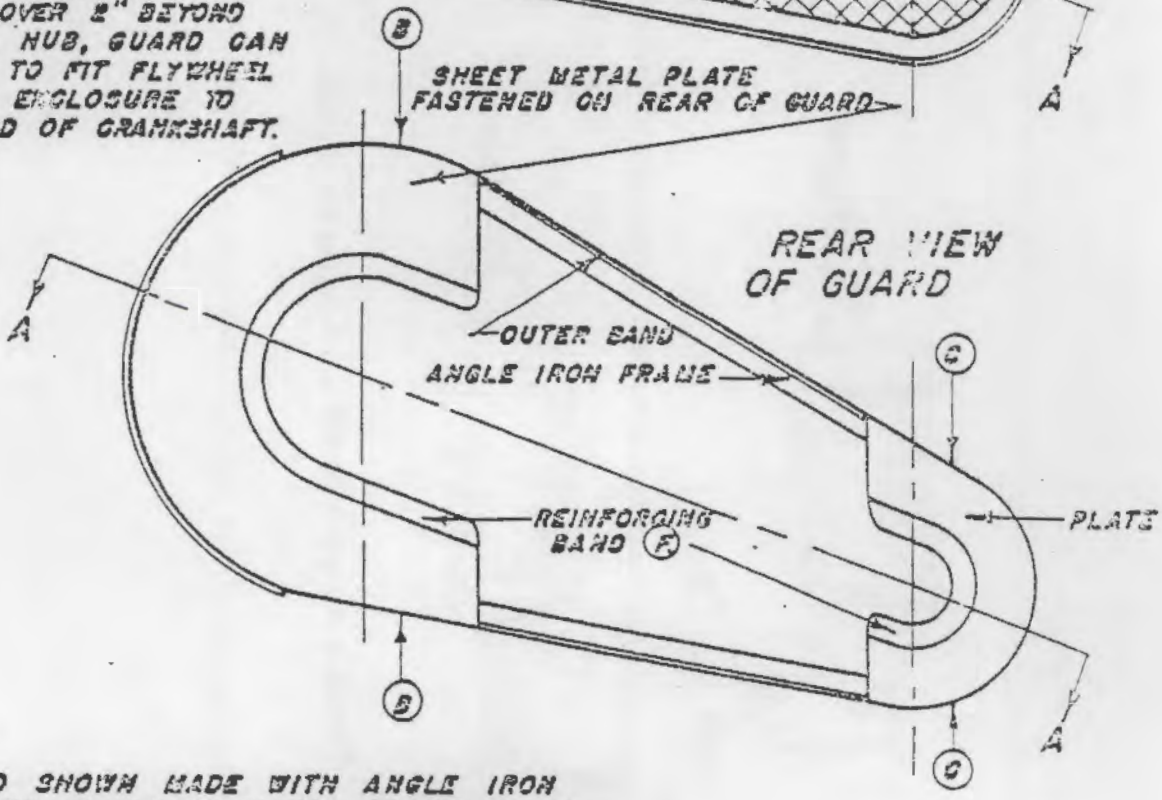
RECOMMENDATIONS

1. Institute a program for frequent and regular inspections of the job site, materials, and equipment by a competent person(s) (1926.20(b)(2))
2. Require employees exposed to the potential hazards associated with flying nails to use appropriate personal protective equipment. (1926.100(a) and 1926.102(a)(1)).
3. Train employees using powder actuated tools in the safe operation of the particular tool (1926.302(e)(1)).
4. Train employees operating powder actuated tools to avoid firing into easily penetrated materials (1926.302(e)(8)).



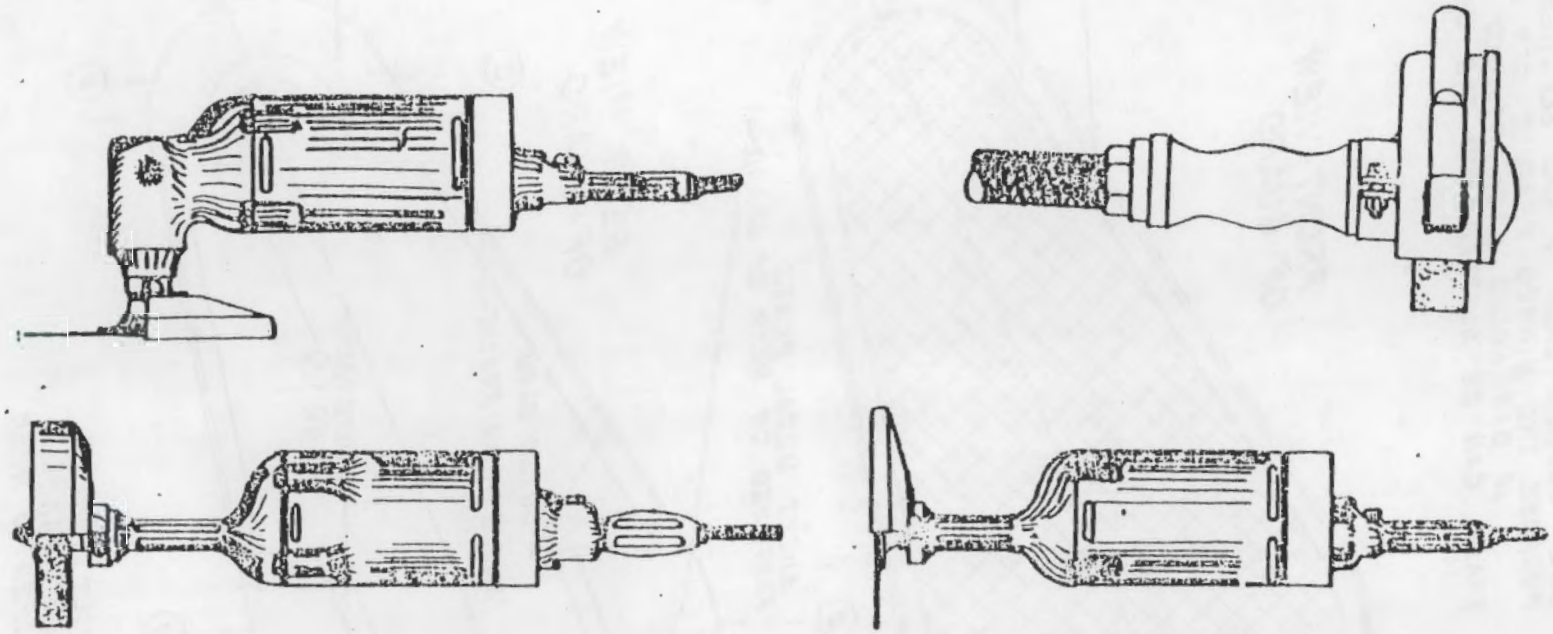






GUARD SHOWN MADE WITH ANGLE IRON FRAME AND EXPANDED METAL FRONT PANEL. SHEET METAL PLATES ARE ATTACHED TO REAR OF GUARD.

GUARD MAY BE OF SOLID OR PERFORATED SHEET METAL CONSTRUCTION. OPENING IN SIDE PANELS SHOULD NOT PASS $\frac{1}{2}$" DIA. BALL.

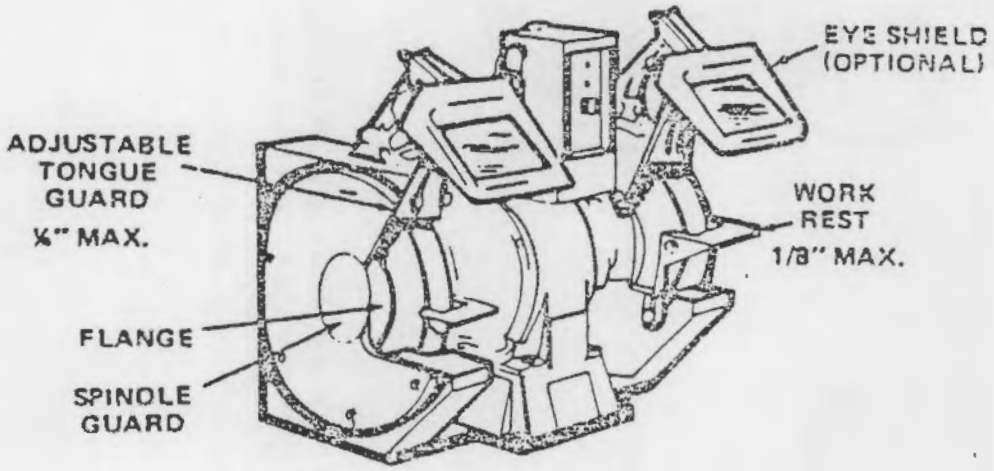


Portable abrasive wheel should also be guarded by as complete an enclosure as practical.

Grinders

Wheel safety guards must cover the spindle end, nut, and flange projections. The exposed area of the grinding wheel should not exceed one-fourth of the area of the entire wheel. When the guard opening is measured, the visors and other accessory equipment are not included as part of the guard unless they are as strong as the guard.

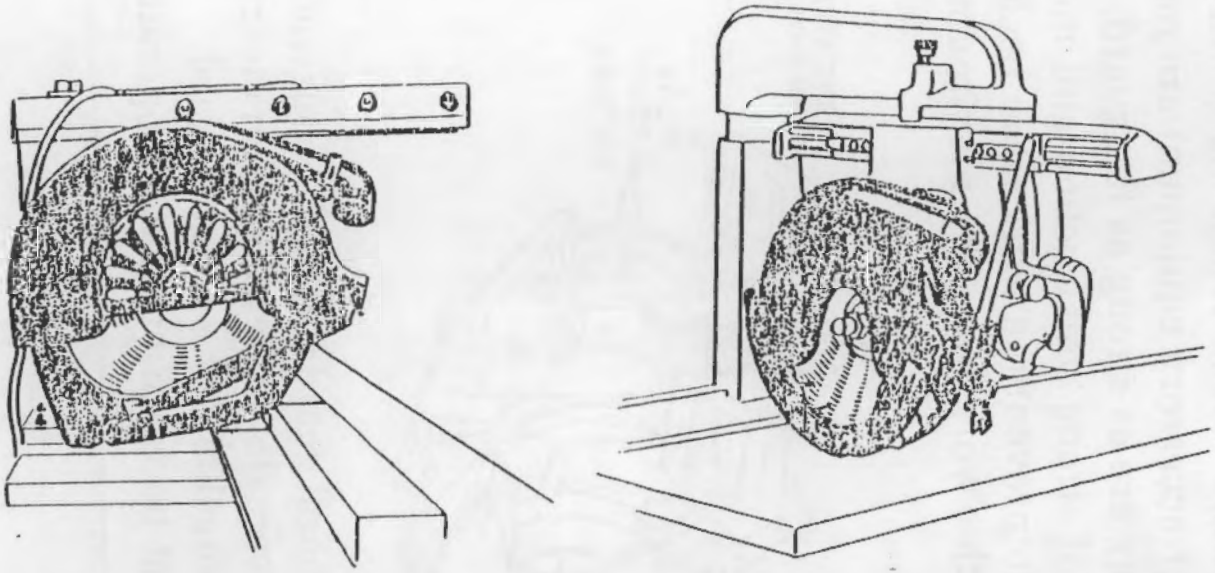
Work or tool rests must be of strong construction and must be kept closely adjusted to the wheel to prevent the work from becoming jammed between the wheel and the work rest. The maximum clearance allowed is 1/8 inch.



Tongue guards (upper peripheral guards) must be constructed so that they adjust to the wheel as it wears down. A maximum clearance of 1/4 inch is allowed between the wheel and the tongue guard.

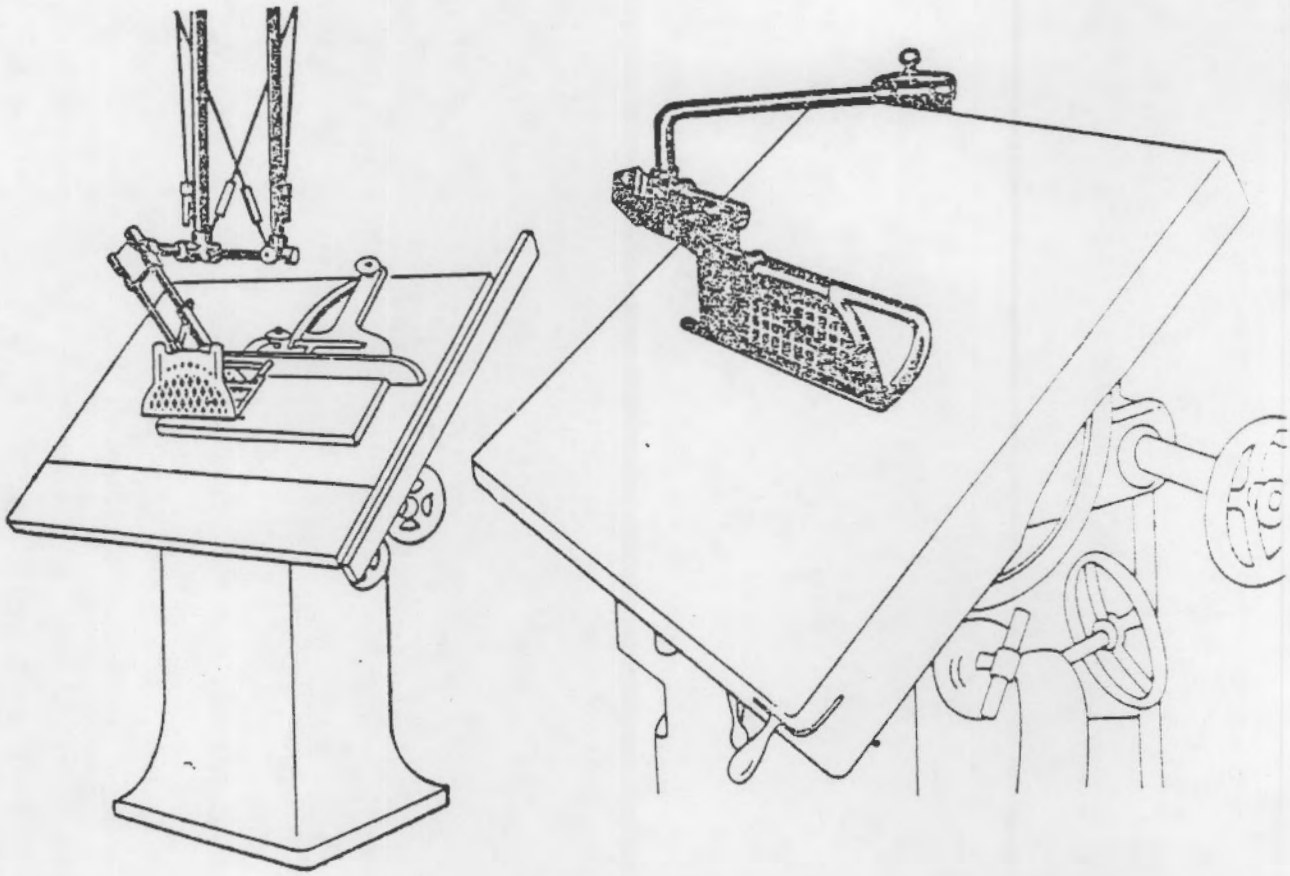
Goggles or a face shield must be worn by grinder operators.

Guarding Cutting Actions by Enclosure Guards



Radial saw. In addition to hood enclosing the blade, an adjustable stop should be provided to limit forward travel and head should automatically return to starting position. When used for ripping, a spreader and antikickback device should be provided.

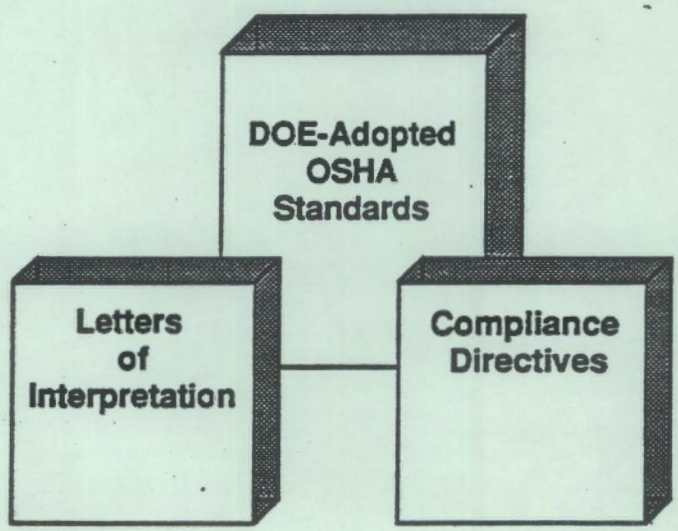
Guarding Cutting Actions by Enclosure Guards



Tilting table saw guard.

DOE Interpretations Guide to OSH Standards

Standards 1926.16 - 1926.551



Volume 6

OSH Information - Building Blocks for Compliance

RECORD ID 1772

STANDARD NUMBER 1926.302; 1926.449
INFORMATION DATE 861212

ABSTRACT This interpretation letter clarifies the 1926.302 requirement that all electrical conductors and equipment shall be of the approved double insulated type or grounded in accordance with Subpart K. Hand-held electrical construction tools, grounded and double insulated, are required to be tested by a qualified testing laboratory as indicated in the 1926.449 definitions applicable to Subpart K - Electrical standards.

(NOTE: Neither standard has not been amended since issuance.)

INTERPRETATION 29 CFR 1926.302; 1926.449

DEC 12, 1986

This is in response to your letter of October 6, 1986, requesting an official clarification of 29 CFR 1926.302. Your letter addressed to the Directorate of Technical Support was forwarded to this office for response.

29 CFR 1926.302(a) requires that all electrical conductors and equipment shall be approved. Therefore, we confirm your understanding that all hand-held electrical construction tools, grounded and double insulated, are required to be tested by a qualified testing laboratory as indicated in our 29 CFR 1926.449 definitions applicable to Subpart K - Electrical standards.

RECORD ID 1318

STANDARD NUMBER 1926.302(b)(7)
INFORMATION DATE 830606

ABSTRACT This clarification letter clarifies that the requirement for a safety device to automatically cut off the flow of compressed air applies only to pneumatic power tools.

(NOTE: This standard has not been amended since issuance.)

INTERPRETATION 29 CFR 1926.302(b)(7)

June 6, 1983

This is in response to your letter of May 9, 1983, requesting a clarification of 29 CFR 1926.302(b)(7).

Our review of this matter reveals that 29 CFR 1926.302(b)(7) requires all hoses exceeding 1/2-inch inside diameter to have a safety device at the source of the supply or branch line to reduce pressure in case of hose failure. Safety device, as mentioned above, means a contrivance or device that will prevent injury or avert danger and will automatically cut off the flow of compressed air, if a hose line ruptures or becomes disconnected. 29 CFR 1926.302(b)(7) applies only to pneumatic power tools.

Your letters and attachments have been forwarded to the Directorate of Safety Standards for their consideration in future standards development.

RECORD ID 1223

STANDARD NUMBER 1926.302(e)(7)
INFORMATION DATE 790725

ABSTRACT This interpretation letter addresses driving power activated fasteners into ductile cast iron ingot molds. Requirements for 1926.302(e)(7), derived from ANSI A10.3-1970, may be cited as de minimis (see directive 200-67) if in compliance with updated ANSI A10.3-1977 regarding fastening into any questionable material. Guidance is given to evaluate whether a fastener should be used on or into the surface material.

INTERPRETATION 29 CFR 1926.302(e)(7)

July 25, 1979

This is in reference to our letter dated May 2, 1979, concerning your request for a variance from Section 1926.302(e)(7) Power Operated Handtools - Power Activated Tools, of the Safety and Health Regulations for Construction.

You have requested a permanent variance from Section 1926.302(e)(7) for an operation involving the use of power activated fasteners being driven into ductile cast iron ingot molds. You have stated that this operation is performed by your employees on a continuing basis for various steel companies.

The above standard (derived from ANSI A10.3-1970, Safety Requirements for Explosive - Activated Fastening Tools) prohibits driving power activated fasteners into hard and brittle material including cast iron. However, the latest ANSI standard concerning this subject (ANSI A10.3-1977, Safety Requirements for Power Activated Fastening Systems) has been modified to provide guidance on fastening into any questionable material. Specifically, ANSI A10.3-1977 paragraph 10.3 still contains the language prohibiting the fastening of hard and brittle materials including cast iron, but also refers back to paragraph 9.10 of the same standard. ANSI A10.3-1977 paragraph 9.10 states as follows:

"Before fastening into any questionable material the operator shall determine its suitability by using a fastener as a center punch. If the fastener point does not easily penetrate, is not blunted, and does not fracture the material, initial test .fastening shall then be made in accordance with the tool manufacturer's recommendations (see 10.3)."

Our technical staff has thoroughly evaluated the data you submitted under date of April 30, 1979 which included a metallurgical report to show that the particular cast iron used in ingot molds is not hard or brittle and a laboratory report prepared by H.P. White Laboratories which concluded that the cast iron molds has sufficient malleability to permit power activated tool fastenings safely. It appears that your present method of fastening is acceptable. However, it is essential that all necessary safety requirements for this type of operation be observed including, but not limited to, appropriate personal protective equipment and proper barricading to isolate and protect your employees. Additionally, the appropriate laboratory testing (metallurgical) and center punch testing shall be made to assure that the metal characteristics of the ductile cast iron are receptive to a power activated fastener.

The enclosed Program Directive #200-67 has been issued to the Occupational Safety and Health Administration's (OSHA) field offices to provide guidance concerning de minimis violations. The Directive authorizes the use of de minimis violations in situations where OSHA standards (derived from such consensus groups as NFPA, ANSI, etc.) have been updated in later consensus publications in accord with new technology or equipment. However, the updated consensus standard shall provide equal or greater safety and health protection to the employees. A de minimis violation carries no penalty and no abatement is necessary.

From the information contained in your application, discussions with our technical staff, the Area Office and our solicitor, it has been determined that your present operation concerning fastening of ductile cast iron molds appears to meet the conditions of a de minimis violation under the terms of Program Directive #200-67 and ANSI A10.3-1977.

Affected employees and their authorized representatives shall be notified of our decision on your application in the same manner they were informed of your request for a variance.

No further action will be taken on your request for a variance.

J

29 CFR 1926—SUBPART J
Welding and Cutting

TERMINAL OBJECTIVE
Apply sound safety and health principles in welding, cutting and brazing operations in the construction industry.

ENABLING OBJECTIVES
1. State how to use, transport and maintain compressed gas cylinders safely.
2. Identify and explain the main types of welding processes and the major hazards associated with each.
3. Identify the fire control/prevention measures which shall be taken by welders.
4. Describe when ventilation or airline respirators are needed when working in confined spaces, or with preservative coatings, lead-based paint, and inadequate ventilation of toxic fumes and gases present.
5. State and explain the requirements for welding, cutting or heating when working with preservative coatings.

REFERENCES
1. U.S. Department of Labor. *29 CFR 1910, General Safety and Health Standards.*
2. U.S. Department of Labor. *29 CFR 1926, Safety and Health Regulations for Construction.*
3. DOE Order 5480.9 and 5483.1b (draft).
4. National Fire Protection Association Standards #51 & #51B
5. National Safety Council. *Accident Prevention Manual for Industrial Operations*; 9th ed., Volume I and II.
6. OSHA Training Institute Courses #222 & #322

DURATION
One Hour

INSTRUCTORS MATERIALS
Course manual with instructor notes
Viewgraphs
White board, markers and pointer
Slide Projector
Overhead Projector

Terminal Objective

Apply sound safety and health principles in welding, cutting and brazing operations in the construction industry.

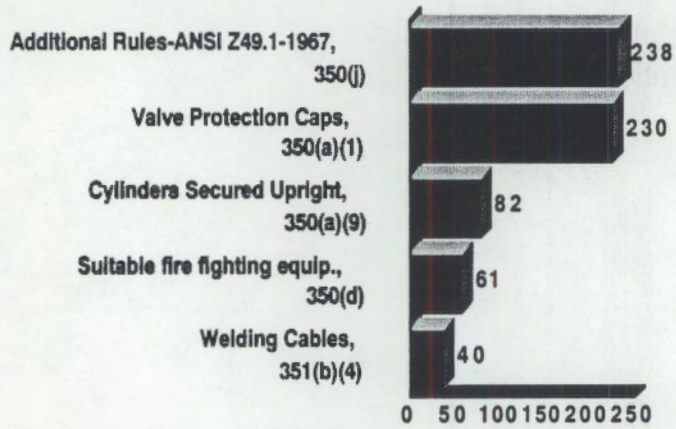
Enabling Objectives

1. **State how to use, transport and maintain compressed gas cylinders safely.**
2. **Identify and explain the main types of welding processes and the major hazards associated with each.**
3. **Identify the fire control/prevention measures which shall be taken by welders.**

Enabling Objectives

4. **Describe when ventilation or airline respirators are needed when working in confined spaces, or with preservative coatings, lead-based paint, and inadequate ventilation of toxic fumes and gases present.**
5. **State and explain the requirements for welding, cutting or heating when working with preservative coatings.**

Violations Most Cited in 1992



1926.350 Gas Welding and Cutting

(a) Transportation, moving and storing compressed gas cylinders

- (1) Valve protection caps
- (2) Hoisting cylinders
- (4) Secured in vertical position during transportation
- (6) Firmly secured during moving
- (7) Supported while in use
- (9) Secured in upright position at all times

1926.350 Gas Welding and Cutting

(b) Placing Cylinders

- (1) Protect from operations by distance or shielding
- (2) Cylinders shall not be placed where they can become part of electrical circuit
- (3) Fuel cylinders upright while in use
- (4) Cylinders not taken into confined spaces

1926.350 Gas Welding and Cutting

(d) Use of Fuel Gas

(1) "Cracking" valve before connecting regulator to clear dust/dirt from opening

(2) Valve open 3/4 to 1-1/2 turns

- special tools—wrenches shall be left on cylinders

(3) Regulator to reduce pressure required

(4) Close valve and depressurize regulator before removal of regulator

(5) Leaking cylinders

(6) Leaking fuse plug or other safety device—remove cylinder from work area

1926.350 Gas Welding and Cutting

(f) Hose

(1) Distinguishable—not interchangeable

(2) Taping

(3) Inspection

(4) Flashback occurance with hose—test to 2x intended pressure if suitable to use

(5) Disconnect by rotary motion

(6) Ventilated storage boxes

(7) Kept clear of passageways, ladders and stairs

1926.350 Gas Welding and Cutting

(g) Torches

(1) Cleaning wires for dogged tip.

(2) Inspection

(3) Lighting (friction lighters) or

(h) Regulators in working order

(i) Keep oil and grease away from oxygen

(j) Additional rules in ANSI Z49.1, Safety in Welding cutting

OSHA-Regulated Welding

Three basic welding types are covered by OSHA:

- ARC welding
- Oxygen/fuel gas welding
- Resistance welding

Welding Processes

Oxy-fuel gas welding or cutting

- usually the fuel used is acetylene
- hydrogen, propane or methane may also be used

Resistance welding

- lap welds (spot and seam welds)
- butt welds (metal ends are joined)

Brazing

Introduction to Welding Processes

Arc welding includes:

- SMAW (Shielded Metal Arc Welding) a.k.a. Stick Welding
- GMAW (Gas Metal Arc Welding) a.k.a. MIG Welding
- GTAW (Gas Tungsten Arc Welding) a.k.a. TIG Welding

Welding Hazards and Abatement

Hazards include:

- fumes
- gases
- radiation
  - ultraviolet (UV)
  - infrared (IR)
- noise
- electrocution

1926.351 Arc Welding and Cutting

(a) Electrode Holders
- (1) Capacity
- (2) Insulated

(b) Cables and Connectors
- (1) Insulated and handle maximum current
- (2) No splices within 10 feet of electrode end of cable
- (3) Splices
- (4) Repairs

1926.351 Arc Welding and Cutting

(c) Ground return and machine guarding
- (1) Current capacity > unit capacity
- (2) Prohibited returns
  - Flammable pipelines
  - Electrical circuits
- (3) Rejection of ground returns—arcs, sparks, heat
- (4) Bonding
- (5) Grounding of welding machine
- (6) Inspection of grounding connections

Subpart J—Welding and Cutting

1926.351 Arc Welding and Cutting

(a) Operating instructions - employee training

(1) Removal and protection of electrodes

(2) Electrodes not dipped in water

(3) Turning off machines

(5) Additional requirements in 1926.406(c)

(e) Shielding of direct rays

Subpart J—Welding and Cutting

1926.352 Fire Prevention

(a) Object moved to safe location or remove fire hazards

(b) Confinement of heat, sparks and slag

(d) Fire extinguishing equipment

(e) Fire watch

(f) Opposite side protection

(g) Enclosed and confined spaces

(i) and (j) Drums and containers

Subpart J—Welding and Cutting

1926.353 Ventilation and Protection

(a) Mechanical Ventilation

(1) General or local exhaust

(2) Sufficient to meet PEL's

(3) Local exhaust as close as practicable

(5) Replacement air

(b) Confined Spaces

(2) Conditions for air-line respirators and standby personnel

Subpart J—Welding and Cutting

1926.353 Ventilation and Protection

(c) Metals of Toxic Significance

(1) General mechanical or local exhaust

(2) Local exhaust and/or air-line respirator

(3) Filter—type respirators

(4) Protection of other employees

Subpart J—Welding and Cutting

1926.353 Ventilation and Protection

(d) Inert-gas metal-arc welding

(1) Ultra-violet radiation

(i) Chlorinated solvents

(ii) Filter lenses

(iii) Skin protection

(iv) Stainless steel

(e) General welding and cutting

(1) Unusual conditions

(2) Eye protection

Subpart J—Welding and Cutting

1926.354 Preservative Coatings

(a) Test for Flammability

(b) Stripping of highly flammable coatings

(c) Toxic Coatings

(1) Enclosed spaces

(2) Open air

(d) Use of artificial cooling

References

TABLE B-1

WELDING
CONSTRUCTION
TYPE OF ACCIDENT
BY INCIDENT TYPE

Type of Accident	Operating Procedure	Equipment Material Facility	Environ-mental Conditions	Other	Number of Fatalities
Fall from elevations including through openings	14	4	0	0	18
Fire/explosion welding/cutting large asphalt/fuel/etc. tanks	11	0	0	0	11
Explosion from cutting into drum/barrel/small container . .	7	0	0	0	7
Fire/explosion in open surroundings from vapors/flammables .	4	1	1	1	7
Caught under or between collapsing material/objects	2	2	2	0	6
Struck/crushed by toppling objects, supports cut/weakened .	6	0	0	0	6
Electrocution	1	2	1	1	5
Fire/explosion while in confined work space	4	0	0	0	4
Caught in, under, or between machinery/equipment/vehicles .	4	0	0	0	4
Asphyxia/poisoning from hazardous vapors, smoke, etc. . . .	3	0	0	0	3
Explosion/fire resulting from welding/cutting pipes to tank	2	0	0	0	2
Struck/crushed by falling objects	1	1	0	0	2
Explosion/fire from tanks/containers used as work supports .	1	0	0	0	1
Burns/injuries from trailer/tank truck explosion/fire . . .	1	0	0	0	1
Inside steel cage that fell	0	1	0	0	1
Burned in flash fires	1	0	0	0	1
Fall preceded by electrical shock	0	0	0	1	1
*** Total ***	62	11	4	3	80

TABLE B-2

WELDING
CONSTRUCTION
EMPLOYEE ACTIVITY
BY INCIDENT TYPE

Employee Activity	Operating Procedure	Equipment Material Facility	Environ-mental Conditions	Other	Number of Fatalities
Installing/repairing metal objects/materials	8	2	0	2	12
Welding/cutting on large fuel/water tanks, boilers, etc. . .	10	0	0	0	10
Welding/cutting drums/barrels containing Hazardous Materials	8	0	0	0	8
Welding/cutting steel beams, bulk heads, catwalks, etc. . .	6	1	1	0	8
Welding/cutting operations in confined work space.	5	0	0	0	5
Handling material during welding/cutting job	3	2	0	0	5
Not clear	4	0	0	0	4
Welding/cutting near flammable material/explosive vapors . .	4	0	0	0	4
Moving self/equipment from one area to another on the job. .	2	1	0	0	3
Unknown	1	1	0	1	3
Directing/giving instructions to employees	0	1	2	0	3
Welding pipes, lines, valves, etc.	1	1	0	0	2
Lighting/relighting or preparing torch to weld	1	1	0	0	2
Cutting supports from tanks, bins, etc.	2	0	0	0	2
Performing maintenance/adjusting welding machine/equipment .	0	1	1	0	2
Welder used sledge hammer to break up concrete	1	0	0	0	1
Checking/measuring/adjusting or placing equipment/material .	1	0	0	0	1
Going to/preparing for/cleaning up/leaving work.	1	0	0	0	1
Attempting to escape an area where fire had ensued	1	0	0	0	1
Walking/working on unsecured plank or platform	1	0	0	0	1
Attempting to retrieve or remove an article/object, etc . .	1	0	0	0	1
Used torch, not his job to do so	1	0	0	0	1
*** Total ***	62	11	4	3	80

TABLE B-3

WELDING
CONSTRUCTION
WORK LOCATION
BY INCIDENT TYPE

Work Location	Operating Procedure	Equipment Material Facility	Environ-mental Conditions	Other	Number of Incidents
Inside tanks, containers and other confined work spaces . .	8	0	0	0	8
On steel beams, girders, steel structure, etc.	6	2	0	0	8
Near storage tanks/large containers in work area	5	0	0	0	5
Outside areas, e.g. junkyards, fields, yards, etc.	3	1	1	0	5
Establishment, shop, plant floor	3	2	0	0	5
Roofs of buildings, sheds, balconies	3	1	0	0	4
Roofs of tanks, bins, freezer units, compactors	3	0	0	1	4
On permanent/semi-permanent platform/catwalk/rack	4	0	0	0	4
On scaffold	2	2	0	0	4
On platform of cherry picker, other mobile platform/cages .	1	1	1	0	3
Repairing/cutting drums/barrels in work area, e.g., garage .	3	0	0	0	3
In buildings/structures being demolished	3	0	0	0	3
On ladders or step-ladders	1	1	0	0	2
Unknown location	1	0	0	1	2
Inside/on/near buildings being constructed	0	0	1	1	2
Near large pipes, lines	2	0	0	0	2
Basement of building, plant	2	0	0	0	2
On or near tank trucks	2	0	0	0	2
On docks, piers	1	0	0	0	1
On or near asphalt tanks	1	0	0	0	1
Sidewalk over basement	1	0	0	0	1
Top of missile launcher silo	0	1	0	0	1
Inside enclosed area of gang saw, under machines	1	0	0	0	1
Garage floor	1	0	0	0	1
Over empty caisson	1	0	0	0	1
*** Total ***	58	11	3	3	75

COMMON WELDING PROCESSES

PROCESS	USED FOR	SHIELDING	SMOKE/FUME	LIGHT/RADIATION	SPECIFIC HAZARD
Stick (SMAW)	Gen. purpose, more than 50% of all welding	electrode coating	high	moderate-variable	depends on electrode, e.g. (low hydrogen-fluorides) (stainless-chromium and nickel)
MIG (GMAW)	High production/ automation	Inert gas (Argon, Helium), Carbon Dioxide	moderate	high-esp. with reflective metal and Argon shield	ozone carbon monoxide (with CO_2 shield) stainless-chromium & nickel
TIG (GTAW)	high precision	Inert gas	low	high	ozone, light
Plasma (PAW)	process can be used to weld, cut, metal spray	gas	moderate/ high	moderate/high	noise, electrical shock, potential x-radiation
Flux core (FCW)	high production/ automation,(like MIG with flux filled wire)	wire filling with or without gas	high	moderate/high	high fume levels
Sub Arc (SAW)	horizontal welds high production	granular flux	low	no visible arc unless have "breakthrough"	generally low hazard
Oxyacetylene (OAW)	thin to medium thickness metals, steel and non-ferrous in all positions	filler rod coating	low/ moderate	low	compressed gas cylinders depends on filler rod, e.g. (silver brazing - cadmium)
Air arc	"gouging",weld preparation	none	very high	high	noise, high fume levels

CYLINDER STORAGE FOR ACETYLENE (C_2H_2)

Acetylene gas may be stored in cylinders specifically designed for this purpose. The gas is first passed through filters and purifiers and then compressed into cylinders to a pressure of approximately 250 psi. The storage of acetylene in its gaseous form under pressure is not safe at pressures above 15 psi. The method used to safely store acetylene in cylinders is as follows:

1. The cylinders are filled with a substance such as pith from cornstalk, fuller's earth, lime silica, and similar substances, which absorb acetone.
2. The cylinders are then charged with acetone which absorbs acetylene.

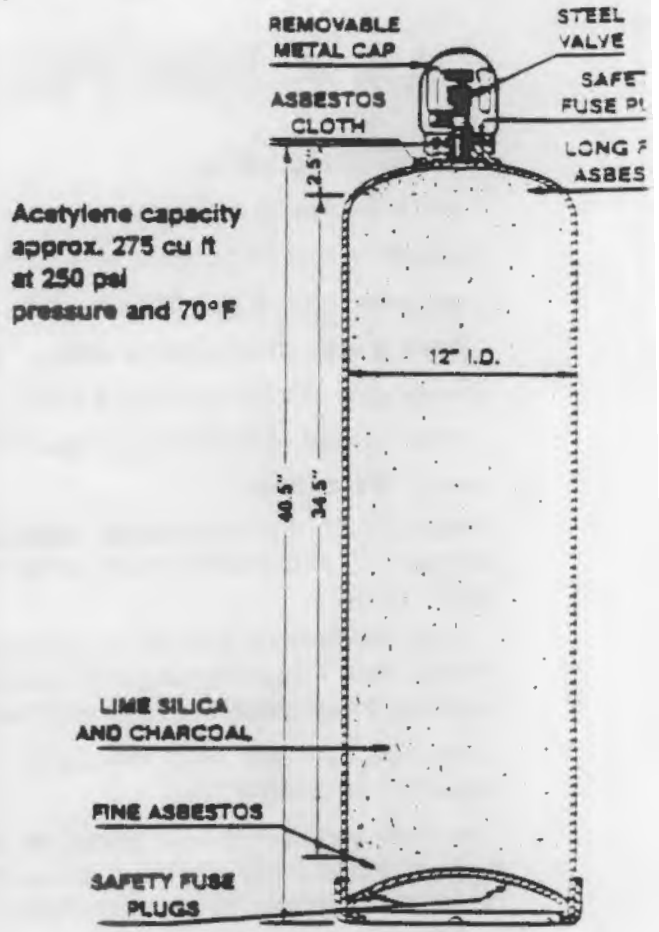
The theory is that the acetylene molecules fit in between the acetone molecules. Using both of these techniques prevents the accumulation of a pocket of high pressure acetylene.

Safety fuse plugs have a metal center which will melt at a temperature of approximately 212°F. If the cylinder should be subjected to a high temperature the plugs will melt and allow the gas to escape before the pressure builds up enough to burst the cylinder. These precautions are necessary as the pressure in an acetylene cylinder builds up rapidly with an increase of temperature.

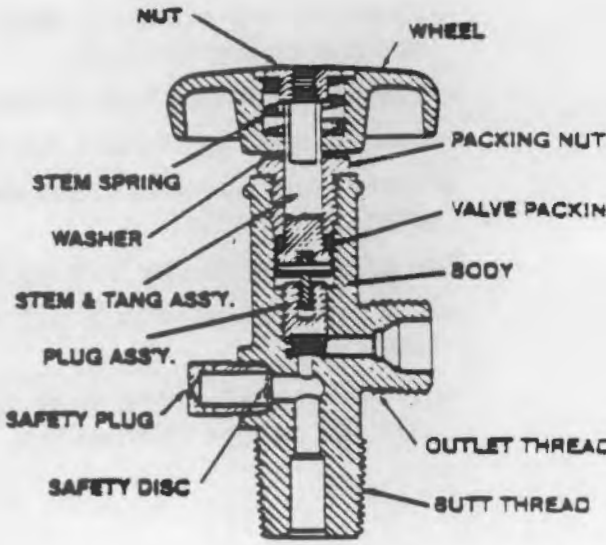
Acetylene cylinder valves come in two types. A common type is provided with a 3/8-in square shank. It is turned by means of a 3/8-in square box socket wrench. It is recommended that this cylinder valve be opened only 1/4 to 1-1/2 turns. The wrench should be left on the valve stem at all times that the valve is open, in order that the valve may be closed quickly in emergencies.

Another type of acetylene cylinder valve is fitted with a handwheel (see sketch). The regulator fitting is a female fitting.

The amount of acetylene in a cylinder cannot be estimated by the pressure in the cylinder because the gas discharge pressure will remain fairly constant (depending on the temperature) until most of the gas is consumed.



Cut-away view of acetylene cylinder showing the porous filler. Note the fuse plugs at the top and bottom of cylinder.



THE SLEEPING GIANT

I AM A HIGH PRESSURE, COMPRESSED GAS CYLINDER

I stand 57 inches tall.

I am 9 inches in diameter.

I weigh in at 155 pounds when filled.

I am pressurized at 2,200 pounds per square inch (psi).

I have a wall thickness of about ¼ inch.

I wear a regulator and hose when at work.

I wear a label to identify the gas I'm holding. My color is not the answer.

I transform miscellaneous stacks of material into glistening ships and many other things—when properly used.

I may transform glistening ships and many other things into miscellaneous stacks of material—when allowed to unleash my fury unchecked.

I can be ruthless and deadly in the hands of the careless or uninformed.

I am too frequently left standing alone on my small base without other visible means of support—my cap removed and lost by an unthinking workman.

I am ready to be toppled over—when my naked valve can be damaged or even snapped off—and all of my power unleashed through an opening no larger than a lead pencil.

I am proud of my capabilities—here are a few of them:

—I have on rare occasions been known to jetaway—faster than any dragster.

—I might smash my way through brick walls.

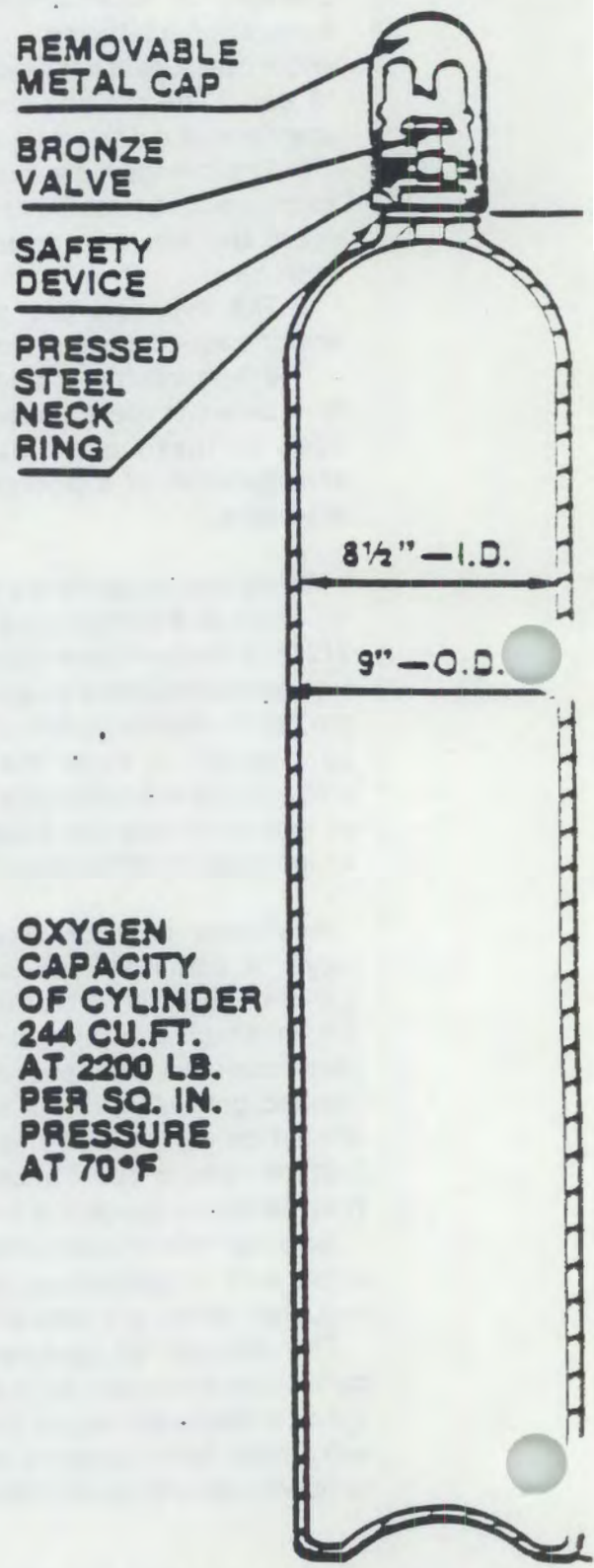
—I might even fly through the air.

—I may spin, ricochet, crash and slash through anything in my path.

You can be my master only under these terms:

—Full or empty—see to it that my cap is on, straight and snug.

—Never—repeat—never leave me standing alone. Secure me so that I cannot fail.



"TREAT ME WITH RESPECT—I AM A SLEEPING GIANT"

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210

OCT 1976

STD 3-8.1

OSHA PROGRAM DIRECTIVE #100-53

OSHA Instruction
October 30, 1976

To: REGIONAL ADMINISTRATORS/OSHA

Subject: Welding, Cutting or Heating of Metals Coated with Lead-Bearing Paint

References: (a) 29 CFR 1926.353(c)(2)(i)
(b) 29 CFR 1926.354(c)(1)

1. Purpose

This directive explains the requirements imposed by the referenced sections of 1926.353 and 1926.354 when welding, cutting or heating is performed in an enclosed space on metals coated with lead-bearing paint.

2. Documents Affected

None.

3. Explanation

In the Construction Industry, the referenced sections of 1926.353 and 1926.354 apply jointly when welding, cutting or heating is performed in an enclosed space on metal coated with lead-bearing paint. Reference (a) requires employers to provide local exhaust ventilation or to protect employees with airline respirators. Reference (b) requires employers to ensure that the paint is stripped back at least 4 inches from the area of heat application or to protect the employees with airline respirators. A presentation on the dual impact of references (a) and (b) is in order.

4. Action

a. Sections 1926.353(c)(2)(i) and 1926.354(c)(1) have joint application when welding, cutting or heating is being performed in an enclosed space on metals coated with lead-bearing paint.

b. There must be compliance with the following dual requirements:

(1) At all times, the toxic preservative coating must be stripped back at least 4 inches from the area of heat application (1926.354(c)(1));

(2) If the concentration of a substance in the breathing zone of the employee exceeds the threshold limit value (TLV) referenced in section 1926.55 (a), local exhaust ventilation must be provided in addition to the stripping back procedure (1926.353(c)(2)(i)).

c. When conformity with these requirements fails to reduce concentrations below the TLV, or when the techniques are impossible to implement, then employees must be provided with airline respirators. (See 1926.103 (a)(1)). All possible paint-stripping and provision of local exhaust ventilation must be continued even though it is determined that airline respirators must be used.

d. The area of heat application is interpreted to be the surface area that the flame or arc contacts.

e. In some instances it may be difficult to visually ascertain the edge of the area of heat application. In those instances where, because of this difficulty, it is uncertain from visual observations whether the lead-bearing paint is stripped back 4 inches from the area of heat application, the OSHA compliance officer shall mark the edge(s) of the stripped surface that is (are) distal from the center of heat application with temperature indicating crayons having a 500°F melting point. Melting of the crayon markings shall be the criterion for affirming insufficient stripping of the lead-bearing paint.

f. Temperature indicating crayons may be purchased locally from scientific equipment supply houses. If help in locating a supply source is needed, contact the National Office at the telephone number given at the end of this directive.

5. Effective Date

This directive is effective immediately and shall be retained until further notice. Questions may be directed to Mr. Gail M. Brinkerhoff of the OSHA Washington, D.C. National Office - 523-8098.

Barry J. White
Associate Assistant Secretary
for Regional Programs

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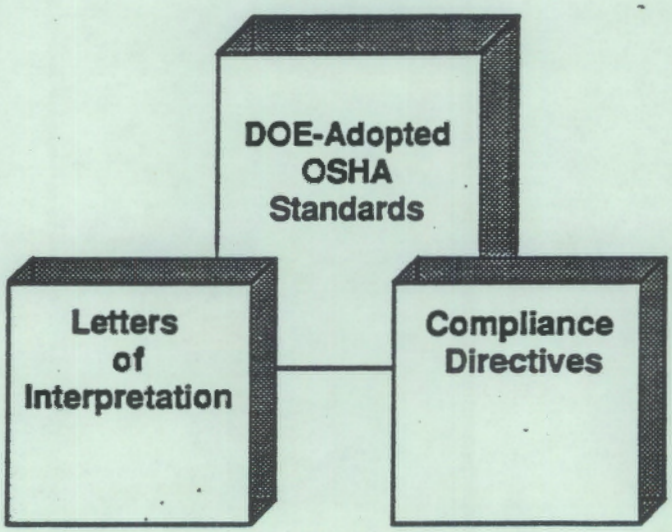
Standards 1926.16 - 1926.551



Volume 6

OSH Information - Building Blocks for Compliance

OSHA Instruction STD 3-8.1

OCT 30, 1978

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K

29 CFR 1926—SUBPART K
Electrical

TERMINAL OBJECTIVE
Identify the hazards, requirements and safeguards which apply to electrical safety requirements in the construction industry.

ENABLING OBJECTIVES
1. State Ohms Law and explain the effects of current, path, and duration of human contact, with electricity.
2. Define the following electrical terms: ground, grounded conductor, grounded, grounding conductor, earth, GFCI, qualified, ohms, volts, amps and hazardous locations.
3. State and explain the four major divisions of Subpart K.
4. Identify the general requirements for the safety and health of employees working in and around electricity.
5. Identify the options for ground-fault protection of construction equipment.
6. Identify the requirements for:
   - outside conductors and lamps
   - wiring design and protection
   - services overcurrent protection
   - temporary wiring
   - flexible cords and cables
   - general use equipment
   - specific purpose equipment
7. Identify the requirements for lockout and tagging of circuits.
8. Identify the requirements for charging batteries.

REFERENCES

1. U.S. Department of Labor. *29 CFR 1926, Safety and Health Regulations for Construction.*
2. National Fire Protection Association. Subscription Service Code 70, *National Electric Code, current edition*

DURATION
Two Hours

INSTRUCTORS MATERIALS
Course manual with instructor notes
Viewgraphs
White board, markers and pointer
Slide Projector

Terminal Objective

Identify the hazards, requirements and safeguards which apply to electrical safety requirements in the construction industry.

Enabling Objectives

1. Restate Ohms Law and explain the effects of current, path, and duration of human contact, with electricity.
2. Define the following electrical terms: ground, grounded conductor, grounded, grounding conductor, earth, GFCI, qualified, ohms, volts, amps and hazardous locations.
3. State and explain the four major divisions of Subpart K.
4. Identify the general requirements for the safety and health of employees working in and around electricity.

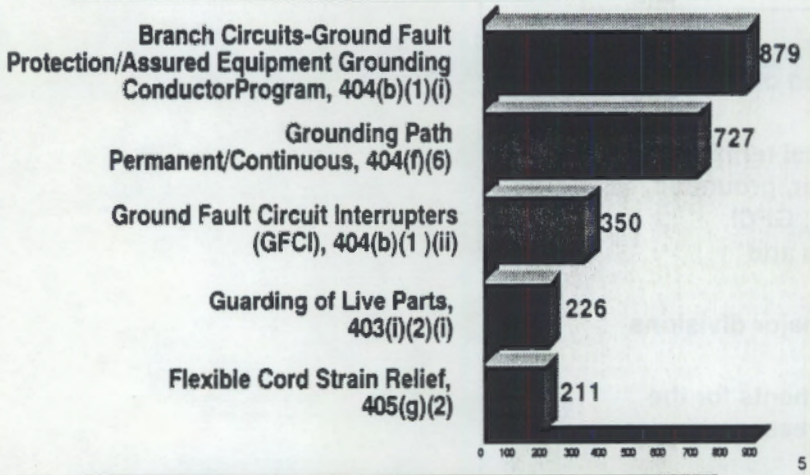
Enabling Objectives

5. Identify the options for ground-fault protection of construction equipment.
6. Identify the requirements for:
   - outside conductors and lamps
   - wiring design and protection
   - services overcurrent protection
   - temporary wiring
   - flexible cords and cables
   - general use equipment
   - specific purpose equipment

Enabling Objectives

7. Identify the requirements for lockout and tagging of circuits.
8. Identify the requirements for charging batteries.

Violations Most Cited in 1992



1926.449 Definitions

Definitions

- Approved, Accepted, Acceptable, Listed
- Grounded
- Grounding
- GFCI
- Earth
- Conductor
- Qualified

1926.449b Definitions

Hazardous locations

- Class I: Flammables
  - Division 1: ignitable concentration of gas
  - Division 2: flammables handled, processed or used
- Class II: Dusts
  - Division 1: explosive dust in atmosphere
  - Division 2: excessive accumulation of dusts

1926.449b Definitions

- Class III: Ignitable Fibers
  - Division 1: Production areas
  - Division 2: Storage areas

1926.402 Major Divisions of Subpart K

- 1926.402—409 Installation safety requirements
- 1926.416—418 Safety-related work practices
- 1926.431—433 Safety-related maintenance and environmental considerations
- 1926.441 Safety requirements for special equipment

Subpart K—Electrical

1926.402 Applicability

(a) Covered—installation safety requirements for electrical equipment and installations used to provide electric power and light at a job site

(b) Not Covered—installations used for the generation, transmission, and distribution of electric energy, including related communication, metering, control, and transformation installations (Subpart V—1926)

Subpart K—Electrical

1926.403 General Requirements

(a) Approved

(b) (1) Equipment shall be free of recognized hazards

(2) Suitable for installation and use

(c) Interrupting rating

(d) Mounting and cooling of equipment

Subpart K—Electrical

1926.403 General Requirements

(e) Splices shall be mechanically and electrically secured

(f) Arcing parts

(g) Marking-Mfg. Name, Trademark or Volt and Current

(h) Identification of Disconnects

Subpart K—Electrical

1926.403 General Requirements

(i) 600 volts or less

(1) Working spaces

(2) Guarding of live parts

Table K-1*

	Minimum clear distance for conditions[1]		
Nominal voltage to ground	(a)	(b)	(c)
	Feet[2]	Feet[2]	Feet[2]
0-150	3	3	3
151-600	3	3 1/2	4

Subpart K—Electrical

1926.403 General Requirements

(j)(1) Over 600 Volts

(2) Enclosures; vault, room, closet access is controlled by lock and key

(2)(i) Electrical installations having exposed live parts shall be accessible to qualified persons only.

Subpart K—Electrical

1926.403 General Requirements

(j)(3) Working space

Table K-2—Minimum Depth of Clear Working Space in Front of Electric Equipment

	Conditions[1]		
Nominal voltage to ground	(a)	(b)	(c)
	Feet[2]	Feet[2]	Feet[2]
601 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9
25,001 to 75 kV	6	8	10
Above 75kV	8	10	12

1926.404(a) Wiring Design and Protection

(1) Identification of conductors
(2) Polarity—reverse polarity
(3) Grounding terminals and devices

1926.404(b)(1) Ground Fault Protection

(i) Required for 220 volts and 440 volts
(ii) GFCI (Ground Fault Circuit Interrupters)
(iii) Assured equipment grounding program—minimums.
- Coverages
  - all cord sets
  - receptacles not part of building
  - cord and plug connected equipment

1926.404(b)(1) Ground Fault Protection

(iii) Assured equipment grounding program—minimums
- Competent person requirements
- Written description of the program available for inspection
- Daily visual inspections of all loose cord sets

1926.404(b)(1) Ground Fault Protection

Subpart K—Electrical

(iii) Assured equipment grounding program—minimums

- tests required
  - continuity
  - correct wiring and grounding
  - before its use
  - after repairs
  - before equipment used after an incident which might have caused damage
- Equipment failing test should not be used
- Tests shall be recorded

1926.404(c) Outside Conductors or Lamps

(1) 600 Volts or Less

(i) Conductors on poles—required horizontal climbing space as indicated

(A) 30 inches—power lines below communication lines

(B) 24 inches—power lines alone/300 volts or less

30 inches—power lines alone/over 300 volts

(C) 24 inches—communication lines below power lines/300 volts or less

30 inches—communication lines below power lines/300 volts or more

1926.404(c) Outside Conductors or Lamps

(1) 600 Volts or Less

(ii) Clearance from ground

(A) 10 feet—above grade, sidewalks, or platforms

(B) 12 feet—over areas without trucks traffic

(C) 15 feet—over areas subject to truck traffic

(D) 18 feet—over public streets, alleys, roads and driveways

(iii) Clearance from building openings

(A) Three feet minimum from windows, doors, fire escapes or similar locations

Subpart K—Electrical

1926.404(c) Outside Conductors or Lamps

(1) 600 Volts or Less

(iv) Clearance from roofs

- Vertically 8 feet or more above employees on walkway for insulated conductors
- Vertically and diagonally 10 feet for covered conductors
- Vertically and diagonally 15 feet for bare wires

(A) Roof accessible by vehicles—18 foot clearance

(B) Roof not normall accessible to employees—three feet for fully insulated conductors

(C) 4 in 12 roof pitch—3 foot clearance between conductors less than 300 volts

Subpart K—Electrical

1926.404(c) Outside Conductors or Lamps

(1) 600 Volts or Less

(iv) Clearance from roofs

(D) 18 inches clearance

no more than four foot conductors over roof terminating at a raceway or support

(2) Location of outdoor lamps

located below live lines on less adequate precautions taken for relamping.

Subpart K—Electrical

1926.404(d) Services

(1) Disconnect means for all conductors

(i) between service and building

(2) Services over 600 volts

(i) guard all open wires

(ii) high voltage warning signs shall be posted

(e)(1) Overcurrent protection for all conductors and equipment

(i) conductors shall sufficiently carry the load

(ii) grounded counductors

(iii) disconnection of fuses and thermal cutouts

1926.404(d) Services

Subpart K—Electrical

(e)(1) Overcurrent protection for all conductors and equipment

- (iv) location in or on premises—overcurrent shall be readily accessible
- (v) arcing or suddenly moving parts—fuses and breaker/employee protection
- (vi) circuit breakers—clear indication as to open or closed

(e)(2) Over 600 volts, nominal

- (i) feeders and branch circuits shall have short circuit protection

1926.404(e) Overcurrent Protection

.404(f)(6) Grounding Path

(1) Portable generators

- gounding path must be continuous and permanent
- ground pin needs to be in place

1926.404(e) Overcurrent Protection

.404(f)(7) Supports, enclosures, and equipment to be grounded

- suppors and enclosures/cableways
- fixed equipment
- service equipment enclosures
- cord and plug connected equipment
- noncurrent carrying metal parts
- double insulated
- non electrical equipment

1926.405 Wiring Methods

(a)(1)(i) Electrical continuity of metal raceways and enclosures

- duct wiring
- prohibited in ducts used for dust, loos stock or flammable vapors

(a)(2)(i) Temporary wiring

- temporary lights
- lamps
- flexible cords and cables
- extension cord sets shall be of three-wire type

1926.405 Wiring Methods

(b)(1) Cabinets, boxes and fittings

- conductors - protected when entering boxes, cabinets
- enclosures

(2) Covers and Canopies

- covers shall be provided on all pull boxes, junction boxes and fittings

(c) Knife switches—blades dead when switch is open

(d) Switchboards and panelboards

1926.405 Wiring Methods

(e) Enclosures for damp or wet locations

(f) Conductors for general wiring

(g) Flexible cords and cables

(i) Permitted use

(ii) Attachment plugs for cords

(iii) Prohibited use

(2)(iii) Splices

(iv) Strain relief

(v) Cords through holes

1926.405 Wiring Methods

(h) Portable cables over 600 volts, nominal

(i) Fixture wires

(j) Equipment for general use

- (1) lighting fixtures and receptacles—no live parts
- (2) receptacles, cord connectors and attachments plugs (caps)
- (3) appliances
- (4) motors
- (5) transformers
- (6) capacitors

1926.406 Specific Purpose Equipment

(a)(1) Cranes and hoists

- installation of electric equipment and wiring

- (1) disconnecting means
- (2) control
- (3) clearance
- (4) grounding

1926.406 Specific Purpose Equipment

(b) Elevators, escalators and moving walks

- (1) disconnecting means
- (2) control panels

(c) Electrical welders-disconnecting means

- (1) motor generated
- (2) resistance welders

(d) X-Ray equipment

- (1) disconnecting means
- (2) control

1926.407 Hazardous (classified) locations

(a) Scope

- Class I Division 1
- Class I Division 2
- Class II Division 1
- Class II Division 2
- Class III Division 1
- Class III Division 2

1926.407 Hazardous (classified) locations

(b) Electrical installations

(1) Intrinsically safe

(2) Appoved for the hazardous (classified) location

- NFPA 70
- Marking

(3) Safe for the hazardous (classified) location

(c) Condits

threaded

made wrench tight

bonding jumper used if not wrench tight

1926.408 Special Systems

(a) Systems over 600 volts, nominal

(1) Wiring methods for fixed installations

(i) Above ground—rigid metal conduit

(ii) Installations emerging from the ground

(2) Interrupting and isolating devices

(i) Circuit breakers

(ii) Fused cut outs

(iii) Equipment isolating means

(3) Mobile and portable equipment

(i) Power cable connections to mobile machines

(ii) Guarding of live ports

Subpart K—Electrical

1926.408 Special Systems

(a) Systems over 600 volts, niminal

(4) Tunnel installations

(i) Application

(ii) Conductors

(iii) Guarding of live ports

(iv) Disconnecting means

(v) Grounding and bonding

Subpart K—Electrical

1926.408 Special Systems

(b) Class 1, Class 2, and Class 3 remote control, signaling and power limited circuits

(1) Classification

(2) Marking

(c) Communications systems

(1) Scope

(2) Protective devices

(3) Conductor location

(4) Equipment location

(5) Grounding

Subpart K—Electrical

1926.416 Safety Related Work Practices

(a)(1) Working in proximity requires protection

(2) Underground electric lines

(3) Overhead lines

(b)(1) Workspace for electrical equipment not to be used as passageway

(2) Working spaces and walkway kept clear of cords

Subpart K—Electrical

1926.417 Lockout and Tagging of Circuits

(a) Controls

- deactivated and tagged

(b) Equipment and circuits

- deenergized and tagged at all points of potential reenergization

(c) Tags

- identify plainly the equipment or circuit to be worked on

Objective 7 40

Subpart K—Electrical

1926.441 Batteries and Battery Charging

(a) General Requirements

(1) Unsealed type requires ventilation
(2) Area ventilation to prevent explosion
(4) Acid resistant floors required
(5) PPE
(6) Emergency eyewash/shower with in 25 feet
(7) Provide spill cleanup and neutralization

Objective 8 41

Subpart K—Electrical

1926.441 Batteries and Battery Charging

(b) Charging

(1) Only in designated posted areas
(2) Chargers should be protected from trucks
(3) Vent caps shall be maintained in place when charging.

Objective 8 42

References

HELPS FOR SUBPART K

STANDARD	CONDITION	HAZARD
403 a 405 a 2 ii J	Romex/Type NM cable was used as extension cords	Poor quality of insulation and is not approved for usage
403 g	Tool, not labeled with manufacturer data, voltage	Unable to make correct repairs
403 i 2 i	Live parts not protected	Electric shock
404 a 2	Reversed polarity	Tool could be energized or short out more easily
404 b 1	Not visually inspecting tools under an AEGCP	Missing obvious defects
404 b 1 i	Not using GFCIs or AEGCP	Prevents or minimizes chance or a ground fault to occur
404 b 1 iii A	No record of AEGCP on site	Unable to tell if coding is correct
404 b 1 iii E 4	Not testing tools every three months when using an AEGCP	Tool could lose grounding conductor
404 c 2 405 a 2 ii B	Open conductor not elevated	Cords run over or struck by object
404 f 6	Ungrounded tool or ground prong missing	Metal part of the tool becomes energized if ground fault occurs
404 f 6	Outlet wired without grounding conductor	Ungrounded outlet
405 a 2 ii C	Receptacle wired without grounding conductor	Ungrounded receptacle
405 a 2 ii C	Receptacle spliced to temporary lights	Ungrounded receptacle
405 a 2 ii E	No guard on temporary lighting	Light bulb subject to damage
405 a 2 ii J	Running over damaged extension cords	Employee stepping and getting a shock

HELPS FOR SUBPART K

STANDARD	CONDITION	HAZARD
405 a 2 ii J	Temporary wiring not grounded	Possible energizing of tool if fault occurs
405 a 2 ii J	Using open conductors as extension cords	Conductor subject to abrasion
405 a 2 ii J	Conductors under metal doors and windows	Metal becomes energized if cord is damaged
405 a 2 ii J	Using two-wire extension cord for three-wire tool	Ungrounded tool
405 b 1	Open conductors pulled through metal box without insulted bushings	Conductors subject to damage
405 b 1	Conductor not insulated from panel box edges	Conductors subject to damage
405 b 1	Knockout missing in box	Dust getting in and shorting electric out
405 b 2	Panel boxes without covers	Wires or breakers
405 e 1	Outside panel boxes not waterproof	Electric short
405 g 1 i	Romex/Type NM cable not secured	Conductor subject to damage (NFPA 336-15)
405 g 1 ii	Hard wiring equipment into a panel	Not able to quickly disconnect
405 g 2 iii	Spliced extension cord	Cord losing ground or energizing metal
405 g 2 iv	No strain releaf on cord	Conductors subject to abrasions
405 j 1 i	Lives parts exposed on receptacles	Electric shock
405 j 1 ii	Conductors protruding from boxes	Conductor subject to abrasion
405 j 1 ii	Receptacles hanging by conductors	Conductors subject to abrasion
405 j 1 iii C	Handlamp had no guards	Bulb breaking

HELPS FOR SUBPART K

STANDARD	CONDITION	HAZARD
405 j 2 i	Nonapproved plug on different voltages	Using higher voltage for tools
405 j 4 iv B	Working on live electric without insulating mats	No protection against shock
407 b	Ordinary electric in chemical plant (vs. Class I, Div II)	Fire if accidental release of flammables
416 a 1	Not deenergizing electrical before starting work nearby	Contact with live electric
416 a 3	No warning signs near electric powerlines or circuits	Unaware of hazard
416 a 3	Not advising employees on location of electrical lines/circuits	Unaware of hazard
416 a 3	Not advising employee of protective means near power circuits	Unaware of hazard
416 e 1	Frayed extension cord	Conductors subject to damage
416 e 1	Insulation peeling off cord	Potential shock hazard due to exposed wiring
416 e 2	Extension cords hanging by nails	Insulation can be damaged
417 a	No tags on deenergized equipment	Turn on accidentally
1910.333 b 2 i	No written lockout/tagout program	No procedure for electrical safety
1910.333 b 2 iv	Not verifying deenergized circuits	May still be live
1910.334 c 2	Defective electrical test equipment	Wrong readings

HELP'S FOR SUBPART K

STANDARD	CONDITION	HAZARD
305 j 2 i	Unapproved plug on different voltages	Using lower voltage for tools
307 j 4 iv 5	Working on live electric without insulating mats	No protection against shock
307 b	Ordinary fuse in chemical plant (vs. Class I Div II)	Fire if accidental release of flammables
416 a 1	Not preemptively electrical before starting work nearby	Contact with live electric
416 a 5	No warning signs near electric switchboxes or circuits	Unknown of hazard
416 a 3	Not warning employees on location of electrical wires/circuits	Unknown of hazard
416 a 3	No warning employees of protective barrier near power circuits	Damages of hazard
416 e 1	Frayed extension cord	Conductors subject to damage
416 e 1	Insulation peeling off cord	Potential shock hazard due to exposed wiring
416 e 2	Extension cords hanging by nails	Insulation can be damaged
417 a 1	No tags on defective equipment	Have to redo/retest
1910.269 b 11	No written lockout/tagout program	No procedure for electrical safety
1910.269 b 2 iv	Not verifying disconnected circuits	May still be live
1910.269 b 2 ii	Defective electrical test equipment	Wrong readings

GROUND FAULT CIRCUIT INTERRUPTERS (GFCI)

GFCI's are installed to protect people from shock hazards. As discussed in the previous sections, system and equipment grounding provides protection for the electrical system and equipment and considerable protection against shock in most situations. However, there is a need for a more sensitive device to protect people from shock in the more hazardous locations in and around the home. The GFCI's are designed for this purpose.

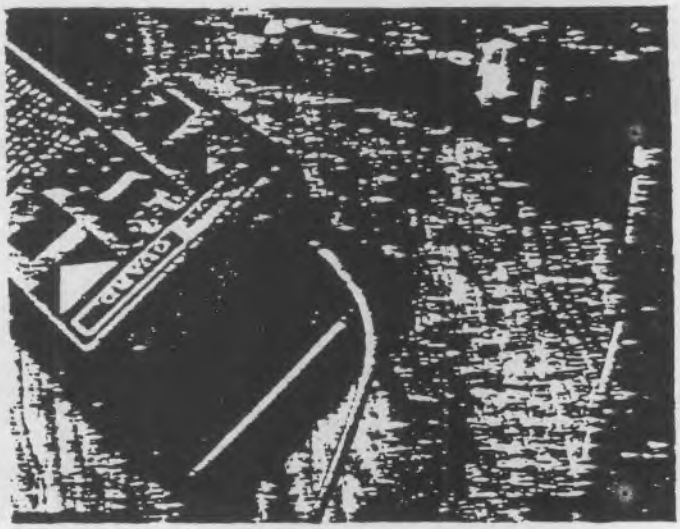
Ground faults can damage equipment. This costs money. But should a person be a part of this unintended path, the result could be injury or death.

Only 50 milliamperes, or 0.0033 of the current required to open a 15-ampere circuit breaker or fuse, can be fatal.

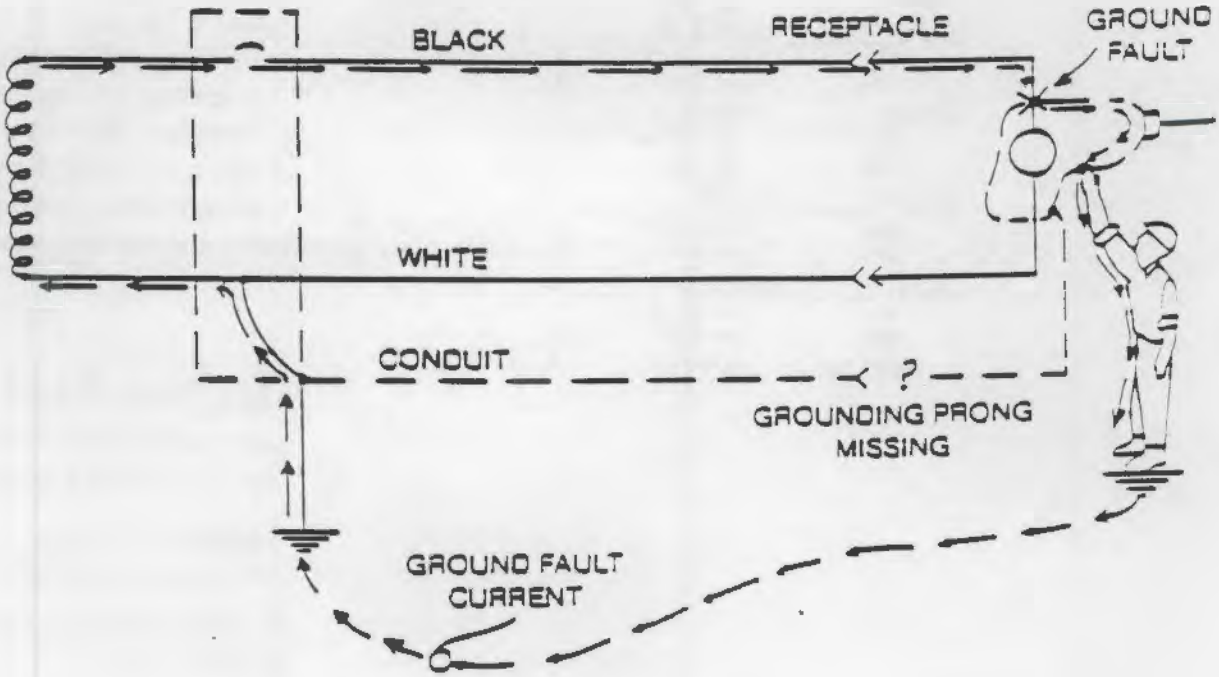
A GFCI can help prevent harm to people in situations like these.

- All 125-volt single phase, 15- and 20-ampere construction site receptacles which are not part of the permanent structure and which ARE IN USE BY EMPLOYEES must have GFCI protection. This is interpreted to mean that employees may use a portable GFCI that can be moved from one receptacle to another on the job.

- The Code requires GFCI protection for all 120-volt, **15- and 20-ampere receptacles** installed in **bathrooms, garages** with some exceptions, and all **outdoor receptacles** of homes. Also, any **receptacle within 4.6 m (15 feet) of a swimming pool** must be controlled by a GFCI. A garage receptacle in space provided for a plug-in appliance such as a freezer.



Portable GFCI's can be located where needed on construction sites



This Program is required OSHA compliance Part 1926.404 (b)(1)(i) Effective 10/9/86 ...where Ground-fault Circuit Interrupters are NOT in use.

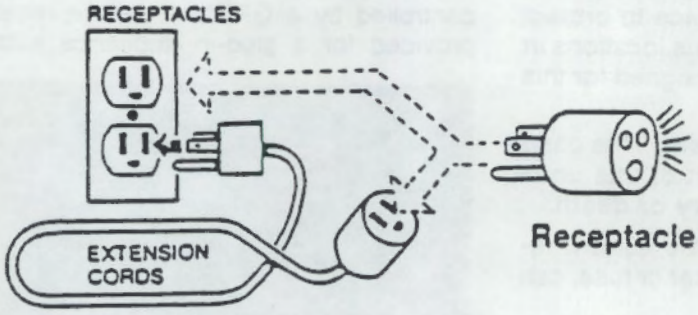
Equipment GROUNDING CONDUCTOR Program

Construction Site .....

Employer .....

Person Implementing Procedure .....

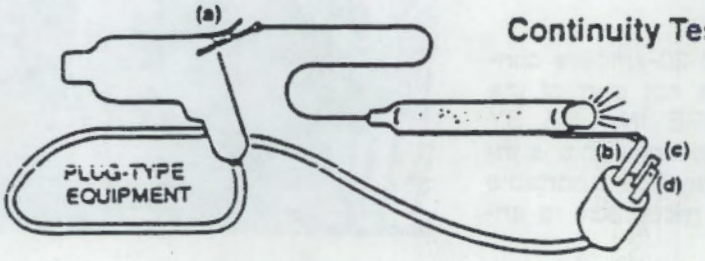
For 120-volt, 15-, 20-ampere wiring which is NOT part of building's permanent service.



Employees shall be allowed to use only equipment which meets these procedures.

TESTED by designated competent person(s) as follows:

Receptacle Tester plugs in to show if terminals are correctly connected to ground . . . and if wire is continuous (without breaks).



Continuity Tester checks if ground is continuous from metal frame (a) thru cord to 3rd prong (b).

Also touch tester contact to (c) then (d) prongs to detect possible ground fault.

Month Tested:

JAN.	WHITE	1
Feb.	" plus YELLOW	2
March	" plus BLUE	3
APRIL	GREEN	4
May	" plus YELLOW	5
June	" plus BLUE	6
JULY	RED	7
Aug.	" plus YELLOW	8
Sept.	" plus BLUE	9
OCT.	ORANGE	10
Nov.	" plus YELLOW	11
Dec.	" plus BLUE	12
"Repair" Test.....	add BROWN	0

TEST RECORD is maintained. COLOR CODE shows month tested.

Tests are made:

- before first use,
- after any repair or after a suspected-damage incident,
- then tested within 3-month periods (except — within 6-month periods if in protected, fixed location).

Code per National Electrical Contractors Assn. (NECA) recommended as national standard.

INSPECTION Before day of use cord-supplied equipment shall be visually inspected for ground problems.

Inspection reminders are shown in employees Construction Safety Manual.

Defective equipment or practices shall NOT be used.

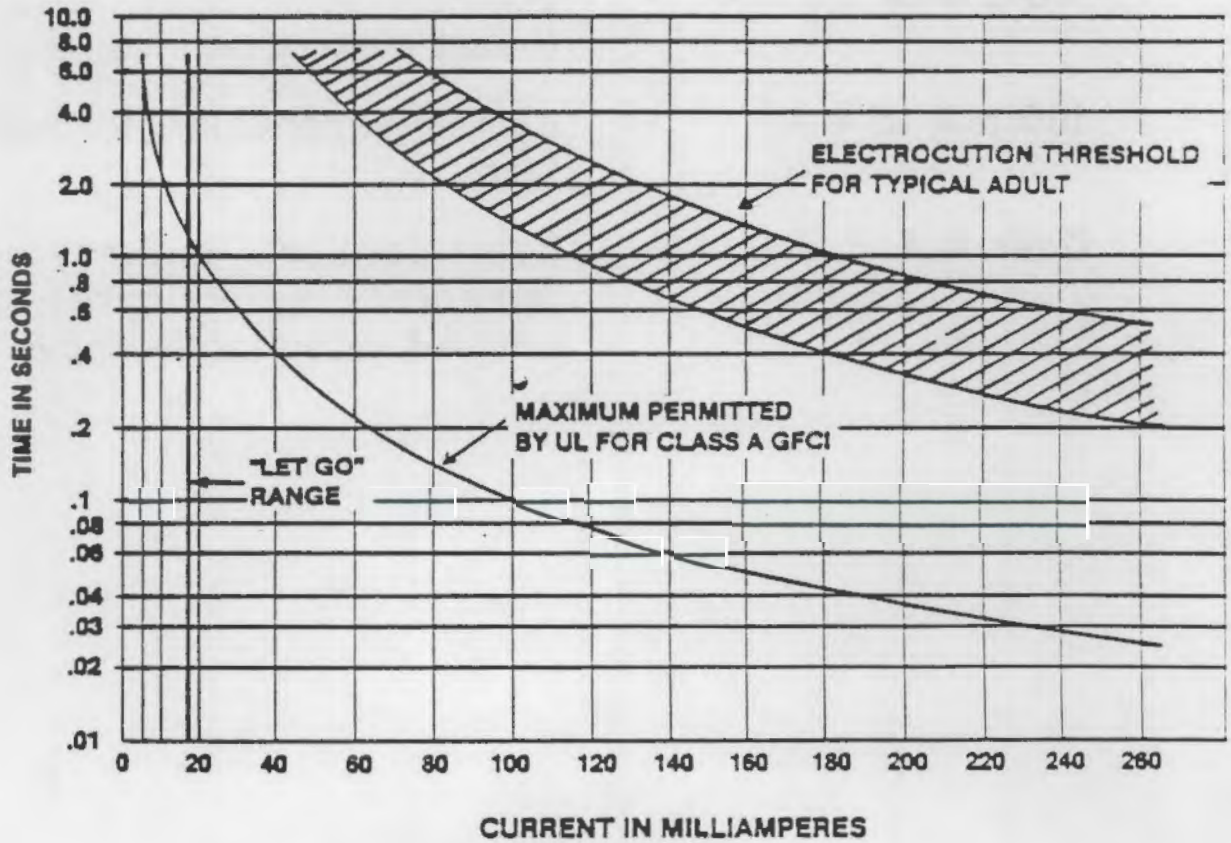
ELECTROCUTION

1. CURRENT AND VOLTAGE

2. PATH

3. TIME - relates to proper grounding

A large majority of electrocutions are caused by voltages of less than 600 V, which are the voltages most common in the workplace. At voltages as low as 115 volts, fibrillation can start in 3 or 4 seconds of current flow. The higher the voltage the shorter the time before fibrillation starts.

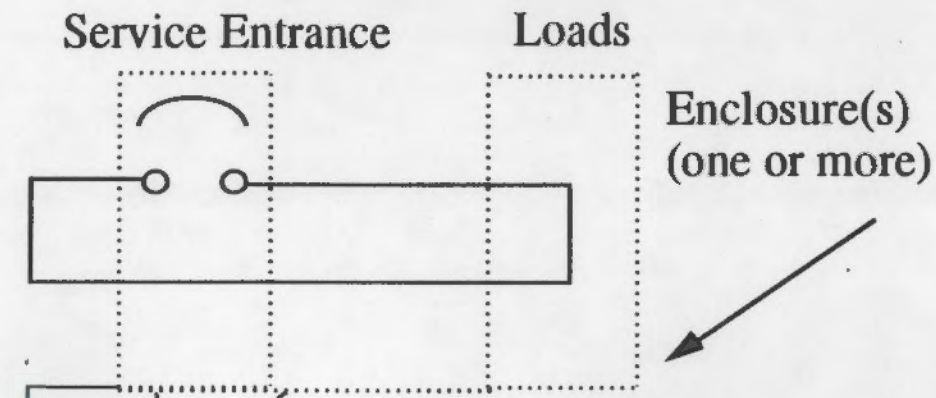


The effects of electrical current and time on the human body

EFFECTS OF AMOUNT OF AC CURRENT 60 CYCLES/SECOND

More than 3 mA	-	painful shock which can cause indirect accidents.
More than 10 mA	-	muscle contraction, "no-let-go" danger.
More than 30 mA	-	lung paralysis, usually temporary.
More than 50 mA	-	possible ventricular fibrillation (heart disfunction, usually fatal).
100 mA to 4 A	-	certain ventricular fibrillation, fatal.
Over 4 A	-	heart paralysis, but may be temporary; severe burns. Usually caused by voltages above 600 V.

Note: 1 mA = 1/1000 A = .001 A

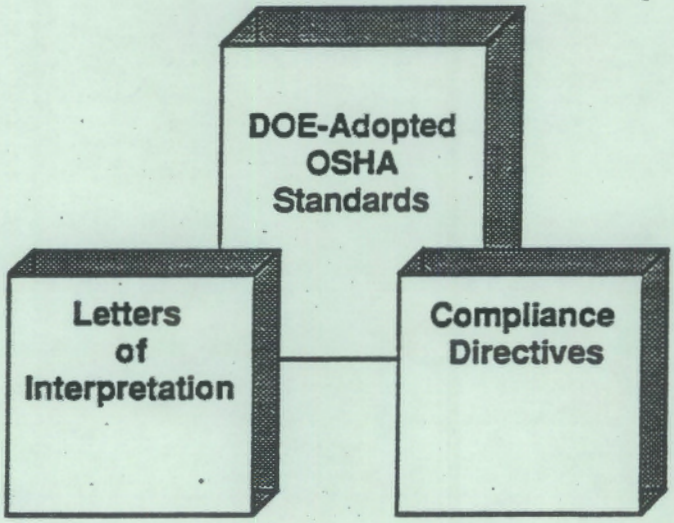


Code Language		Clarification	
Conductor	**Function**	**Conductor**	**Function**
Equipment grounding Conductor →	Equipment Grounding →	Equipment-Bonding Conductor →	Connects Enclosures Together (not necessarily to ground)
Main Bonding Jumper →	System Grounding →	System-Bonding Jumper →	Connects System Conductor to Equipment-Bonding Conductor (not necessarily to ground)
Grounding Electrode Conductor →	Grounding →	Earthing Conductor →	Connects equipment, or the System, or Both, to their Surroundings (earth or building steel)

The code uses the word grounding in three different ways.
Clarification is necessary

DOE Interpretations Guide to OSH Standards

Standards 1926.16 - 1926.551



Volume 6

OSH Information - Building Blocks for Compliance

RECORD ID 1206

STANDARD NUMBER 1926.404
INFORMATION DATE 771007

ABSTRACT This interpretation letter addresses double-insulated tools and ground-fault protection used on construction sites. The ground fault protection standard (1926.404) requires either ground-fault circuit interrupters or an assured equipment grounding program to protect employees on construction sites. Potential problems with the use of double-insulated tools are discussed.

(NOTE: Subpart K 1926.400-405 was revised in 1986. Ground fault circuit interrupters are covered in 1926.404(b)(ii). They are required for all 120 volt, single phase, 15 and 20 amp construction site receptacle outlets which are not part of the permanent wiring of the building or structure and which are in use by employees. The electric powered hand tools are covered in 1926.302(g) following the grounding requirements described in Subpart K).

INTERPRETATION 29 CFR 1926.404

October 7, 1977

MEMORANDUM

SUBJECT: Double-Insulated Tools and Ground-Fault Protection on Construction Sites

This is in response to your letter dated August 5, 1977, on the above subject.

The ground-fault protection standard requires the employer to provide either ground-fault circuit interrupters (GFCI's) or an assured equipment grounding conductor program to protect employees on construction sites. If the employer has chosen the GFCI option, he must use them to protect his employee whether grounded or double-insulated tools are used. If the employer uses the assured equipment grounding conductor program, he must comply with all the provisions given under that option. However, double-insulated tools do not require the equipment grounding conductor tests, since they are not required to be grounded.

The exposure to ground-fault hazards exists when any electric tool is being used even on a grounded circuit. Specifically, a shock hazard develops with the use of a double-insulated tool under the following conditions (among others):

1. When the tool is immersed in water;
2. When the tool is abused and the internal double insulation is bridged; and,
3. When defects develop in the supply cord of the tool.

RECORD ID 1241

STANDARD NUMBER 1926.404
INFORMATION DATE 770426

ABSTRACT This interpretation letter responds to a request for a clarification on ground fault circuit interrupters on portable generators.

(NOTE: The subpart K standard was revised in 1986. The subsection designations referenced in the interpretation letter are not correct but the information is correct. The former section 1926.400(b) is now designated 1926.404(b)).

INTERPRETATION 29 CFR 1926.404

August 24, 1977

This is in response to your letter dated March 1, 1977, requesting clarification of the requirements in using ground fault circuit interrupters (GFCI) on portable generators, other than the type specified in the existing standard.

In the case of the GFCI option, the standard addresses receptacles not generators. All 120-volt, 15 and 20 ampere receptacles, other than those noted in the exception, which are not part of the permanent wiring and which are in use on construction sites must be protected. Therefore, when it is in use by an employee on a construction site, a 120-volt, 15 or 20 ampere receptacle powered by a portable or vehicle-mounted generator, which is not a two-wire generator, or which is rated more than 5kw must be protected by a GFCI.

April 26, 1977

This acknowledges receipt of your letter requesting clarification of the requirements to use ground fault circuit interrupters on portable generators other than the one type specified in the standard.

Your question may have nationwide affect on the application of the OSHA standard. Therefore, we are taking the liberty of forwarding your letter to our National Office in Washington, D.C. and requesting that they respond directly to you indicating the requirement for GFCI on portable generators of the voltages and types you specify in your letter.

RECORD ID 1309

STANDARD NUMBER 1926.405; 1926.403
INFORMATION DATE 830523

ABSTRACT Electrical tape may be used to insulate splices if insulating properties are equivalent to that of the conductor. It may not be used on flexible cords.

(NOTE: Subpart K was revised in 1986. The section referenced in the interpretation letter, 1926.400(g) is no longer valid. The information in that section remains valid and is found at 1926.403(e). Section 1926.402(a)(5) is no longer valid but the information in it still is, and it can be found in 1926.405(g)(2)(iii). The former section 1926.401 is now designated 1926.405(a)(2)).

INTERPRETATION 29 CFR 1926.405; 1926.403

May 23, 1983

This is in response to your letter of April 13, 1983, to Mr. S, concerning the use of electrician's electrical tape to protect energized temporary wiring on construction sites. Your letter was referred to this office for reply.

The OSHA Construction Standards (copy enclosed) that apply to splices and relate to the typical uses of electrical tape are as follows:

(1) General wiring. Section 110-14(b) (copy enclosed) of the 1971 National Electrical Code (adopted by reference in 1926.400(a)) states, in part:

Conductors shall be spliced or joined with splicing devices suitable for the use or by brazing, welding, or soldering with a fusible metal or alloy...All splices and joints and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an insulting device suitable for the purpose.

(2) Temporary lighting. Paragraph (j)(2) of 1926.401 requires splices to have insulation equal to that of cable.

(3) Flexible cord. Paragraph (a)(5) of 1926.402 contains the following requirements:

Flexible cord shall be used only in continuous lengths without splice, except suitable molded or vulcanized splices may be used where properly made, and the insulation shall be equal to the cable being spliced and wire connections soldered.

For general purposes electrical tape may be used to insulate splices if the type of electrical tape used and the method of application are such that the insulation properties are equivalent to that of the conductor being spliced. Additionally, before the tape is applied, the conductors must be joined with suitable splicing devices or must be soldered, welded, or brazed. Flexible cords, on the other hand, may have only vulcanized or molded splices.

RECORD ID 1557

STANDARD NUMBER 1926.405
INFORMATION DATE 850926

ABSTRACT This interpretation letter addresses temporary lighting at construction sites. 1926.405(a)(2)(ii)(J) requires temporary and portable lights be installed with heavy duty electric cords or flexible cords designed for hard or extra hard use.

(NOTE: The subpart K standard underwent minor revisions in 1986. Some of the info was changed by that revision. 1926.401 was also renumbered to 1926.405)

INTERPRETATION 29 CFR 1926.405

September 26, 1985

A (State) standard interpretation, Standards Policy Memorandum 81-328 has been brought to Region IX's attention.

This interpretation allows the use of (product) for temporary lighting on construction sites.

The interpretation contradicts the memo sent by Mr. G to Mr. T, dated February 13, 1981 (copy attached).

Region IX requests that (state) delete the interpretation and revert to 1926.401(j)(2) for compliance. Please submit a written response to this request by October 25, 1985.

February 13, 1981

We have reviewed the request from State compliance personnel to allow "(product)" to be used for temporary lighting at construction sites.

The construction standard, 1926.401(j)(2), requires temporary lighting to be installed with heavy duty electric cords.

The Region would be revising the standard if (product) was an acceptable alternative, therefore, we cannot approve the use requested.

INTEROFFICE MEMORANDUM

TO ALL DOSH PERSONNEL

STANDARDS POLICY MEMORANDUM 81-328 29 CFR 1926.401(j)(2) and 1926.402

An opinion of whether use of (product) for temporary lighting on construction jobs is a citable hazard has been requested. It has been ruled that use of (product) for this purpose is not citable unless it can be clearly demonstrated that this constitutes an immediate hazard. Factors taken into consideration in making this decision are:

1. Historically use of (product)for temporary lighting has been occurring frequently without its creating an obvious hazard or frequent injury to employees.

2. Decisions to cite should be based on conditions as they exist at the time of the inspection, i.e., (product)must be used meeting the criteria set for placement, supports and fastening, absence of damage exposing wires, etc. (product) should be cited in any instance where "heavy duty electric cords" would have been cited under similar circumstances, e.g., worn and frayed cord; stapled or hung from nails, etc.

Officially (product) cannot be recognized as a substitute for "heavy duty electric cords," however, we often have occasions when common sense decisions must be made regarding safety on the job. Therefore, in the absence of a recognized hazard in the use of (product)for temporary lighting on construction job sites, citations and notices of violation will not be issued for its use.

RECORD ID 1710

STANDARD NUMBER 1926.405; 1926.404

ABSTRACT This interpretation letter addresses application of standard 1926.405 to the use of cord sets (extension cords) plugged into permanent wiring at construction sites to supply portable electrical hand tools. Cord sets plugged into permanent wiring at construction sites are temporary wiring; and, therefore, require ground-fault protection as specified in 1926.404(b).

INTERPRETATION 29 CFR 1926.405; 1926.404

JUL 31, 1984

This is in response for an interpretation of cord sets (extension cords) plugged into permanent wiring at construction sites to supply portable electrical hand tools.

Section 305-4(a) of the code requires all 125-volts single-phase, 15 and 20 amperes receptacle outlets which are not a part of the permanent wiring of the building or structure and which are in use by employees shall have ground-fault circuit-interrupter protection for personnel.

I have been advised by my staff that cord sets (extension cords) plugged into permanent wiring at construction sites are temporary wiring and as such require ground-fault protection for personnel on construction sites.

29 CFR 1926—SUBPART L
Scaffolding

TERMINAL OBJECTIVE
Explain requirements for the safe erection and use of selected scaffolds.

ENABLING OBJECTIVES
1. State and explain the general requirements for scaffold use and installation.
2. Identify light, medium and heavy duty scaffolds, their components, and associated installation and loading requirements.
3. Identify competent person duties regarding scaffolds.

REFERENCES
1. U.S. Department of Labor. *29 CFR 1926, Safety and Health for Construction*
2. ANSI A-10.8, Requirements for the erection and use of scaffolds.

DURATION
Two Hours

INSTRUCTORS MATERIALS
Course manual with instructor notes
Viewgraphs
White board, markers and pointer
Slide Projector
Overhead Projector
Scaffold Illustrations

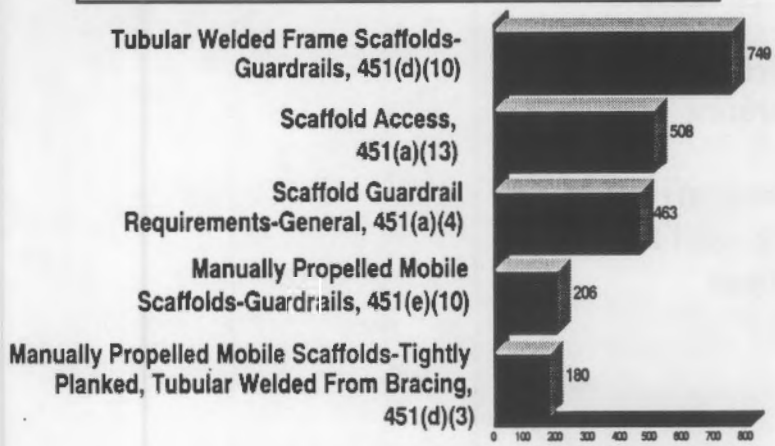
Terminal Objective

Explain requirements for the safe erection and use of selected scaffolds.

Enabling Objectives

1. **State and explain the general requirements for scaffold use and installation.**
2. **Identify light, medium and heavy duty scaffolds, their components, and associated installation and loading requirements.**
3. **Identify competent person duties regarding scaffolds.**

Violations Most Cited in 1992



Subpart L—Scaffolding

1926.451(a) General Requirements

(1) Shall be erected in accordance with this section

(2) Sound footing/anchorage capable of carrying maximum load capabilities

(3) Erection, movement, alteration or dismantlement only under supervision of competent person

Subpart L—Scaffolding

1926.451(a) General Requirements

(4) Guardrails and toeboards required on open ends and sides of scaffolds more than 10 ft. above the ground

(5) Guardrails 2 x 4, or from 4-10 ft. above the ground if any platform dimension is <45 inches

Subpart L—Scaffolding

1926.451(a) General Requirements

(6) Screened guardrails required between midrail and toeboard if persons pass under scaffold

- wire mesh (#18 guage, 1/2" opening) required

(7) Scaffolds and components shall be capable of supporting 4 times maximum intended load

Subpart L—Scaffolding

1926.451(a) General Requirements

(8) Damaged parts immediately repaired or replaced

(9) Load carrying timbers; minimum 1.500 fiber (stress grade) construction grade lumber

- Nominal sized, as provided by American Lumber Standards, except as noted (i.e. rough sized)

Subpart L—Scaffolding

1926.451(a) General Requirements

(10) All planking shall be scaffold grades, or equivalent

- maximum permissible
- spans 2x10 inches or wider, shall match Table L-3

Subpart L—Scaffolding

1926.451(a) General Requirements

(11) Maximum permissible span

- 1 1/4 x 9 inch or wider plank of full thickness shall be 4 ft. with medium loading of 50 p.s.f.

(12) Planking overlapped or secured

- 12" minimum overlap

(13) Provide an access ladder or equivalent safe access

(14) Scaffold planks shall extend over end supports a minimum of 6 inches but no longer than 12 inches

Subpart L—Scaffolding

1926.451(a) General Requirements

(15) Poles, legs or uprights shall be plumb, secured and rigid

(16) Overhead hazards require hard hats and overhead protection

(17) Eliminate all slippery hazards immediately

Subpart L—Scaffolding

1926.451(a) General Requirements

(18) No welding, burning, riveting or open flame work on any staging suspended by fiber or synthetic rope

(19) Synthetic or fiber rope (6 times the rated load)

Subpart L—Scaffolding

1926.451(a) General Requirements

(20) Use of shore or lean-to scaffolds prohibited—same type/different name

(21) Lumber sizes shall be nominal, except where otherwise stated (in this subpart only)

Subpart L—Scaffolding

1926.451 Types of Scaffolds

(b) Wood Pole
(c) Tube and coupler
(d) Tubular Welded Frame
(e) Manually Propelled Mobile
(f) Elevating and Rotating Work Platforms
(g) Outriggers

Subpart L—Scaffolding

1926.451 Types of Scaffolds

(h) Masons Adjustable Multipoint Suspension
(i) Swinging Two-Point Suspension
(j) Stone Setters Adjustable Multipoint Suspension
(k) Single-Point Adjustable Suspension
(l) Boatswain's Chairs
(m) Carpenter's Bracket

Subpart L—Scaffolding

1926.451 Types of Scaffolds

(n) Bricklayer's Square
(o) Horse
(p) Needle Beam
(q) Plasterer's, Decorator's and Large Area
(r) Interior Hung
(s) Ladder Jack

1926.451 Types of Scaffolds

(t) Window Jack
(u) Roofing Brackets
(v) Crawling Boards or Chicken Ladders
(w) Float or Ship
(x) Form
(y) Pump Jack

1926.451(d) Tubular Welded Frame

(1) 4 times maximum intended load
(2) Spacing of panels/frames shall be consistant with loads imposed
(3) Cross bracing
(4) Scaffold legs on base plates or screw type adjustable bases
(5) Frames—properly vertically aligned with legs

1926.451(d) Tubular Welded Frame

(6) Locking Pins placed vertically—prevent uplift
(7) Securing to building—30 ft. horizontally and 26 ft. vertically
(8) Max permissible spans per Table L-3
(9) PE design required if over 125 ft. high

1926.451(d) Tubular Welded Frame

(10) Guard rails made of not less than 2x4 lumber

- 42 inches high
- Midrail—1x6 lumber
- Installed on open sides/ends at 10 feet or higher level
- 4 inch toe boards
- wire mesh where necessary

1926.451(e) Manually Propelled Mobile Scaffolds

(1) Height not to exceed 4 times minimum base dimension

(2) Casters locked during use

(3) Cross bracing and horizontal bracing

(4) Platforms fully planked

(5) Access by ladder

1926.451(e) Manually Propelled Mobile Scaffolds

(6) Moving scaffolds:

- apply force near base
- assure tower stability

(7) Riding prohibited unless:

- floor is level
- base ≥1/2 height
- rubber type tires
- no tools on platform

1926.451(i) Swinging Two-Point Suspension

(1) 20"-36" width of platform
(2) Hangers capable of 4 times rated load
(3) Design tested and approved UL/FM hoisting machines required
(4) Mild steel roof hooks with tiebacks required

1926.451(i) Swinging Two-Point Suspension

(5) Suspension ropes—6 to 1 safety factor
(6) Sheaves and blocks in good condition accessories 4 to 1 safety factor
(7) Inspection required less than one month, periodic inspection of all suspension equipment

1926.451(i) Swinging Two-Point Suspension

(8) Light duty scaffold (500 lbs) two person max.
- Lifeline for each employee attached to substantial member of structure (not the scaffold)

(9) Scaffold lashed to building to prevent swaying (use of window cleaners' anchors not permitted)

1926.451(i) Swinging Two-Point Suspension

(10) Ladder type platform must comply with Table L-14

(i) Side Stringer shall be of clear straight-grained spruce or equivalent and rungs of oak

(ii) Plank type platforms:

- 2 x 10 cleated underneath at 4 ft intervals
- end support overhang 12-in max
- secured to prevent slipping off hanger
- maximum span 8 ft

1926.451(i) Swinging Two-Point Suspension

(10)(iii) Beam platforms shall have:

- side stringers 2x6 on edge
- maximum 12 ft. span
- specific flooring specifications

(10)(iv) Light metal-type platforms shall be listed or approved by UL or FM

(11) Guardrails required above 10 ft.

References

Day 2 (500-45)
Handout #1

U.S. Department of Labor

Occupational Safety and Health Administration
Washington, D.C. 20210

Reply to the Attention of:

AUG 6 1985

cc LRA
TS
FSO

HANDWERK

AUG 2 1985

MEMORANDUM FOR: ALL REGIONAL ADMINISTRATORS

FROM: JOHN B. MILES, JR., Director
Directorate of Field Operations

SUBJECT: Fall Protection for employees engaged in erecting or dismantling scaffolds in the Construction Industry

It is not the intent of the construction scaffold standards to specifically require employees who erect or dismantle scaffolds to use a safety belt and lanyard at all times. However, employees erecting or dismantling scaffolds must wear safety belts and lanyards in performing work at a stationary location for a period of time which allows the practical use of safety belts and lanyards. It is OSHA's position that requiring the constant wearing of belts and lanyards while erecting or dismantling scaffolds could be hazardous to employees.

The Directorate of Safety Standards Programs anticipates publishing a new proposal for Subpart L - Ladders and Scaffolding later this year. The fall protection proposed for employees erecting/dismantling scaffolds will be specifically included in that proposal and the text contains a provision which will exempt employees engaged in erecting or dismantling scaffolds from using any fall protection.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210

JAN 31 1978

OSHA PROGRAM DIRECTIVE #100-84

TO: REGIONAL ADMINISTRATORS/OSHA

THRU: DONALD E. MACKENZIE
Field Coordinator

OSHA Instruction
October 30, 1978
STD 3-10.4

Subject: 29 CFR 1926.451, Scaffolding

1. Purpose

The purpose of this directive is to clarify the application of 29 CFR 1926.451, Scaffolding, Construction standards.

2. Documentation Affected

This directive supersedes Field Information Memorandum #75-19 dated March 6, 1975.

3. Background

As the result of a request to clarify the application of 29 CFR 1926.451, the following is herewith forwarded:

a. 29 CFR 1926.451(a)(2)--Concrete block is not always an "unstable object" when used as a base for scaffolding. The circumstances and techniques under which it is used must be considered to determine its stability.

b. 29 CFR 1926.451(a)(3)--A brace is defined in 29 CFR 1926.452 (b)(3) as a tie that holds one scaffold member in a fixed position with respect to another member. The fact that a scaffold member has a place for a brace does not necessarily require that the brace be in place, if it interferes with the erection or stocking of the scaffold. This is only true if the scaffolding is capable of supporting four times the maximum intended load and meets the other applicable requirements of 29 CFR 1926.451. Also, the manufacturer's design specifications, particularly with respect to the lateral stresses involved, are an important aspect which must be considered in the decision to remove pieces of bracing.

c. 29 CFR 1926.451(a)(7) and (8)—A scaffold plank is considered a component of the scaffolding. As such, it must be capable of supporting four times the maximum intended load without failure (a safety factor of four). The fact that a plank might have a split in one end does not automatically mean that it must be removed from service, provided it does not otherwise create a hazard to the employees.

d. 29 CFR 1926.451(d)(4)—The standard requires scaffold legs to be placed on a foundation that is adequate to support four times the intended load of the scaffold. The standard does not require that base plates always be employed, but only when conditions necessitate their use. For example, the scaffold legs cannot be placed on a mud foundation without a base to prevent the legs from sinking into the mud.

4. Action

As in all cases, the determination of compliance or noncompliance depends upon the conditions the CSHO observes at the time of inspection. These four interpretations are meant as guidelines only.

5. Effective Date

This directive is effective immediately and will remain in effect until canceled or superseded.

Richard P. Wilson

Richard P. Wilson
Deputy Director, Federal Compliance
and State Programs

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U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210

OSHA Instruction STD 3-10.1B
AUG 14 1979
Office of Compliance Programming

SUBJECT: General Industry and Maritime Industry Standards as Related to Construction Standard, 29 CFR 1926.451(a)(10)

A. Purpose. This instruction provides information and guidance on laminated planking which meets the equivalent requirements of 29 CFR 1910.28(a)(9), 29 CFR 1915.41(h)(1), 29 CFR 1916.41(h)(1), 29 CFR 1917.41(d)(1), 29 CFR 1918.98(a)(2) and 29 CFR 1926.451(a)(10).

B. Scope. This instruction applies OSHA-wide.

C. Cancellation. OSHA Instruction STD 3-10.1A, February 28, 1979, Office of Compliance Programming, is canceled.

D. Action.

1. 29 CFR 1910.28(a)(9) and 29 CFR 1926.451(a)(10) state: "All planking shall be scaffold grades, or equivalent, as recognized by approved grading rules for species of wood used." The applicable maritime standards, 29 CFR 1915.41(h)(1), 29 CFR 1916.41(h)(1), 29 CFR 1917.41(d)(1) and 29 CFR 1918.98(a)(2), require that planking shall be straight-grained lumber, 2-inch by 10-inch, free from large or loose knots, and of specified woods.

2. A comparison of engineering data on certain laminated planking with engineering data on planking of scaffold grades, as indicated in the West Coast Lumber Inspection Bureau Grading Rule, finds that some laminated planking provides the equivalent strength of scaffold grade planking, and meets the equivalent requirements of the standards mentioned in the previous paragraph D.1.

U.S. DEPT. OF LABOR
O.S.H.A. TRAINING INSTITUTE
SEP - 6 1979

planking which is equivalent to scaffold grades is acceptable in General Industry, the Maritime Industry and the Construction Industry and complies with 29 CFR 1926.451(a)(10). CSHO's shall check laminated planking engineering data to insure that it is equivalent.

E. 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.

3. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing, within 30 days of notification, to the Regional Administrator. This acknowledgement should include a description either of the State's plan to implement the change or of the reasons why the change should not apply to that State.

4. Review policies, instructions and guidelines issued by the State to determine that this change has been communicated to State program personnel. Routine monitoring activities (accompanied inspections, spot check visits and case file reviews) shall also be used to determine if this change has been implemented in actual performance.

F. Background. Several Regional Offices have reviewed and provided documentation indicating that some laminated planking is equivalent to scaffold grade planking.

Grover C. Wrenn
Director, Federal Compliance
and State Programs

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U.S. Department of Labor

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

OSHA Instruction STD 3-10.6
AUG 16 1982
Office of Compliance Programming

STD3-10.6

SUBJECT: 29 CFR 1926.451(w) and 1926.451(a)(18) As Applied to Welding Required on Float or Ship Scaffolds

A. Purpose. This instruction clarifies the application of the subject standards to welding on float or ship scaffolds.

B. Scope. This instruction applies OSHA-wide.

C. Action. OSHA Regional Administrators/Area Directors shall take action to ensure that 29 CFR 1926.451(w) and 1926.451(a)(18) are enforced in accordance with E. of this instruction.

D. 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.

3. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing, within 30 days of notification, to the Regional Administrator. This acknowledgment should include a description either of the State's plan to implement the change or of the reasons why the change should not apply to that State.

4. Review policies, instructions and guidelines issued by the State to determine that this change has been communicated to State program personnel. Routine monitoring activities (accompanied inspections and case file reviews) shall also be used to determine if this change has been implemented in actual performance.

E. Guidelines.

1. 29 CFR 1926.451(w)(1) states in part that float or ship scaffolds shall not be used to support more than three men and a few light tools, such as those needed for riveting, bolting, and welding. Therefore, welding on the scaffolds is allowed, provided the supporting rope is free from defects.

2. 29 CFR 1926.451(w)(5) allows employers to use float or ship scaffolds supported with 1-inch diameter manila rope or equivalent, free from deterioration, chemical damage, flaws or other imperfections.

3. Each employee shall be protected by an approved safety lifebelt and lifeline, in accordance with 29 CFR 1926.451(w)(6).

F. Background. 29 CFR 1926.451(a)(18) requires that no welding, burning, riveting, or open flame work shall be performed on any staging suspended by means of fiber or synthetic rope. However, 1926.451(a)(18) refers to 1926.451(w) for specific requirements for float or ship scaffolds, which clearly contemplates that welding will be performed from float or ship scaffolds. Thus, welding from float or ship scaffolds is not forbidden by OSHA's regulations. However, 29 CFR 1926.451(w)(5) requires that supporting ropes shall be 1-inch diameter manila rope or equivalent, free from deterioration, flaws or other imperfections.

Thorne G. Auchter
Assistant Secretary

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U.S. GOVERNMENT PRINTING OFFICE: 1982-0-361-495/219

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210

FEB 18 1977

OSHA Instruction
October 30, 1978
STD 3-10.3

OSHA PROGRAM DIRECTIVE #100-58

TO: REGIONAL ADMINISTRATORS - OSHA

Subject: 29 CFR 1926.451(a)(5) Scaffolding, General Requirements, Guardrails

1. Purpose

To establish guidelines on the use of chains, and wire, fiber, or synthetic ropes as guardrails on scaffolding.

2. Directives Affected

None.

3. Background

a. Several inquiries have been made regarding the meaning of the term "or the equivalent" when used in 29 CFR 1926.451(a)(5), which states:

> Guardrails shall be 2 x 4 inches, or the equivalent, approximately 42 inches high with a midrail, when required. Supports shall be at intervals not to exceed 8 feet. Toeboards shall be a minimum of 4 inches in height.

b. In addition, inquiries have been made regarding the use of chains and ropes for scaffold guardrails, in lieu of guardrails made of not less than 2 x 4 inches lumber. When chains or ropes are used for guardrails, questions are asked regarding the maximum allowable slack in the chain or rope and types of ropes that can be used.

4. Action

a. The use of chain and synthetic, fiber, or wire ropes as top rails and intermediate rails of guardrails used on scaffolding meets the equivalent requirements of 1926.451(a)(5) when in compliance with the following guidelines.

(1) Rope or chain shall be secured to each support and taut at all times. It may be necessary to use a positive tensioning device to reduce the sag or catenary to a minimum.

(2) The rope or chain shall be free of sharp edges, burrs, or projections which may be a hazard.

(3) The maximum deflection of the top rail when a load of 200 pounds is applied in any direction at any point on the top rail shall not exceed 3 inches in one direction which includes the free hanging sag in the rope or chain.

5. Effective Date

This directive is effective upon receipt and will remain in effect until canceled or superseded.

for Richard P. Wilson
Deputy Director, Federal Compliance
and State Programs

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(Originator:OCCS)

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210

JUN 16 1975

OSHA PROGRAM DIRECTIVE #100-32

OSHA Instruction
January 30, 1978
STD 3-10.2

TO: ASSISTANT REGIONAL DIRECTORS/OSH

Subject: 29 CFR 1926.451(i)(8) Multistage Suspension Scaffolds

1. Purpose

To provide specific interpretation of 29 CFR 1926.451(i)(8).

2. Directives Affected

None.

3. Interpretation

Questions have arisen relating to the application of 29 CFR 1926.451(i)(8) to multistage suspension scaffolds. Multistage suspension scaffolds have two or more stages (platforms) and the usual method of fabrication results in rigid end suspension members structure. If 29 CFR 1926.451(i)(8) were applicable to multistage suspension scaffolds, personnel on the various stages of the scaffold would have to be secured to the building structure. In the event of failure of one of the suspension lines, employees on the lower levels of the multistage scaffolding would be subject to a greater hazard by attaching their safety belts to the building structure than by attaching their safety belts to a suitable member of the scaffold structure.

Subpart D of 29 CFR 1910 is currently being revised and one proposed part will address this subject. It will require personnel on multistage suspension scaffolding to be secured to the scaffold structure instead of to the building structure. It is also proposed that a like standard will be promulgated in 29 CFR 1926.

The Construction Standards were promulgated by the Construction Safety Task Force as provided by PL 91-54 prior to passage of the Occupational Safety and Health Act of 1970. Several members of the original task force have been contacted and their statement is that at the time 1926.451(i)(8) was promulgated that there was no intent for the standard to apply to a suspension scaffold having more than one platform. Therefore, 1926.451(i)(8) shall not apply to multistage suspension scaffolds.

CSP 1 Instruction
October 30, 1978
5170.3-CH-2

4. Action

Pending final promulgation of the standard, an alleged violation for failure of the employee to tie-off on the scaffold structure shall be cited under 5(a)(1) of the Act, providing it merits the requirement of a serious violation.

Barry J. White
Associate Assistant Secretary
for Regional Programs

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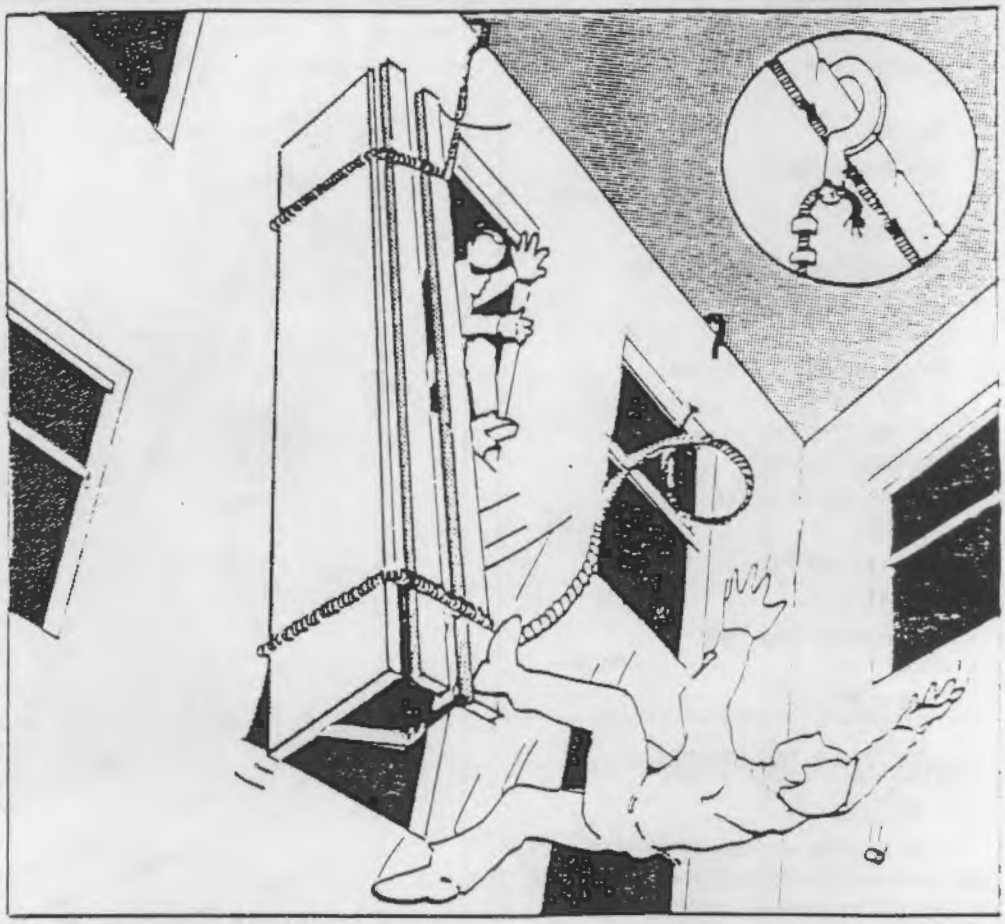
ACCIDENT REPORT
FATAL FACTS

U.S. Department of Labor
Occupational Safety and
Health Administration

No. 12

ACCIDENT SUMMARY

Accident Type	Fall From Elevation
Weather	Cool, Clear
Type of Operation	Exterior Renovation
Crew Size	2
Collective Bargaining	No
Competent Safety Monitor on Site?	Yes
Safety and Health Program in Effect?	Yes
Was the Worksite Inspected Regularly?	Yes
Training and Education Provided?	No
Employee Job Title	Laborer
Age/Sex	22/M
Experience at This Type Work	2 Days
Time on Project	2 Hours



BRIEF DESCRIPTION OF ACCIDENT

Two laborers were working on a motorized two-point suspension scaffold 70 feet above ground level without safety belts, lanyards, or lifelines. Three wire rope clips forming an "eye" for connecting the wire rope to the C-hook failed and that end of the scaffold came down. One employee fell to the ground, and the second employee at the other end was catapulted through an open window where he was pulled to safety by office workers. Two of the rope clips were still attached to the end of the rope after the accident. The inside tread of the third clip, which fell, was found to be stripped.

INSPECTION RESULTS

As a result of its investigation, OSHA issued citations for four alleged repeat violations of its construction standards.

OSHA's construction safety standards include several requirements which, if they had been followed here, might have prevented this fatality.

ACCIDENT PREVENTION RECOMMENDATIONS

1. All wire ropes, fiber and synthetic ropes, slings, hangers, platforms, and other supporting parts must be inspected before every installation. Periodic inspections also must be made while the scaffold is in use (29 CFR 1926.451(i)(7)).

2. On suspension scaffolds each employee must be protected by an approved safety life belt attached to the lifeline. The lifeline must be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines which will safely suspend the employee in case of fail. The lifeline must be appropriately adjusted as the work progresses (29 CFR 1926.451(i)(8)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains OSHA job safety and health rules and regulations (29 CFR 1926 and 29 CFR 1910) covering construction.
- Selected Occupational Fatalities Related to Powered, Two-Point Suspension Scaffolds/Powered Platforms as found in reports of OSHA Fatality/Catastrophe Investigations (available from the National Technical Information Service — Order No. PB83-194-050).
- OSHA-funded free onsite consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under the U.S. Labor Department or under the state government section where states administer their own OSH programs).

NOTE: The case here described was selected as being representative of fatalities caused by improper work practices. No special emphasis or priority is implied nor is the case necessarily a recent occurrence. The legal aspects of the incident have been resolved, and the case is now closed.

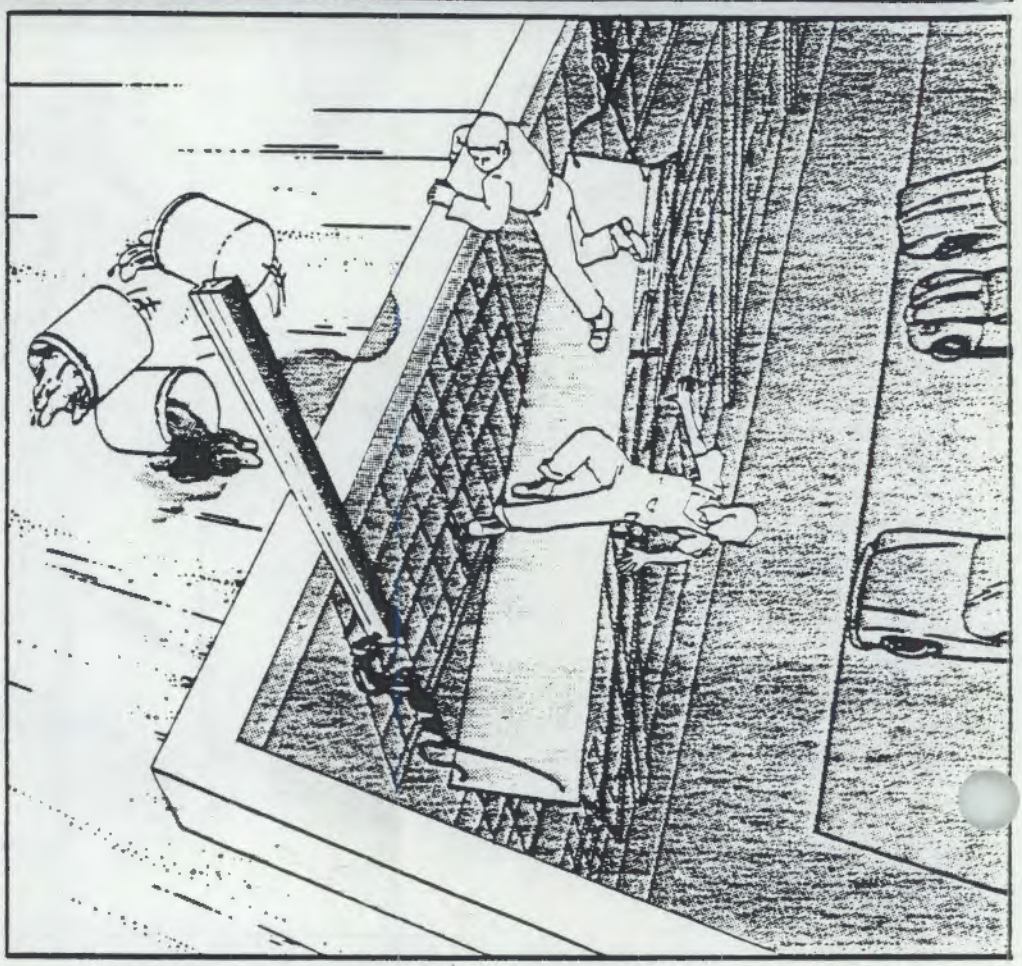
ACCIDENT REPORT FATAL FACTS

U.S. Department of Labor
Occupational Safety and
Health Administration

No. 14

ACCIDENT SUMMARY

Accident Type	Fall, Different Level
Weather	Clear, Warm
Type of Operation	Painting Contractor
Crew Size	2
Collective Bargaining	No
Competent Safety Monitor on Site?	No
Safety and Health Program in Effect?	No
Was the Worksite Inspected Regularly?	No
Training and Education Provided?	Inadequate
Employee Job Title	Painter
Age/Sex	29/M
Experience at This Type Work	Unknown
Time on Project	1 Month



BRIEF DESCRIPTION OF ACCIDENT

Two employees were painting the exterior of a three-story building when one of the two outriggers on their two-point suspension scaffold failed. One painter safely climbed back onto the roof while the other fell approximately 35 feet to his death. The outriggers were inadequately counterweighted with three 5-gallon buckets containing sand and were not secured to a structurally sound portion of the building. Neither painter was wearing an approved safety belt and lanyard attached to an independent lifeline.

INSPECTION RESULTS

As a result of its investigation, OSHA issued citations for five serious and two other than serious violations of its construction standards.

OSHA's construction safety standards include several requirements which, if they had been followed here, might have prevented this fatality.

ACCIDENT PREVENTION RECOMMENDATIONS

1. Develop and maintain a safety and health program to provide guidance for safe operations (29 CFR 1926.20(b)(1)).

2. Institute a program for frequent and regular inspections of the job site, as well as materials and equipment by a competent person(s) (29 CFR 1926.20(b)(2)).

3. Instruct each employee on how to recognize and avoid unsafe conditions which apply to the work and work areas (29 CFR 1926.21(b)(2)).

4. Construct scaffolds and their components so that they can support at least four times the maximum intended load (29 CFR 1926.451(a)(7)).

5. Install outrigger tiebacks of ¾ inch rope, or equivalent, to a structurally sound portion of the building to provide a secondary means of anchorage (29 CFR 1926.451(i)(4)).

6. Require employees to wear approved safety belt and lanyard equipment attached to an independent lifeline that is attached to a substantial structural member (29 CFR 1926.451(i)(8)).

SOURCES OF HELP

- Construction Safety and Health Standards (OSHA 2207) which contains OSHA job safety and health rules and regulations (1926 and 1910) covering construction.
- "Selected Occupational Fatalities Related to Powered, Two-Point Suspension Scaffolds/Powered Platforms as Found in Reports of OSHA Fatality/Catastrophe Investigations" (available from the National Technical Information Service — Order No. PB83-194-050).
- OSHA-funded free onsite consultation services. Consult your telephone directory for the number of your local OSHA area or regional office for further assistance and advice (listed under the U.S. Labor Department or under the state government section where states administer their own OSH programs).

NOTE: The case here described was selected as being representative of fatalities caused by improper work practices. No special emphasis or priority is implied nor is the case necessarily a recent occurrence. The legal aspects of the incident have been resolved, and the case is now closed.

SCAFFOLDS

This handout has been prepared for use in the OSHA National Training Institute Course, 308 - Principles of Scaffolding.

Primary reference has been made to the Construction Industry Standard 29 CFR 1926.451. Where the General Industry Standard, 29 CFR 1910.28 varies significantly it is also cited.

Because this publication reflects the standards at the time it went to press, it will continue to be updated and revised periodically.

The contents of this handout were researched and the material herein was compiled by Richard Tapio, OSHA Training Institute, Paul Bonfiglio, OSHA Long Island Area Office, Region 2, and David Robertson, of OSHA's Office of Training and Education, Division of Training and Educational Development. Mr. Robertson edited the materials.

April 1986

Scaffold Sketches To Be Corrected

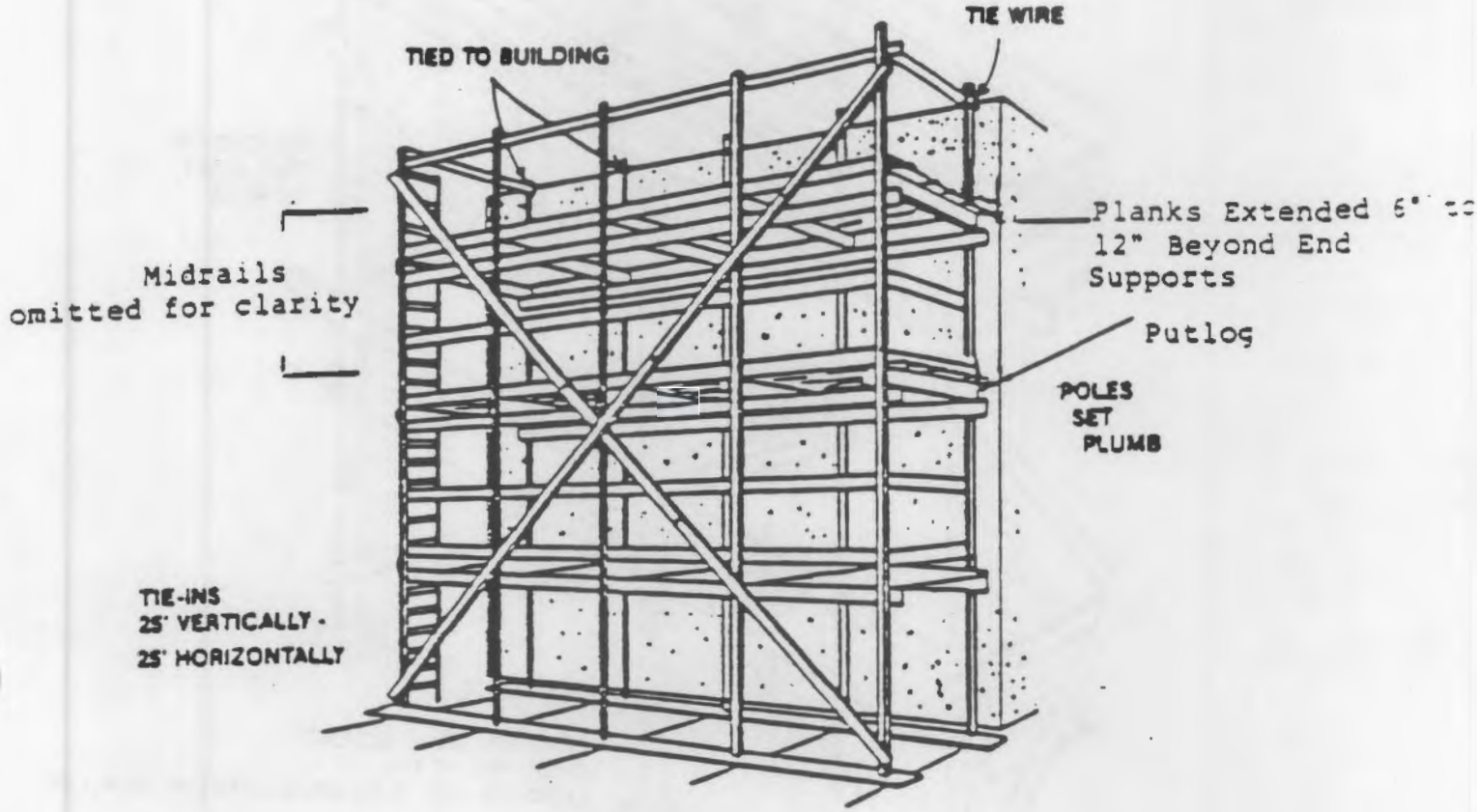
Sketches on the following pages need to be corrected as follows:

Page	Correction
20	Redraw to show spans between panels or frames
35	Redraw-take out u-bolts, drums with rope wound vertically
42	Redraw to show engine-retitle
48	Draw free end of suspension rope secured
50	Draw outrigger in upright position
54	Show scaffold on outriggers-close motor
56	Show connection properly
58	Need new OSHA standard
60	Show safety belt and lifeline
61	Show roof hook tied back to building member
63	Show bracket on wall-Label metal bracket
66	Redraw for perspective-Label tight planking nailed down
73	Redraw for perspective-Label tight planking
75	Redraw to show tube and coupler hanging members
76	Show tube and coupler hangers, wire mesh label supporting bearers and permissible spans
80	Shrink metal bracket. Enlarge catch platform and redraw for perspective
83	Redraw form scaffold thicker for strength
85	Redraw as wooden brackets not hooked over. Enlarge cross sections. Label scaffold brace dimensions and scaffold width
86	Put in wall, triangular braces at foot and in middle of poles. Label maximum span between poles and between braces
87	Draw in triangular braces. Label braces, mudsill, planks secured, pole composition
88	Draw in triangular braces middle and bottom widen platform and overhead protection, place ladder at near end
89	Alter perspective. Enlarge drawing.

1926.451 — SCAFFOLDING

1910.28 — SCAFFOLDING

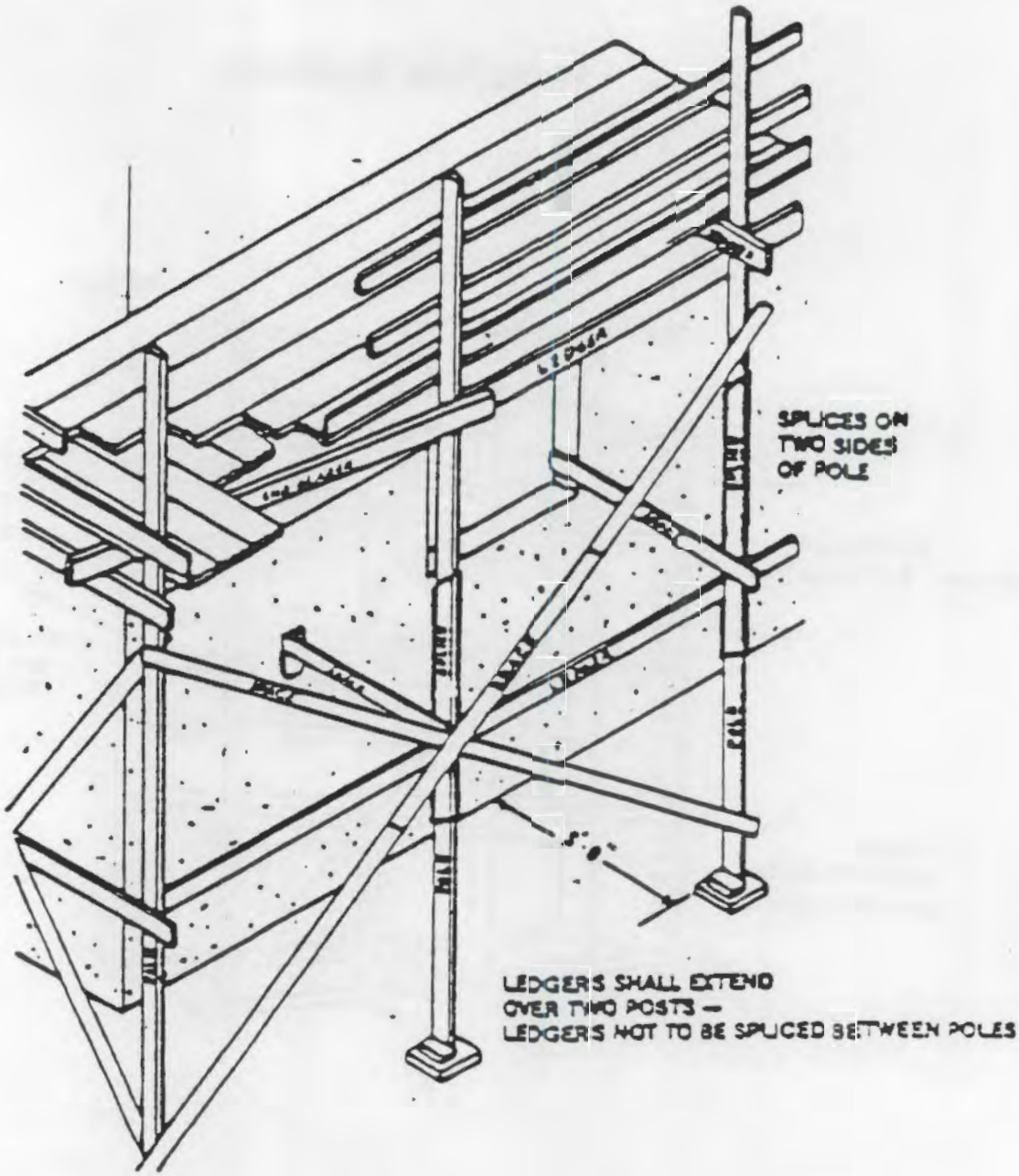
Wood Pole Scaffolds



451(b)(1) Scaffold poles shall bear on a foundation of sufficient size and strength to spread the load from the pole over a sufficient area to prevent settlement. All poles shall be set plumb.

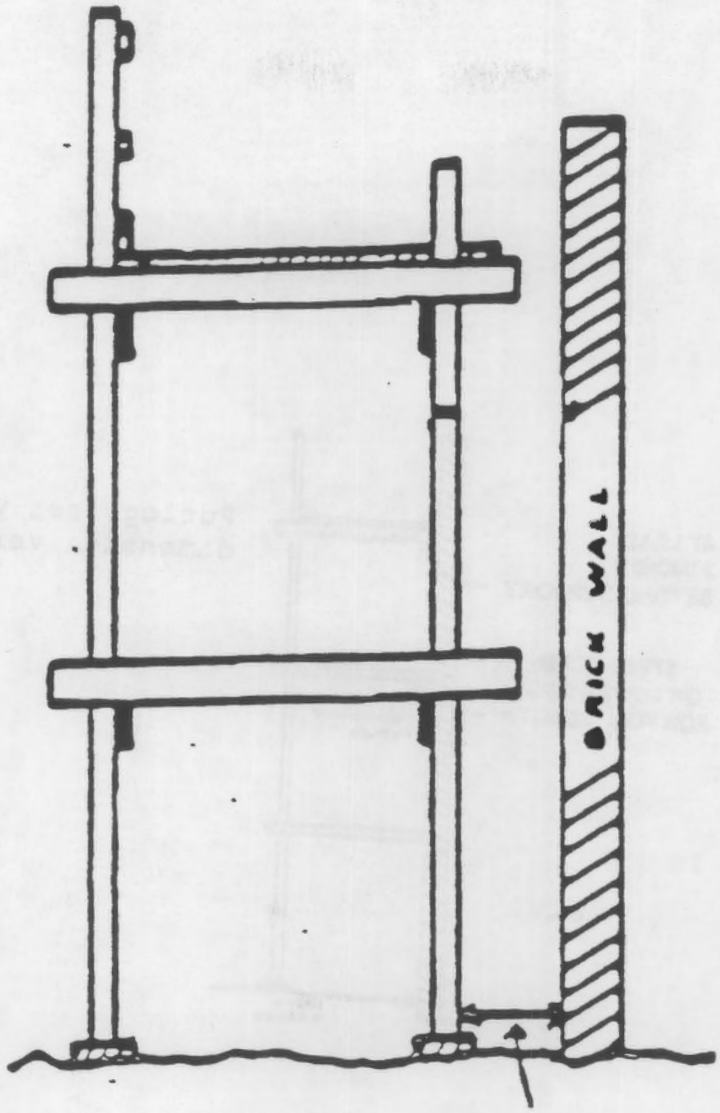
451(b)(4) All pole scaffolds shall be securely guyed or tied to the building or structure. Where the height or length exceeds 25 feet, the scaffold shall be secured at intervals not greater than 25 feet vertically and horizontally.

451(b)(14) When moving platforms to the next level, the old platform shall be left undisturbed until the new putlogs or bearers have been set in place, ready to receive the platform planks.



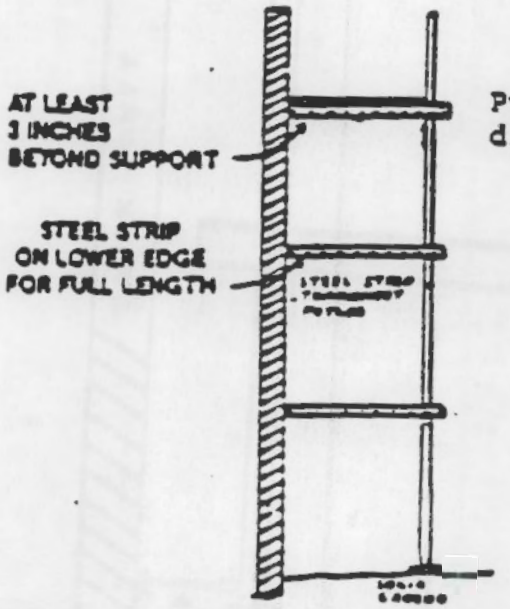
451(b)(2) Where wood poles are spliced, the ends shall be squared and the upper section shall rest squarely on the lower section. Wood splice plates shall be provided on at least two adjacent sides and shall be not less than 4 feet in length, overlapping the abutted ends equally, and have the same width and not less than the cross-sectional area of the pole. Splice plates or other materials of equivalent strength may be used.

451(b)(7) Ledgers shall be long enough to extend over two pole spaces. Ledgers shall not be spliced between the poles. Ledgers shall be reinforced by bearing blocks securely nailed to the side of the pole to form a support for the ledger.



AS CLOSE AS PRACTICABLE

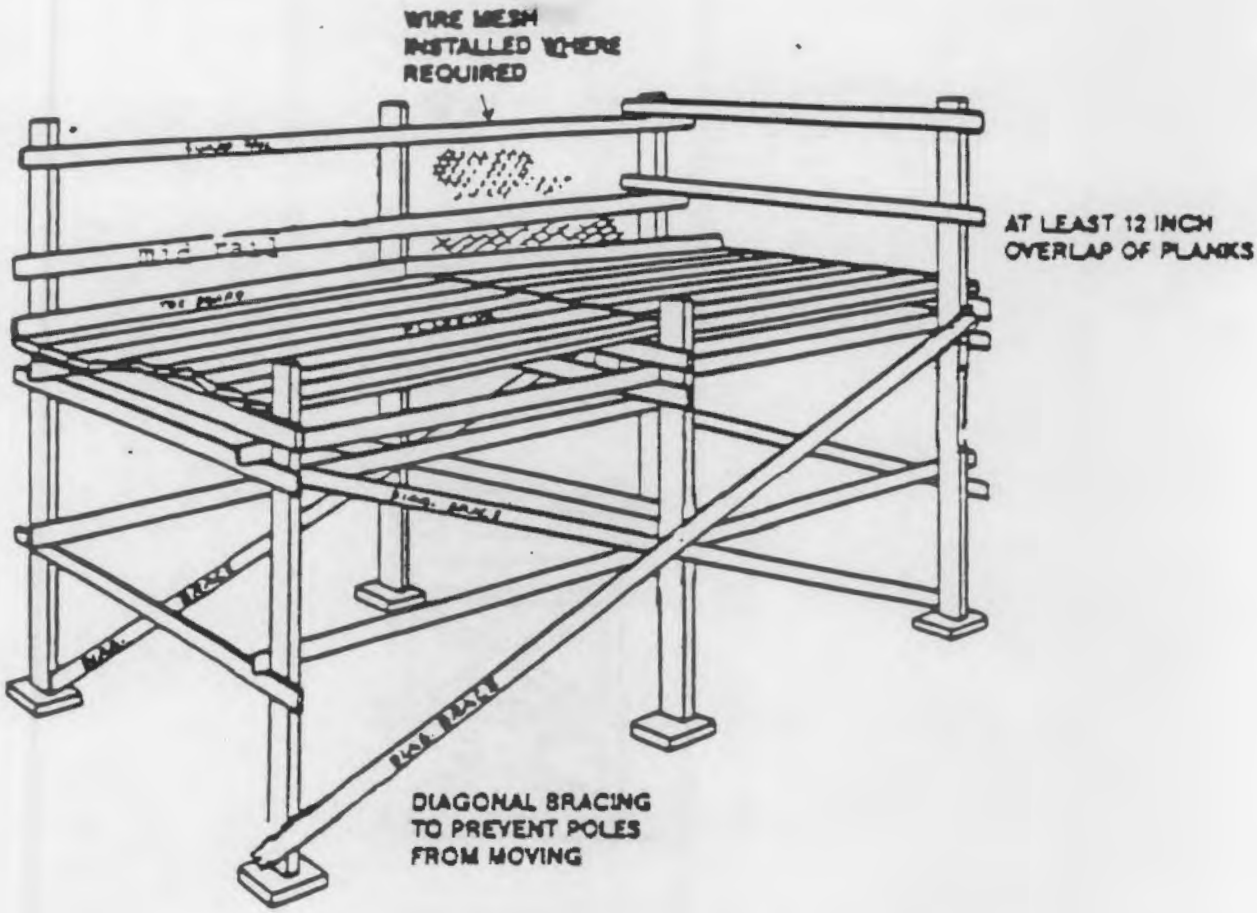
451(b)(3) Independent pole scaffolds shall be set as near to the wall of the building as practicable.



Putlogs set with greater dimension vertical

451(b)(5) Putlogs or bearers shall be set with their greater dimension vertical, long enough to project over the ledgers of the inner and outer rows of poles at least 3 inches for proper support.

451(b)(6) Every wooden putlog on single pole scaffolds shall be reinforced with a 3/16" × 2-inch steel strip, or equivalent, secured to its lower edge throughout its entire length.

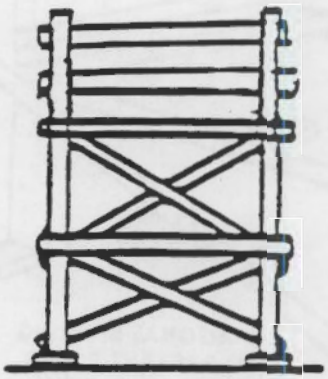


451(b)(8) Diagonal bracing shall be provided to prevent the poles from moving in a direction parallel with the wall of the building, or from buckling.

451(b)(12) Where planking is lapped, each plank shall lap its end supports at least 12 inches. Where the ends of planks abut each other to form a flush floor, the butt joint shall be at the centerline of a pole. The abutted ends shall rest on separate bearers. Intermediate beams shall be provided where necessary to prevent dislodgment of planks due to deflection, and the ends shall be secured to prevent their dislodgment.

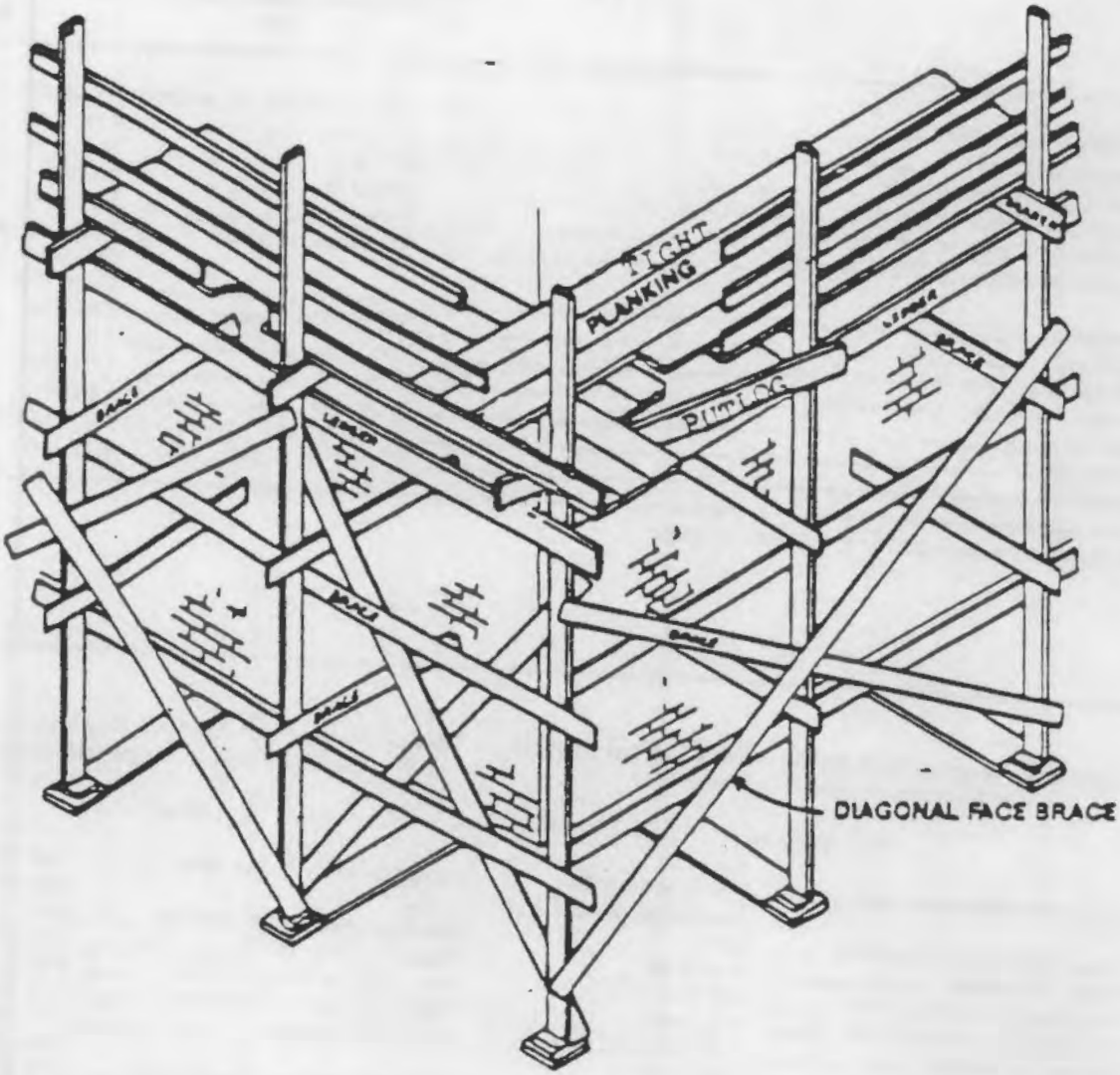
1910.28(b)(15) Guardrails not less than 2 × 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- × 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

451(b)(15) Guardrails, made of lumber not less than 2 × 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a midrail of 1 × 6 inch lumber (or other material providing equivalent protection), and toeboards, shall be installed at all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(6) of this section, when required.



CROSS BRACING
BETWEEN INNER
AND OUTER SETS
OF POLES.

451(b)(9) Cross bracing shall be provided between the inner and outer sets of poles in independent pole scaffolds. The free ends of pole scaffolds shall be cross braced.



451(b)(10) Full diagonal face bracing shall be erected across the entire face of pole scaffolds in both directions. The braces shall be spliced at the poles. The inner row of poles on medium and heavy duty scaffolds shall be braced in a similar manner.

451(b)(11) Platform planks shall be laid with their edges close together so the platform will be tight with no spaces through which tools or fragments of material can fall.

451(b)(13) When a scaffold materially changes its direction, the platform planks shall be laid to prevent tipping. The planks that meet the corner putlog at an angle shall be laid first, extending over the diagonally placed putlog far enough to have a good safe bearing, but not far enough to involve any danger from tipping. The planking running in the opposite direction at an angle shall be laid so as to extend over and rest on the first layer of planking.

Table O-7—Minimum Nominal Size and Maximum Spacing of Members of Single Pole Scaffolds
Light Duty

	Maximum height of scaffold	
	20 ft	60 ft
Uniformly distributed load	Not to exceed 25 pounds per square foot	
Poles or uprights	2 by 4 in	4 by 4 in
Pole spacing (longitudinal)	6 ft. 0 in.	10 ft. 0 in
Maximum width of scaffold	5 ft. 0 in	5 ft. 0 in
Bearers or putlogs to 3 ft. 0 in width	2 by 4 in.	2 by 4 in
Bearers or putlogs to 5 ft. 0 in. width	2 by 6 in. or 3 by 4 in.	2 by 6 in. or 3 by 4 in (rough)
Ledgers	1 by 4 in.	1¼ by 9 in.
Planking	1¼ by 9 in. (rough)	2 by 9 in.
Vertical spacing of horizontal members	7 ft. 0 in.	7 ft. 0 in.
Bracing, horizontal and diagonal	1 by 4 in.	1 by 4 in.
Tie-ins	1 by 4 in.	1 by 4 in.
Toeboards	4 in. high (minimum)	4 in. high (minimum)
Guardrail	2 by 4 in.	2 by 4 in.

All members except planking are used on edge.

Table O-8—Minimum Nominal Size and Maximum Spacing of Members of Single Pole Scaffolds

Medium Duty

Uniformly distributed load.	Not to exceed 50 pounds per square foot.
Maximum height of scaffold.	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal).	8 ft. 0 in.
Maximum width of scaffold.	5 ft. 0 in.
Bearers or putlogs	2 by 9 in. or 3 by 4 in.
Spacing of bearers or putlogs	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members.	9 ft. 0 in.
Bracing, horizontal	1 by 6 in. or 1¼ by 4 in.
Bracing, diagonal	1 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4-in. high (minimum.)
Guardrail	2 by 4 in.

All members except planking are used on edge.

Table O-9—Minimum Nominal Size and Maximum Spacing of Members of Single Pole Scaffolds

Heavy Duty

Uniformly distributed load.	Not to exceed 75 pounds per square foot.
Maximum height of scaffold.	50 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal).	6 ft. 0 in.
Maximum width of scaffold.	5 ft. 0 in.
Bearers or putlogs	2 by 9 in. or 3 by 5 in. (rough).
Spacing of bearers or putlogs	6 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members.	6 ft. 6 in.
Bracing, horizontal and diagonal	2 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4-in. high (minimum.)
Guardrail	2 by 4 in.

All members except planking are used on edge.

1910.28(b)(16) All wood pole scaffolds 60 feet or less in height shall be constructed and erected in accordance with tables O-7 through O-12 of this section. If they are over 60 feet in height they shall be designed by a registered professional engineer and constructed and erected in accordance with such design. A copy of the typical drawings and specifications shall be made available to the employer and for inspection purposes.

Table L-4—Minimum Nominal Size and Maximum Spacing of Members of Single Pole Scaffolds Light Duty

	Maximum height of scaffold	
	20 ft.	60 ft.
Uniformly distributed load	Not to exceed 25 p.s.f.	
Poles or uprights	2 × 4 in.	4 × 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.	10 ft. 0 in.
Maximum width of scaffold	5 ft. 0 in.	5 ft. 0 in.
Bearers or putlogs to 3 ft. 0 in. width	2 × 4 in.	2 × 4 in.
Bearers or putlogs to 5 ft. 0 in. width	2 × 6 in. or 3 × 4 in.	2 × 6 or 3 × 4 in. (rough)
Ledgers	1 × 4 in.	1¼ × 9 in.
Planking	1¼ × 9 in. (rough)	2 × 10 in.
Vertical spacing of horizontal members	7 ft. 0 in.	9 ft. 0 in.
Bracing, horizontal and diagonal	1 × 4 in.	1 × 4 in.
Tie-ins	1 × 4 in.	1 × 4 in.
Toeboards	4 in. high (minimum)	4 in. high (minimum)
Guardrail	2 × 4 in.	2 × 4 in.

All members except planking are used on edge.

Table L-5—Minimum Nominal Size and Maximum Spacing of Members of Single Pole Scaffolds Medium Duty

Uniformly distributed load	Not to exceed 50 p.s.f.
Maximum height of scaffold	60 ft.
Poles or uprights	4 × 4 in.
Pole spacing (longitudinal)	8 ft. 0 in.
Maximum width of scaffold	5 ft. 0 in.
Bearers or putlogs	2 × 10 in. or 3 × 4 in.
Spacing of bearers or putlogs	8 ft. 0 in.
Ledgers	2 × 10 in.
Vertical spacing of horizontal members	7 ft. 0 in.
Bracing, horizontal	1 × 6 in. or 1¼ × 4 in.
Bracing, diagonal	1 × 4 in.
Tie-ins	1 × 4 in.
Planking	2 × 10 in.
Toeboards	4-in. high (minimum.)
Guardrail	2 × 4 in.

All members except planking are used on edge.

Table L-6—Minimum Nominal Size and Maximum Spacing of Members of Single Pole Scaffolds Heavy Duty

Uniformly distributed load	Not to exceed 75 p.s.f.
Maximum height of scaffold	60 ft.
Poles or uprights	4 × 6 in.
Pole spacing (longitudinal)	6 ft. 0 in.
Maximum width of scaffold	5 ft. 0 in.
Bearers or putlogs	2 × 10 in. or 3 × 5 in.
Spacing of bearers or putlogs	6 ft. 0 in.
Ledgers	2 × 10 in.
Vertical spacing of horizontal members	6 ft. 6 in.
Bracing, horizontal and diagonal	2 × 4 in.
Tie-ins	1 × 4 in.
Planking	2 × 10 in.
Toeboards	4-in. high (minimum.)
Guardrail	2 × 4 in.

All members except planking are used on edge

451(b)(16) All wood pole scaffolds 60 feet or less in height shall be constructed and erected in accordance with Tables L-4 to 10. If they are over 60 feet in height, they shall be designed by a qualified engineer competent in this field, and it shall be constructed and erected in accordance with such design.

Table D-10—Minimum Nominal Size and Maximum Spacing of Members of Independent Pole Scaffolds
Light Duty

	Maximum height of scaffold	
	20 ft	60 ft
Uniformly distributed load	Not to exceed 25 pounds per square foot	
Poles or uprights	2 by 4 in.	4 by 4 in
Pole spacing (longitudinal)	6 ft. 0 in.	10 ft. 0 in
Pole spacing (transverse)	6 ft. 0 in	10 ft. 0 in
Ledgers	1¼ by 4 in.	1¼ by 9 in
Bearers to 3 ft. 0 in span	2 by 4 in.	2 by 4 in.
Bearers to 10 ft. 0 in. span	2 by 6 in. or 3 by 4 in.	2 by 9 (rough) or 3 by 8 in
Planking	1¼ by 9 in.	2 by 9 in.
Vertical spacing of horizontal members	7 ft. 0 in.	7 ft. 0 in.
Bracing, horizontal and diagonal	1 by 4 in.	1 by 4 in.
Tie-ins	1 by 4 in.	1 by 4 in.
Toeboards	4 in. high	4 in. high (minimum)
Guardrail	2 by 4 in.	2 by 4 in.

All members except planking are used on edge.

Table D-11—Minimum Nominal Size and Maximum Spacing of Members of Independent Pole Scaffolds

Medium Duty

Uniformly distributed load	Not to exceed 50 pounds per square foot.
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	8 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	6 ft. 0 in.
Spacing of bearers	8 ft. 0 in.
Bearers	2 by 9 in. (rough) or 2 by 10 in.
Bracing, horizontal	1 by 6 in. or 1¼ by 4 in.
Bracing, diagonal	1 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4-in. high (minimum.)
Guardrail	2 by 4 in.

All members except planking are used on edge.

Table D-12—Minimum Nominal Size and Maximum Spacing of Members of Independent Pole Scaffolds

Heavy Duty

Uniformly distributed load	Not to exceed 75 pounds per square foot
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	4 ft. 6 in.
Bearers	2 by 9 in. (rough)
Bracing, horizontal and diagonal	2 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4-in. high (minimum.)
Guardrail	2 by 4 in.

All members except planking are used on edge.

1510.28(b)(17) Wood-pole scaffolds shall not be erected beyond the reach of effective firefighting apparatus.

Table L-7—Minimum Nominal Size and Maximum Spacing of Members of Independent Pole Scaffolds Light Duty

	Maximum height of scaffold	
	20 ft	60 ft
Uniformly distributed load	Not to exceed 25 p.s.f.	
Poles or uprights	2 × 4 in.	4 × 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.	10 ft. 0 in.
Pole spacing (transverse)	6 ft. 0 in.	10 ft. 0 in.
Ledgers	1¼ × 4 in.	1¼ × 9 in.
Bearers to 3 ft. 0 in. span	2 × 4 in.	2 × 4 in.
Bearers to 10 ft. 0 in. span	2 × 6 in. or 3 × 4 in.	2 × 10 (rough) or 3 × 8 in.
Planking	1¼ × 9 in.	2 × 10 in.
Vertical spacing of horizontal members	7 ft. 0 in.	7 ft. 0 in.
Bracing, horizontal and diagonal	1 × 4 in.	1 × 4 in.
Tie-ins	1 × 4 in.	1 × 4 in.
Toeboards	4 in. high	4 in. high (minimum).
Guardrail	2 × 4 in.	2 × 4 in.

All members except planking are used on edge.

Table L-8—Minimum Nominal Size and Maximum Spacing of Members of Independent Pole Scaffolds Medium Duty

Uniformly distributed load	Not to exceed 50 p.s.f.
Maximum height of scaffold	60 ft.
Poles or uprights	4 × 4 in.
Pole spacing (longitudinal)	8 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 × 10 in.
Vertical spacing of horizontal members	6 ft. 0 in.
Spacing of bearers	8 ft. 0 in.
Bearers	2 × 10 in.
Bracing, horizontal	1 × 6 in. or 1¼ × 4-in.
Bracing, diagonal	1 × 4 in.
Tie-ins	1 × 4 in.
Planking	2 × 10 in.
Toeboards	4-in. high (minimum).
Guardrail	2 × 4 in.

All members except planking are used on edge.

Table L-9—Minimum Nominal Size and Maximum Spacing of Members of Independent Pole Scaffolds Heavy Duty

Uniformly distributed load	Not to exceed 75 p.s.f.
Maximum height of scaffold	60 ft.
Poles or uprights	4 × 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 × 10 in.
Vertical pacing of horizontal members	6 ft. 0 in.
Bracers	2 × 10 in. (rough).
Bracing, horizontal and diagonal	2 × 4 in.
Tie-ins	1 × 4 in.
Planking	2 × 10 in.
Toeboards	4-in. high (minimum).
Guardrail	2 × 4 in.

All members except planking are used on edge.

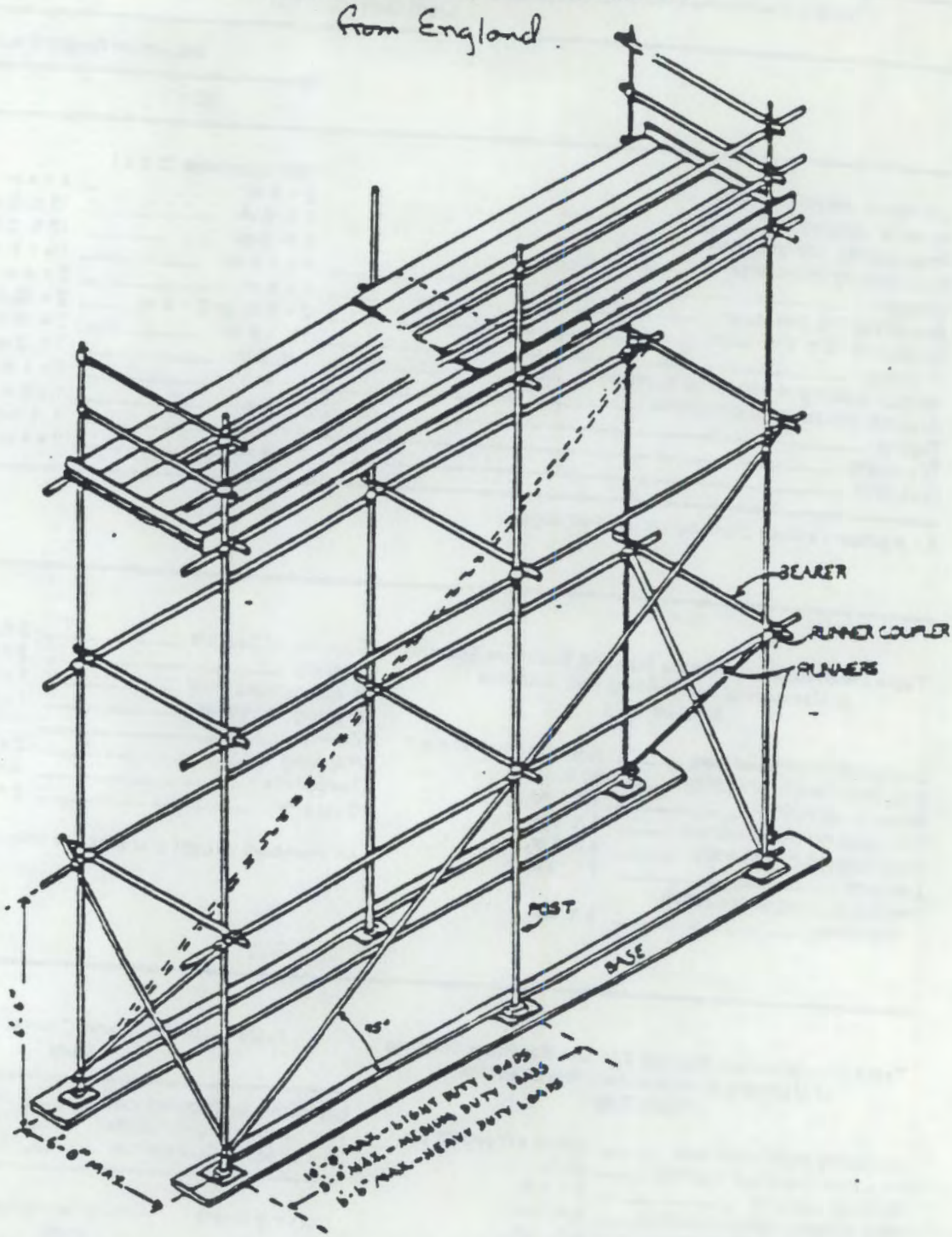
Table L-10—Tube and Coupler Scaffolds Light Duty

Uniformly distributed load	Not to exceed 25 p.s.f.
Post spacing (longitudinal)	10 ft. 0 in.
Post spacing (transverse)	6 ft. 0 in.

Working levels	Additional planked levels	Maximum height
1	8	125 ft.
2	4	125 ft.
3	0	91 ft. 0 in.

Tube and Coupler Scaffolds

From England

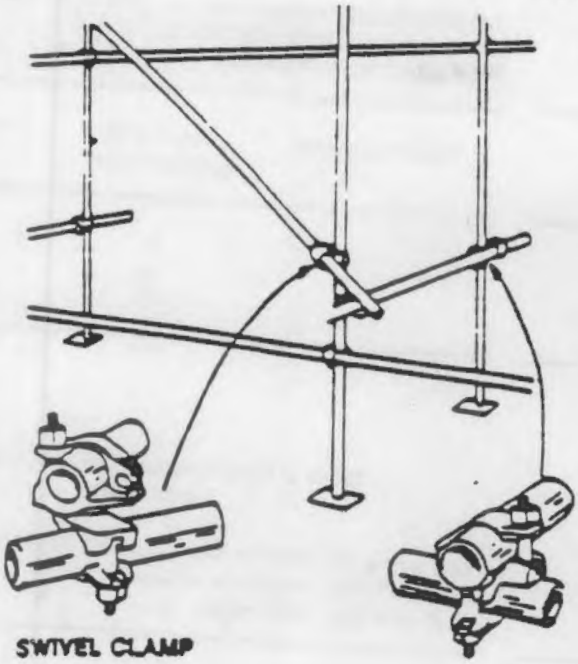


1910.28(c)(1) Tube and coupler scaffolds. A light-duty tube and coupler scaffold shall have all posts, bearers, runners, and bracing of nominal 2-inch O.D. steel tubing. The posts shall be spaced no more than 6 feet apart by 10 feet along the length of the scaffold. Other structural metals when used must be designed to carry an equivalent load.

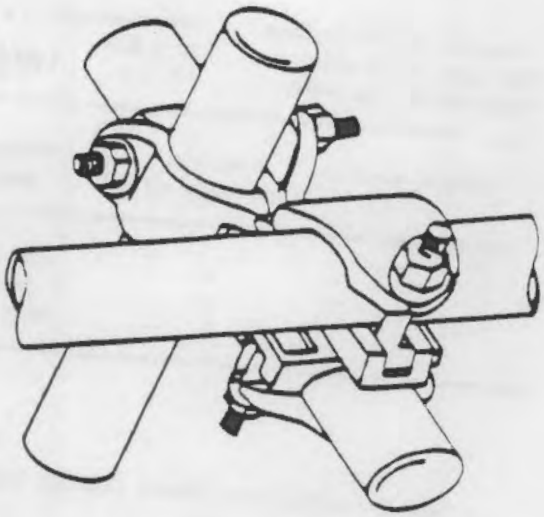
1910.28(c)(2) A medium-duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 1-inch O.D. steel tubing. Posts spaced not more than 6 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2½-inch O.D. steel tubing. Posts spaced not more than 5 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2-inch O.D. steel tubing. Other structural metals when used must be designed to carry an equivalent load.

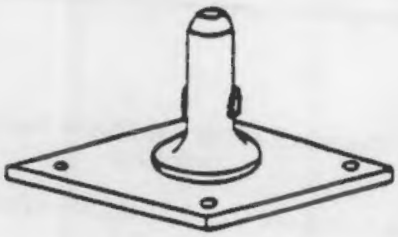
451(c)(1) A light duty tube and coupler scaffold shall have all posts, bearers, runners, and bracing of nominal 2 inch O.D. steel tubing. The posts shall be spaced no more than 6 feet apart by 10 feet along the length of the scaffold. Other structural metals when used must be designed to carry an equivalent load. No dissimilar metals shall be used together.

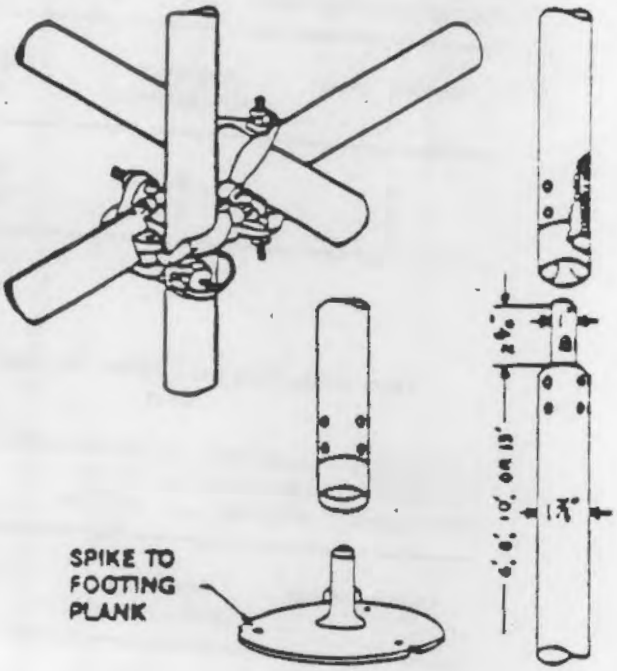
451(c)(3) A heavy duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch O.D. steel tubing, with the posts spaced not more than 6 feet by 6 feet-6 inches. Other structural metals, when used, must be designed to carry an equivalent load. No dissimilar metals shall be used together.



SWIVEL CLAMP







SPIKE TO FOOTING PLANK

TUBE AND CLAMP FITTINGS

451(c)(2) A medium duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch O.D. steel tubing. Posts spaced not more than 6 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2½-inch O.D. steel tubing. Posts spaced not more than 5 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2-inch O.D. steel tubing. Other structural metals, when used, must be designed to carry an equivalent load. No dissimilar metals shall be used together.

Table D-13—Tube and Coupler Scaffolds Light Duty

Uniformly distributed load ..... Not to exceed 25 p.s.f.
Post spacing (longitudinal) ..... 10 ft. 0 in.
Post spacing (transverse) ..... 6 ft. 0 in.

Working levels	Additional planked levels	Maximum height
1	6	125 ft.
2	4	125 ft.
3	0	91 ft. 0 in.

Table D-14—Tube and Coupler Scaffolds Medium Duty

Uniformly distributed load ..... Not to exceed 50 p.s.f.
Post spacing (longitudinal) ..... 8 ft. 0 in.
Post spacing (transverse) ..... 6 ft. 0 in.

Working levels	Additional planked levels	Maximum height
1	6	125 ft.
2	0	78 ft. 0 in.

Table D-15—Tube and Coupler Scaffolds Heavy Duty

Uniformly distributed load ..... Not to exceed 75 p.s.f.
Post spacing (longitudinal) ..... 6 ft. 6 in.
Post spacing (transverse) ..... 6 ft. 0 in.

Working levels	Additional planked levels	Maximum height
1	6	125 ft.

1910.28(c)(4) Tube and coupler scaffolds shall be limited in heights and working levels to those permitted in tables D-13, 14, and 15, of this section. Drawings and specifications of all tube and coupler scaffolds above the limitations in tables D-13, 14, and 15 of this section shall be designed by a registered professional engineer and copies made available to the employer and for inspection purposes.

1910.28(c)(5) All tube and coupler scaffolds shall be constructed and erected to support four times the maximum intended loads as set forth in tables D-13, 14, and 15 of this section, or as set forth in the specifications by a registered professional engineer, copies which shall be made available to the employer and for inspection purposes.

Table L-10—Tube and Coupler Scaffolds Light Duty

Uniformly distributed load ..... Not to exceed 25 p.s.f.
Post spacing (longitudinal) ..... 10 ft. 0 in.
Post spacing (transverse) ..... 6 ft. 0 in.

Working levels	Additional planked levels	Maximum height
1	6	125 ft.
2	4	125 ft.
3	0	91 ft. 0 in.

Table L-11—Tube and Coupler Scaffolds Medium Duty

Uniformly distributed load ..... Not to exceed 50 p.s.f.
Post spacing (longitudinal) ..... 8 ft. 0 in.
Post spacing (transverse) ..... 6 ft. 0 in.

Working levels	Additional planked levels	Maximum height
1	6	125 ft.
2	0	78 ft. 0 in.

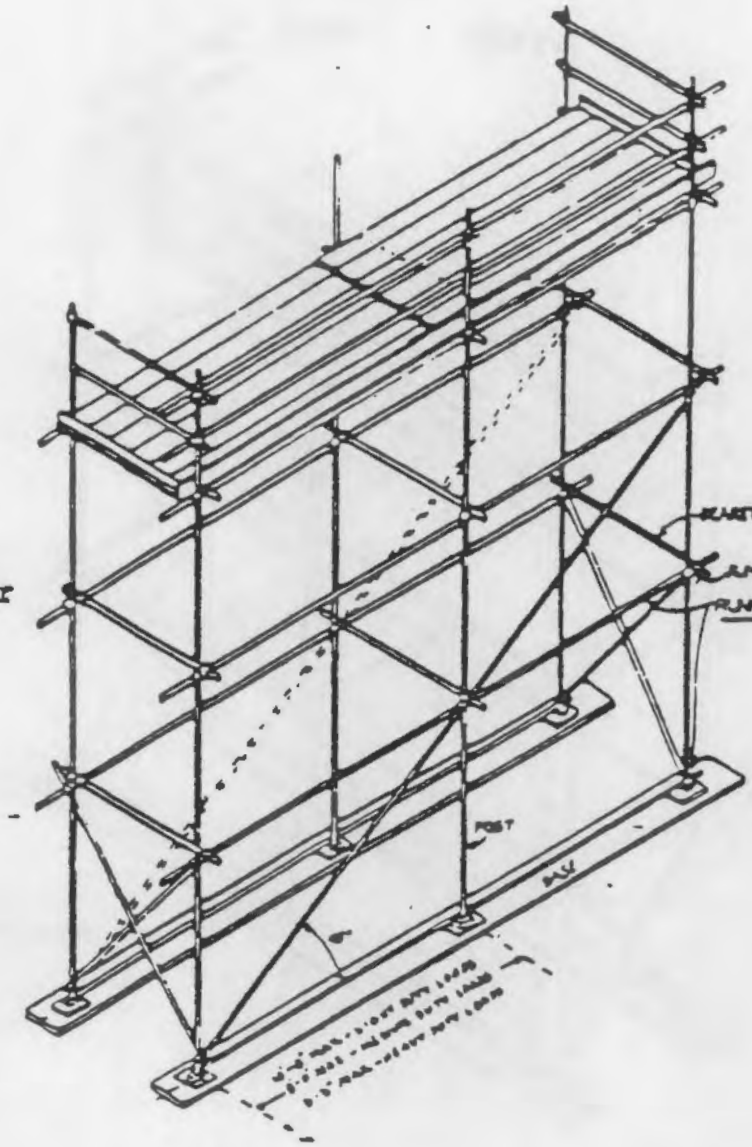
Table L-12—Tube and Coupler Scaffolds Heavy Duty

Uniformly distributed load ..... Not to exceed 75 p.s.f.
Post spacing (longitudinal) ..... 6 ft. 6 in.
Post spacing (transverse) ..... 6 ft. 0 in.

Working levels	Additional planked levels	Maximum height
1	6	125 ft.

451(c)(4) Tube and coupler scaffolds shall be limited in heights and working levels to those permitted in Tables L-10, 11, and 12. Drawings and specifications of all tube and coupler scaffolds above the limitations in Tables L-10, 11, and 12 shall be designed by a qualified engineer competent in this field.

451(c)(5) All tube and coupler scaffolds shall be constructed and erected to support four times the maximum intended loads, as set forth in Tables L-10, 11, and 12, or as set forth in the specifications by a licensed professional engineer competent in this field.



1910.28(c)(6) All tube and coupler scaffolds shall be erected by competent and experienced personnel.

1910.28(c)(7) Posts shall be accurately spaced, erected on suitable bases, and maintained plumb

1910.28(c)(8) Runners shall be erected along the length of the scaffold located on both the inside and the outside posts at even height. Runners shall be interlocked to form continuous lengths and coupled to each post. The bottom runners shall be located as close to the base as possible. Runners shall be placed not more than 6 feet 6 inches on centers.

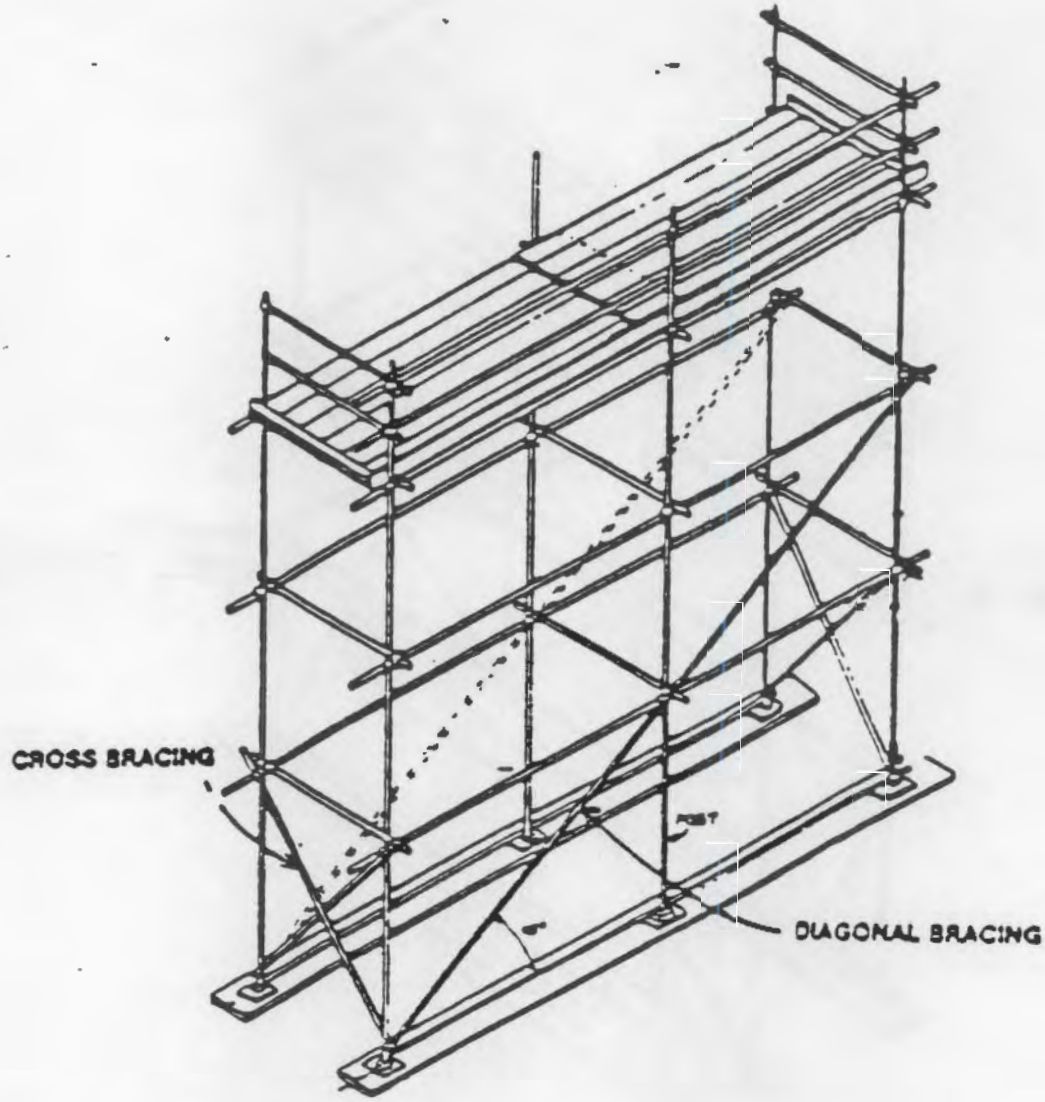
1910.28(c)(9) Bearers shall be installed transversely between posts and shall be securely coupled to the posts bearing on the runner coupler. When coupled directly to the runners, the coupler must be kept as close to the posts as possible.

451(c)(6) Posts shall be accurately spaced, erected on suitable bases, and maintained plumb.

451(c)(7) Runners shall be erected along the length of the scaffold, located on both the inside and the outside posts at even height. Runners shall be interlocked to the inside and the outside posts at even heights. Runners shall be interlocked to form continuous lengths and coupled to each post. The bottom runners shall be located as close to the base as possible. Runners shall be placed not more than 6 feet-6 inches on centers.

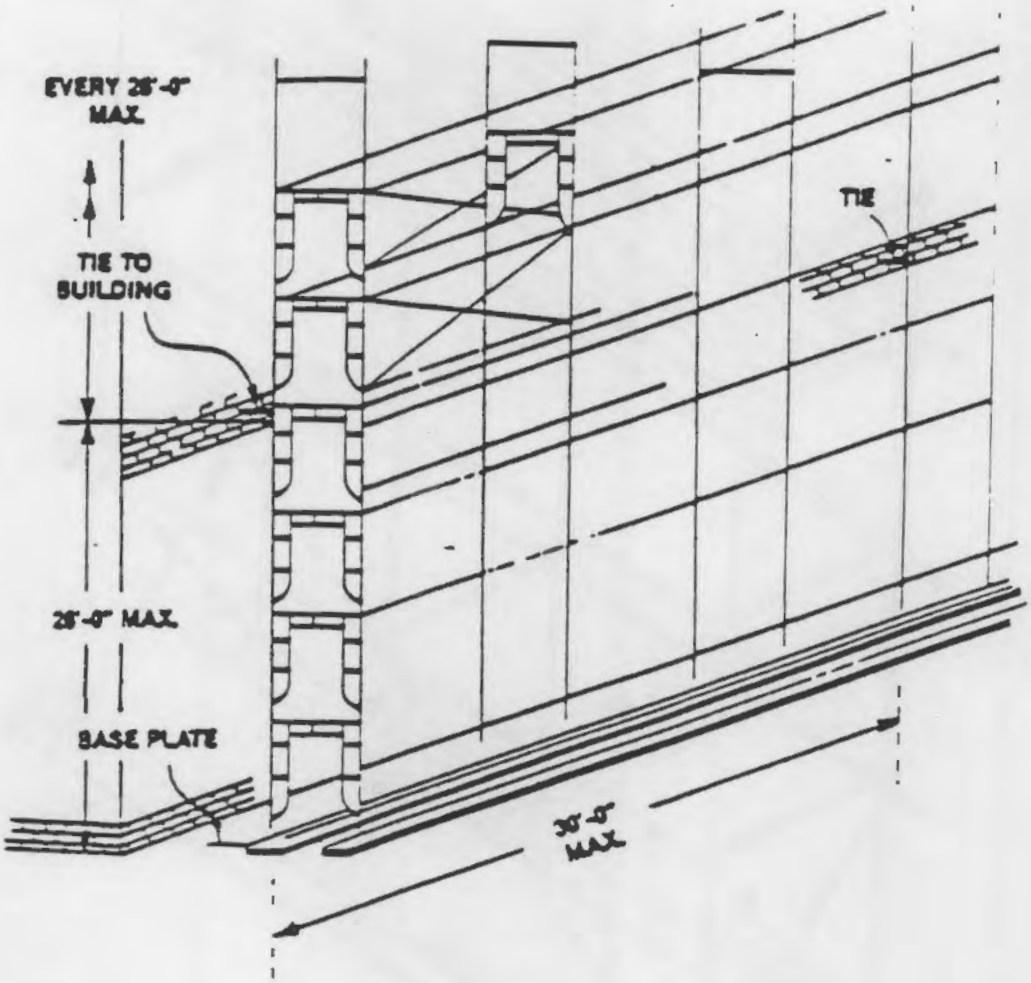
451(c)(8) Bearers shall be installed transversely between posts and shall be securely coupled to the posts bearing on the runner coupler. When coupled directly to the runners, the coupler must be kept as close to the posts as possible.

451(c)(9) Bearers shall be at least 4 inches but not more than 12 inches longer than the post spacing or runner spacing.



451(c)(10) Cross bracing shall be installed across the width of the scaffold at least every third set of posts horizontally and every fourth runner vertically. Such bracing shall extend diagonally from the inner and outer runners upward to the next outer and inner runners.

451(c)(11) Longitudinal diagonal bracing on the inner and outer rows of poles shall be installed at approximately a 45° angle from near the base of the first outer post upward to the extreme top of the scaffold. Where the longitudinal length of the scaffold permits, such bracing shall be duplicated beginning at every fifth post. In a similar manner, longitudinal diagonal bracing shall also be installed from the last post extending back and upward toward the first post. Where conditions preclude the attachment of this bracing to the posts, it may be attached to the runners.

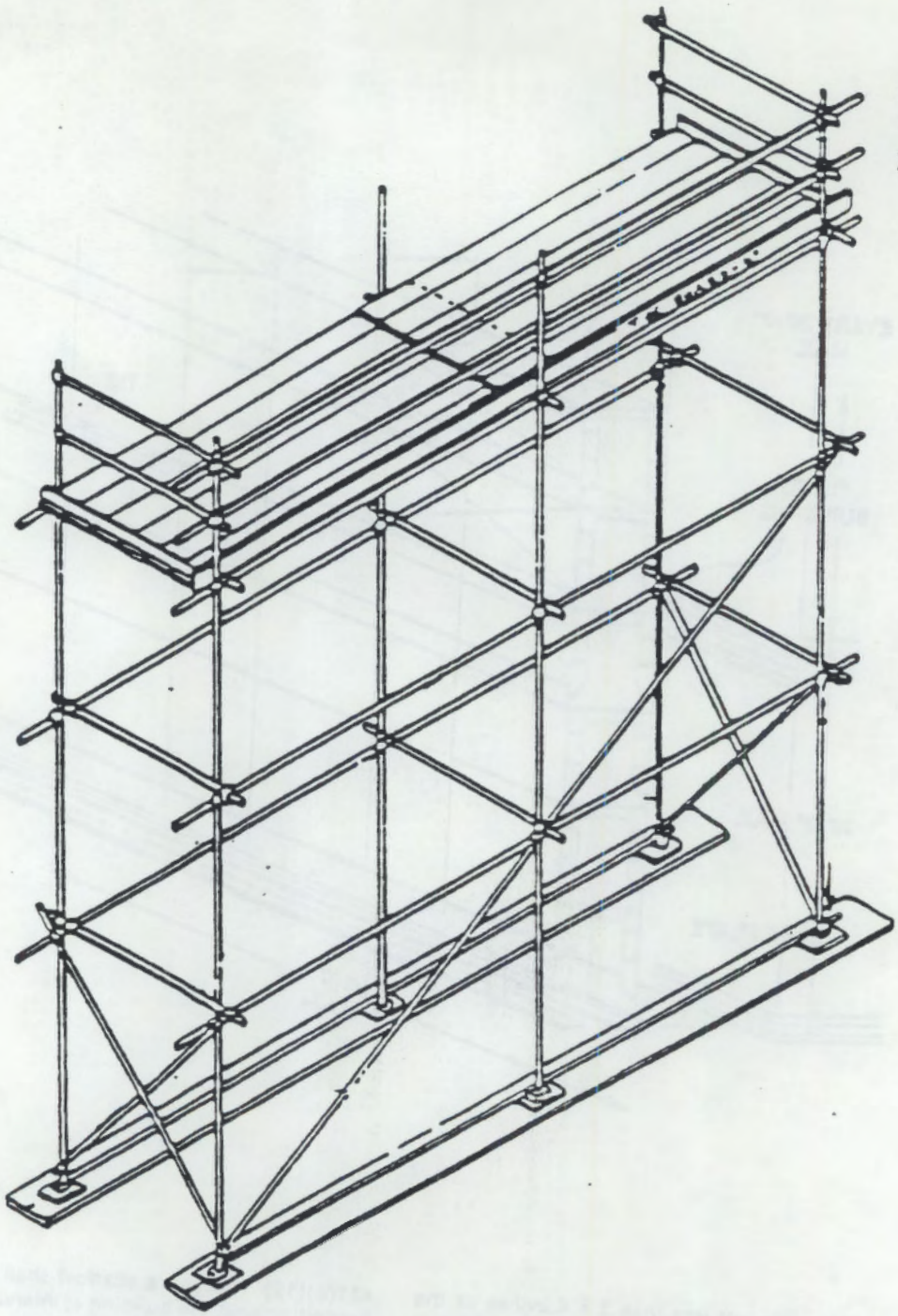


1910.28(d)(7) Guardrails not less than 2 × 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- × 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

1910.28(d)(8) All tubular metal scaffolds shall be constructed and erected to support four times the maximum intended loads.

1910.28(d)(9) To prevent movement, the scaffold shall be secured to the building or structure at intervals not to exceed 30 feet horizontally and 26 feet vertically.

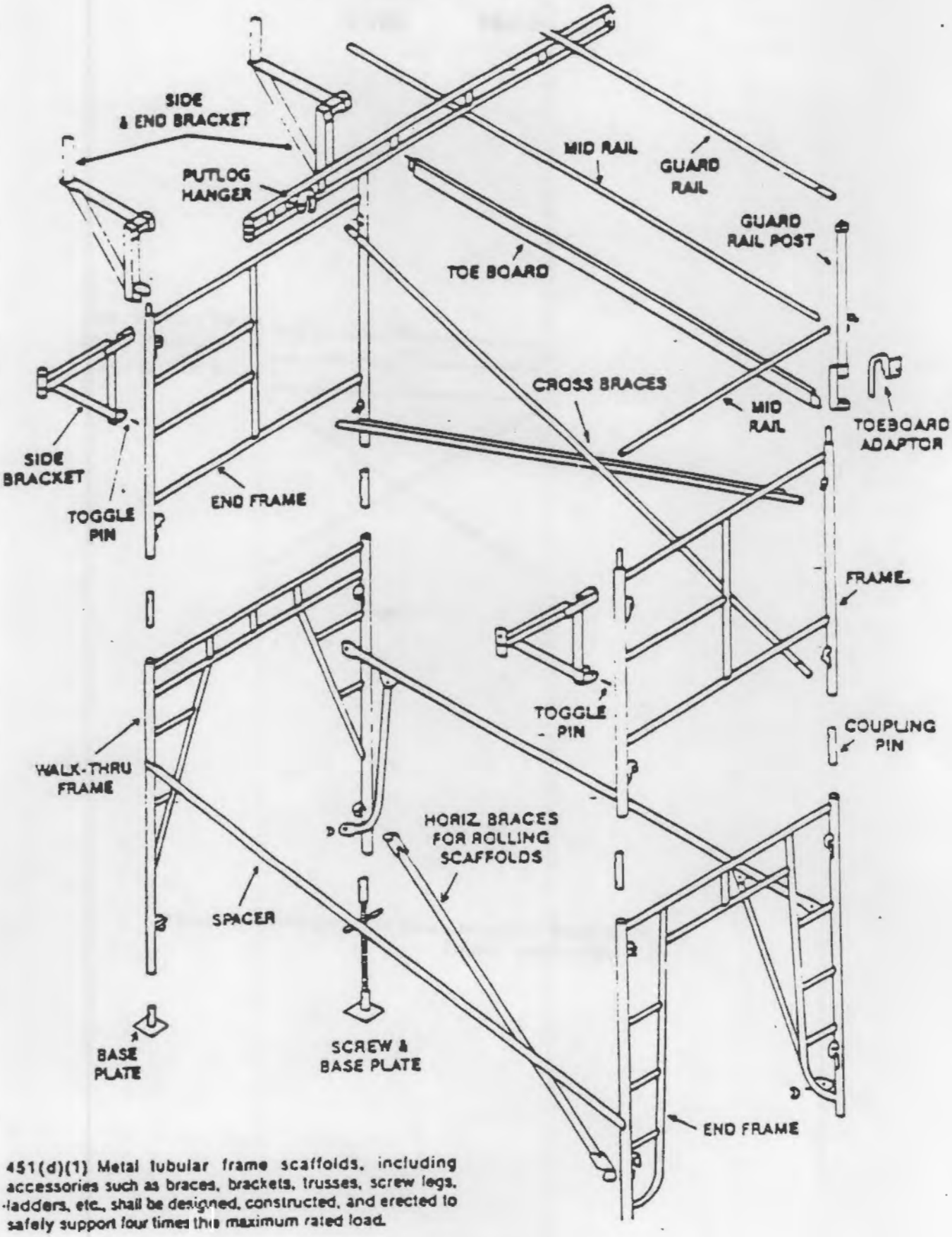
451(c)(12) The entire scaffold shall be tied to and securely braced against the building at intervals not to exceed 30 feet horizontally and 26 feet vertically.



1910.28(c)(14) Guardrails not less than 2 × 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- × 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

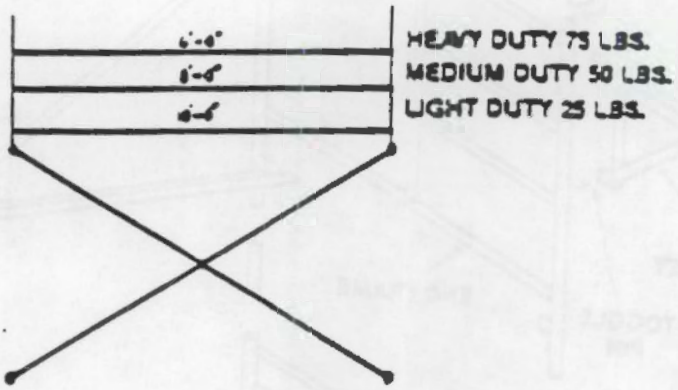
451(c)(13) Guardrails made of lumber not less than 2 × 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a midrail of 1 × 6 inch lumber (or other material providing equivalent protection), and toeboard shall be installed at all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(6) of this section.

Tubular Welded Frame Scaffolds



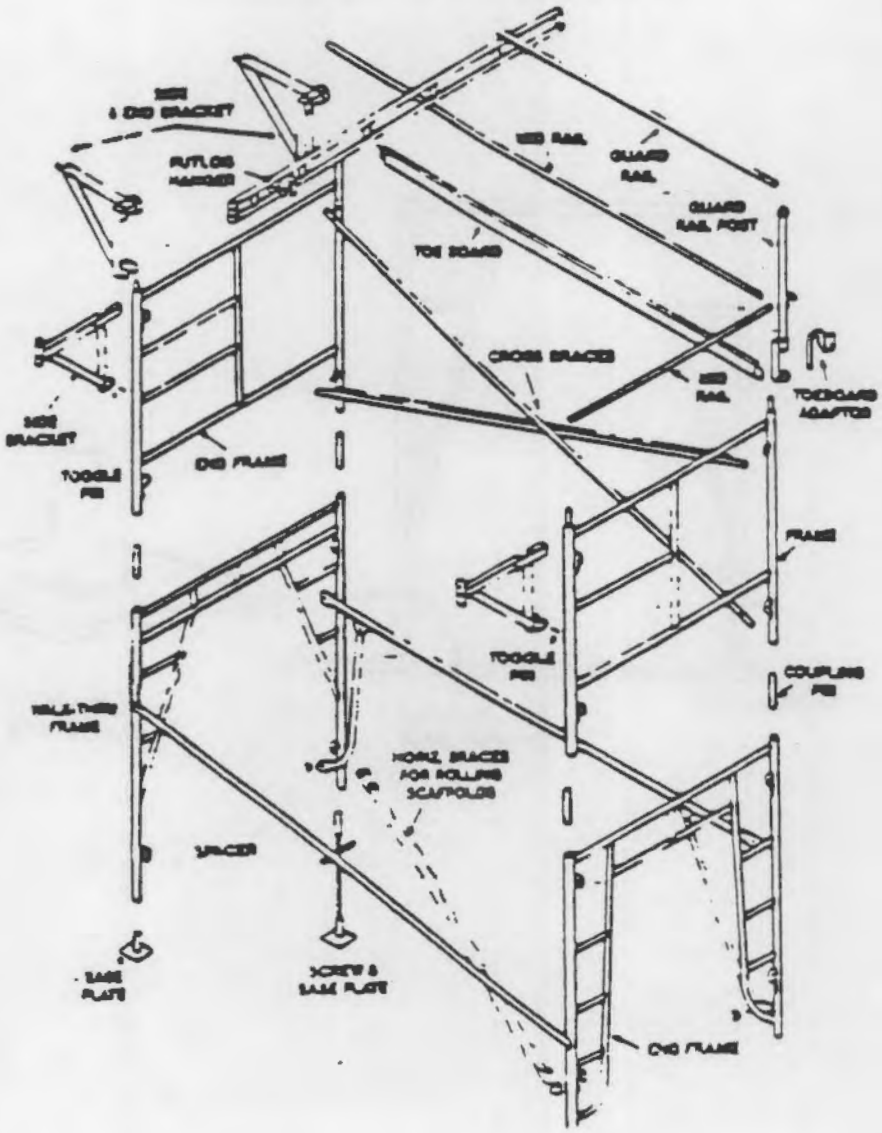
451(d)(1) Metal tubular frame scaffolds, including accessories such as braces, brackets, trusses, screw legs, ladders, etc., shall be designed, constructed, and erected to safely support four times the maximum rated load.

Bricklayers use this aid



451(d)(2) Spacing of panels or frames shall be consistent with the loads imposed.

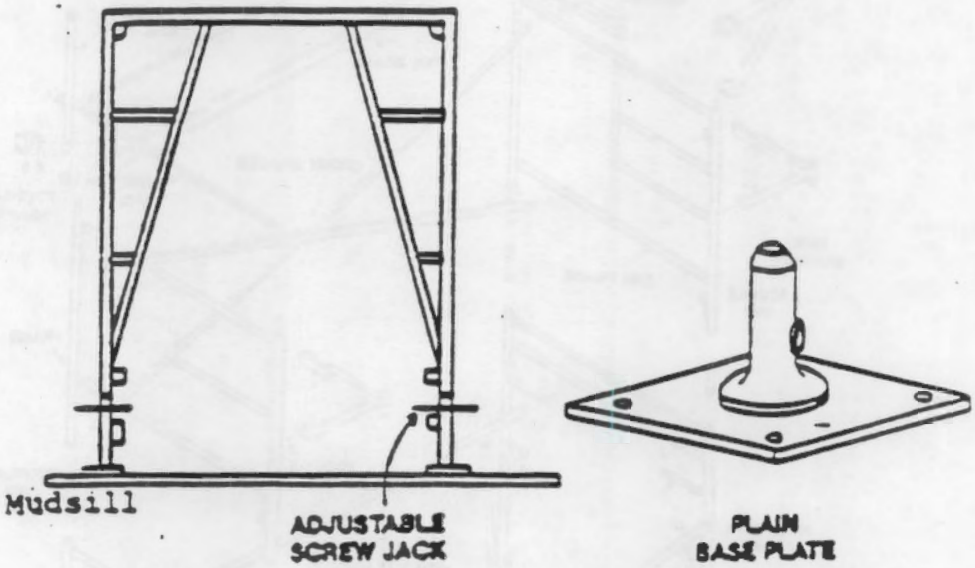
Tubular Welded Frame Scaffolds



451(d)(3) Scaffolds shall be properly braced by cross bracing or diagonal braces, or both, for securing vertical members together laterally, and the cross braces shall be of such length as will automatically square and align vertical members so that the erected scaffold is always plumb, square, and rigid. All brace connections shall be made secure.

451(d)(5) The frames shall be placed one on top of the other with coupling or stacking pins to provide proper vertical alinement of the legs.

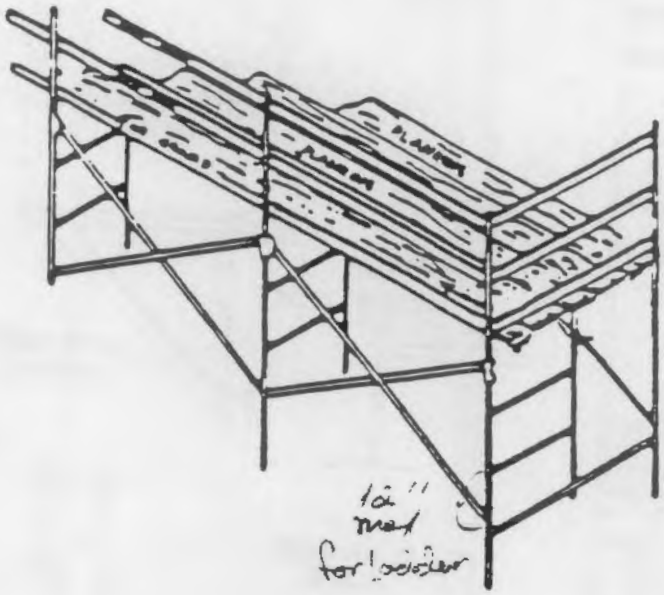
451(d)(6) Where uplift may occur, panels shall be locked together vertically by pins or other equivalent suitable means.



Common Leg

1910.28(d)(4) Scaffold legs shall be set on adjustable bases or plain bases placed on mud sills or other foundations adequate to support the maximum intended load.

451(d)(4) Scaffold legs shall be set on adjustable bases or plain bases placed on mud sills or other foundations adequate to support the maximum rated load.



1910.28(a)(9) All planking shall be Scaffold Grade as recognized by grading rules for the species of wood used. The maximum permissible spans for 2- × 9-inch or wider planks are shown in the following table:

	Material				
	Full thickness undressed lumber			Nominal thickness lumber	
Working load (p.s.f.)	25	50	75	25	50
Permissible span (ft.)	10	8	6	8	6

The maximum permissible span for 1¼- × 9-inch or wider plank of full thickness is 4 feet with medium loading of 50 p.s.f.

1910.28(d)(10) Maximum permissible spans of planking shall be in conformity with paragraph (a)(9) of this section.

1910.28(d)(7) Guardrails not less than 2 × 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- × 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

1926.451(a)(10) All planking shall be Scaffold Grades, or equivalent, as recognized by approved grading rules for the species of wood used. The maximum permissible spans for 2- × 10-inch or wider planks shall be as shown in the following

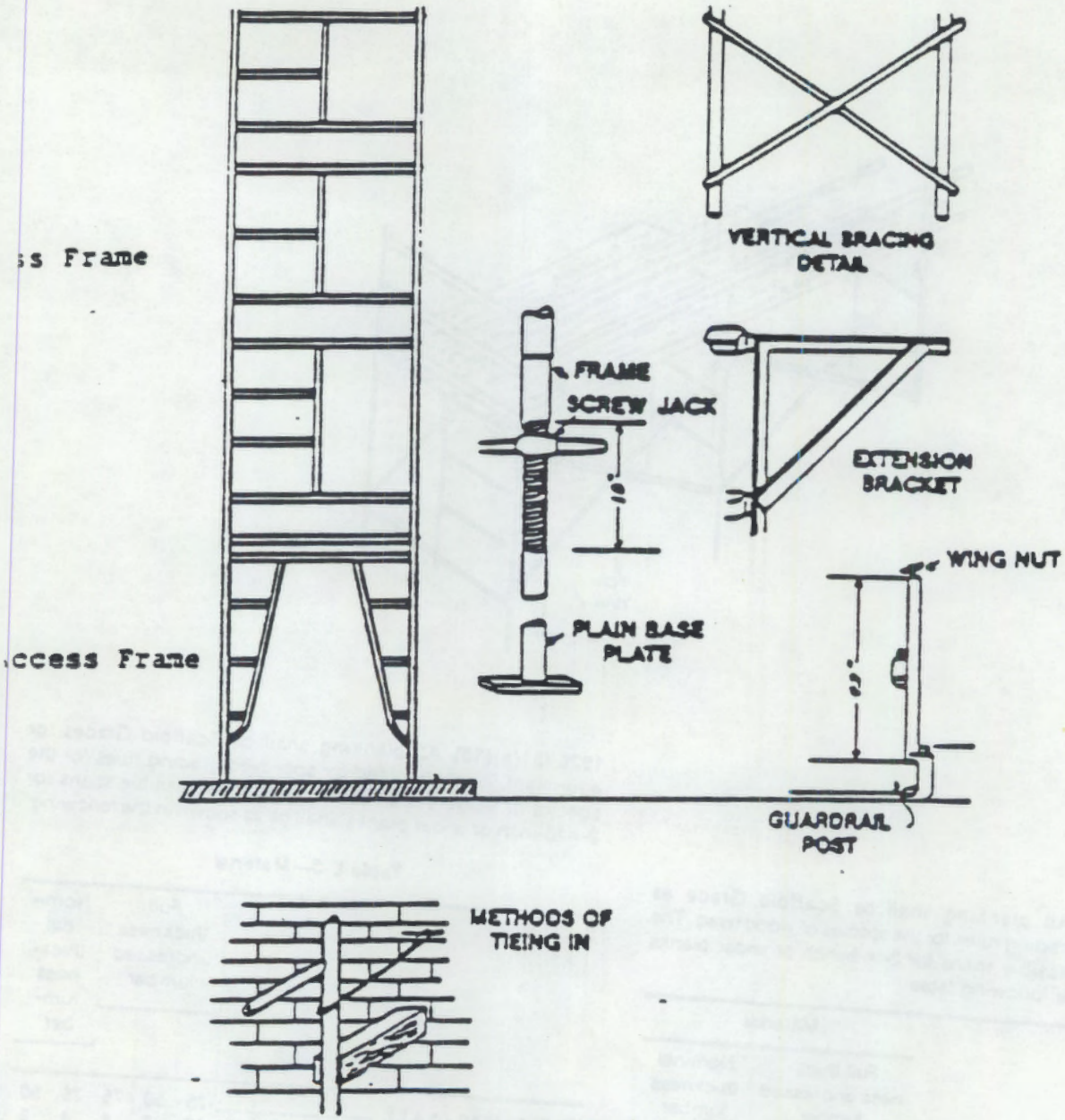
Table L-3—Material

	Full thickness undressed lumber			Nominal thickness lumber[1]	
Working load (p.s.f.)	25	50	75	25	50
Permissible span (ft.)	10	8	6	8	6

[1]Nominal thickness lumber not recommended for heavy duty use.

451(d)(8) Maximum permissible spans or planking shall be in conformity with paragraph (a)(10), of this section.

451(d)(10) Guardrails made of lumber, not less than 2 × 4 inches (or other material providing equivalent protection), and approximately 42 inches high, with a midrail of 1 × 6 inch lumber (or other material providing equivalent protection), and toeboards, shall be installed at all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(6) of this section.



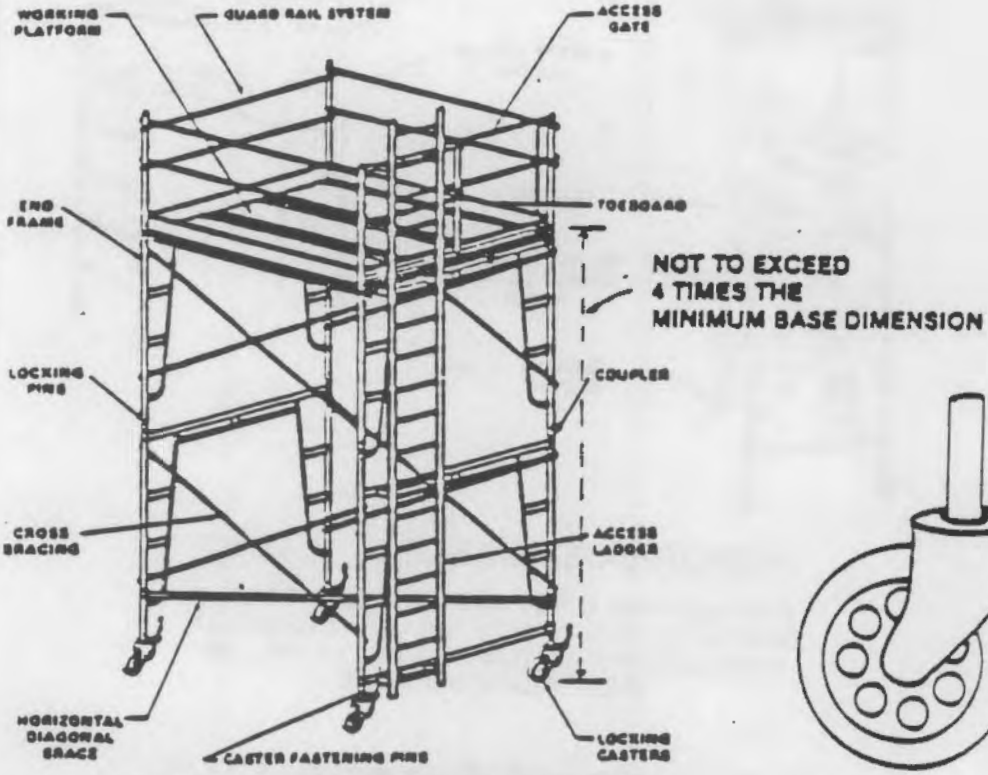
1910.28(d)(11) Drawings and specifications for all frame scaffolds over 125 feet in height above the base plates shall be designed by a registered professional engineer and copies made available to the employer and for inspection purposes.

1910.28(d)(12) All tubular welded frame scaffolds shall be erected by competent and experienced personnel.

1910.28(d)(13) Frames and accessories for scaffolds shall be maintained in good repair and every defect, unsafe condition, or noncompliance with this section shall be immediately corrected before further use of the scaffold. Any broken, bent, excessively rusted, altered, or otherwise structurally damaged frames or accessories shall not be used.

1910.28(d)(14) Periodic inspections shall be made of all welded frames and accessories, and any maintenance, including painting, or minor corrections authorized by the manufacturer, shall be made before further use.

Manually Propelled Mobile Scaffolds



FABRICATED TUBULAR FRAME
MANUALLY PROPELLED MOBILE SCAFFOLD

451(e)(1) When free-standing mobile scaffold towers are used, the height shall not exceed four times the minimum base dimension.

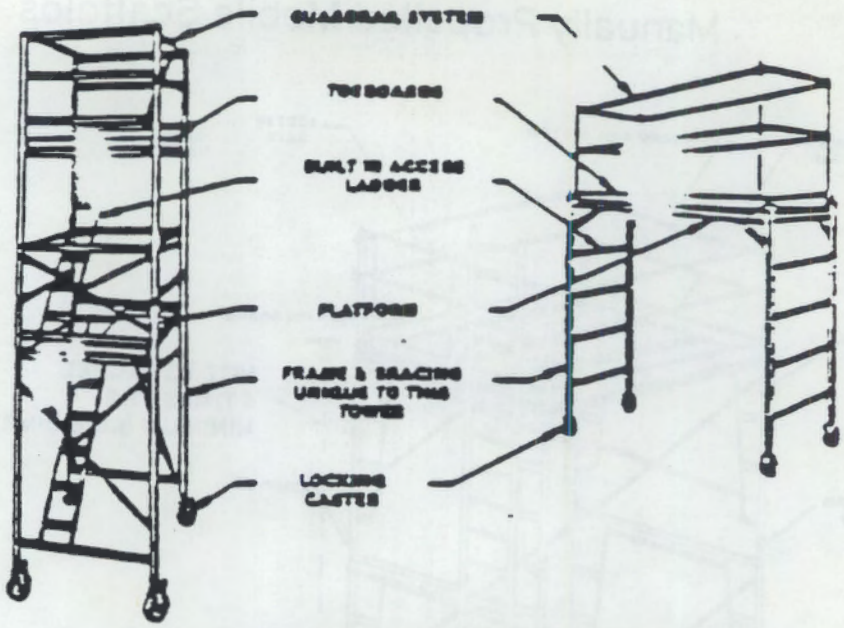
451(e)(2) Casters shall be properly designed for strength and dimensions to support four times the maximum intended load. All casters shall be provided with a positive locking device to hold the scaffold in position.

451(e)(3) Scaffolds shall be properly braced by cross bracing and horizontal bracing conforming with paragraph (d)(3) of this section.

451(e)(4) Platforms shall be tightly planked for the full width of the scaffold except for necessary entrance opening. Platforms shall be secured in place.

451(e)(5) A ladder or stairway shall be provided for proper access and exit and shall be affixed or built into the scaffold and so located that when in use it will not have a tendency to tip the scaffold. A landing platform must be provided at intervals not to exceed 35 feet.

451(e)(6) The force necessary to move the mobile scaffold shall be applied near or as close to the base as practicable and provision shall be made to stabilize the tower during movement from one location to another. Scaffolds shall only be moved on level floors, free of obstructions and openings.



PREFABRICATED MOBILE TOWER UNIT

THIS SCAFFOLD IS NORMALLY M[illegible]UFACTURED AS COMPLETE UNITS/TOWERS FOR [illegible]S MANUALLY PROPELLED MOBILE SCAFFOLD [illegible] SUPPLIERS IDENTIFICATION SYMBOL

451(e)(7) The employer shall not allow employees to ride on manually propelled scaffolds unless the following conditions exist:

(i) The floor or surface is within 3° of level, and free from pits, holes, or obstructions;

(ii) The minimum dimension of the scaffold base when ready for rolling, is at least one-half of the height. Outriggers, if used, shall be installed on both sides of the staging;

(iii) The wheels are equipped with rubber or similar resilient tires;

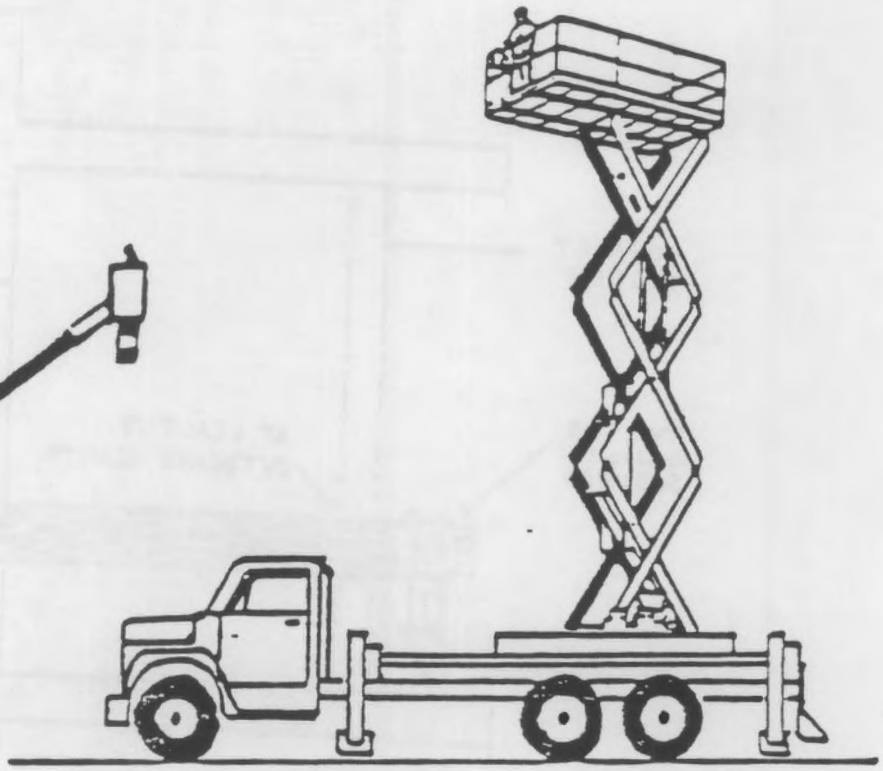
(iv) All tools and materials are secured or removed from the platform before the mobile scaffold is moved.

451(e)(8) Scaffolds in use by any persons shall rest upon a suitable footing and shall stand plumb. The casters or wheels shall be locked to prevent any movement.

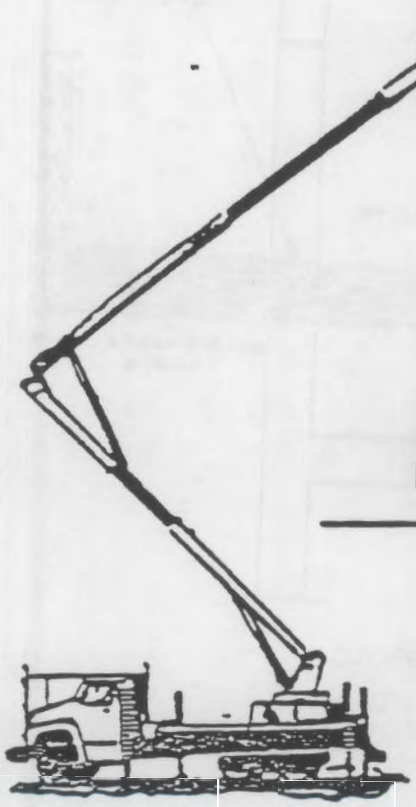
451(e)(9) Mobile scaffolds constructed of metal members shall also conform to applicable provisions of paragraphs (b), (c), or (d) of this section, depending on the material of which they are constructed.

451(e)(10) Guardrails made [illegible] lumber, not less than 2 × 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a midrail, of 1 × 6 inch lumber (or other material providing equivalent protection), and toeboards, shall be installed at all open sides and ends on all scaffolds more than [illegible] feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(6) of this section.

VEHICLE-MOUNTED ELEVATING AND ROTATING AERIAL DEVICES



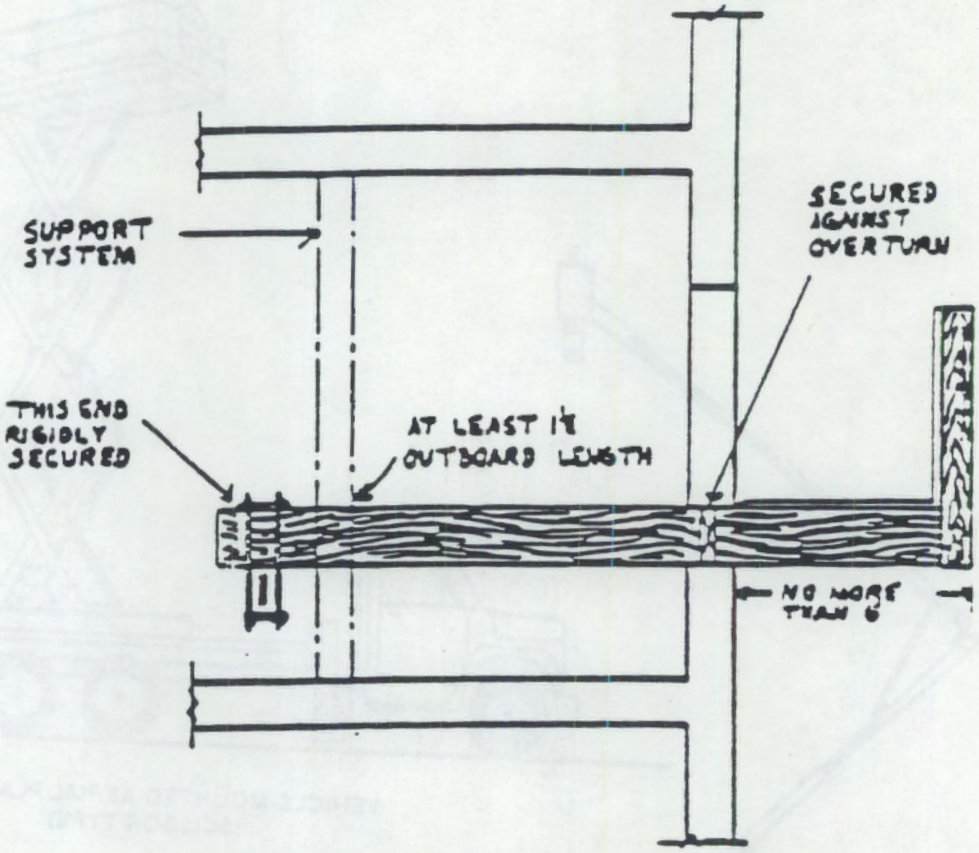
VEHICLE-MOUNTED AERIAL PLATFORM
(SCISSOR TYPE)



VEHICLE-MOUNTED AERIAL PLATFORM
WITH TELESCOPING AND ROTATING BOOM

451(f) Applicable requirements of American National Standards Institute A92.2-1969, Vehicle Mounted Elevating and Rotating Work Platforms, shall be complied with for such equipment, as required by the provisions of § 1926.556.

Outrigger Scaffolds

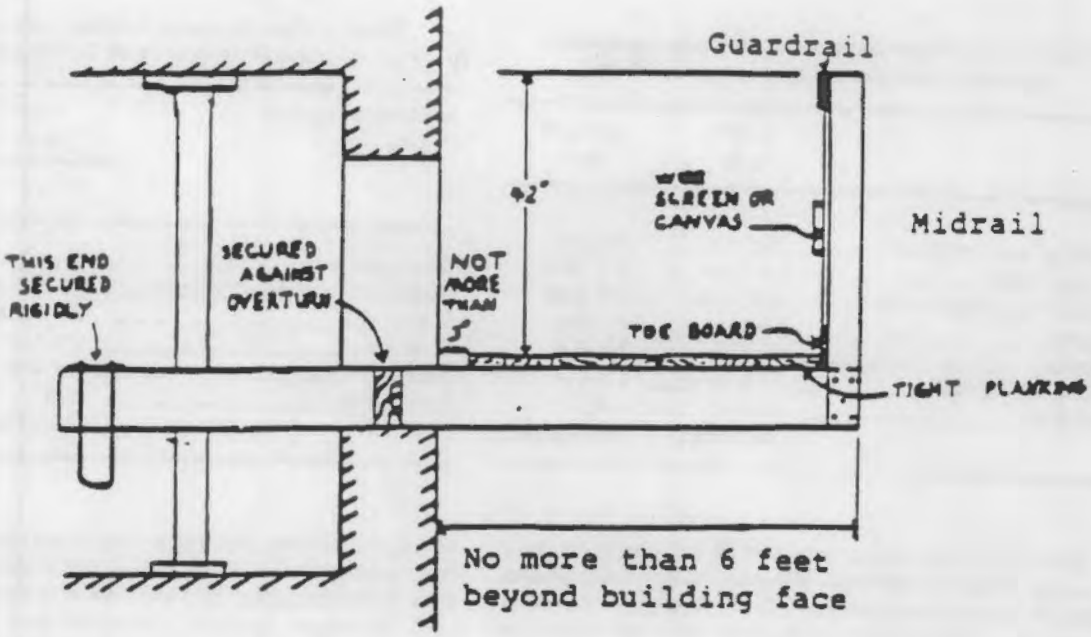


OUTRIGGER SCAFFOLD

CAN ALSO BE USED FOR CATCH PLATFORM

1910.28 Outrigger scaffold standards appear under subsection (e).

451(g)(1) Outrigger beams shall extend not more than 6 feet beyond the face of the building. The inboard end of the outrigger beams, measured from the fulcrum point to anchorage point, shall be not less than 1½ times the outboard end in length. The beams shall rest on edge, the sides shall be plumb, and the edges shall be horizontal. The fulcrum point of the beam shall rest on a secure bearing at least 6 inches in each horizontal dimension. The beam shall be secured in place against movement and shall be securely braced at the fulcrum point against tipping.



1910.28(e)(4) Planking shall be laid tight and shall extend to within 3 inches of the building wall. Planking shall be nailed or bolted to outriggers.

1910.28(e)(5) Where there is danger of material falling from the scaffold, a wire mesh or other enclosure shall be provided between the guardrail and the toeboard.

1910.28(e)(6) Where additional working levels are required to be supported by the outrigger method, the plans and specifications of the outrigger and scaffolding structure shall be designed by a registered professional engineer.

451(g)(2) The inboard ends of outrigger beams shall be securely anchored either by means of struts bearing against sills in contact with the overhead beams or ceiling, or by means of tension members secured to the floor joists underfoot, or by both if necessary. The inboard ends of outrigger beams shall be secured against tipping and the entire supporting structure shall be securely braced in both directions to prevent any horizontal movement.

451(g)(4) Planking shall be laid tight and shall extend to within 3 inches of the building wall. Planking shall be secured to the beams.

451(g)(5) Guardrails made of lumber, not less than 2 × 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a midrail of 1 × 6 inch lumber (or other material providing equivalent protection), and toeboards, shall be installed at all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(6) of this section.

Table D-16—Minimum Nominal Size and Maximum Spacing of Members of Outrigger Scaffolds

	Light duty	Medium duty
Maximum scaffold load	25 p.s.f.	50 p.s.f.
Outrigger size	2 × 10 in.	3 × 10 in.
Maximum outrigger spacing	10 ft. 6 in.	6 ft. 0 in.
Planking	2 × 9 in.	2 × 9 in.
Guardrail	2 × 4 in.	2 × 4 in.
Guardrail uprights	2 × 4 in.	2 × 4 in.
Toeboards	4 in. (minimum)	4 in. (minimum)

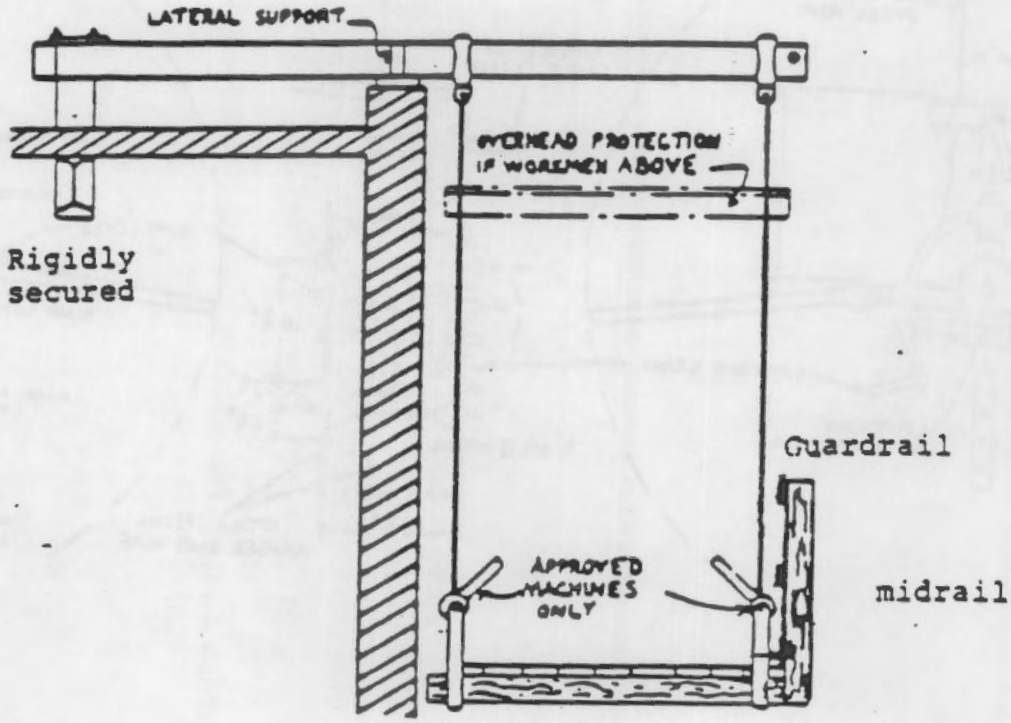
1910.28(e)(3) Unless outrigger scaffolds are designed by a licensed professional engineer, they shall be constructed and erected in accordance with table D-16. Outrigger scaffolds designed by a registered professional engineer shall be constructed and erected in accordance with such design. A copy of the detailed drawings and specifications showing the sizes and spacing of members shall be kept on the job.

Table L-13—Minimum Nominal Size and Maximum Spacing of Members of Outrigger Scaffolds

Maximum scaffold load	Light duty	Medium duty
	25 p.s.f.	50 p.s.f.
Outrigger size	2 × 10 in.	3 × 10 in.
Maximum outrigger spacing	10 ft. 0 in.	6 ft. 0 in.
Planking	2 × 10 in.	2 × 10 in.
Guardrail	2 × 4 in.	2 × 4 in.
Guardrail uprights	2 × 4 in.	2 × 4 in.
Toeboards	4 in. (minimum)	4 in. (minimum)

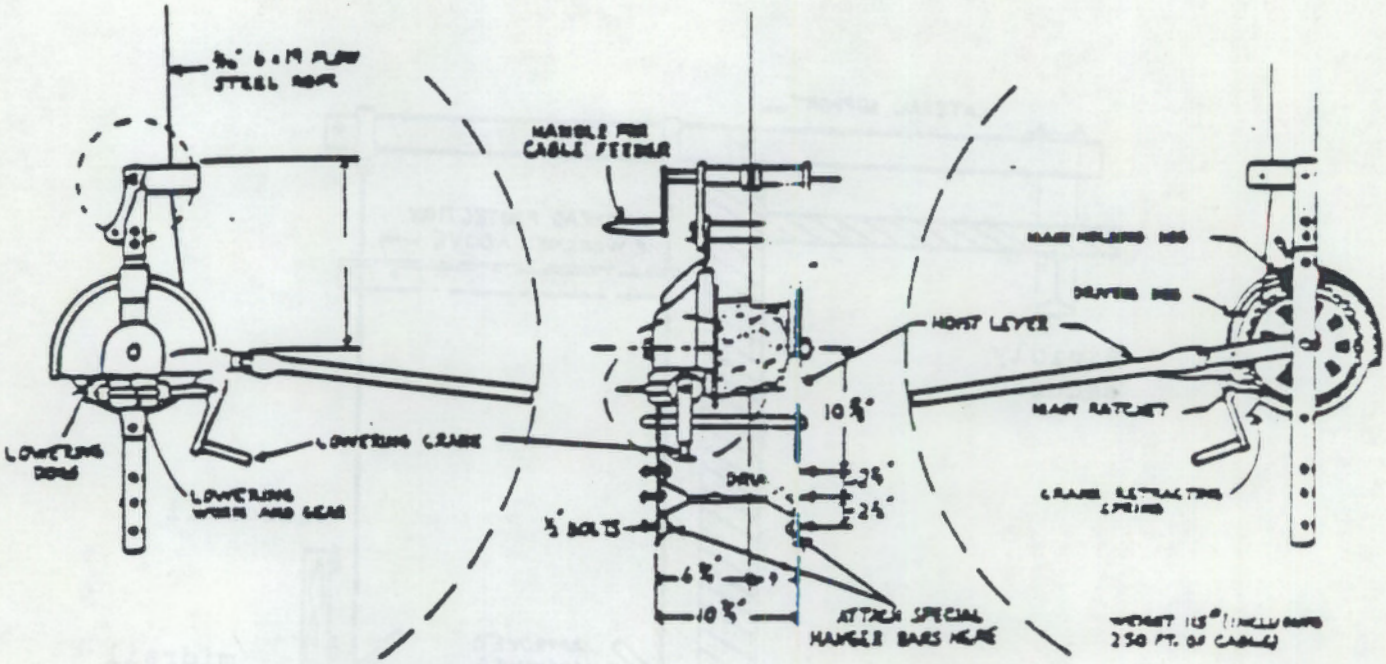
451(g)(3) Unless outrigger scaffolds are designed by a registered professional engineer competent in this field, they shall be constructed and erected in accordance with Table L-13. Outrigger scaffolds, designed by a registered professional engineer, shall be constructed and erected in accordance with such design.

Masons Multi Point Suspended Scaffolds

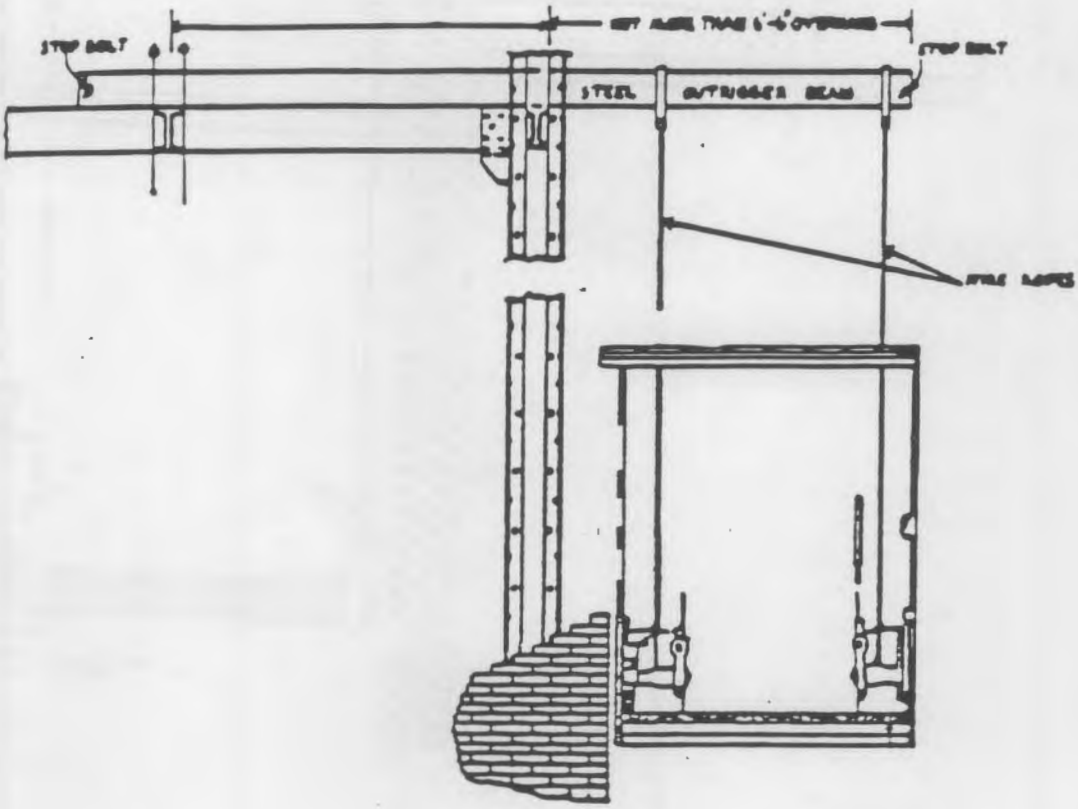


1910.28 Standards on this topic appear under subsection (f).

451(h)(1) The scaffold shall be capable of sustaining a working load of 50 pounds per square foot and shall not be loaded in excess of that figure.



451(h)(2) . .e scaffold shall be provided with hoisting machines that meet the requirements of Underwriters' Laboratories or Factory Mutual Engineering Corporation.



1910.28(a)(22) Wire or fiber rope used for scaffold suspension shall be capable of supporting at least six times the intended load.

1910.28(f)(3) The platform shall be supported by wire ropes in conformity with paragraph (a)(22) of this section, suspended from overhead outrigger beams.

1910.28(f)(6) Where the overhang exceeds 6 feet 6 inches, outrigger beams shall be composed of stronger beams or multiple beams and be installed in accordance with approved designs and instructions.

1910.28(f)(7) If channel iron outrigger beams are used in place of I-beams, they shall be securely fastened together with the flanges turned out.

1910.28(f)(8) All outrigger beams shall be set and maintained with their webs in a vertical position.

451(h)(3) The platform shall be supported by wire ropes, capable of supporting at least 6 times the intended load, suspended from overhead outrigger beams.

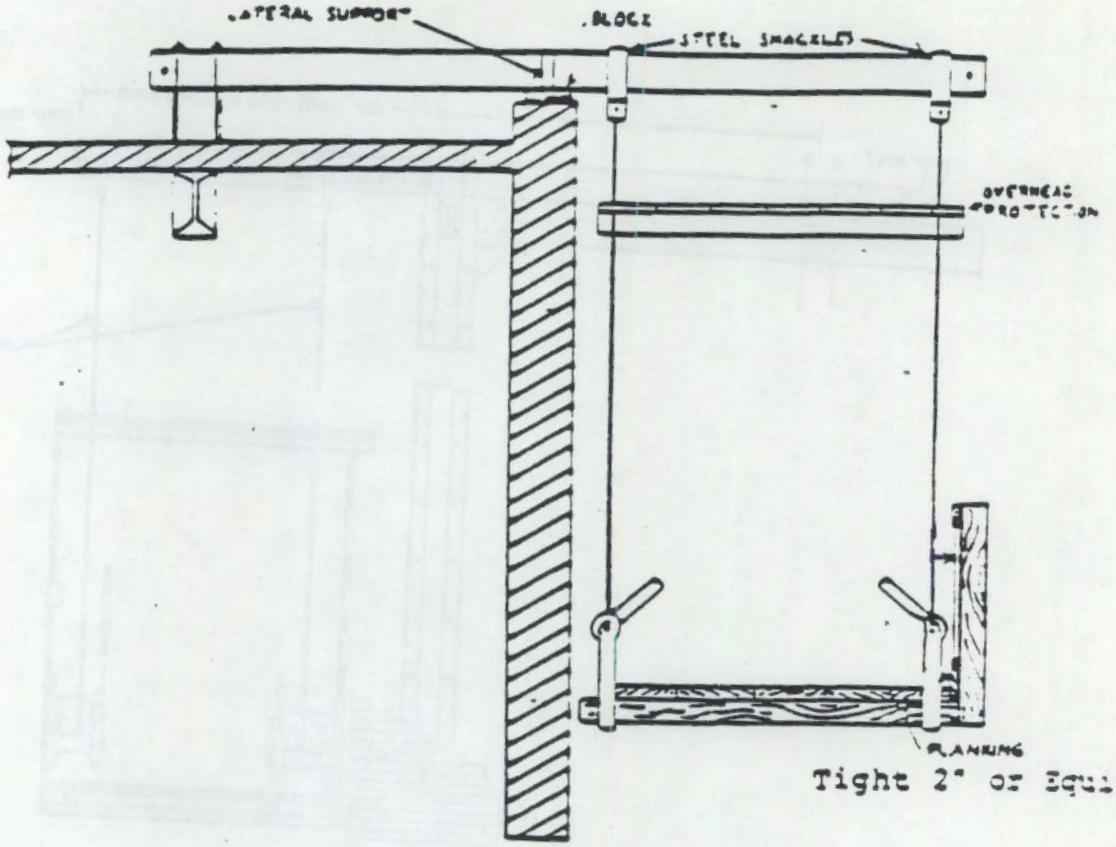
451(h)(4) The scaffold outrigger beams shall consist of structural metal securely fastened or anchored to the frame or floor system of the building or structure.

451(h)(5) Each outrigger beam shall be equivalent in strength to at least a standard 7-inch, 15.3-pound steel I-beam, at least 15 feet long, and shall not project more than 6 feet 6 inches beyond the bearing point.

451(h)(6) Where the overhang exceeds 6 feet 6 inches, outrigger beams shall be composed of stronger beams or multiple beams and be installed under the supervision of a competent person.

451(h)(7) All outrigger beams shall be set and maintained with their webs in a vertical position.

451(h)(8) A stop bolt shall be placed at each end of every outrigger beam.



Tight 2" or Equivalent

1910.28(f)(16) Overhead protection shall be provided on the scaffold, not more than 9 feet above the platform, consisting of 2-inch planking or material of equivalent strength laid tight, when men are at work on the scaffold and an overhead hazard exists.

1910.28(f)(17) Each scaffold shall be installed or relocated in accordance with designs and instructions, of a registered professional engineer, and supervised by a competent, designated person.

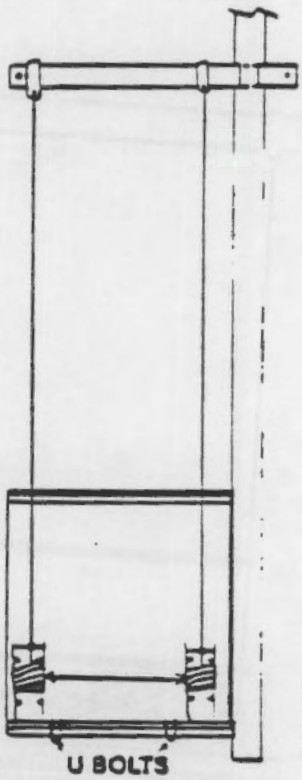
451(h)(9) The outrigger beam shall rest on suitable wood bearing blocks.

451(h)(11) Where a single outrigger beam is used, the steel shackles or clevises with which the wire ropes are attached to the outrigger beams shall be placed directly over the hoisting drums.

451(h)(12) The scaffold platform shall be equivalent in strength to at least 2-inch planking. (For maximum planking spans, see paragraph (a)(11) of this section.)

451(h)(13) When employees are at work on the scaffold and an overhead hazard exists, overhead protection shall be provided on the scaffold, not more than 9 feet above the platform, consisting of 2-inch planking, or material of equivalent strength, laid tight, and extending not less than the width of the scaffold.

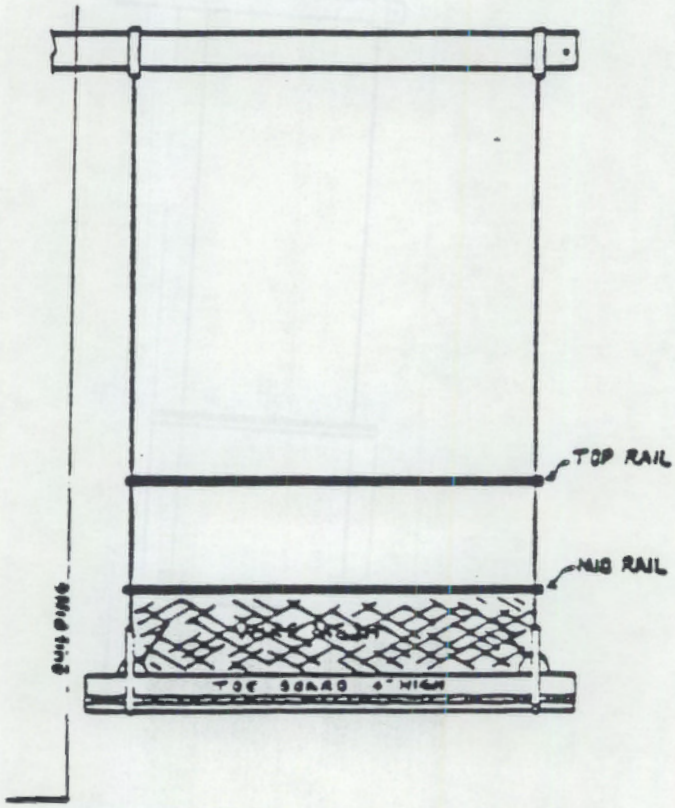
451(h)(14) Each scaffold shall be installed or relocated under the supervision of a competent person.



1910.28(f)(11) All parts of the scaffold such as bolts, nuts, fittings, clamps, wire ropes, and outrigger beams and their fastenings, shall be maintained in sound and good working condition and shall be inspected before each installation and periodically thereafter.

1910.28(f)(12) The free end of the suspension wire ropes shall be equipped with proper size thimbles and be secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of rope shall at all times remain on the drum.

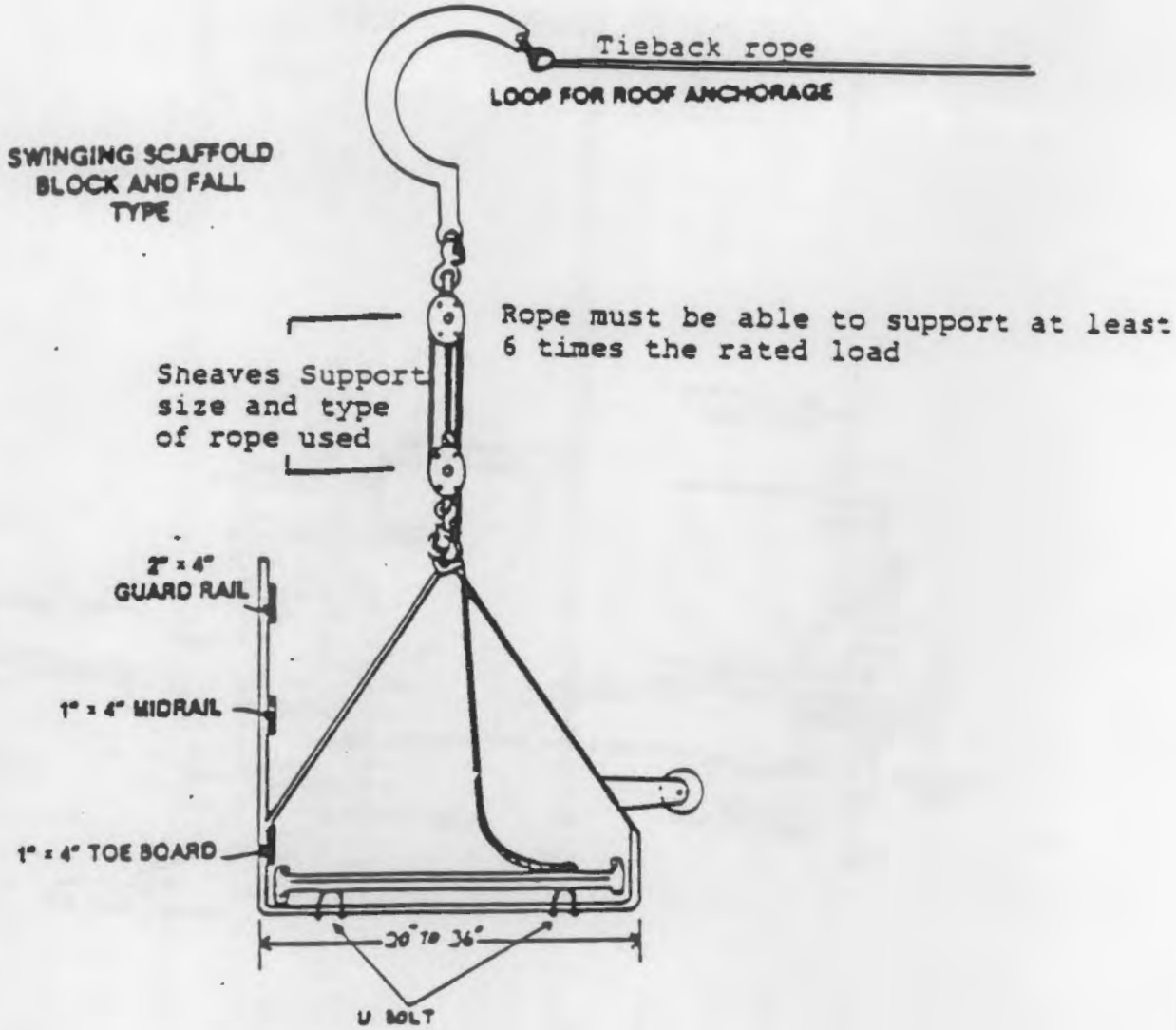
451(h)(10) The free end of the suspension wire ropes shall be equipped with proper size thimbles and secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of wire rope shall at all times remain on the drum. The use of fiber rope is prohibited.



1910.28(f)(15) Guardrails not less than 2 × 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- × 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides, on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

451(h)(15) Guardrails made of lumber, not less than 2 × 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a midrail, and toeboards, shall be installed at all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(6) of this section.

Swinging Scaffolds



1910.28 Standards on this topic appear under subsection (g).

1910.28(g)(2) The hangers of two-point suspension scaffolds shall be made of wrought iron, mild steel, or other equivalent material having a cross-sectional area capable of sustaining four times the maximum intended load, and shall be designed with a support for guardrail, intermediate rail, and toeboard.

1910.28(g)(6) Two-point suspension scaffolds shall be suspended by wire or fiber ropes. Wire and fiber ropes shall conform to paragraph (a)(22) of this section.

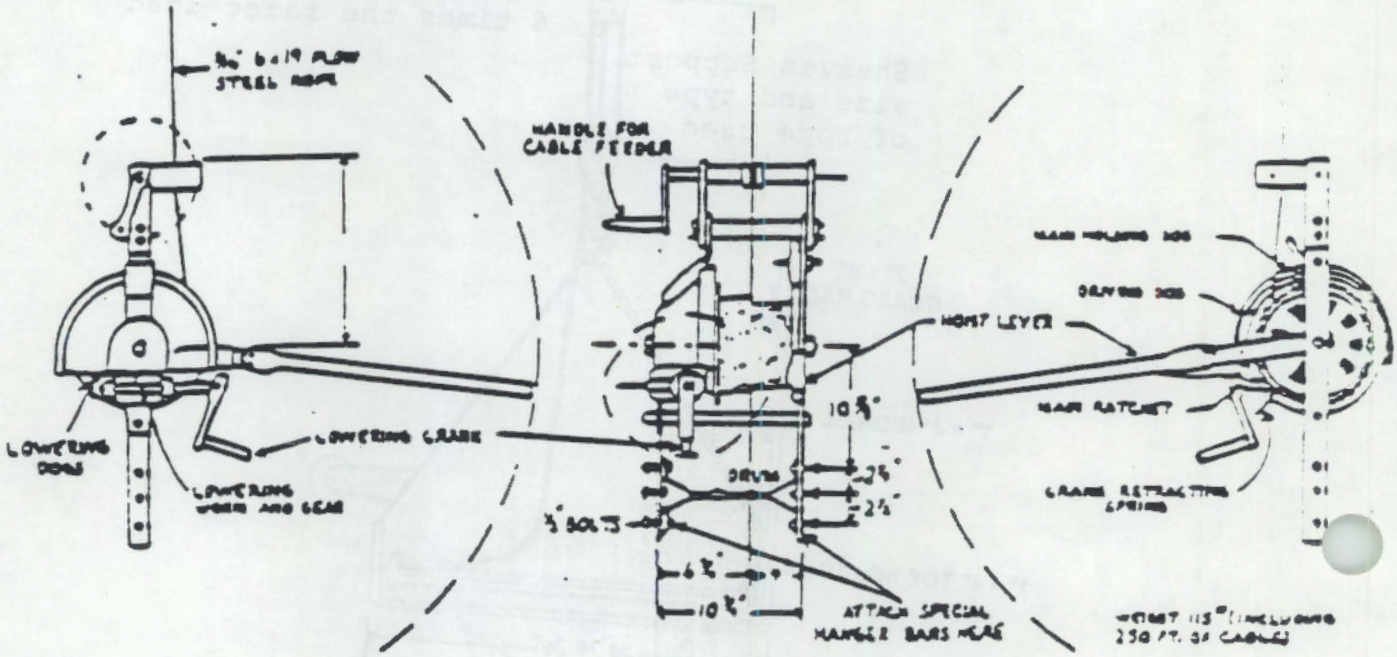
1910.28(g)(7) The blocks for fiber ropes shall be of standard 6-inch size, consisting of at least one double and one single block. The sheaves of all blocks shall fit the size of rope used.

451(l)(1) Two-point suspension scaffold platforms shall not be less than 20 inches nor more than 36 inches wide overall. The platform shall be securely fastened to the hangers by U-bolts or by other equivalent means.

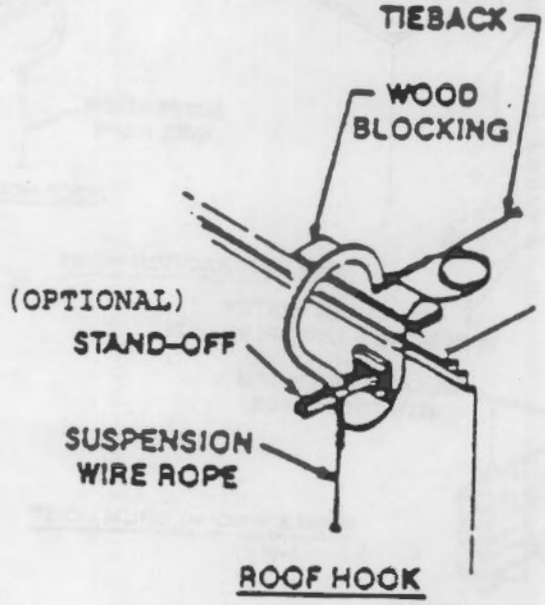
451(l)(2) The hangers of two-point suspension scaffolds shall be made of mild steel, or other equivalent materials, having a cross-sectional area capable of sustaining 4 times the maximum rated load, and shall be designed with a support for guardrail, intermediate rail, and toeboard.

451(l)(5) Two-point suspension scaffolds shall be suspended by wire, synthetic, or fiber ropes capable of supporting at least 6 times the rated load. All other components shall be capable of supporting at least four times the rated load.

451(l)(6) The sheaves of all blocks, consisting of at least one double and one single block, shall fit the size and type of rope used.



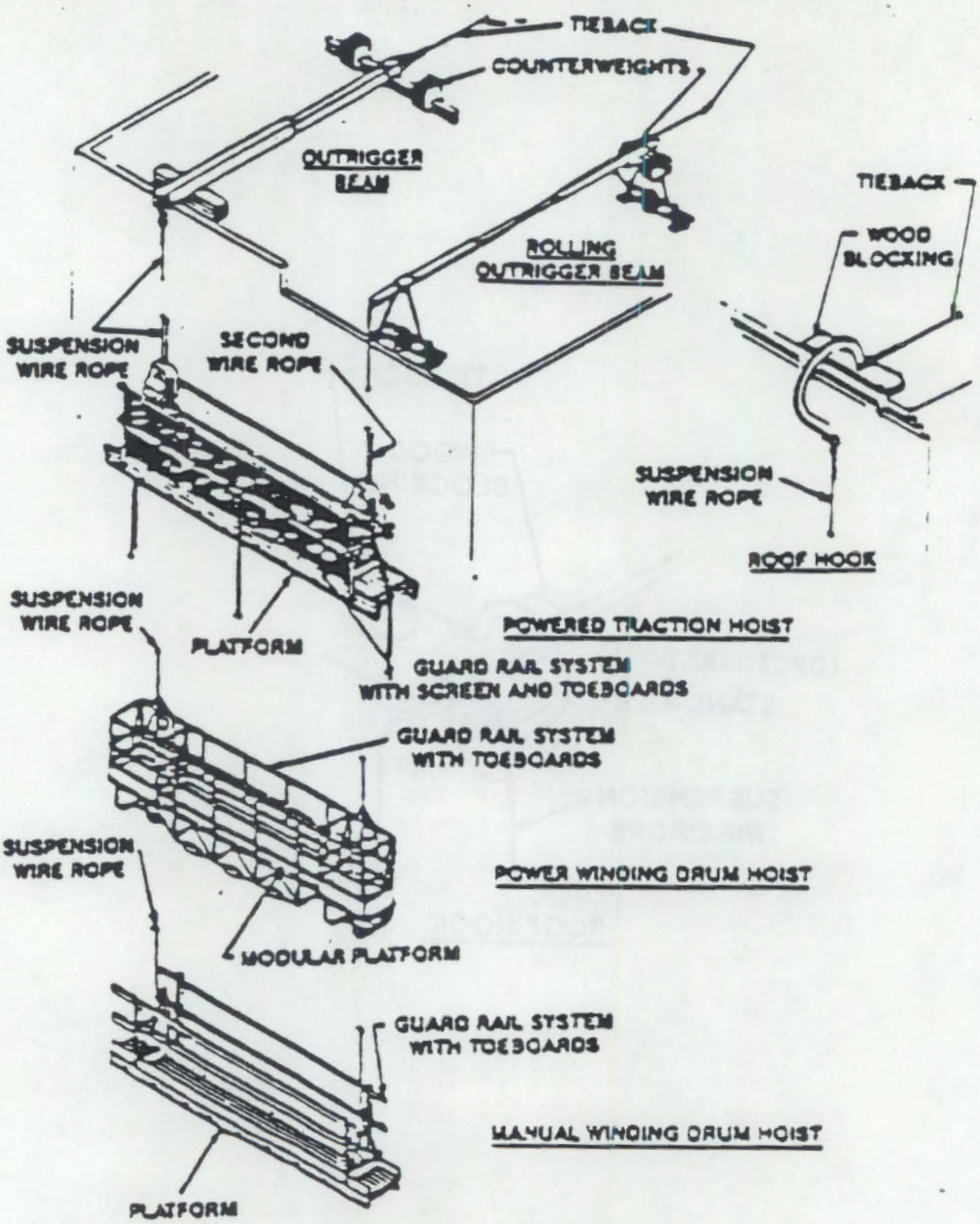
451(f)(3) When hoisting machines are used on two-point suspension scaffolds, such machines shall be of a design tested and approved by Underwriters' Laboratories or Factory Mutual Engineering Corporation.



1910.28(f)(4) The roof irons or hooks shall be of wrought iron, mild steel, or other equivalent material of proper size and design, securely installed and anchored. Tiebacks of three-fourth inch manila rope or the equivalent shall serve as a secondary means of anchorage, installed at right angles to the face of the building whenever possible and secured to a structurally sound portion of the building.

451(f)(4) The roof irons or hooks shall be of mild steel, or other equivalent material, of proper size and design, securely installed and anchored. Tiebacks of ¾-inch manila rope, or the equivalent, shall serve as a secondary means of anchorage, installed at right angles to the face of the building, whenever possible, and secured to a structurally sound portion of the building.

TWO-POINT SUSPENDED SCAFFOLD



1910.28(g)(8) All wire ropes, fiber ropes, slings, hangers, platforms, and other supporting parts shall be inspected before every installation. Periodic inspections shall be made while the scaffold is in use.

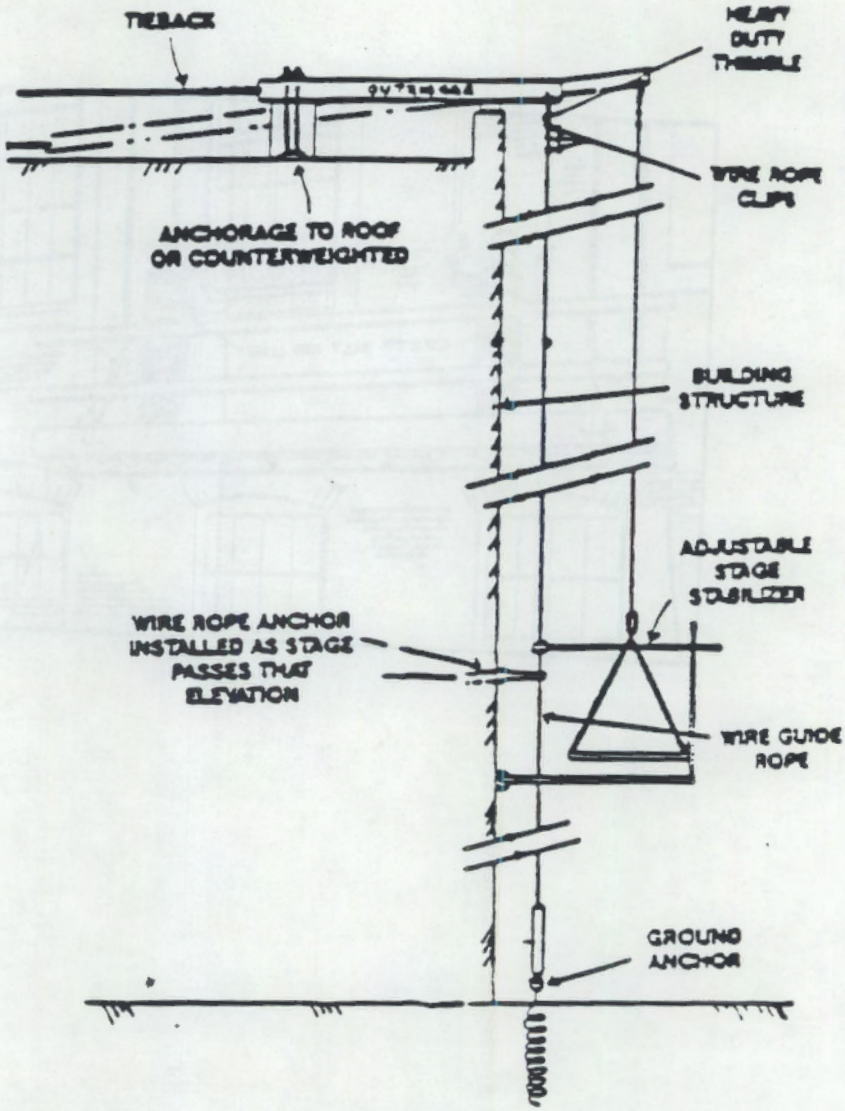
1910.28(g)(10) Where acid solutions are used, fiber ropes are not permitted unless acidproof.

451(l)(7) All wire ropes, fiber and synthetic ropes, slings, hangers, platforms, and other supporting parts shall be inspected before every installation. Periodic inspections shall be made while the scaffold is in use.

1910.28(g)(9) On suspension scaffolds designed for a working load of 500 pounds no more than two men shall be permitted to work at one time. On suspension scaffolds with a working load of 750 pounds, no more than three men shall be permitted to work at one time. Each workman shall be protected by a safety lifebelt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the workman in case of a fall.

451(f)(8) On suspension scaffolds designed for a working load of 500 pounds, no more than two men shall be permitted to work at one time. On suspension scaffolds with a working load of 750 pounds, no more than three men shall be permitted to work at one time. Each employee shall be protected by an approved safety life belt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the employee in case of a fall. In order to keep the lifeline continuously attached, with a minimum of slack, to a fixed structure, the attachment point of the lifeline shall be appropriately changed as the work progresses.

TWO-POINT SUSPENDED SCAFFOLD GROUND RIGGED SWAY CONTROL ILLUSTRATION



SYSTEM MUST BE DESIGNED BY QUALIFIED PERSONNEL

1910.28(g)(11) Two-point suspension scaffolds shall be securely lashed to the building or structure to prevent them from swaying. Window cleaners' anchors shall not be used for this purpose.

451(l)(9) Two-point suspension scaffolds shall be securely lashed to the building or structure to prevent them from swaying. Window cleaners' anchors shall not be used for this purpose.

1910.28(g)(12) The platform of every two-point suspension scaffold shall be one of the following types

(i) The side stringer of ladder-type platforms shall be clear straight-grained spruce or materials of equivalent strength and durability The rungs shall be of straight-grained oak, ash, or hickory, at least 1¼-inch in diameter, with seven-eighth inch tenons mortised into the side stringers at least seven-eighth inch. The stringers shall be tied together with the tie rods not less than one-quarter inch in diameter, passing through the stringers and riveted up tight against washers on both ends. The flooring strips shall be spaced not more than five-eighth inch apart except at the side rails where the space may be 1 inch. Ladder-type platforms shall be constructed in accordance with table D-17. .

(ii) Plank-type platforms shall be composed of not less than nominal 2- × 8-inch unspliced planks, properly cleated together on the underside starting 6 inches from each end; intervals in between shall not exceed 4 feet. The plank-type platform shall not extend beyond the hangers more than 18 inches. A bar or other effective means shall be securely fastened to the platform at each end to prevent its slipping off the hanger.

The span between hangers for plank-type platforms shall not exceed 10 feet.

(iii) Beam platforms shall have side stringers of lumber not less than 2 × 6 inches set on edge. The span between hangers shall not exceed 12 feet when beam platforms are used. The flooring shall be supported on 2- and 6-inch crossbeams, laid flat and set into the upper edge of the stringers with a snug fit, at intervals of not more than 4 feet, securely nailed in place. The flooring shall be of 1- × 6-inch material properly nailed. Floorboards shall not be spaced more than one-half inch apart.

Table D-17—Schedule for Ladder-Type Platforms

	Length of platform (feet)				
	12	14 & 16	18 & 20	22 & 24	26 & 30
Side stringers, minimum cross section (finished sizes):					
At ends (in.)	1¾ × 2¾	1¾ × 2¾	1¾ × 3	1¾ × 3	1¾ × 3
At middle (in.)	1¾ × 3¾	1¾ × 3¾	1¾ × 4	1¾ × 4¾	1¾ × 5
Reinforcing strip (minimum)	A ¼ × ¾-in. steel reinforcing strip or its equivalent shall be attached to the side or underside full length.				
Rungs	Rungs shall be 1¼-in. minimum, diameter with at least ⅞-in. diameter tenons, and the maximum spacing shall be 12 in. center to center.				
Tie rods:					
Number (minimum)	3	4	4	5	6
Diameter (minimum)	¼ in.	¼ in.	¼ in.	¼ in.	¼ in.
Flooring, minimum finished size (in.)	½ × 2¾	½ × 2¾	½ × 2¾	½ × 2¾	½ × 2¾

Table L-14—Schedule for Ladder-Type Platforms

	Length of platform (feet)				
	12	14 & 16	18 & 20	22 & 24	28 & 30
Side stringers, minimum cross section (finished sizes)					
At ends (in.)	1¾ × 2¾	1¾ × 2¾	1¾ × 3	1¾ × 3	1¾ × 3½
At middle (in.)	1¾ × 3¾	1¾ × 3¾	1¾ × 4	1¾ × 4½	1¾ × 5
Reinforcing strip (minimum)	A ⅛ × ⅞-in steel reinforcing strip or its equivalent shall be attached to the side or underside full length.				
Rungs	Rungs shall be 1⅛-in. minimum diameter with at least ⅞-in. diameter tenons, and the maximum spacing shall be 12 in center to center.				
Tie rods:					
Number (minimum)	3	4	4	5	6
Diameter (minimum)	¼ in.	¼ in.	¼ in.	¼ in.	¼ in
Flooring, minimum finished size (in.)	½ × 2¾	½ × 2¾	½ × 2¾	½ × 2¾	½ × 2¾

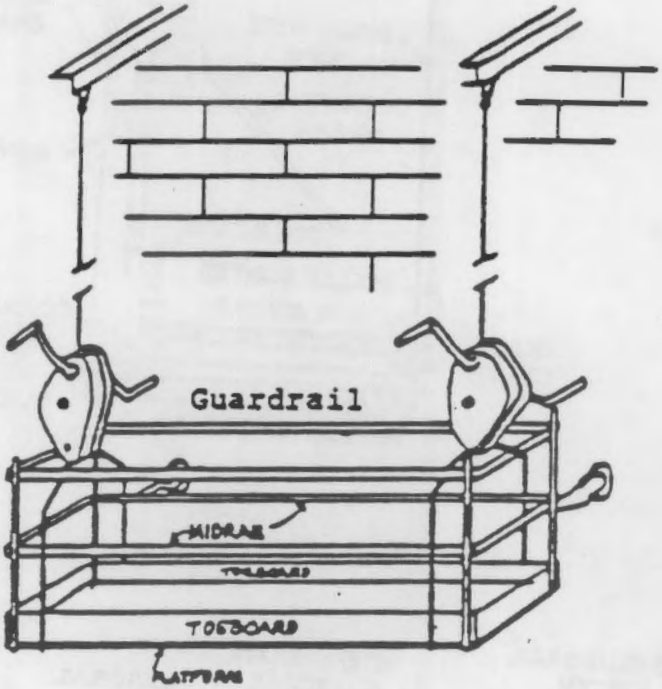
451(l)(10) The platform of every two-point suspension scaffold shall be one of the following types.

(I) Ladder-type platforms. The side stringer shall be of clear straight-grained spruce or materials of equivalent strength and durability. The rungs shall be of straight-grained oak, ash, or hickory, at least 1⅛ inch in diameter, with ⅞-inch tenons mortised into the side stringers at least seven-eights inch. The stringers shall be tied together with tie rods not less than one-quarter inch in diameter, passing through the stringers and riveted up tight against washers on both ends. The flooring strips shall be spaced not more than five-eights inch apart except at the side rails where the space may be 1 inch. Ladder-type platforms shall be constructed in accordance with Table L-14.

(II) Plank-type platforms. Plank-type platforms shall be composed of not less than nominal 2- × 10-inch unspliced planks, properly cleated together on the underside, starting 6 inches from each end, intervals in between shall not exceed 4 feet. The plank-type platform shall not extend beyond the hangers more than 12 inches. A bar or other effective means shall be securely fastened to the platform at each end to prevent its slipping off the hanger. The span between hangers for plank-type platforms shall not exceed 8 feet.

(III) Beam-type platforms. Beam platforms shall have side stringers of lumber not less than 2 × 6 inches set on edge. The span between hangers shall not exceed 12 feet when beam platforms are used. The flooring shall be supported on 2- × 6-inch cross beams, laid flat and set into the upper edge of the stringers with a snug fit, at intervals of not more than 4 feet, securely nailed in place. The flooring shall be of 1- × 5-inch material properly nailed. Floor boards shall not be spaced more than one-half inch apart.

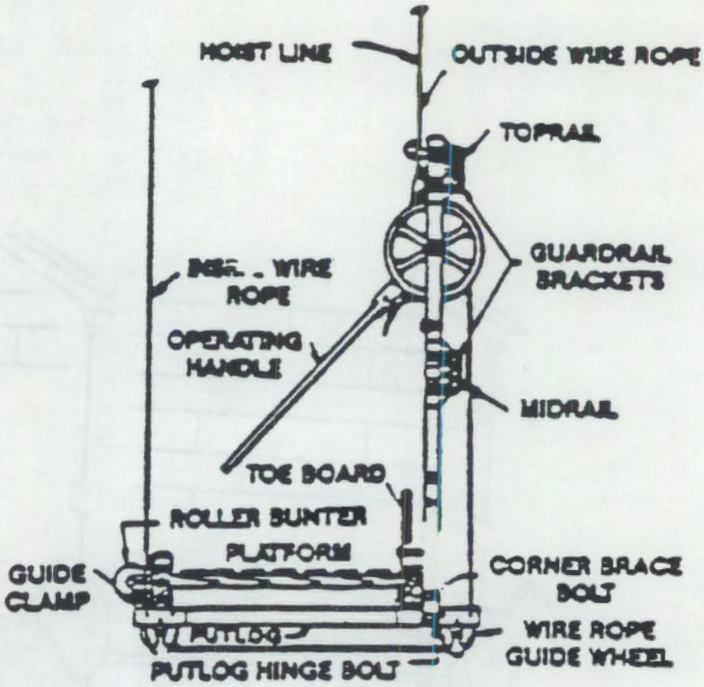
(IV) Light metal-type platforms, when used, shall be tested and listed according to Underwriters' Laboratories or Factory Mutual Engineering Corporation.

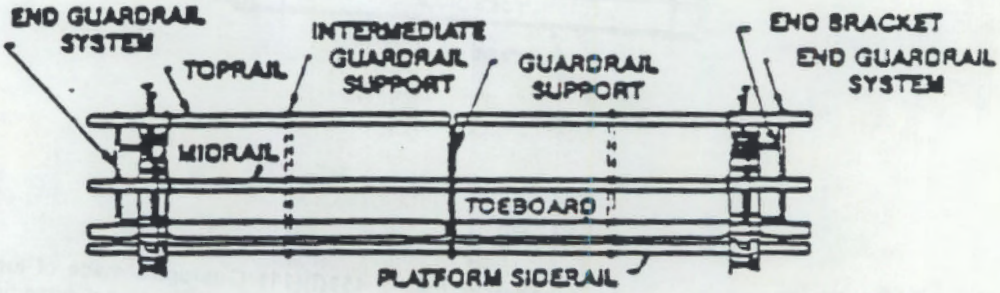


1910.28(g)(5) Guardrails not less than 2 × 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- × 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

451(f)(11) Guardrails made of lumber, not less than 2 × 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a midrail, and toeboards, shall be installed at all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(6) of this section.

Stone Setters Adjustable Multi Point Suspension Scaffolds

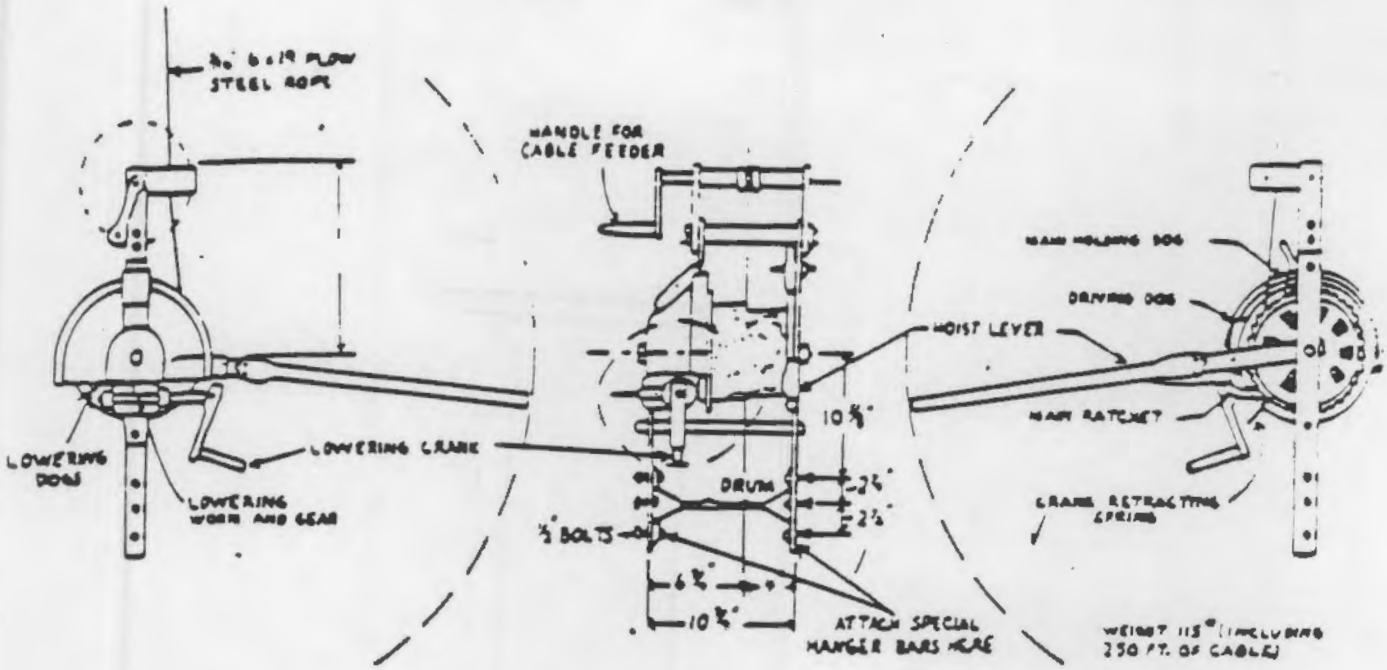


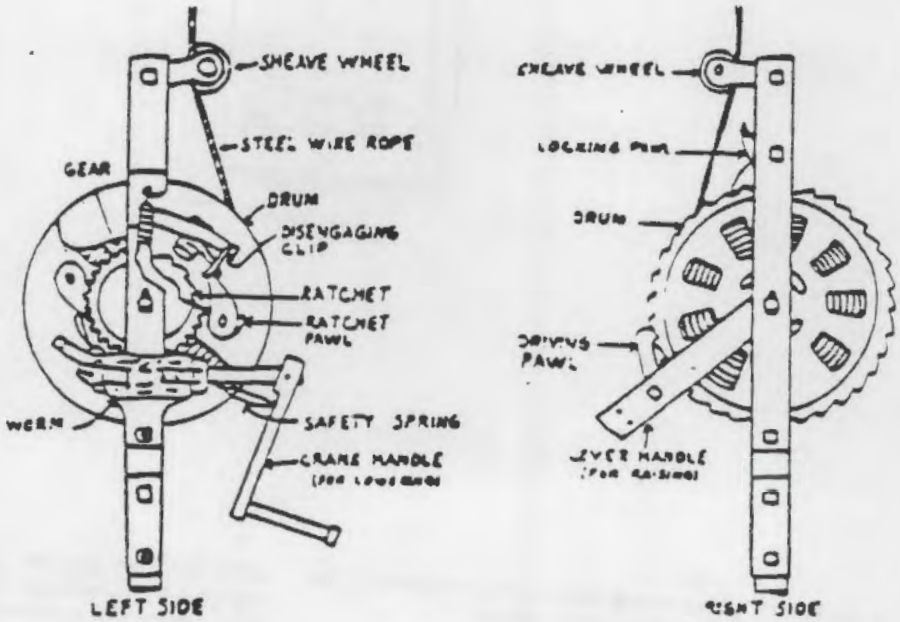


STONE SETTERS' ADJUSTABLE
MULTI-POINT SUSPENDED SCAFFOLD
WITH MANUAL WINDING
DRUM HOISTS

1910.28 Standards on this topic appear under subsection (h).

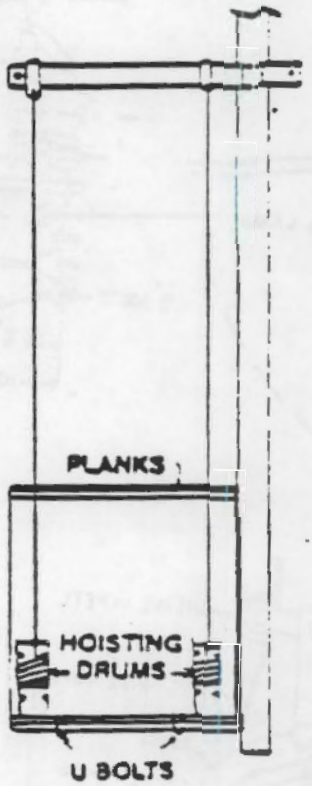
451(j)(* The scaffold shall be capable of sustaining a working load of 25 pounds per square foot and shall not be overloaded. Scaffolds shall not be used for storage of stone or other heavy materials.





1910.28(h)(2) The hoisting machine and its supports shall be of a type tested and listed by Underwriters' Laboratories or Factory Mutual Engineering Corp.

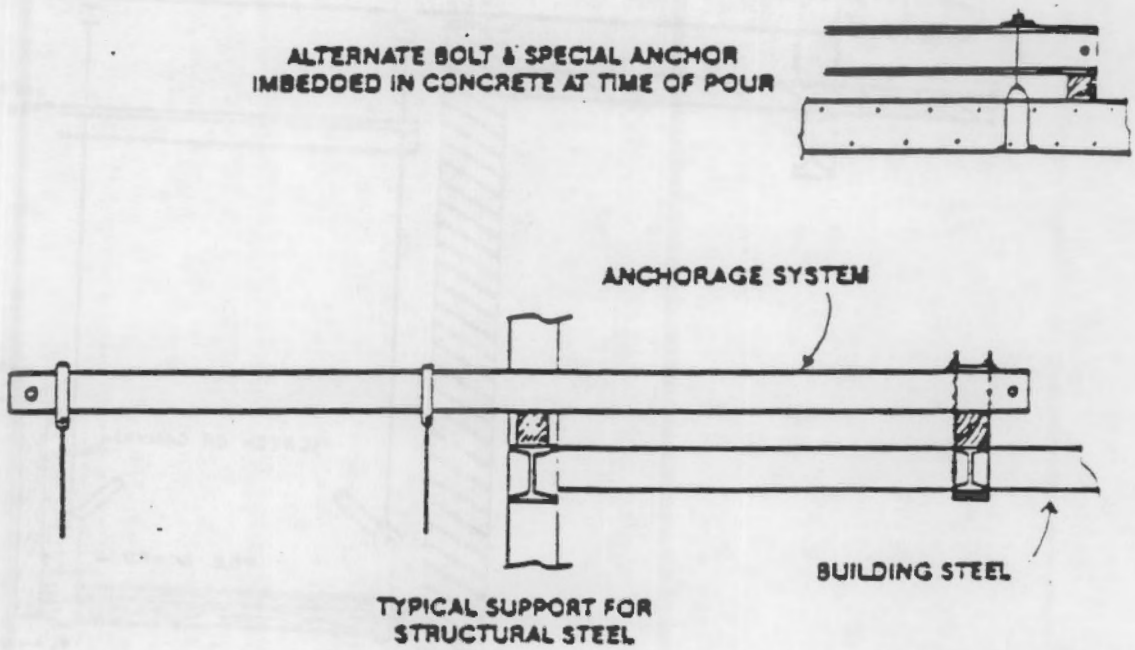
451(j)(2) When used, the hoisting machine and its supports shall be of a type tested and listed by Underwriters' Laboratories or Factory Mutual Engineering Corporation.



1910.28(h)(3) The platform shall be securely fastened to the hangers by U-bolts or other equivalent means.

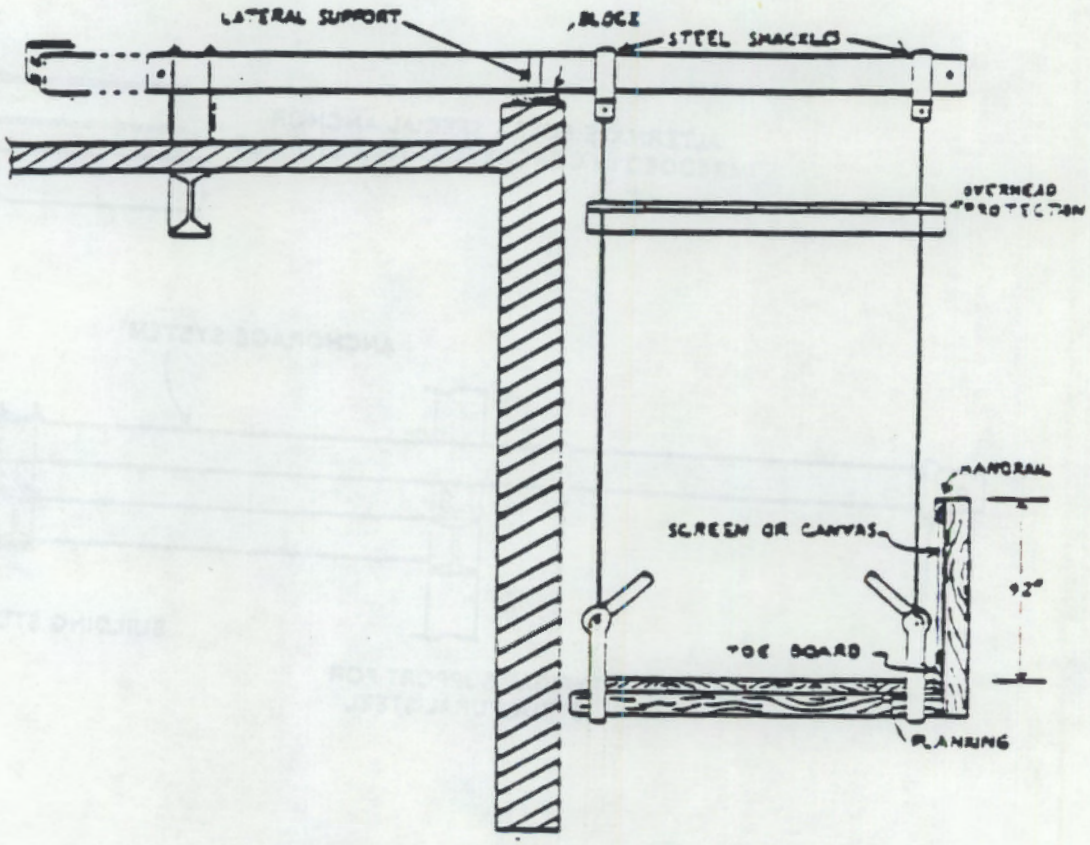
451(j)(3) The platform shall be securely fastened to the hangers by U-bolts or other equivalent means. (For materials and spans, see subdivision (ii) of paragraph (i)(10) Plank-Type Platforms, and Table L-14 of this section.)

451(j)(7) The free ends of the suspension wire ropes shall be equipped with proper size thimbles, secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of wire rope shall remain at the drum at all times.



1910.28(h)(4) The scaffold unit shall be suspended from metal outriggers, iron brackets, wire rope slings, or iron hooks which will safely support the maximum intended load.

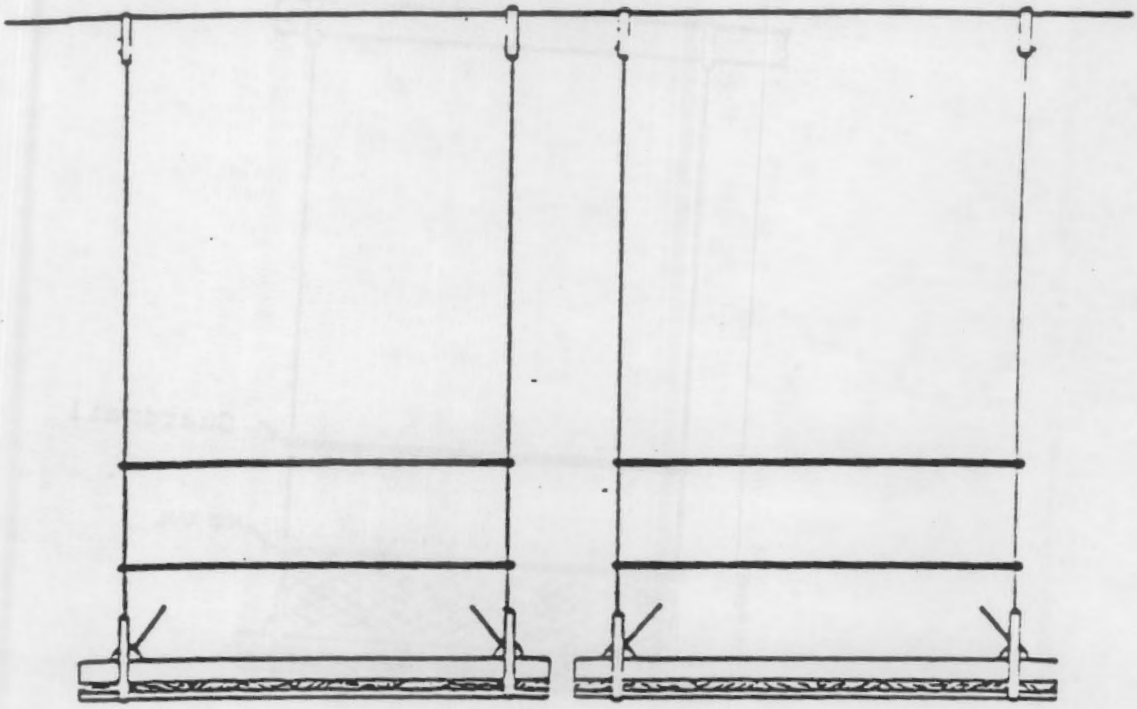
451(j)(4) The scaffold unit shall be suspended from metal outriggers, iron brackets, wire rope slings, or iron hooks.



1910.28(h)(6) The scaffold shall be supported by wire rope conforming with paragraph (a)(22) of this section, suspended from overhead supports.

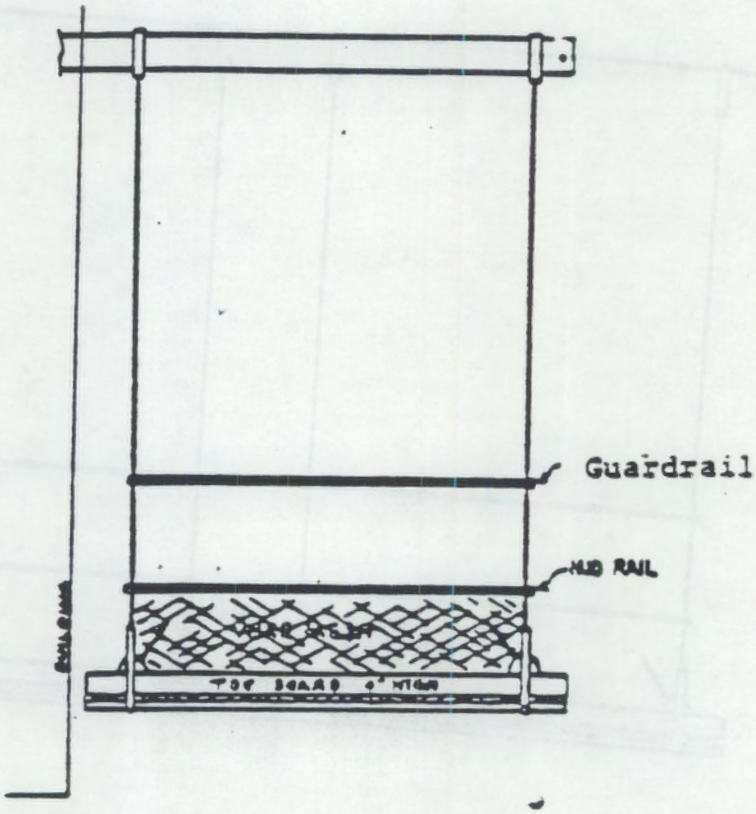
451(j)(5) Outriggers, when used, shall be set with their webs in a vertical position, securely anchored to the building or structure and provided with stop bolts at each end.

451(j)(6) The scaffold shall be supported by wire rope capable of supporting at least 6 times the rated load. All other components shall be capable of supporting at least 4 times the rated load.



1910.28(h)(9) When two or more scaffolds are used on a building or structure they shall not be bridged one to the other but shall be maintained at even height with platforms butting closely.

451(j)(8) When two or more scaffolds are used on a building or structure, they shall not be bridged one to the other but shall be maintained at even height with platforms abutting closely.

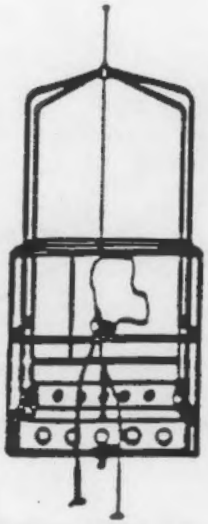


1910.28(h)(8) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

1910.28(h)(10) Each scaffold shall be installed or relocated in accordance with designs and instructions a registered professional engineer, and such installation or relocation shall be supervised by a competent designated person.

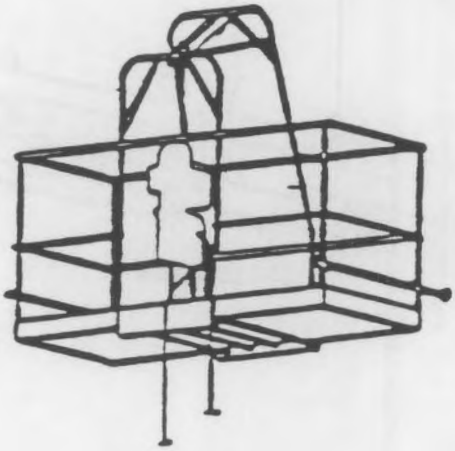
451(j)(9) Guardrails made of lumber, not less than 2 × 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a midrail, and toeboards, shall be installed at all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(6) of this section.

Single Point Suspension Scaffold



POWER
TRACTION HOIST
WORK CAGE

SINGLE POINT
SUSPENSION SCAFFOLD
WINDING DRUM HOIST



POWER TRACTION
HOIST WORK CAGE
WITH EXTENSIONS

1910.28 Standards on this topic appear under subsection (i).

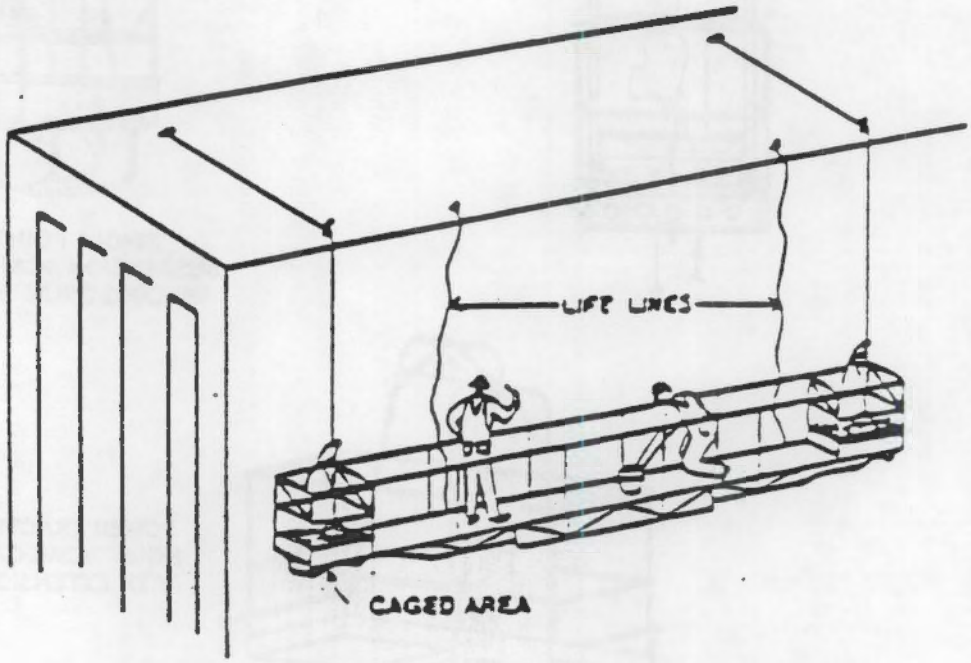
1910.28(l)(8) The hoisting machines, cables, and equipment shall be regularly serviced and inspected after each installation and every 30 days thereafter.

1910.28(l)(9) Equipment shall be maintained and used in accordance with the manufacturers' instructions.

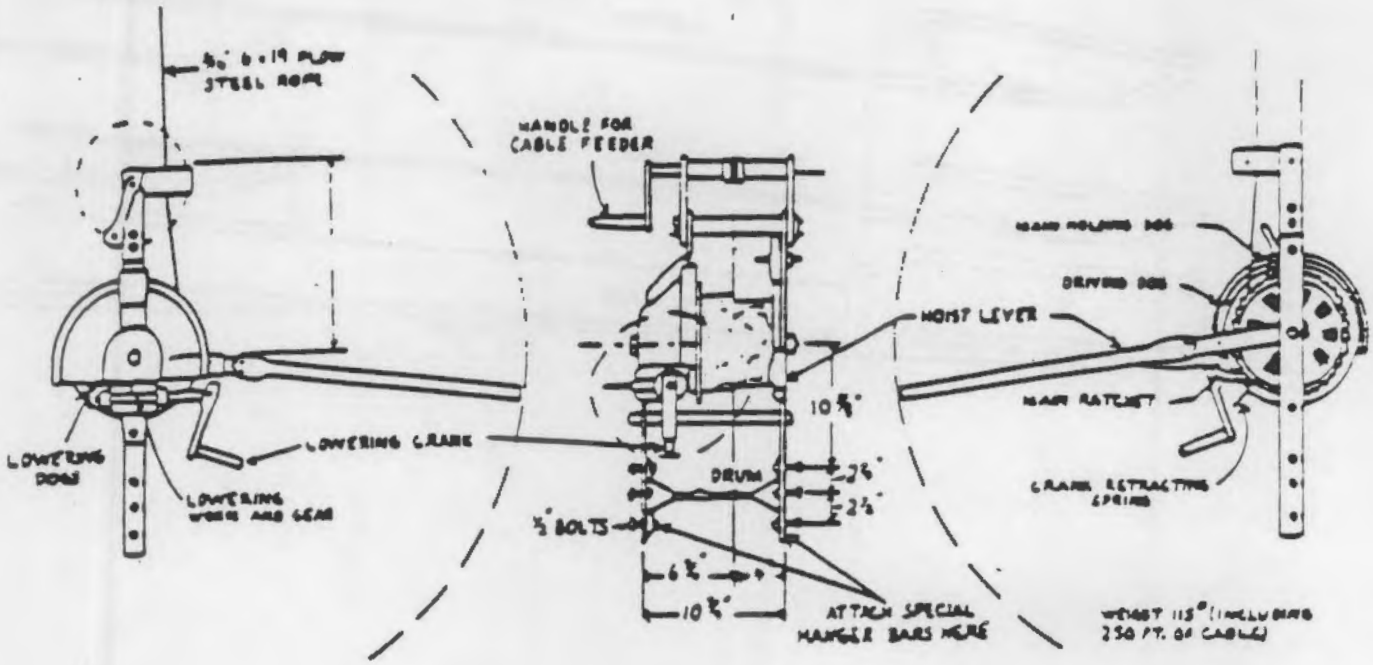
451(k)(1) The scaffolding, including power units or manually operated winches, shall be of a type tested and listed by Underwriters' Laboratories or Factory Mutual Engineering Corporation.

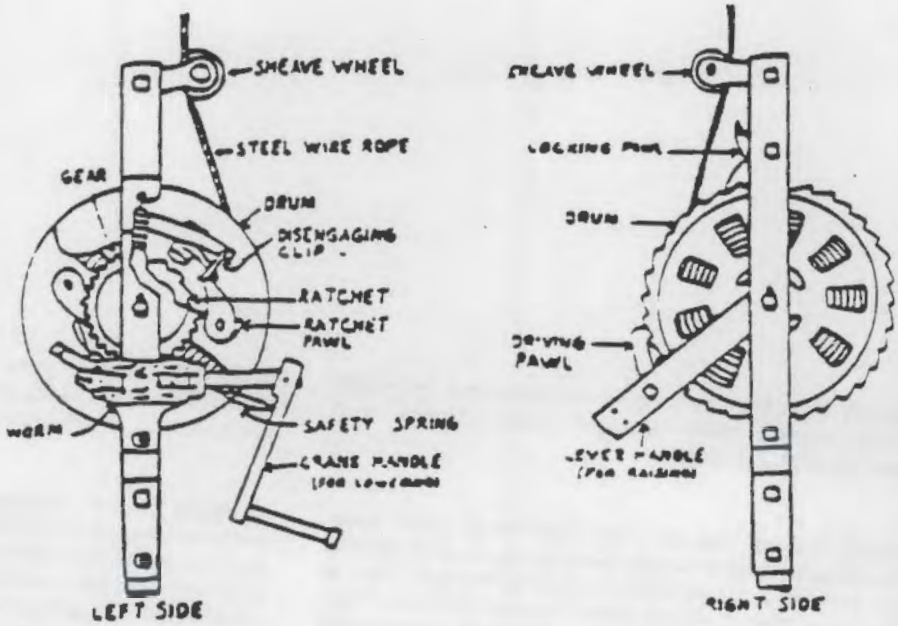
451(k)(2) The power units may be either electrically or air motor driven.

451(k)(5) The hoisting machines, cables, and equipment shall be regularly serviced and inspected.

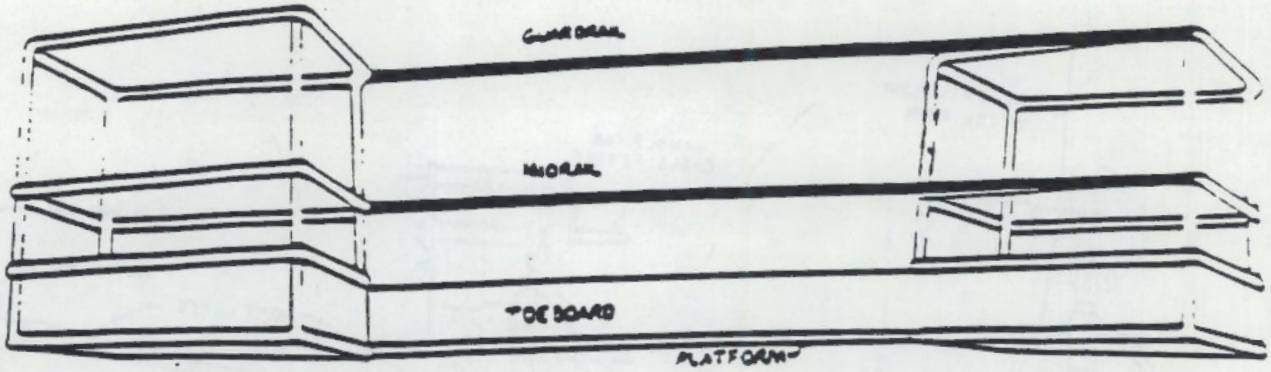


451(k)(3) All power-operated gears and brakes shall be enclosed.





451(k)(4) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

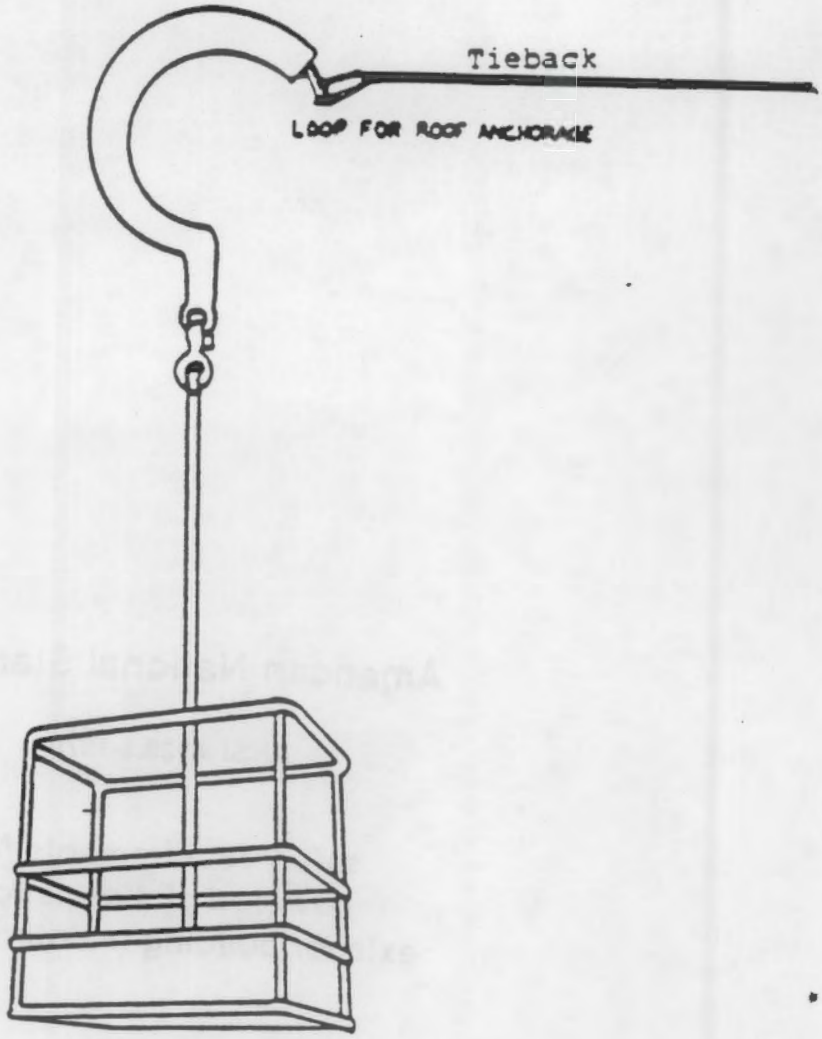


1910.28(i)(7) The units may be combined to form a two-point suspension scaffold. Such scaffold shall comply with paragraph (g) of this section.

1910.28(i)(5) Guards, mid-rails, and toeboards shall completely enclose the cage or basket. Guardrails shall be no less than 2 by 4 inches or the equivalent installed no less than 36 inches nor more than 42 inches above the platform. Mid-rails shall be 1 by 6 inches or the equivalent, installed equidistant between the guardrail and the platform. Toeboards shall be a minimum of 4 inches in height.

451(k)(6) The units may be combined to form a two-point suspension scaffold. Such scaffold shall then comply with paragraph (i) of this section.

451(k)(9) Guards, mid-rails, and toeboards shall completely enclose the cage or basket. Guardrails shall be no less than 2 × 4 inches or the equivalent, approximately 42 inches above the platform. Midrails shall be 1 × 6 inches or the equivalent, installed equidistant between the guardrail and the platform. Toeboards shall be a minimum of 4 inches in height.



1910.28(l)(8) The supporting cable shall be straight for its entire length, and the operator shall not sway the basket and fix the cable to any intermediate points to change his original path of travel.

1910.28(l)(10) Suspension methods shall conform to applicable provisions of paragraphs (f) and (g) of this section.

451(k)(7) The supporting cable shall be vertical for its entire length, and the basket shall not be swayed nor the cable fixed to any intermediate points to change the original path of travel.

451(k)(8) Suspension methods shall conform to applicable provisions of paragraphs (h) and (i) of this section.

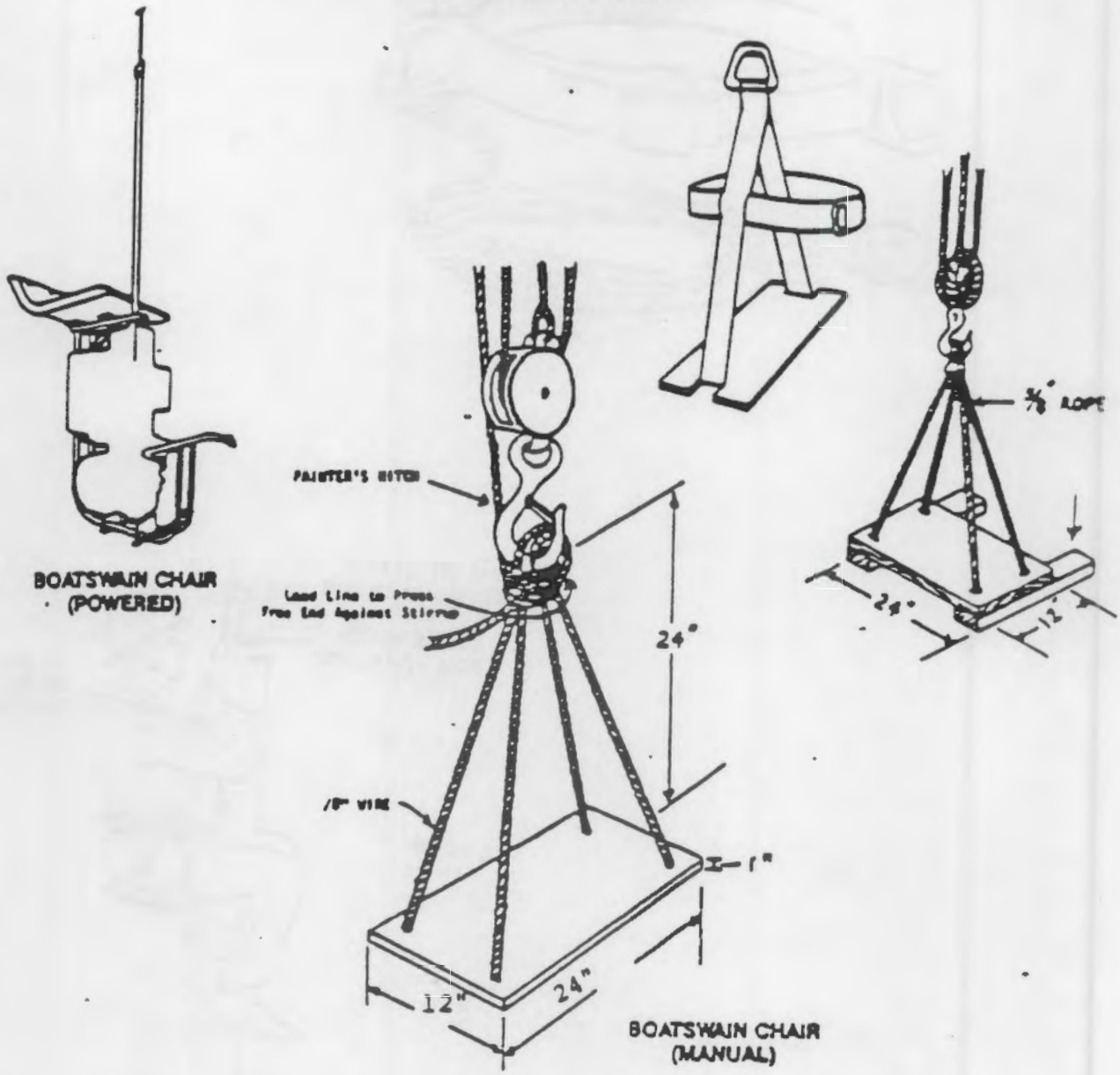
American National Standard

ANSI A120.1-1970

safety requirements for powered platforms for exterior building maintenance

451(k)(10) For additional details not covered in this paragraph, applicable technical portions of American National Standards Institute, A120.1-1970, Power-Operated Devices for Exterior Building Maintenance Powered Platforms, shall be used.

Boatswains Chair

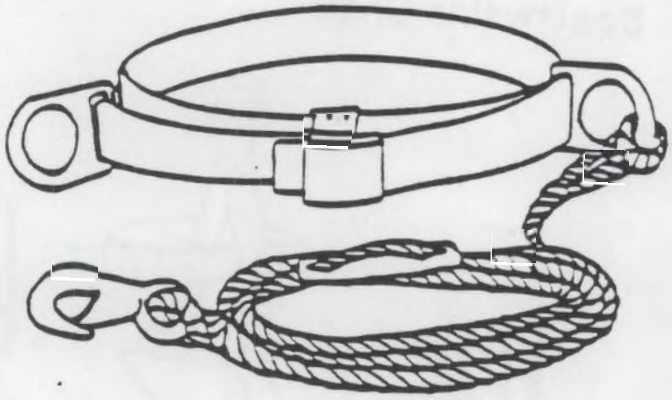


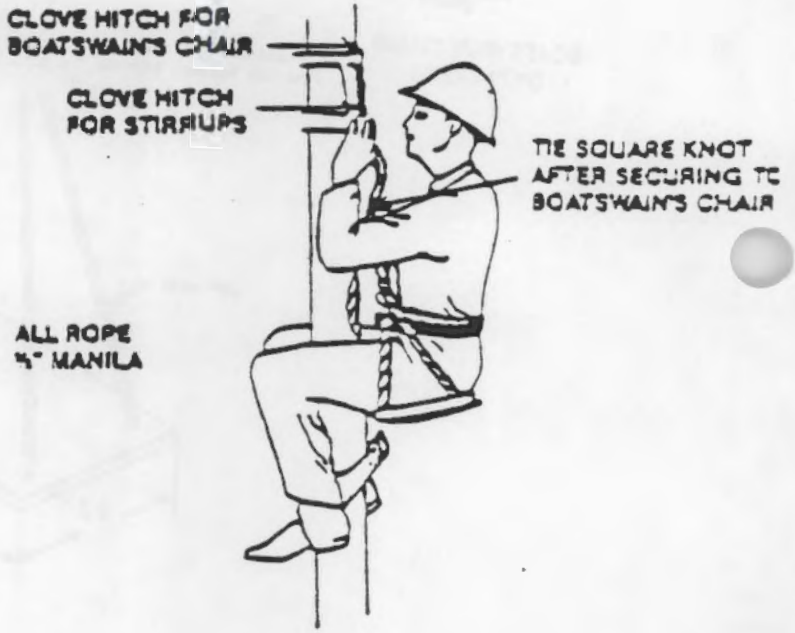
1910.28 Standards on this topic appear under subsection (j).

451(f)(1) The chair seat shall not be less than 12 × 24 inches, and 1-inch thickness. The seat shall be reinforced on the underside by cleats securely fastened to prevent the board from splitting.

451(f)(2) The two fiber rope seat slings shall be of ⅝-inch diameter, reeved through the four seat holes so as to cross each other on the underside of the seat.

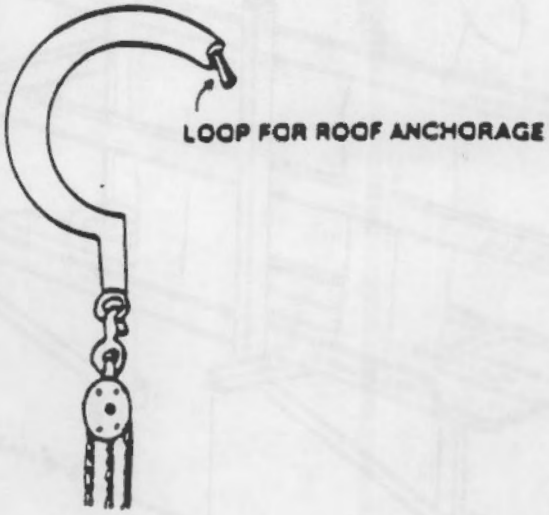
451(f)(3) Seat slings shall be of at least ⅝-inch wire rope when an employee is conducting a heat-producing process, such as gas or arc welding.

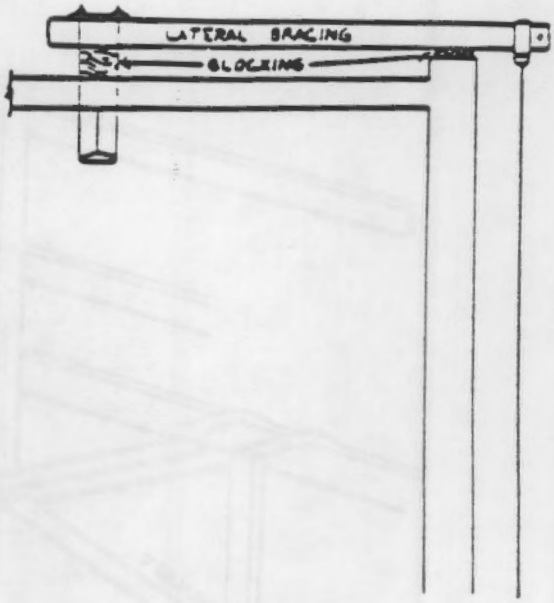




1910.28(j)(4) The workman shall be protected by a safety life belt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the worker in case of a fall.

451(l)(4) The employee shall be protected by a safety belt and lifeline in accordance with § 1926.104. The attachment point of the lifeline to the structure shall be appropriately changed as the work progresses.



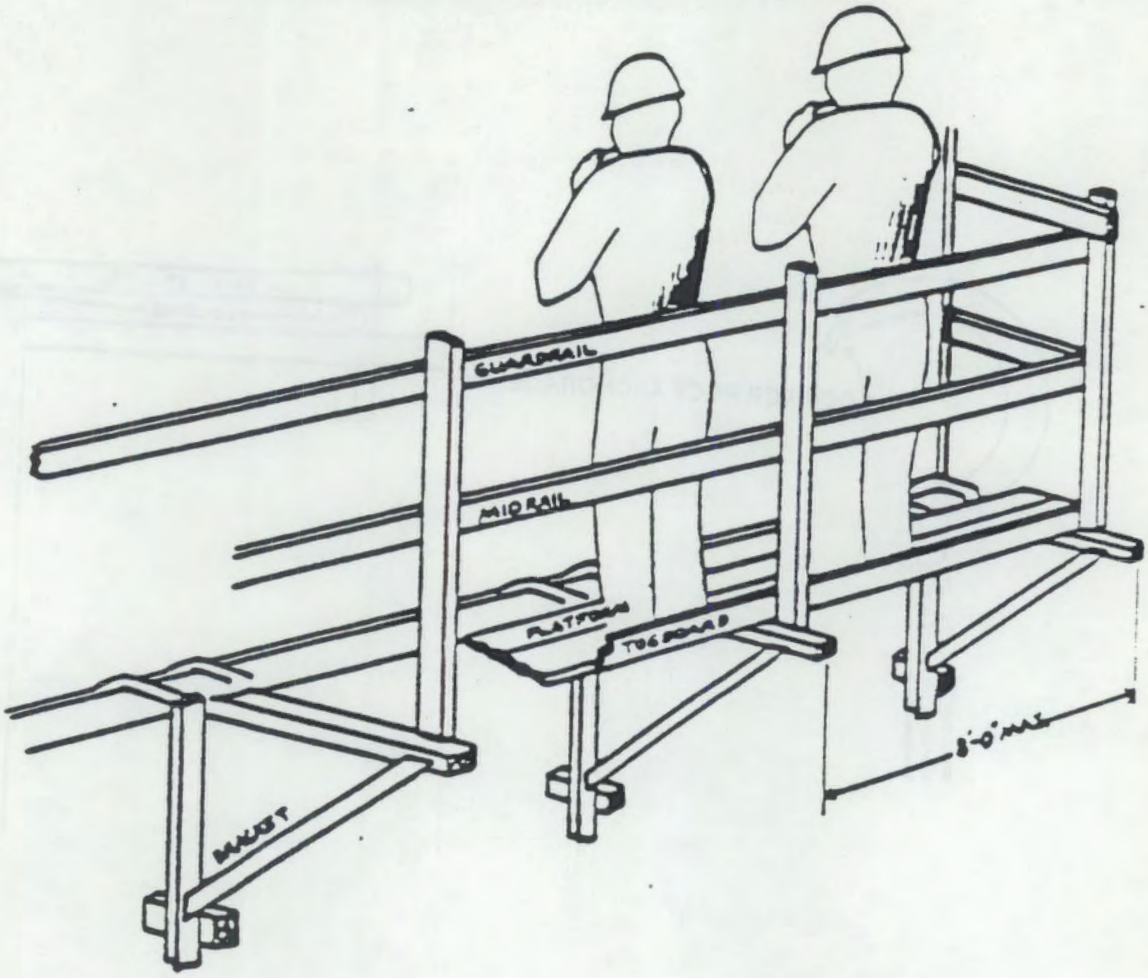


1910.28(j)(6) The roof irons, hooks, or the object to which the tackle is anchored shall be securely installed. Tiebacks when used shall be installed at right angles to the face of the building and securely fastened to a chimney.

451(f)(5) The tackle shall consist of correct size ball bearing or bushed blocks and properly spliced ¾-inch diameter first-grade manila rope, or equivalent.

451(f)(6) The roof irons, hooks, or the object to which the tackle is anchored, shall be securely installed. Tiebacks, when used, shall be installed at right angles to the face of the building and securely fastened.

Carpenters' Bracket Scaffold



1910.28 Standards on this topic appear under subsection (k).

1910.28(k)(3) No more than two persons shall occupy any given 10 feet of a bracket scaffold at any one time. Tools and materials shall not exceed 75 pounds in addition to the occupancy.

1910.28(k)(4) The platform shall consist of not less than two 2- by 9-inch nominal size planks extending not more than 18 inches or less than 6 inches beyond each end support.

1910.28(k)(5) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

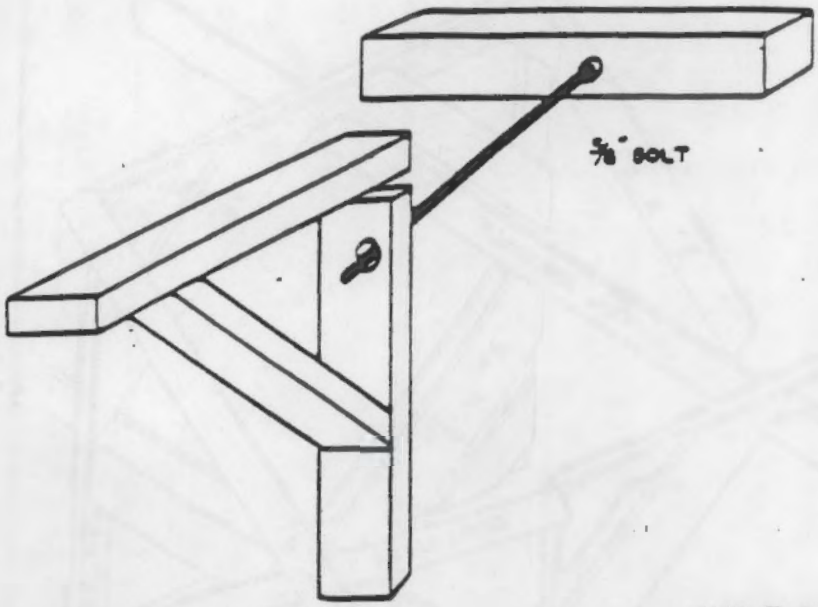
451(m)(1) The brackets shall consist of a triangular wood frame not less than 2 × 3 inches in cross section, or of metal of equivalent strength. Each member shall be properly fitted and securely joined.

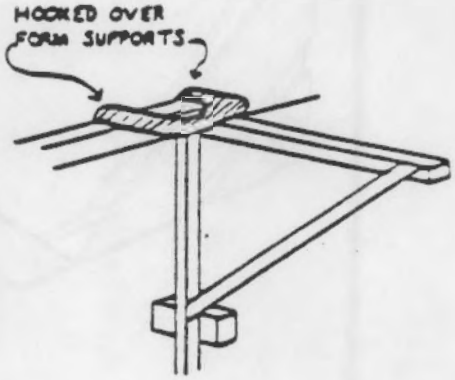
451(m)(3) The brackets shall be spaced no more than 8 feet apart.

451(m)(4) No more than two employees shall occupy any given 8 feet of a bracket scaffold at any one time. Tools and materials shall not exceed 75 pounds in addition to the occupancy.

451(m)(5) The platform shall consist of not less than two 2- × 10-inch nominal size planks extending not more than 12 inches or less than 6 inches beyond each end support.

451(m)(6) Guardrails made of lumber, not less than 2 × 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a midrail, of 1 × 6 inch lumber (or other material providing equivalent protection), and toeboards, shall be installed at all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(6) this section.





1910.28(k)(2) Each bracket shall be attached to the structure by means of one of the following:

(i) A bolt no less than five-eights inch in diameter which shall extend through the inside of the building wall.

(ii) A metal stud attachment device.

(iii) Welding to steel tanks.

(iv) Hooking over a well-secured and adequately strong supporting member. The brackets shall be spaced no more than 10 feet apart.

451(m)(2) Each bracket shall be attached to the structure by means of one of the following:

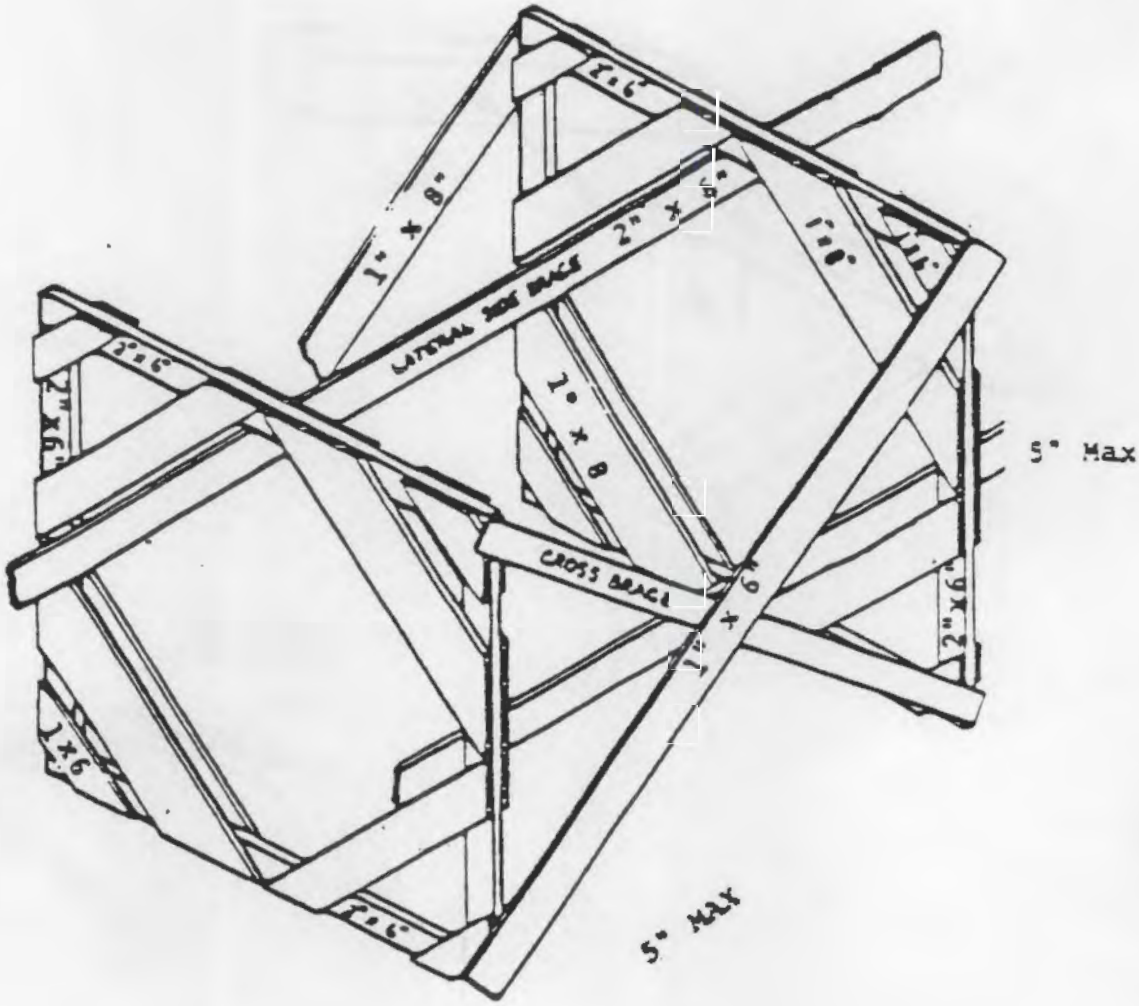
(i) A bolt, no less than five-eights inch in diameter, which shall extend through to the inside of the building wall;

(ii) A metal stud attachment device;

(iii) Welding to steel tanks;

(iv) Hooking over a well-secured and adequately strong supporting member.

Bricklayers Square Scaffold



1910.28 Standards on this topic appear under subsection (l).

1910.28(l)(2) Members shall be not less than those specified in Table D-18.

Table D-18—Minimum Dimensions for Bricklayers' Square Scaffold Members

Members:	Dimensions (inches)
Bearers or horizontal members	2 by 6.
Legs	2 by 6.
Braces at corners	1 by 6.
Braces diagonally from center frame	1 by 6.

451(n)(1) The squares shall not exceed 5 feet in width and 5 feet in height.

451(n)(2) Members shall be not less than those specified in Table L-15.

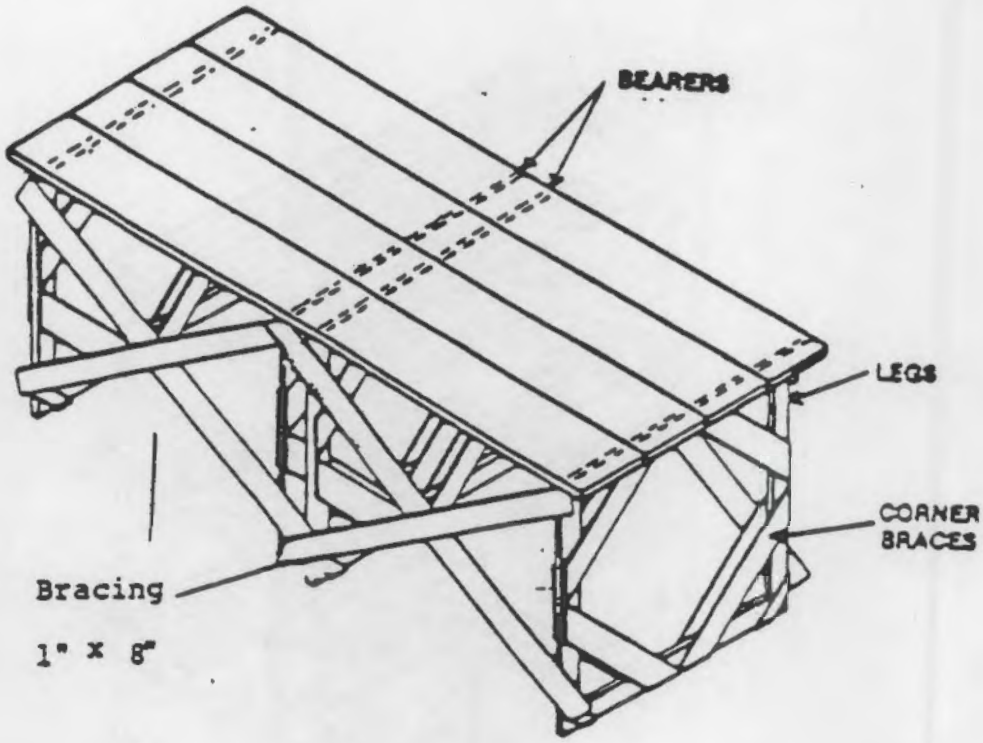
Table L-15—Minimum Dimensions for Bricklayers' Square Scaffold Members

Members:	Dimensions
Bearers or horizontal members	2 × 6 in.
Legs	2 × 6 in.
Braces at corners	1 × 6 in.
Braces diagonally from center frame	1 × 8 in.

451(n)(3) The squares shall be reinforced on both sides of each corner with 1- × 6-inch gusset pieces. They shall also have diagonal braces 1 × 8 inches on both sides running from center to center of each member, or other means to secure equivalent strength and rigidity.

Planks

2" x 10"
Nominal

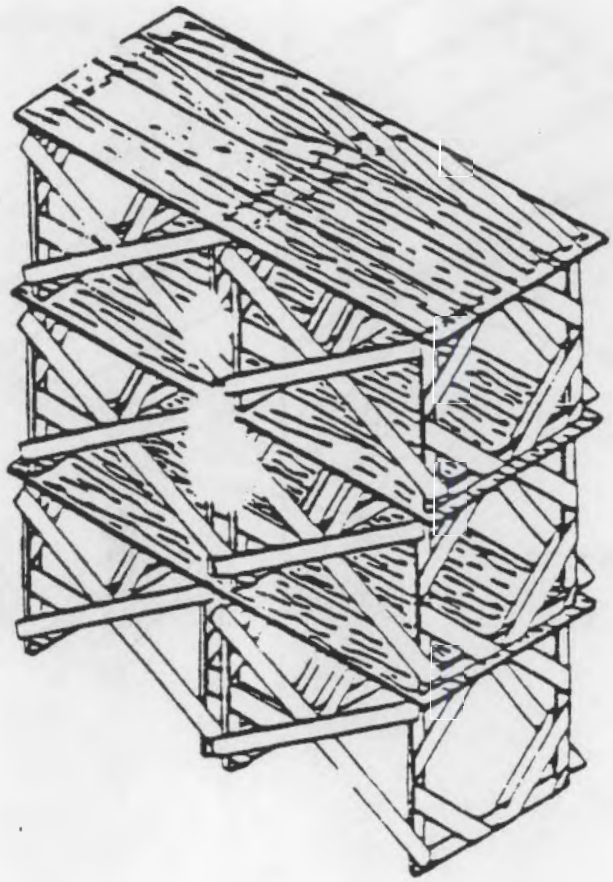


1910.28(l)(5) Platform planks shall be at least 2- by 9-inch nominal size. The ends of the planks shall overlap the bearers of the squares and each plank shall be supported by not less than three squares.

451(n)(4) The squares shall be set not more than 5 feet apart for medium duty scaffolds, and not more than 8 feet apart for light duty scaffolds. Bracing, 1 x 8 inches, extending from the bottom of each square to the top of the next square, shall be provided on both front and rear sides of the scaffold.

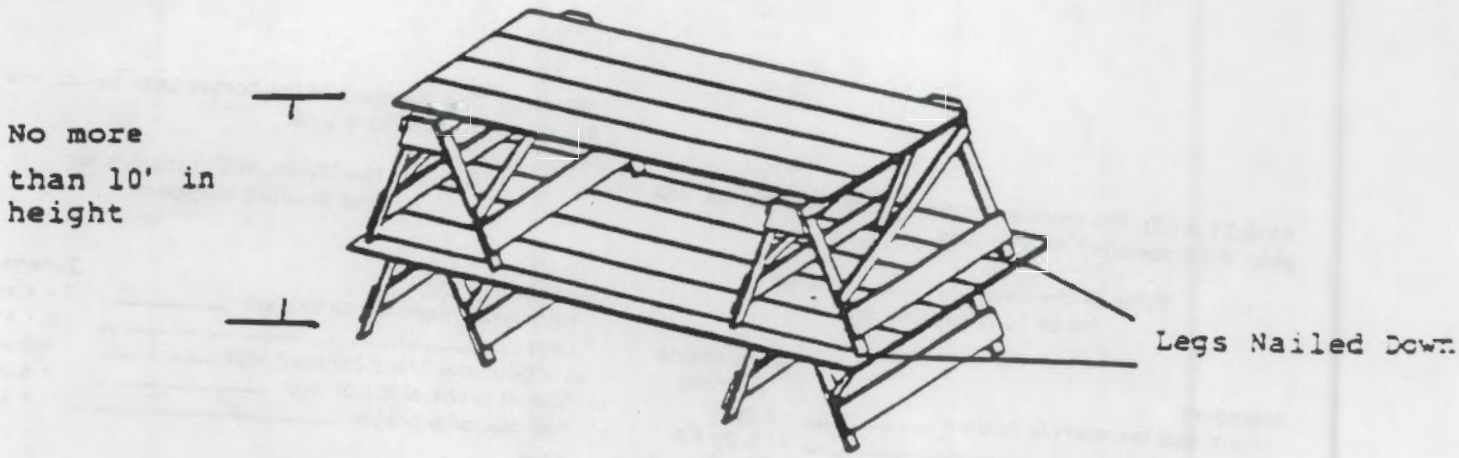
451(n)(5) Platform planks shall be at least 2- x 10-inch nominal size. The ends of the planks shall overlap the bearers of the squares and each plank shall be supported by not less than three squares

451(n)(7) Scaffolds shall be level and set upon a firm foundation.



.451(n)(6) Bricklayers' square scaffolds shall not exceed three tiers in height and shall be so constructed and arranged that one square shall rest directly above the other. The upper tiers shall stand on a continuous row of planks laid across the next lower tier and be nailed down or otherwise secured to prevent displacement.

Horse Scaffolds



1910.28 Standards on this topic appear under subsection (m).

451(o)(1) Horse scaffolds shall not be constructed or arranged more than two tiers or 10 feet in height.

451(o)(4) When arranged in tiers, each horse shall be placed directly over the horse in the tier below.

451(o)(5) On all scaffolds arranged in tiers, the legs shall be nailed down or otherwise secured to the planks to prevent displacement or thrust and each tier shall be substantially cross braced.

1910.28(m)(2) The members of the horses shall be not less than those specified in Table D-19.

Table D-19—Minimum Dimensions for Horse Scaffold Members

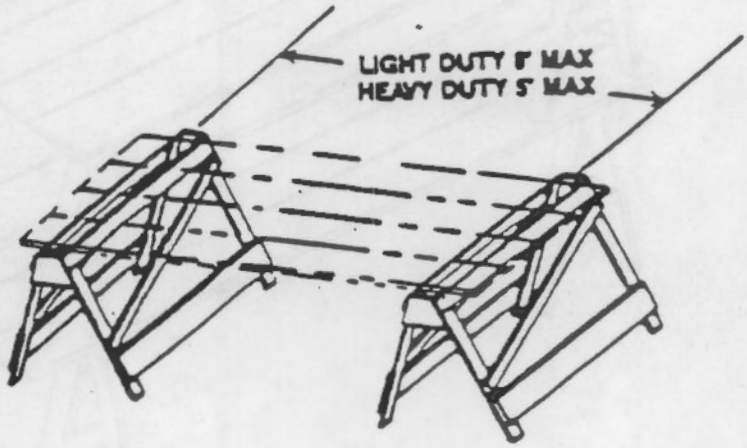
Members:	Dimensions (inches)
Horizontal members or bearers	3 by 4.
Legs	1¾ by 4½
Longitudinal brace between legs	1 by 6.
Gusset brace at top of legs	1 by 6.
Half diagonal braces	1¾ by 4½

451(e)(2) The members of the horses shall be not less than those specified in Table L-16.

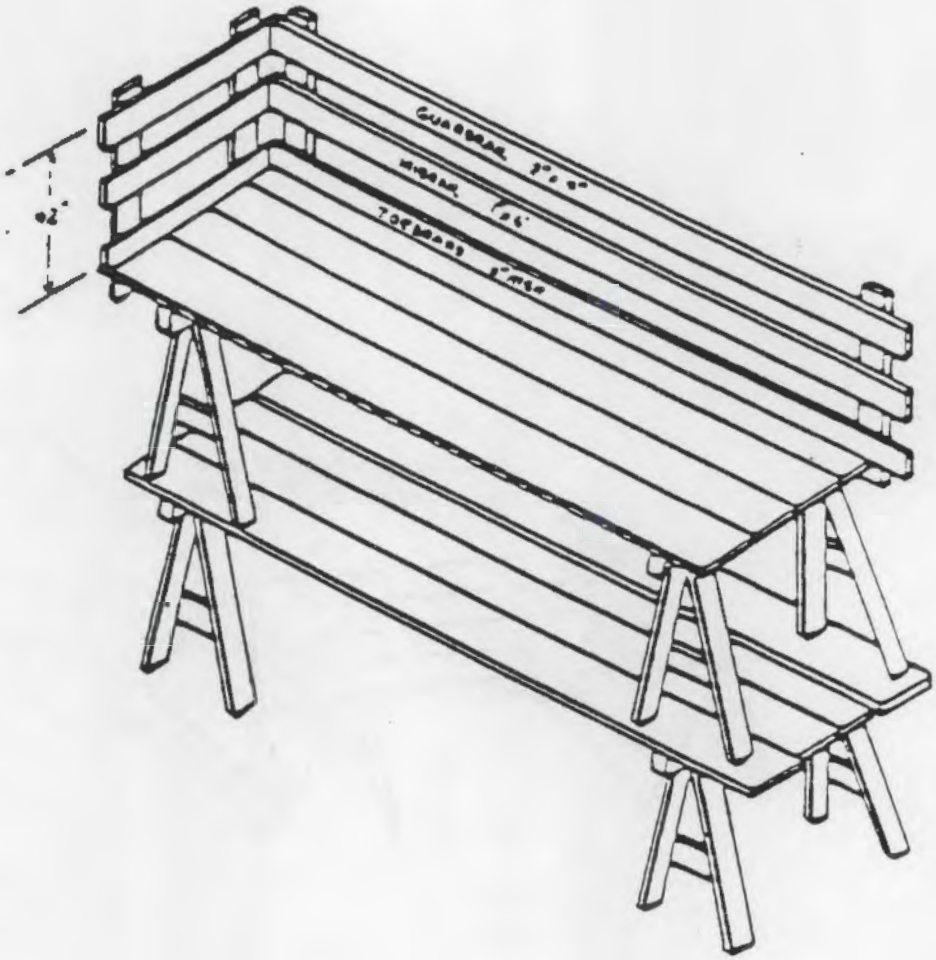
Table L-16—Minimum Dimensions for Horse Scaffold Members

Members:	Dimensions
Horizontal members or bearers	3 × 4 in.
Legs	1¾ × 4½ in.
Longitudinal brace between legs	1 × 6 in.
Gusset brace at top of legs	1 × 6 in.
Half diagonal braces	1¾ × 4½ in.

451(e)(6) Horses or parts which have become weak or defective shall not be used.



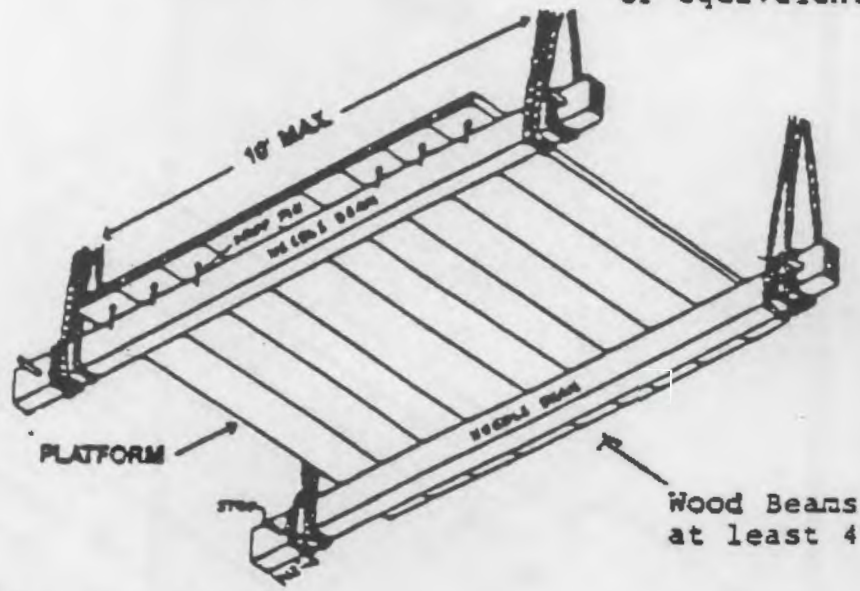
451(o)(3) Horses shall be spaced not more than 5 feet for medium duty and not more than 8 feet for light duty.

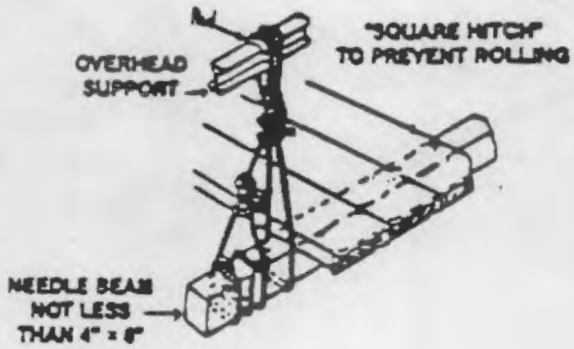


1910.28(m)(7) Guardrails not less than 2 by 4 inches or the equivalent and not less than 38 inches or more than 42 inches high with a mid-rail, when required, or 1- by 4-inch lumber or equivalent and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

451(a)(7) Guardrails made of lumber, not less than 2 × 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a midrail, of 1 × 6 inch lumber (or other material providing equivalent protection), and toeboards, shall be installed at all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(5) of this section.

Needle Beam Scaffolds





1910.28 Standards on this topic appear under subsection (n).

1910.28(n)(1) Wood needle beams shall be in accordance with paragraph (a)(5) and (9) of this section, and shall be not less than 4 by 6 inches in size, with the greater dimension placed in a vertical direction. Metal beams or the equivalent conforming to paragraph (a)(4) and (8) of this section may be used.

1910.28(n)(4) The platform span between the needle beams shall not exceed 8 feet when using 2-inch scaffold plank. For spans greater than 8 feet, platforms shall be designed based on design requirements for the special span. The overhang of each end of the platform planks shall be not less than 1 foot and not more than 18 inches.

1910.28(n)(5) When one needle beam is higher than the other or when the platform is not level the platform shall be secured against slipping.

1910.28(n)(6) All unattached tools, bolts, and nuts used on needle beam scaffolds shall be kept in suitable containers.

451(p)(1) Wood needle beams shall be not less than 4 x 6 inches in size, with the greater dimension placed in a vertical direction. Metal beams or the equivalent, conforming to paragraphs (a)(8) and (10) of this section, may be used and shall not be altered or moved horizontally while they are in use.

451(p)(2) Ropes or hangers shall be provided for supports. The span between supports on the needle beam shall not exceed 10 feet for 4- x 6-inch timbers. Rope supports shall be equivalent in strength to 1-inch diameter first-grade manila rope.

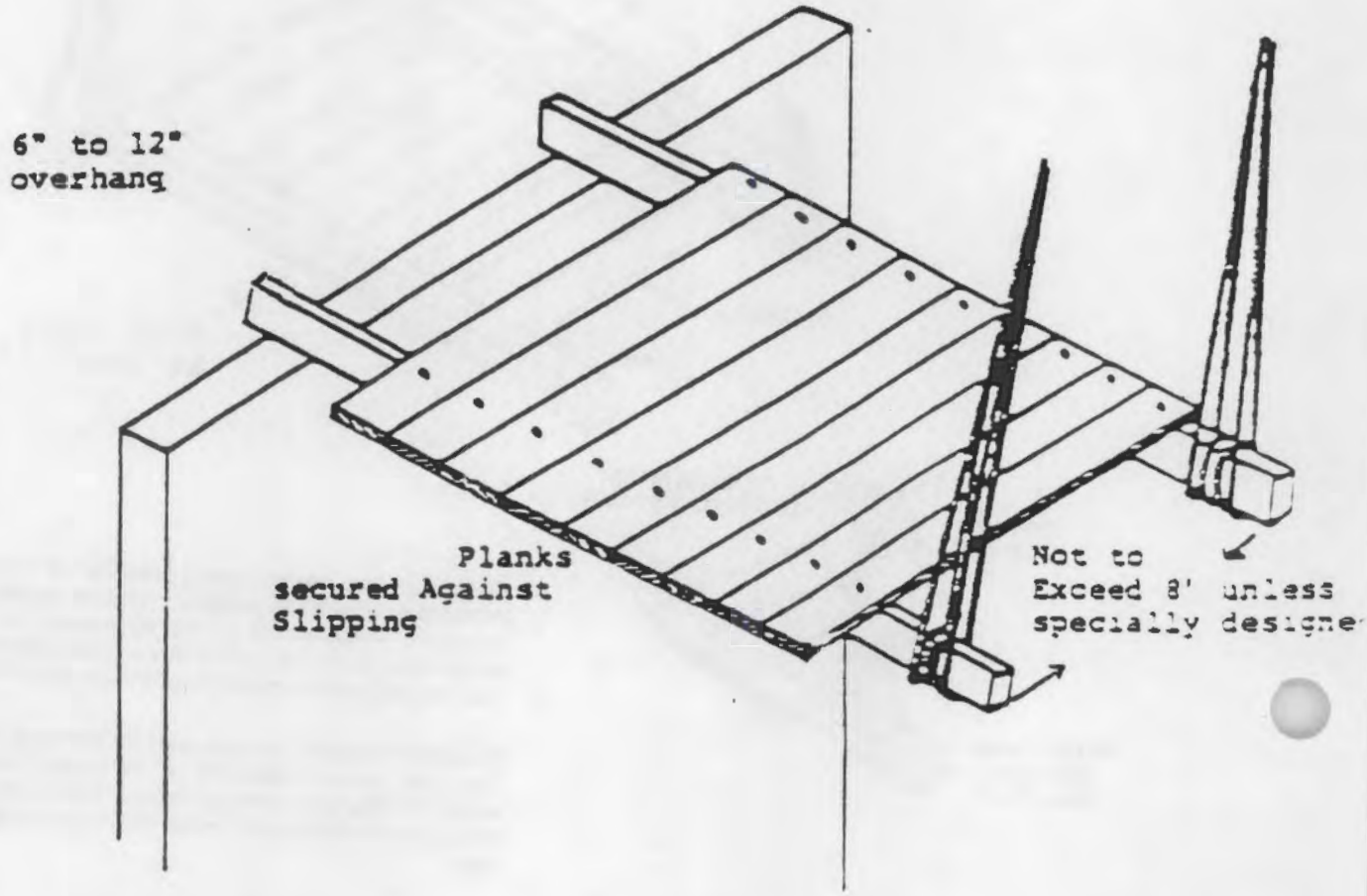
451(p)(3) The ropes shall be attached to the needle beams by a scaffold hitch or a properly made eye splice. The loose end of the rope shall be tied by a bowline knot or by a round turn and a half hitch.

451(p)(4) The scaffold hitch shall be arranged so as to prevent the needle beam from rolling or becoming otherwise displaced.

451(p)(5) The platform span between the needle beams shall not exceed 8 feet when using 2-inch scaffold planks. For spans greater than 8 feet, platforms shall be designed based on design requirements for the special span. The overhang of each end of the platform planks shall be not less than 6 inches and not more than 12 inches.

451(p)(6) When needle beam scaffolds are used, the planks shall be secured against slipping.

451(p)(7) All unattached tools, bolts, and nuts used on needle beam scaffolds shall be kept in suitable containers, properly secured.



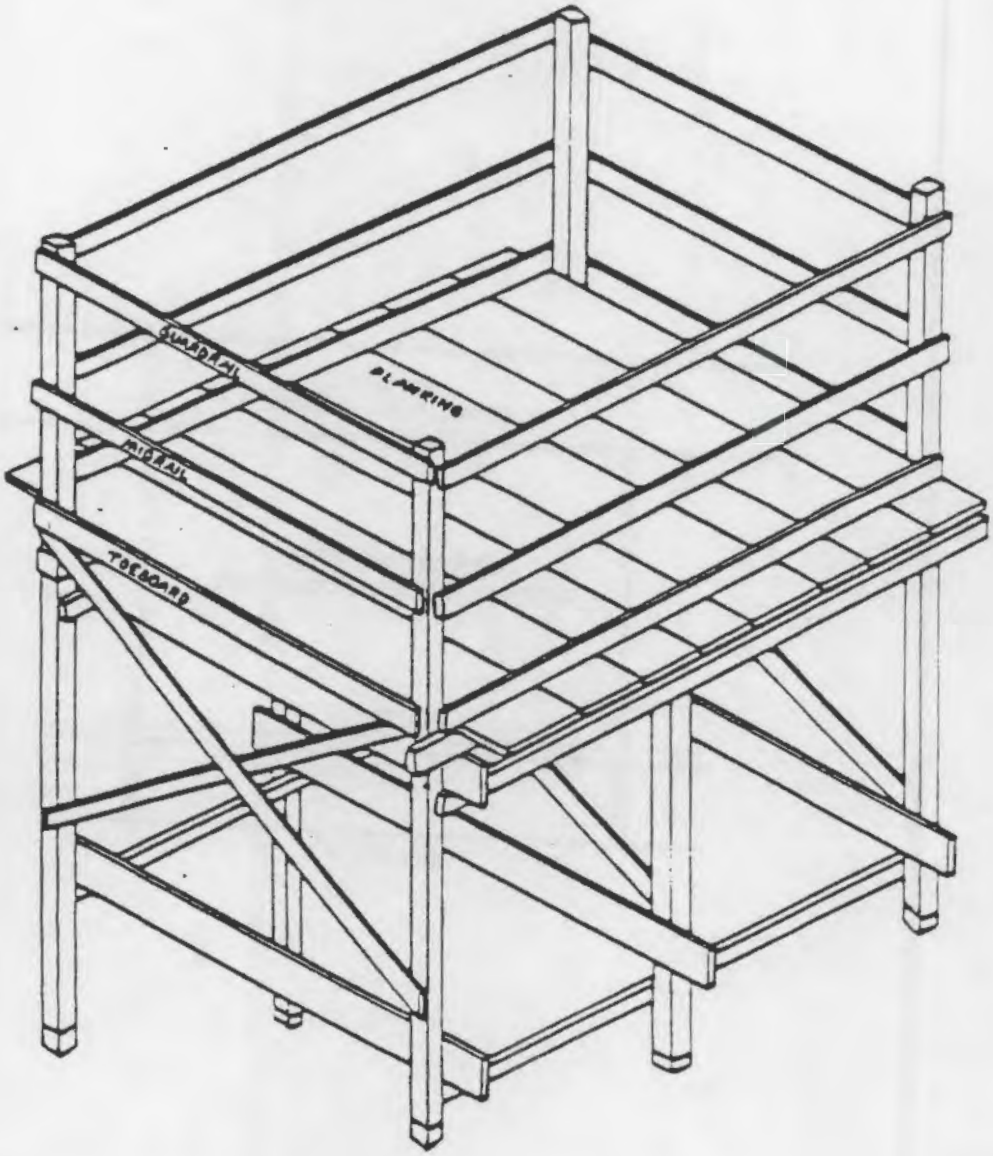
1910.28(n)(7) One end of a needle beam scaffold may supported by a permanent structural member conforming .o paragraph (a)(4) and (8) of this section.

1910.28(n)(8) Each man working on a needle beam scaffold 20 feet or more above the ground or floor and working with both hands, shall be protected by a safety life belt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the workman in case of a fall.

451(p)(8) One end of a needle beam scaffold may be supported by a permanent structural member conforming to c[illegible]ions (a)(8) and (10) of this section.

451(p)(9) Each employee working on a needle beam scaffold shall be protected by a safety belt and lifeline in accordance with § 1926.104.

Plasterers Decorators Scaffold



1910.28 Standards on this topic appear under subsection (o)

1910.28(o)(1) Plasterers', decorators', lathers', and ceiling workers' inside scaffolds shall be constructed in accordance with the general requirements set forth for independent wood pole scaffolds.

1910.28(n)(2) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

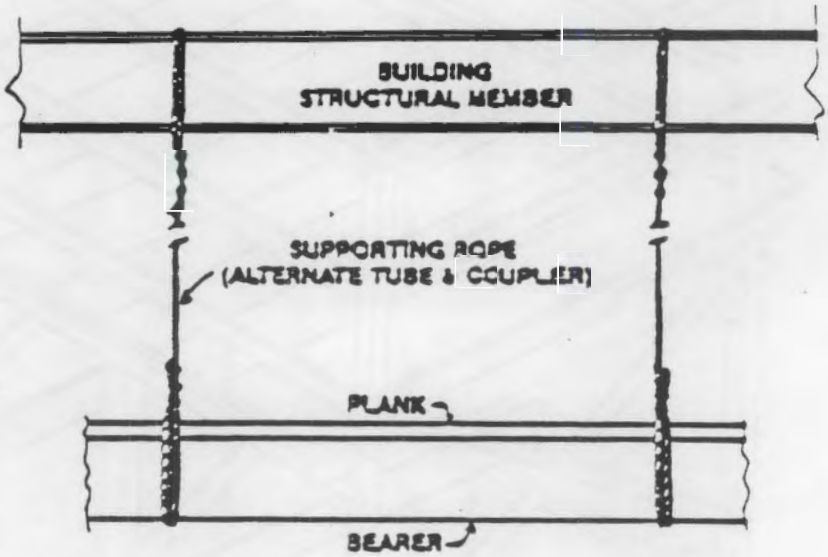
451(q)(1) Plasterers', lathers', and ceiling workers' inside scaffolds shall be constructed in accordance with the general requirements set forth for independent wood pole scaffolds. See paragraph (b) and Tables L-7, 8, and 9 of this section.)

51(q)(2) All platform planks shall be laid with the edges close together.

451(q)(3) When independent pole scaffold platforms are erected in sections, such sections shall be provided with connecting runways equipped with substantial guardrails.

451(q)(4) Guardrails made of lumber, not less than 2 × 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a midrail of 1 × 6 inch lumber (or other material providing equivalent protection), and toeboards, shall be installed on all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(6) of this section.

Interior Hung Scaffolds



1910.28 Standards on this topic appear under subsection P.

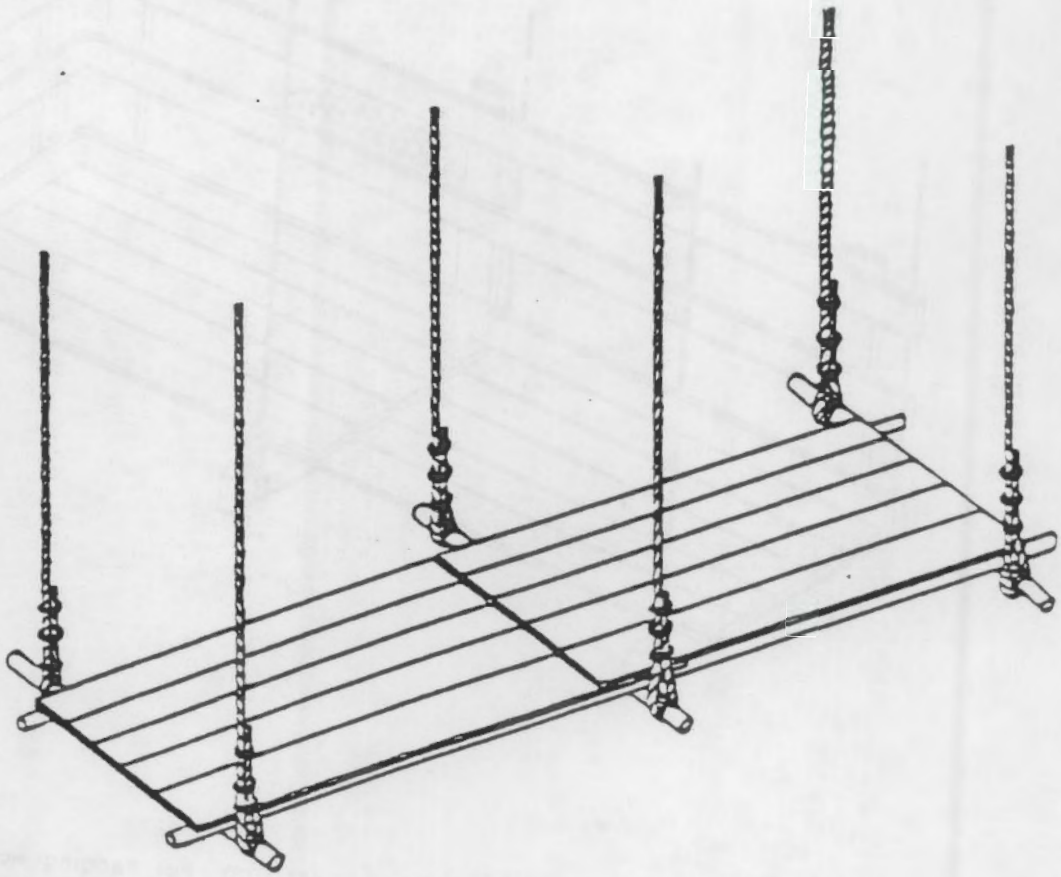
1910.28(p)(2) The suspended steel wire rope shall conform to paragraph (a)(22) of this section. Wire may be used providing the strength requirements of paragraph (a)(22) of this section are met.

1910.28(p)(5) When a hanging scaffold is supported by means of wire rope, such wire rope shall be wrapped at least twice around the supporting members and twice around the bearers of the scaffold, with each end of the wire rope secured by at least three standard wire-rope clips.

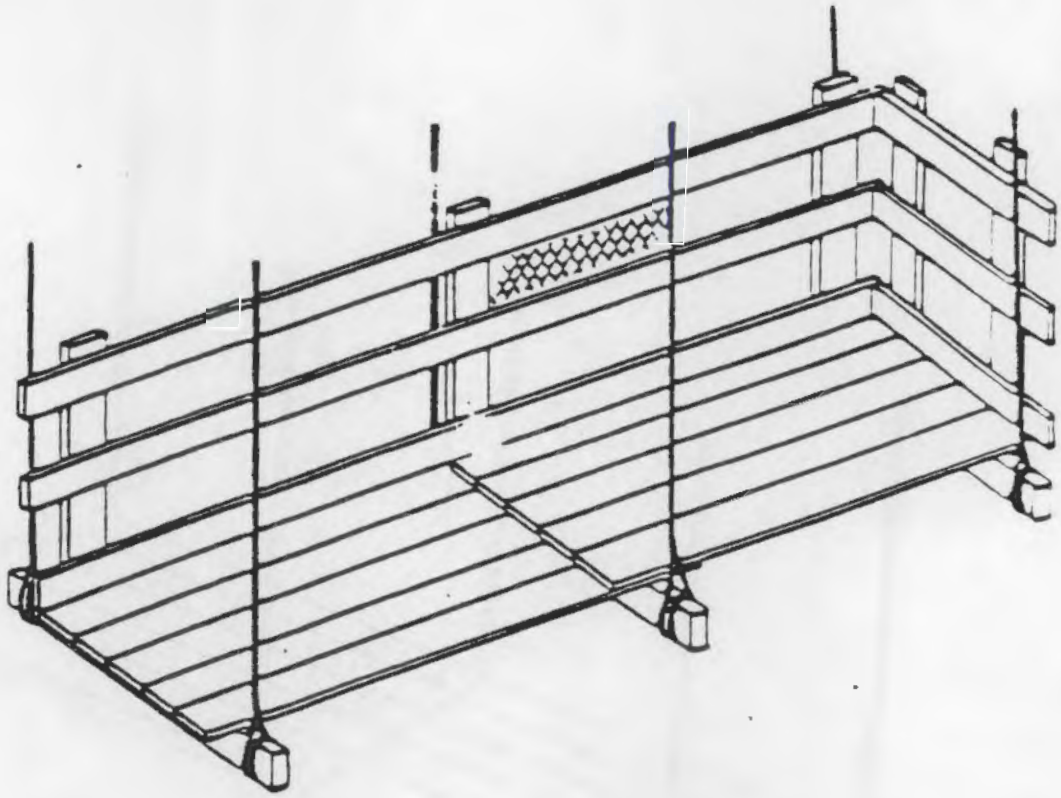
1910.28(p)(6) All overhead supporting members shall be inspected and checked for strength before the scaffold is erected.

451(r)(1) An interior hung scaffold shall be hung or suspended from the roof structure or ceiling beams.

451(r)(2) The suspending wire or fiber rope shall be capable of supporting at least 6 times the rated load. The rope shall be wrapped at least twice around the supporting members and twice around the bearers of the scaffold, with each end of the wire rope secured by at least three standard wire rope clips properly installed.



451(r)(4) Steel tube and coupler members may be used for hanging scaffolds with both types of scaffold designed to sustain a uniform distributed working load up to heavy duty scaffold loads with a safety factor of four.



1910.28(p)(3) For hanging wood scaffolds, the following minimum nominal size material is recommended:

(i) Supporting bearers 2 by 9 inches on edge.

(ii) Planking 2 by 9 inches or 2 by 10 inches, with maximum span 7 feet for heavy duty and 10 feet for light duty or medium duty.

1910.28(p)(7) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, 1- by 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

451(r)(3) For hanging wood scaffolds, the following minimum nominal size material shall be used:

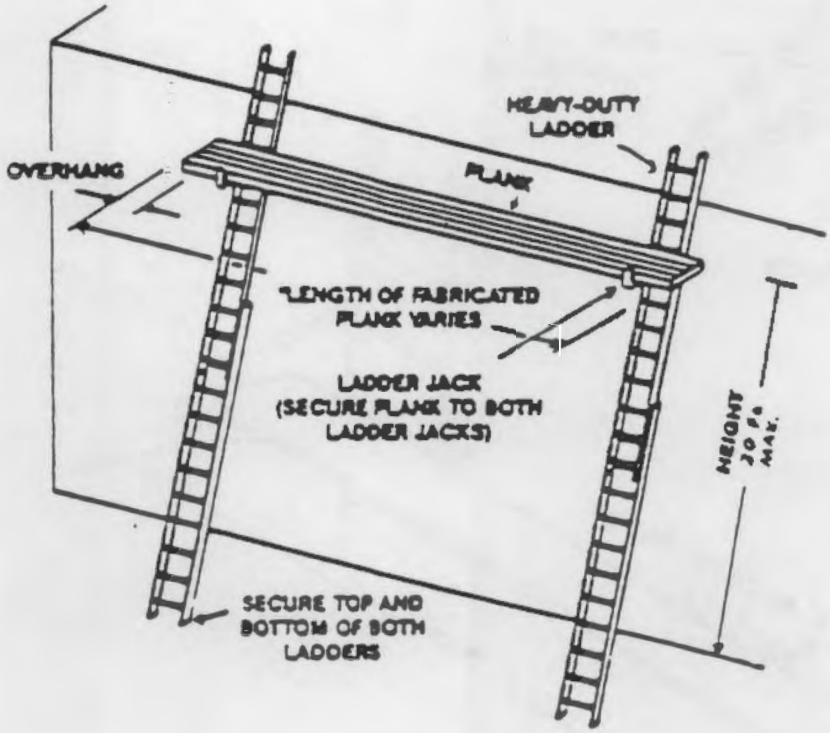
(i) Supporting bearers 2 × 10 inches on edge;

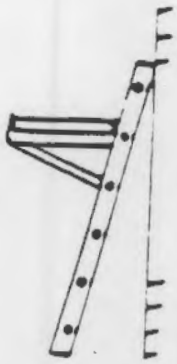
(ii) Planking 2 × 10 inches, with maximum span 7 feet for heavy duty and 10 feet for light duty or medium duty.

451(r)(5) Guardrails made of lumber, not less than 2 × 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a midrail of 1 × 6 inch lumber (or other material providing equivalent protection), and toeboards, shall be installed at all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(6) of this section.

LADDER JACK SCAFFOLD

LIGHT DUTY





JACK INSTALLED ON SIDE OF LADDER AWAY FROM SURFACE

JACK INSTALLED ON SIDE OF LADDER TOWARD SURFACE

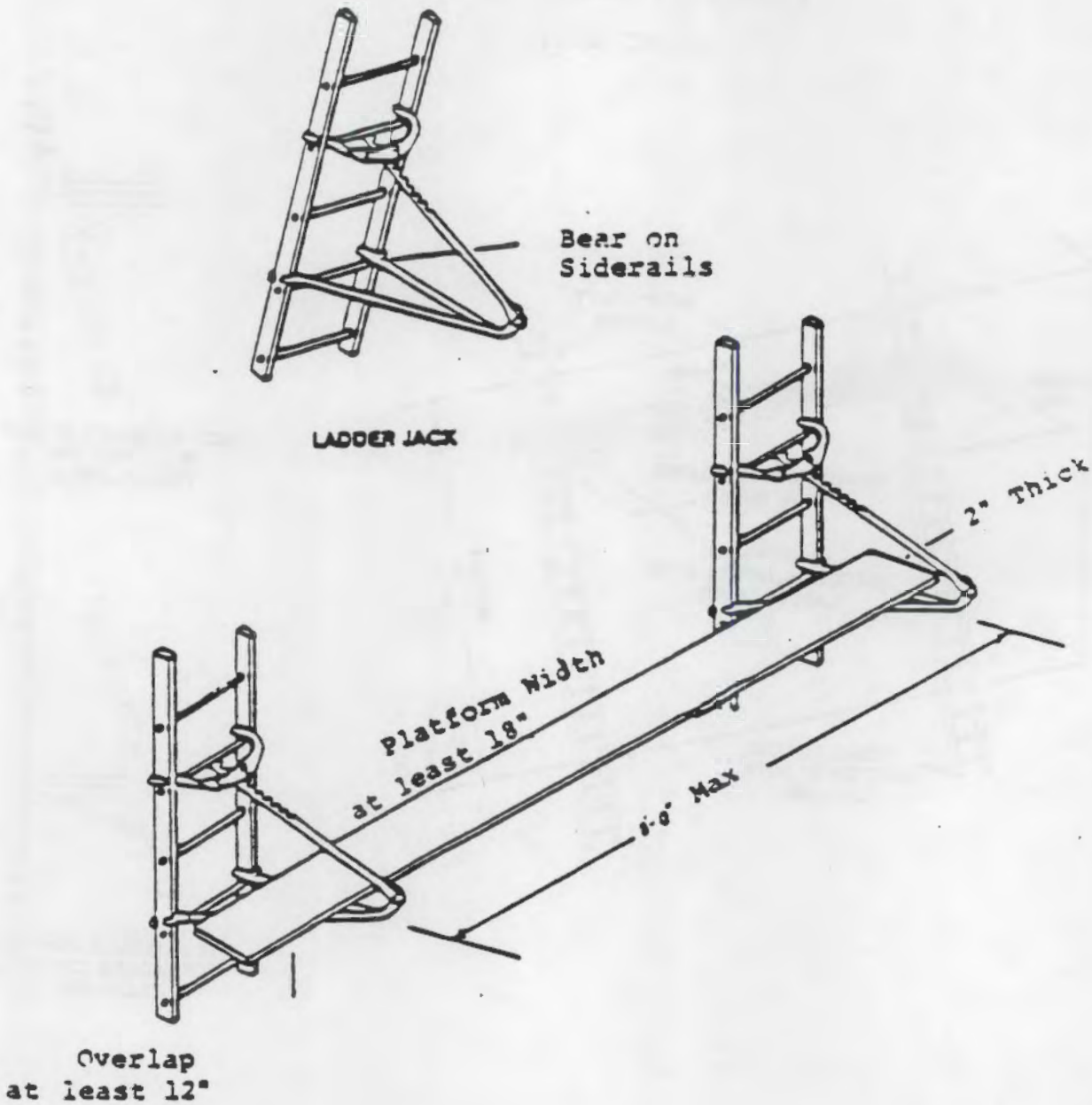
1910.28 Standards on this topic appear under subsection (q)

1910.25(q)(2) All ladders used in connection with ladder-jack scaffolds shall be heavy-duty ladders and shall be designed and constructed in accordance with § 1910.25 and § 1910.26.

451(s)(1) All ladder jack scaffolds shall be limited to light duty and shall not exceed a height of 20 feet above the floor or ground.

451(s)(2) All ladders used in connection with ladder jack scaffolds shall be heavy-duty ladders and shall be designed and constructed in accordance with American National Standards Institute A 14.1—1968, Safety Code for Portable Wood Ladders, and A 14.2—1968, Safety Code for Portable Metal Ladders. Cleated ladders shall not be used for this purpose.

451(s)(4) Ladders used in conjunction with ladder jacks shall be so placed, fastened, held, or equipped with devices so as to prevent slipping.

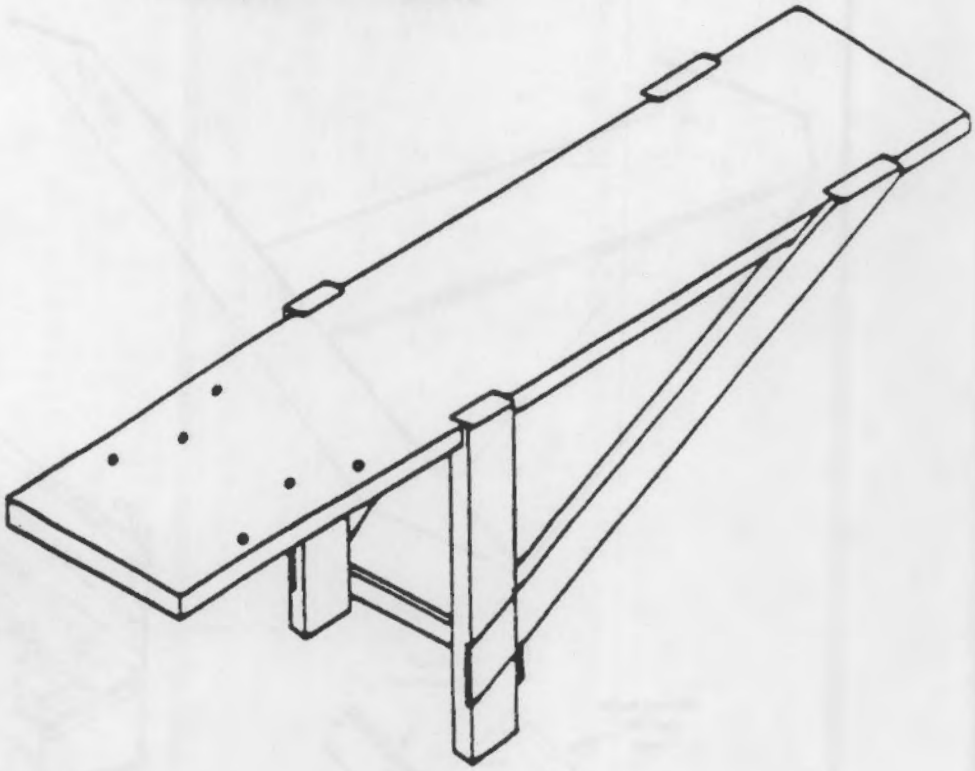


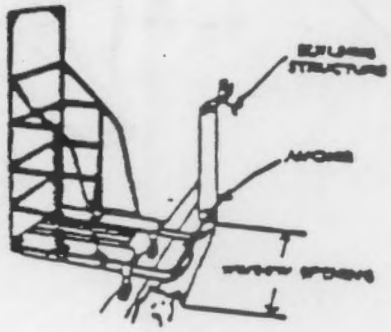
451(a)(3) The ladder jack shall be so designed and constructed that it will bear on the side rails in addition to the ladder rungs, or if bearing on rungs only, the bearing area shall be at least 10 inches on each rung.

451(a)(5) The wood platform planks shall be not less than 2 inches nominal in thickness. Both metal and wood platform planks shall overlap the bearing surface not less than 12 inches. The span between supports for wood shall not exceed 8 feet. Platform width shall be not less than 18 inches.

451(a)(6) Not more than two employees shall occupy any given 8 feet of any ladder jack scaffold at any one time.

Window Jack Scaffold





1910.28 Standards on this topic appear under subsection (r).

(3) Window-jack scaffolds shall be provided with suitable guardrails unless safety belts with lifelines are attached and provided for the workman. Window-jack scaffolds shall be used by one man only.

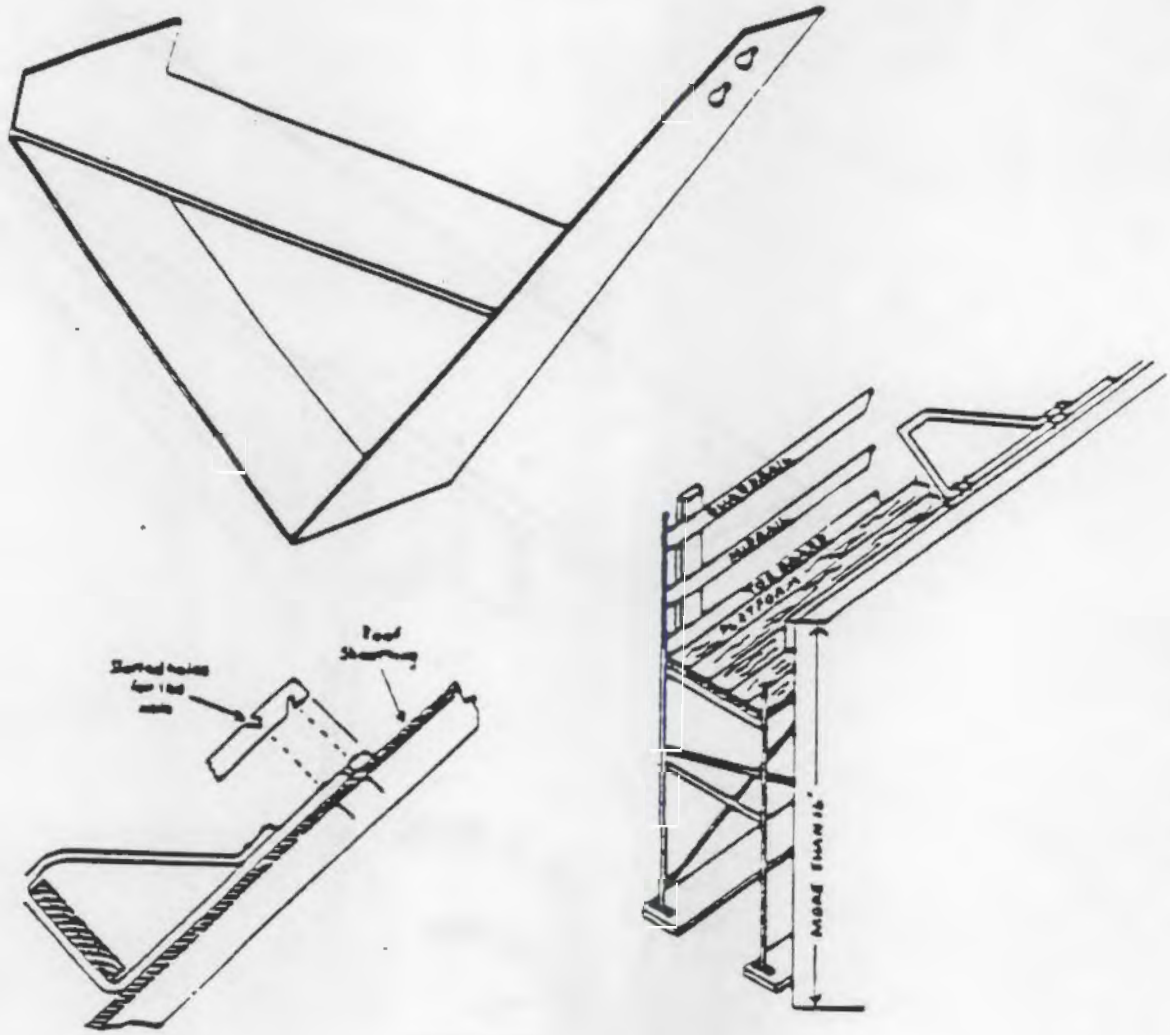
451(l)(1) Window jack scaffolds shall be used only for the purpose of working at the window opening through which the jack is placed.

451(l)(2) Window jacks shall not be used to support planks placed between one window jack and another or for other elements of scaffolding.

451(l)(3) Window jack scaffolds shall be provided with guardrails unless safety belts with lifelines are attached and provided for employees.

451(l)(4) Not more than one employee shall occupy a window jack scaffold at any one time.

Roofing Bracket



1910.28 Standards on this topic appear under subsection S.

1910.28(s)(2) Brackets shall be secured in place by nailing in addition to the pointed metal projections. The nails shall be driven full length into the roof. When rope supports are used, they shall consist of first-grade manila of at least three-quarter-inch diameter, or equivalent.

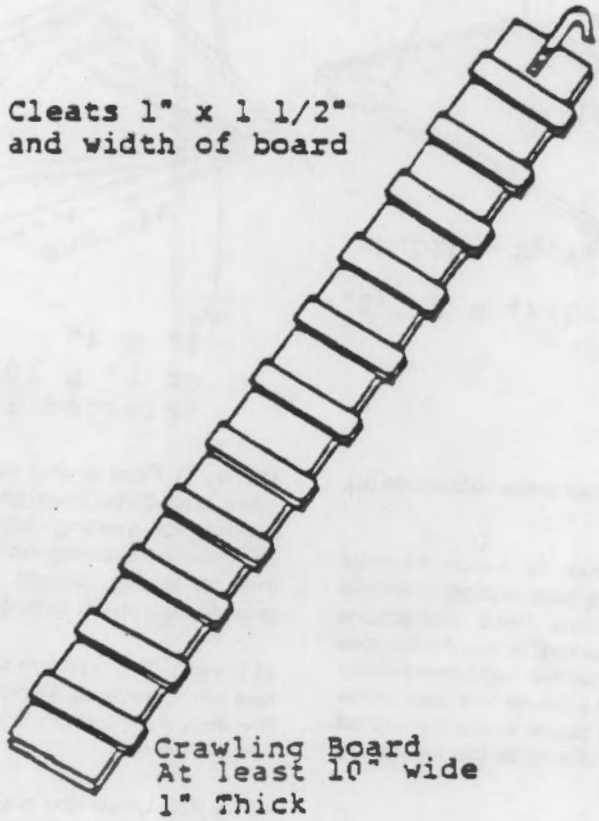
1910.28(s)(3) A substantial catch platform shall be installed below the working area of roofs more than 20 feet from the ground to eaves with a slope greater than 3 inches in 12 inches without a parapet. In width the platform shall extend 2 feet beyond the projection of the eaves and shall be provided with a safety rail, mid-rail, and toeboard. This provision shall not apply where employees engaged in work upon such roofs are protected by a safety belt attached to a lifeline.

451(u)(1) Roofing brackets shall be constructed to fit the pitch of the roof.

451(u)(2) Brackets shall be secured in place by nailing in addition to the pointed metal projections. When it is impractical to nail brackets, rope supports shall be used. When rope supports are used, they shall consist of first-grade manila of at least ¾-inch diameter, or equivalent.

451(u)(3) A catch platform shall be installed below the working area of roofs more than 16 feet from the ground to eaves with a slope greater than 4 inches in 12 inches without a parapet. In width, the platform shall extend 2 feet beyond the protection of the eaves and shall be provided with a guardrail, midrail, and toeboard. This provision shall not apply wh employees engaged in work upon such roofs are protecte a safety belt attached to a lifeline.

Chicken Ladder



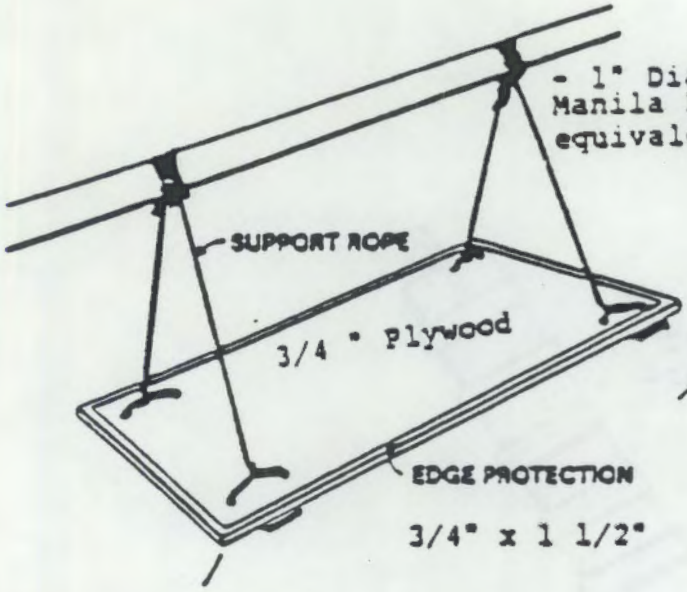
1910.28 Standards on this topic appear under subsection (l)

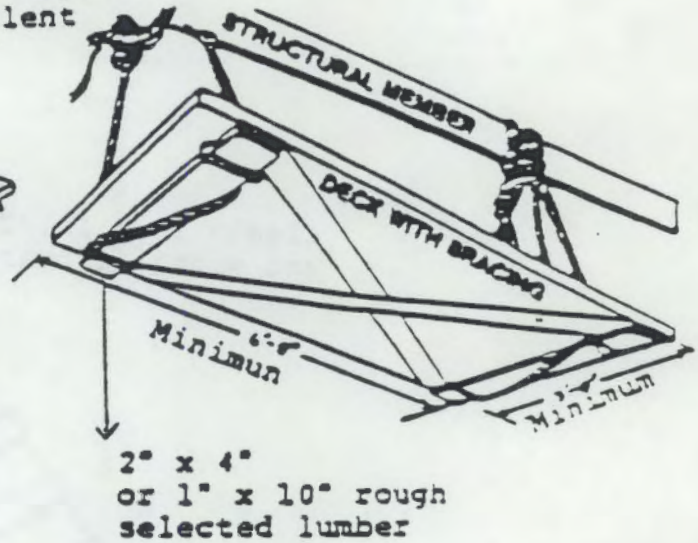
451(v)(1) Crawling boards shall be not less than 10 inches wide and 1 inch thick, having cleats 1 x 1½ inches. The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed 24 inches. Nails shall be driven through and clinched on the underside. The crawling board shall extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.

451(v)(2) A firmly fastened lifeline of at least ¾-inch diameter rope, or equivalent, shall be strung beside each crawling board for a handhold.

451(v)(3) Crawling boards shall be secured to the roof by means of adequate ridge hooks or other effective means.

Float Scaffolds





1910.28 Standards on this topic appear under subsection (u).

1910.28(u)(5) Supporting ropes shall be 1-inch diameter manila rope or equivalent, free from deterioration, chemical damage, flaws, or other imperfections. Rope connections shall be such that the platform cannot shift or slip. If two ropes are used with each float, each of the two supporting ropes shall be hitched around one end of a bearer and pass under the platforms to the other end of the bearer where it is hitched again, leaving sufficient rope at each end for the supporting ties.

1910.28(u)(6) Each workman shall be protected by a safety lifebelt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the workman in case of a fall.

451(w)(1) Float or ship scaffolds shall not be used to support more than three men and a few light tools, such as those needed for riveting, bolting, and welding. They shall be constructed as designed in subparagraphs (2) through (6) of this paragraph, unless substitute designs and materials provide equivalent strength, stability, and safety.

451(w)(2) The platform shall be not less than 3 feet wide and 6 feet long, made of ¾-inch plywood, equivalent to American Plywood Association Grade B-B, Group 1, Exterior or other similar material.

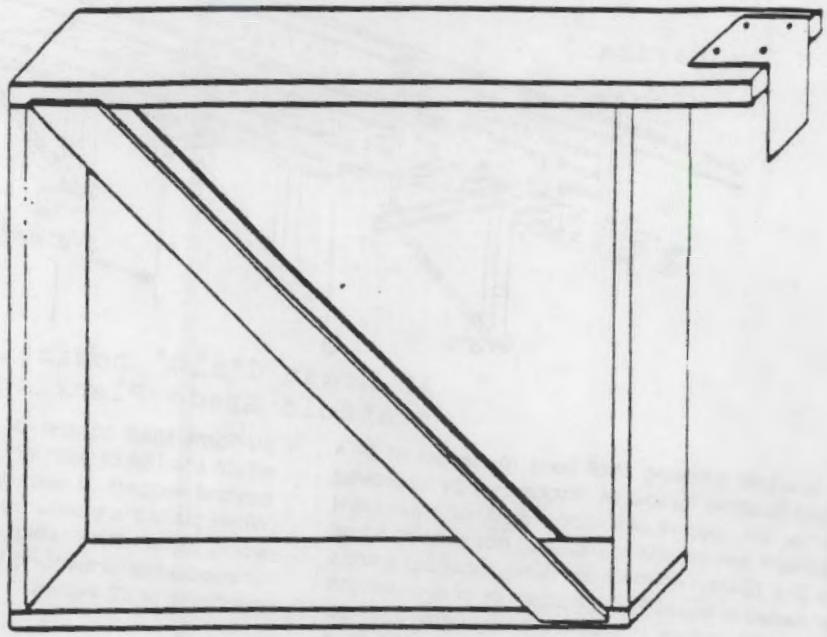
451(w)(3) Under the platform, there shall be two supporting bearers made from 2- x 4-inch, or 1- x 10-inch rough, "selected lumber," or better. They shall be free of knots or other flaws and project 6 inches beyond the platform on both sides. The ends of the platform shall extend 6 inches beyond the outer edges of the bearers. Each bearer shall be securely fastened to the platform.

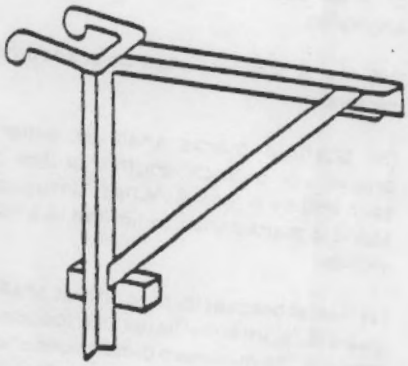
451(w)(4) An edging of wood not less than ¾ x 1½ inches or equivalent shall be placed around all sides of the platform to prevent tools from rolling off.

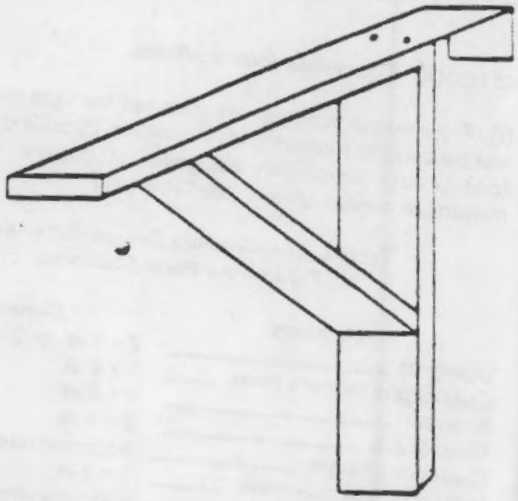
451(w)(5) Supporting ropes shall be 1-inch diameter manila rope or equivalent, free from deterioration, chemical damage, flaws, or other imperfections. Rope connections shall be such that the platform cannot shift or slip. If two ropes are used with each float, they shall be arranged so as to provide four ends which are to be securely fastened to an overhead support. Each of the two supporting ropes shall be hitched around one end of bearer and pass under the platforms to the other end of the bearer where it is hitched again, leaving sufficient rope at each end for the supporting ties.

451(w)(6) Each employee shall be protected by an approved safety lifebelt and lifeline, in accordance with § 1926.104.

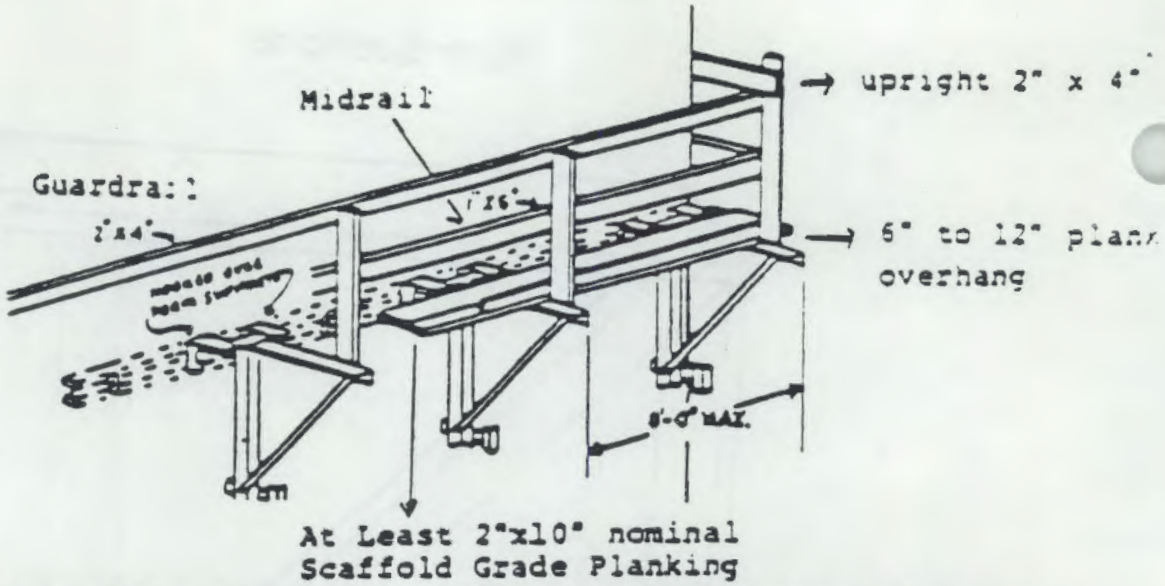
Form Scaffolds







451(x)(1) Form scaffolds shall be constructed of wood or other suitable materials, such as steel or aluminum members of known strength characteristics. All scaffolds shall be designed and erected with a minimum safety factor of 4, computed on the basis of the maximum rated load.



451(x)(2) All scaffold planking shall be a minimum of 2- × 10-inch nominal Scaffold Grade, as recognized by approved grading rules for the species of lumber used, or equivalent material. Maximum permissible spans shall not exceed 8 feet on centers for 2- × 10-inch nominal planking. Scaffold planks shall be either nailed or bolted to the ledgers or of such length that they overlap the ledgers at least 6 inches. Unsupported projecting ends of scaffolding planks shall be limited to a maximum overhang of 12 inches.

451(x)(3) Scaffolds shall not be loaded in excess of the working load for which they were designed.

451(x)(4) Figure-four form scaffolds.

(i) Figure-four scaffolds are intended for light duty and shall not be used to support loads exceeding 25 pounds per square foot unless specifically designed for heavier loading. For minimum design criteria, see Table L-17.

Table L-17—Minimum Design Criteria for Figure-Four Form Scaffolds

Members	*Dimensions*
Uprights	2 × 4 in. or 2 × 6 in.
Outriggers ledgers (two)	1 × 6 in.
Braces	1 × 6 in.
Guardrails	2 × 4 in.
Guardrail height	Approximately 42 in.
Intermediate guardrails	1 × 6 in.
Toeboards	4 in. (minimum)
Maximum length of ledgers	3 ft. 6 in. (unsupported).
Planking	2 × 10 in.
Upright spacing	8 ft. 0 in. (on centers)

(ii) Figure-four form scaffold frames shall be spaced not more than 8 feet on centers and constructed from sound lumber, as follows: The outrigger ledger shall consist of two pieces of 1- × 6-inch or heavier material nailed on opposite sides of the vertical form support. Ledgers shall project not more than 3 feet 6 inches from the outside of the form support and shall be substantially braced and secured to prevent tipping or turning. The knee or angle brace shall intersect the ledger at least 3 feet from the form at an angle of approximately 45°, and the lower end shall be nailed to a vertical support. The platform shall consist of two or more 2- × 10-inch planks, which shall be of such length that they extend at least 6 inches beyond ledgers at each end unless secured to the ledgers. When planks are secured to the ledgers (nailed or bolted), a wood filler strip shall be used between the ledgers. Unsupported projecting ends of planks shall be limited to an overhand of 12 inches.

451(x)(5) Metal bracket form scaffolds.

(i) Metal brackets or scaffold racks which are an integral part of the form shall be secured, bolted or welded to the form. Folding type brackets shall be either bolted or secured with a locking-type pin when extended for use.

(ii) "Clip-on" or "hook-over" brackets may be used, provided the form walers are bolted to the form or secured by snap ties or shea-bolt extending through the form and securely anchored.

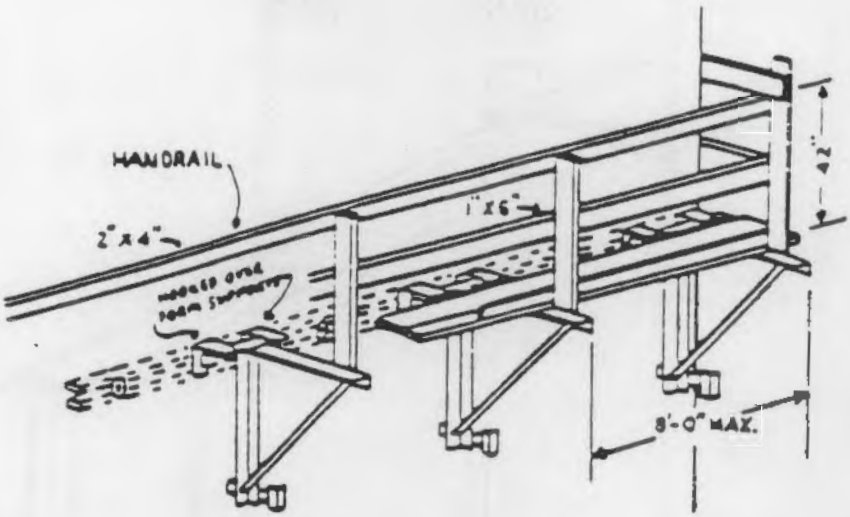
(iii) Metal brackets shall be spaced not more than 8 feet on centers.

(iv) Scaffold planks shall be either bolted to the metal brackets or of such length that they overlap the brackets at each end by at least 6 inches. Unsupported projecting ends of scaffold planks shall be limited to a maximum overhand of 12 inches.

(v) Metal bracket form scaffolds shall be equipped with wood guardrails, intermediate rails, toeboards, and scaffold planks meeting the minimum dimensions shown in Table L-18. (Metal may be substituted for wood, providing it affords equivalent or greater design strength.)

Table L-18—Minimum Design Criteria for Metal Bracket Form Scaffolds

Members	*Dimensions*
Uprights	2 × 4 in.
Guardrails	2 × 4 in.
Guardrail height	Approximately 42 in.
Intermediate guardrails	1 × 6 in.
Toeboards	4 in. (minimum).
Planking	2 × 9 in.



451(z)(6) Wooden bracket form scaffolds:

(i) Wooden bracket form scaffolds shall be an integral part of the form panel. The minimum design criteria set forth herein and in Table L-19 cover scaffolding intended for light duty and shall not be used to support loads exceeding 25 pounds per square foot, unless specifically designed for heavier loading.

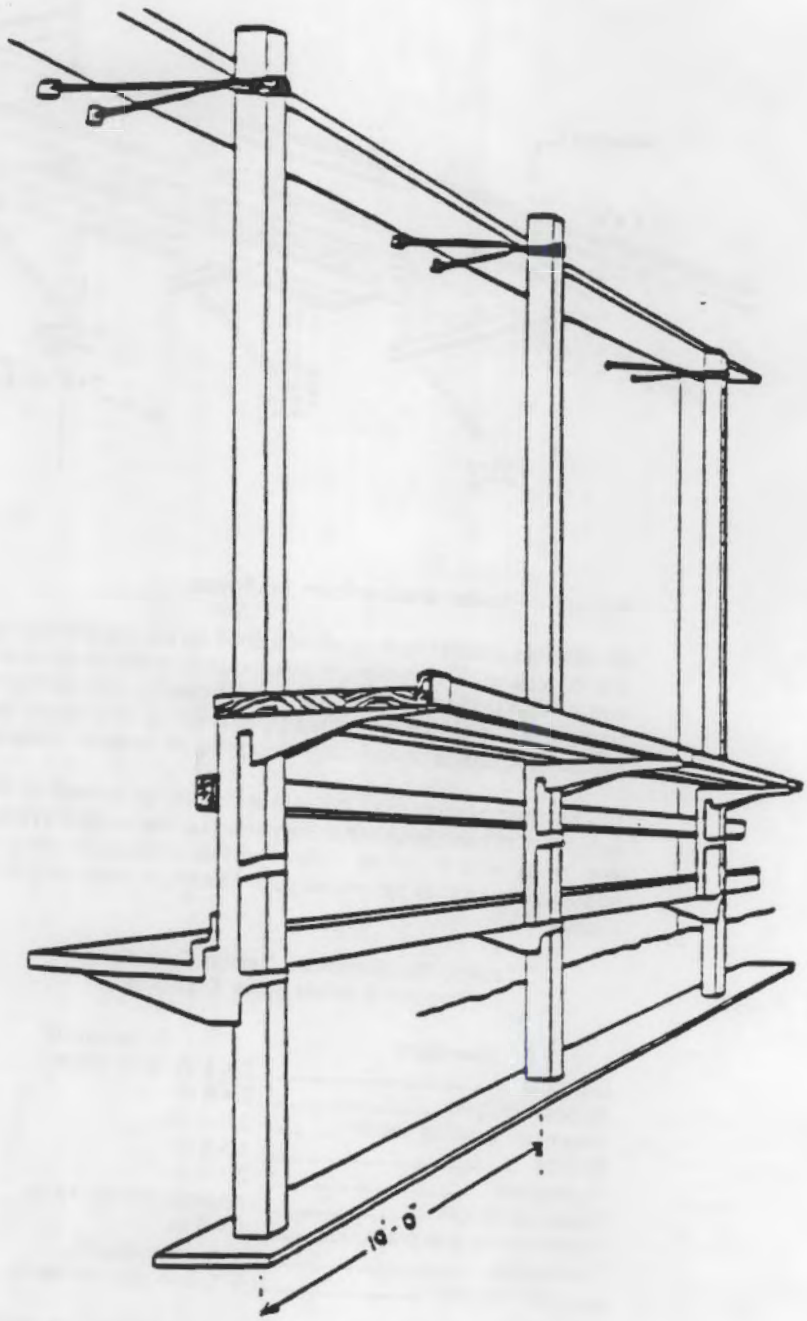
(ii) Scaffold planks shall be either nailed or bolted to the ledgers or of such length that they overlap the ledgers at each end by at least 6 inches. Unsupported projecting ends of scaffold planks shall be limited to a maximum overhang of 12 inches.

Table L-19—Minimum Design Criteria for Wooden Bracket Form Scaffolds

Members	*Dimensions*
Uprights	2 × 4 in. or 2 × 6 in.
Support ledgers	2 × 6 in.
Maximum scaffold width	3 ft. 6 in.
Braces	1 × 6 in.
Guardrails	2 × 4 in.
Guardrail height	Approximately 42 in.
Intermediate guardrails	1 × 6 in.
Toeboards	4 in. (minimum).
Upright spacing	8 ft. 0 in. (on centers).

(iii) Guardrails and toeboards shall be installed on all open sides and ends of platforms and scaffolding over 10 feet above floor or ground. Guardrails shall be made of lumber 2 × 4 inch nominal dimension (or other material providing equivalent protection), approximately 42 inches high, supported at intervals not to exceed 8 feet. Guardrails shall be equipped with midrails constructed of 1 × 6 inch nominal lumber (or other material providing equivalent protection). Toeboards shall extend not less than 4 inches above the scaffold plank.

Pump Jack Scaffolds



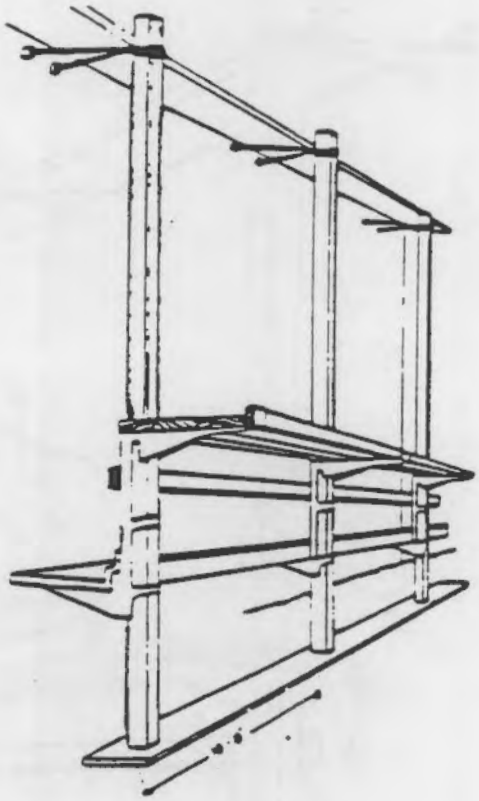
451(y)(1) Pump jack scaffolds shall:

(I) Not carry a working load exceeding 500 pounds; and

(II) Be capable of supporting without failure at least four times the maximum intended load.

(III) The manufactured components shall not be loaded in excess of the manufacturer's recommended limits.

451(y)(2) Pump jack brackets, braces, and accessories shall be fabricated from metal plates and angles. Each pump jack bracket shall have two positive gripping mechanisms to prevent any failure or slippage.



451(y)(3) The platform bracket shall be fully decked and the planking secured. Planking, or equivalent, shall conform with paragraph (a) of this section.

451(y)(4)(i) When wood scaffold planks are used as platforms, poles used for pump jacks shall not be spaced more than 10 feet center to center. When fabricated platforms are used that fully comply with all other provisions of this paragraph (y), pole spacing may exceed 10 feet center to center.

(ii) Poles shall not exceed 30 feet in height.

(iii) Poles shall be secured to the work wall by rigid triangular bracing, or equivalent, at the bottom, top, and other points as necessary, to provide a maximum vertical spacing of not more than 10 feet between braces. Each brace shall be capable of supporting a minimum of 225 pounds tension or compression.

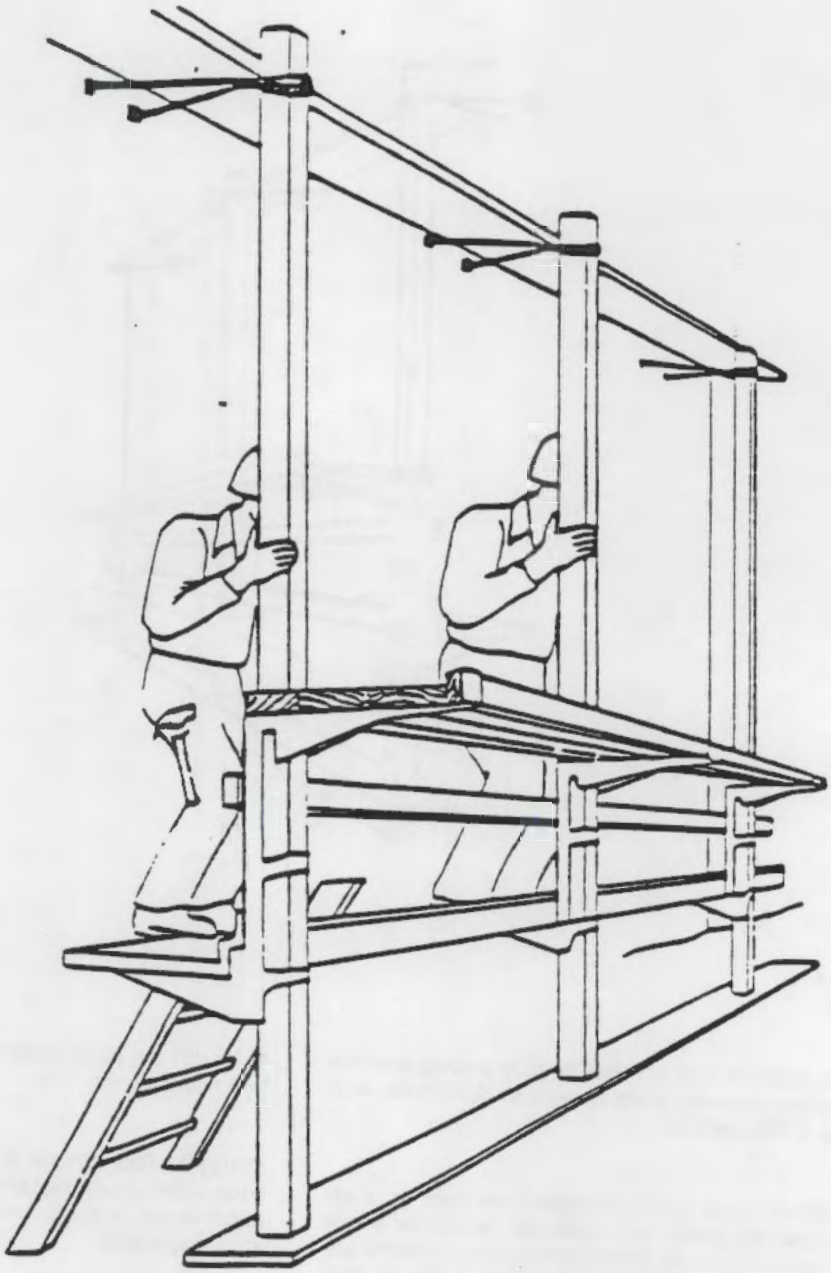
(iv) For the pump jack bracket to pass bracing already installed, an extra brace shall be used approximately 4 feet above the one to be passed until the original brace is reinstalled.

451(y)(5) All poles shall bear on mud sills or other adequate firm foundations.

451(y)(6) Pole lumber shall be two 2 × 4's, of Douglas fir, or equivalent, straight-grained, clear, free of cross-grain, shakes, large loose or dead knots, and other defects which might impair strength.

451(y)(7) When poles are constructed of two continuous lengths, they shall be two by fours, spiked together with the seam parallel to the bracket, and with 10d common nails, no more than 12 inches center to center, staggered uniformly from opposite outside edges.

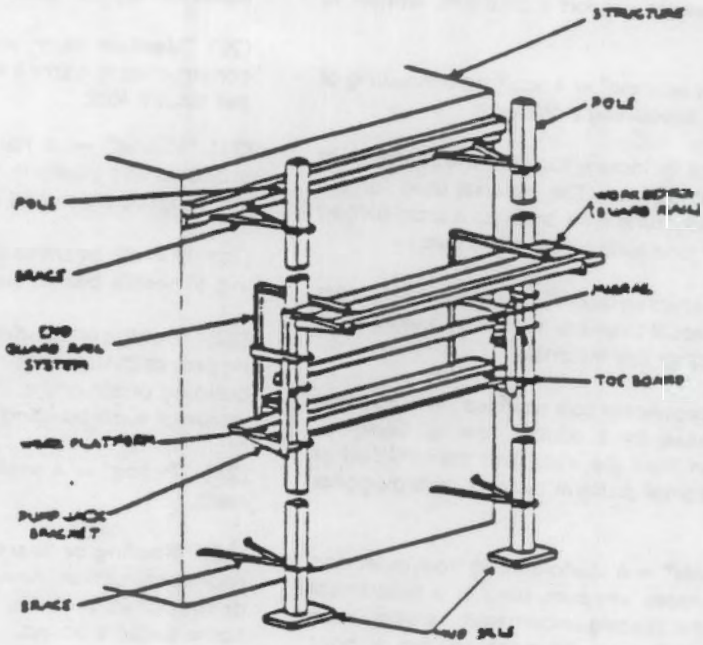
451(y)(8) If two by fours are spliced to make up the pole, the splices shall be so constructed as to develop the full strength of the member.



451(y)(9) A ladder, in accordance with § 1926.450, shall be provided for access to the platform during use.

451(y)(10) Not more than two persons shall be permitted at one time upon a pump jack scaffold between any two supports.

451(y)(13) Employees shall not be permitted to use a work bench as a scaffold platform.



451(y)(11) Pump jack scaffolds shall be provided with standard guardrails as defined in § 1926.451(a)(15), but no guardrail is required when safety belts with lifelines are provided for employees.

451(y)(12) When a work bench is used at an approximate height of 42 inches, the top guardrail may be eliminated, if the work bench is fully decked, the planking secured, and is capable of withstanding 200 pounds pressure in any direction.

SCAFFOLDING DEFINITIONS

(1) "Bearer" — A horizontal member of a scaffold upon which the platform rests and which may be supported by ledgers.

(2) "Boatswain's chair" — A seat suspended by slings attached to a suspended rope, designed to accommodate one workman in a sitting position.

(3) "Brace" — A tie that holds one scaffold member in a fixed position with respect to another member.

(4) "Bricklayers' square scaffold" — A scaffold composed of framed wood squares which support a platform, limited to light and medium duty.

(5) "Carpenters' bracket scaffold" — A scaffold consisting of wood or metal brackets supporting a platform.

(6) "Coupler" — A device for locking together the component parts of a tubular metal scaffold. (The material used for the couplers shall be of a structural type, such as a drop-forged steel, malleable iron, or structural grade aluminum.)

(7) "Crawling board or chicken ladder" — A plank with cleats spaced and secured at equal intervals, for use by a worker on roofs, not designed to carry any material.

(8) "Double pole or independent pole scaffold" — A scaffold supported from the base by a double row of uprights, independent of support from the walls and constructed of uprights, ledgers, horizontal platform bearers, and diagonal bracing.

(9) "Float or ship scaffold" — A scaffold hung from overhead supports by means of ropes and consisting of a substantial platform having diagonal bracing underneath, resting upon and securely fastened to two parallel plank bearers at right angles to the span.

(10) "Guardrail" — A rail secured to uprights and erected along the exposed sides and ends of platforms.

(11) "Heavy duty scaffold" — A scaffold designed and constructed to carry a working load not to exceed 75 pounds per square foot.

(12) "Horse scaffold" — A scaffold for light or medium duty, composed of horses supporting a work platform.

(13) "Interior hung scaffold" — A scaffold suspended from the ceiling or roof structure.

(14) "Ladder jack scaffold" — A light duty scaffold supported by brackets attached to ladders.

(15) "Ledgers (stringer)" — A horizontal scaffold member which extends from post to post and which supports the putlogs or bearers forming a tie between the posts.

(16) "Light duty scaffold" — A scaffold designed and constructed to carry a working load not to exceed 25 pounds per square foot.

(17) "Manually propelled mobile scaffold" — A portable rolling scaffold supported by casters.

(18) "Masons' adjustable multiple-point suspension scaffold" — A scaffold having a continuous platform supported by bearers suspended by wire rope from overhead supports, so arranged and operated as to permit the raising or lowering of the platform to desired working positions.

(19) "Maximum rated load" — The total of all loads including the working load, the weight of the scaffold, and such other loads as may be reasonably anticipated.

(20) "Medium duty scaffold" — A scaffold designed and constructed to carry a working load not to exceed 50 pounds per square foot.

(21) "Midrail" — A rail approximately midway between the guardrail and platform, secured to the uprights erected along the exposed sides and ends of platforms.

(22) "Needle beam scaffold" — A light duty scaffold consisting of needle beams supporting a platform.

(23) "Outrigger scaffold" — A scaffold supported by outriggers or thrustouts projecting beyond the wall or face of the building or structure, the inboard ends of which are secured inside of such building or structure.

(24) "Putlog" — A scaffold member upon which the platform rests.

(25) "Roofing or bearer bracket" — A bracket used in slope roof construction, having provisions for fastening to the roof or supported by ropes, fastened over the ridge and secured to some suitable object.

(26) "Runner" — The lengthwise horizontal bracing or bearing members or both.

(27) "Scaffold" — Any temporary elevated platform and its supporting structure used for supporting workmen or materials, or both.

(28) "Single-point adjustable suspension scaffold" — A manually or power-operated unit designed for light duty use, supported by a single wire rope from an overhead support so arranged and operated as to permit the raising or lowering of platform to desired working positions.

(29) "Single-pole scaffold" — Platforms resting on putlogs or cross beams, the outside ends of which are supported on ledgers secured to a single row of posts or uprights, and the inner ends of which are supported on or in a wall.

(30) "Stone setters' adjustable multiple-point suspension scaffold" — A swinging type scaffold having a platform supported by hangers suspended at four points so as to permit the raising or lowering of the platform to the desired working position by the use of hoisting machines.

DEFINITIONS

(31) "Toeboard" — A barrier secured along the sides and ends of a platform to guard against the falling of materia

(32) "Tube and coupler scaffold" — An assembly consisting of tubing which serves as posts bearers braces ties and runners a base supporting the posts, and special couplers which serve to connect the uprights and to join the various members

(33) "Tubular welded frame scaffold" — A sectional panel or frame metal scaffold substantially built up of prefabricated welded sections which consists of posts and horizontal bearer with intermediate members

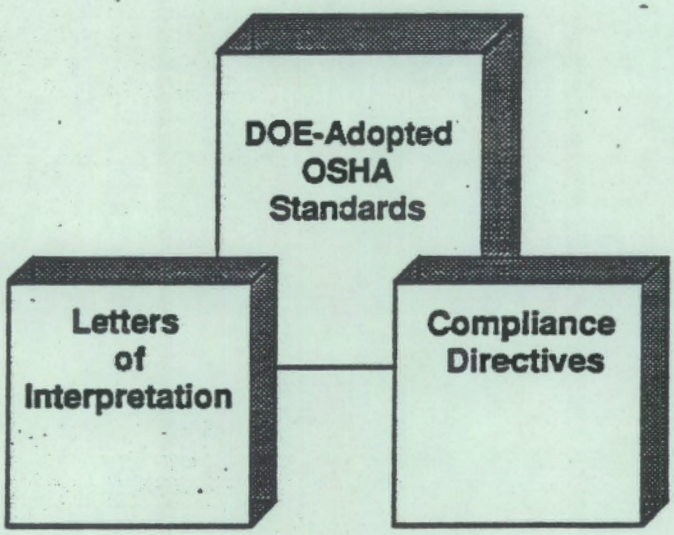
(34) "Two-point suspension scaffold (swinging scaffold" — A scaffold, the platform of which is supported by hangers (stirrups) at two points, suspended from overhead supports so as to permit the raising or lowering of the platform to the desired working position by tackle or hoisting machines

(35) "Window jack scaffold" — A scaffold, the platform of which is supported by a bracket or jack which projects through a window opening

(36) "Working load" — Load imposed by men materials, and equipment

DOE Interpretations Guide to OSH Standards

Standards 1926.16 - 1926.551



Volume 6

OSH Information - Building Blocks for Compliance

OSHA Instruction STD 3-10.3

October 30, 1978

OSHA PROGRAM DIRECTIVE #100-58

SUBJECT: 29 CFR 1926.451(a)(5) Scaffolding, General Requirements, Guardrails

1. Purpose

   To establish guidelines on the use of chains, and wire, fiber, or synthetic ropes as guardrails on scaffolding.

2. Directives Affected

   None.

3. Background

   a. Several inquiries, have been made regarding the meaning of the term "or the equivalent" when used in 29 CFR 1926.451(a)(5), which states:

      Guardrails shall 2 x 4 inches, or the equivalent, approximately 42 inches high with a midrail, when required. Supports shall be at intervals not to exceed 8 feet. Toe boards shall be a minimum of 4 inches in height.

   b. In addition, inquiries have been made regarding the use of chains and ropes for scaffold guardrails, in lieu of guardrails made of not less than 2 x 4 inches lumber. When chains or ropes are used for guardrails, questions are asked regarding the maximum allowable slack in the chain or rope and types of ropes that can be used.

4. Action

   a. The use of chain and synthetic, fiber, or wire ropes as top rails and intermediate rails of guardrails used on scaffolding meets the equivalent requirements of 1926.451(a)(5) when in compliance with the following guidelines.

      (1) Rope or chain shall be secured to each support and taut at all times. It may be necessary to use a positive tensioning device to reduce the sag or catenary to a minimum.

      (2) The rope or chain shall be free of sharp edges, burrs, or projections which may be a hazard.

      (3) The maximum deflection of the top rail when a load of 200 pounds is applied in any direction at any point on the too rail shall not exceed 3 inches in one direction which includes the free hanging sag in the rope or chain.

5. Effective Date

   This directive is effective upon receipt and will remain in effect until canceled or superseded.

OSHA INSTRUCTION STD 3-10.4

OCTOBER 30, 1978

OSHA PROGRAM DIRECTIVE #100-84

Subject: 29 CFR 1926.451, Scaffolding

1. Purpose

The purpose of this directive is to clarify the application of 29 CFR 1926.451, Scaffolding, Construction standards.

2. Documentation Affected

This directive supersedes Field Information Memorandum #75-19 dated March 6, 1975.

3. Background

As the result of a request to clarify the application of 29 CFR 1926.451, the following is herewith forwarded:

a. 29 CFR 1926.451(a)(2)--Concrete block is not always an "unstable object" when used as a base for scaffolding. The circumstances and techniques under which it is used must be considered to determine its stability.

b. 29 CFR 1926.451(a)(3)--A brace is defined in 29 CFR 1926.452 (b)(3) as a tie that holds one scaffold member in a fixed position with respect to another member. The fact that a scaffold member has a place for a brace does not necessarily require that the brace be in place, if it interferes with the erection or stocking of the scaffold. This is only true if the scaffolding is capable of supporting four times the maximum intended load and meets the other applicable requirements of 29 CFR 1926.451. Also, the manufacturer's design specifications, particularly with respect to the lateral stresses involved, are an important aspect which must be considered in the decision to remove pieces of bracing.

c. 29 CFR 1926.451(a)(7) and (8)--A scaffold plank is considered a component of the scaffolding. As such, it must e capable of supporting four times the maximum intended load without failure (a safety factor of four). The fact that a plank might have a split in one end does not automatically mean that it must be removed from service, provided it does not otherwise create a hazard to the employees.

d. 29 CFR 1926.451(d)(4)--The standard requires scaffold legs to be placed on a foundation that is adequate to support four times the intended load of the scaffold. The standard does not require that base plates always be employed, but only when conditions necessitate their use. For example, the scaffold legs cannot be placed on a mud foundation without a base to prevent the legs from sinking into the mud.

4. Action

As in all cases, the determination of compliance or noncompliance depends upon the conditions the CSHO observes at the time of inspection. These four interpretations are meant as guidelines only.

5. Effective Date

This directive is effective immediately and will remain in effect until canceled or superseded.

OSHA Instruction STD 3-10.6

AUG 16, 1982

SUBJECT: 29 CFR 1926.451(w) and 1926.451(a)(18) As Applied to Welding Required on Float or Ship Scaffolds.

A. Purpose. This instruction clarifies the application of the subject standards to welding on float or ship scaffolds.

B. Scope. This instruction applies OSHA-wide.

C. Action. OSHA Regional Administrators/Area Directors shall take action to ensure that 29 CFR 1926.451(w) and 1926.451(a)(18) are enforced in accordance with E. of this instruction.

D. 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. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing, within 30 days of notification, to the Regional Administrator. This acknowledgment should include a description either of the State's plan to implement the change or of the reasons why the change should not apply to that State.

3. Review policies, instructions and guidelines issued by the State to determine that this change has been communicated to State program personnel. Routine monitoring activities (accompanied inspections and case file reviews) shall also be used to determine if this change has been implemented in actual performance.

E. Guidelines.

1. 29 CFR 1926.451(w)(1) states in part that float or ship scaffolds shall not be used to support more than three men and a few light tools, such as those needed for riveting, bolting, and welding. Therefore, welding on the scaffolds is allowed, provided the supporting rope is free from defects.

2. 29 CFR 1926.451(w)(5) allows employers to use float or ship scaffolds supported with 1-inch diameter manila rope or equivalent, free from deterioration, chemical damage, flaws or other imperfections. Each employee shall be protected by an approved safety life belt and lifeline, in accordance with 29 CFR 1926.451 (w)(6).

F. Background. 29 CFR 1926.451(a)(18) requires that no welding, burning, riveting, or open flame work shall be performed on any staging suspended by means of fiber or synthetic rope. However, 1926.451(a)(18) refers to 1926.451(w) for specific requirements for float or ship scaffolds, which clearly contemplates that welding will be performed from float or ship scaffolds. Thus, welding from float or ship scaffolds is not forbidden by OSHA's regulations. However, 29 CFR 1926.451(w)(5) requires that supporting ropes shall be 1-inch diameter manila rope or equivalent, free from deterioration, flaws or other imperfections.

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RECORD ID 1544

STANDARD NUMBER 1926.451
INFORMATION DATE 850802

ABSTRACT This interpretation letter addresses fall protection for employees engaged in erecting or dismantling scaffolds in the construction industry. It is not the intent of the construction scaffold standards to require specifically that employees who erect or dismantle scaffolds use a safety belt and lanyard at all times. However, employees should wear safety belts and lanyards when practical.

(NOTE: The last paragraph refers to a revised standard that would clarify fall protection. Section (a)(3) of the standard provides that no scaffolding shall be erected, moved, dismantled, or altered except under supervision of competent persons; there is no mention of fall protection.)

INTERPRETATION 29 CFR 1926.451

August 2, 1985

MEMORANDUM FOR: All Regional Administrators

SUBJECT: Fall Protection for employees engaged in erecting or dismantling scaffolds in the Construction Industry

It is not the intent of the construction scaffold standards to specifically require employees who erect or dismantle scaffolds to use a safety belt and lanyard at all times. However, employees erecting or dismantling scaffolds must wear safety belts and lanyards in performing work at a stationary location for a period of time which allows the practical use of safety belts and lanyards. It is OSHA's position that requiring the constant wearing of belts and lanyards while erecting or dismantling scaffolds could be hazardous to employees.

The Directorate of Safety Standards Programs anticipates publishing a new proposal for Subpart L - Ladders and Scaffolding later this year. The fall protection proposed for employees erecting/dismantling scaffolds will be specifically included in that proposal and the text contains a provision which will exempt employees engaged in erecting or dismantling scaffolds from using any fall protection.

RECORD ID 1790

STANDARD NUMBER 1926.451
INFORMATION DATE 860905

ABSTRACT This interpretation letter clarifies 1926.451(c) concerning the intermingling of tube and coupler scaffold components. The standard for scaffolds does not prohibit the utilization of scaffolding components manufactured by two different companies provided the scaffold complies with all of the applicable regulations in 1926.451 when used by employees.

(NOTE: This standard has not been amended since 1974.)

INTERPRETATION 29 CFR 1926.451

SEP 5, 1986

This is in response to your letter of July 30, requesting a clarification of 29 CFR 1926.451(c) concerning the intermingling of tube and coupler scaffold components. Your letter addressed to our (city) Area Office was forwarded to this office for response.

The occupational safety and health standard for scaffolds do not prohibit the utilization of scaffolding components manufactured by two different companies provided the scaffold complies with all of the applicable regulations in 29 CFR 1926.451 when used by employees.

RECORD ID 2266

STANDARD NUMBER 1926.451
INFORMATION DATE 830311

ABSTRACT This clarification of 29 CFR 1926.451(a)(4) applies to scaffold heights under 10 feet. Guardrails are not required for scaffolds with a height under 10 feet and with a horizontal dimension in either direction greater than 45 inches, except when the scaffold is adjacent to dangerous equipment and similar hazards.

(NOTE: This standard has not been amended since 1974.)

INTERPRETATION 29 CFR 1926.451

MAR 11, 1983

MEMORANDUM

SUBJECT: Clarification of 29 CFR 1926.451(a)(4) Relative to Scaffold Heights Under Ten (10) Feet

This memorandum was prepared in response to your written request of March 3, 1983 for clarification of Construction Standard 1926.451(a)(4) which requires standard guardrails on scaffolds 4 to 10 feet in height and having minimum horizontal dimension in either direction of less than 45 inches.

The National Office of Compliance Programming interpretation is that the particular vertical standard for scaffolds applies in this case. Examination of 1926.451(a) for Tubular Welded Frame Scaffolds (The Bailey scaffold appears to be this type) indicates that no minimum dimension of scaffold is specified and there is no guardrail requirement for scaffolds under 10 feet in height.

Thus, the Regional Office interpretation is that guardrails are not required for the subject scaffold for heights under 10 feet, except for adjacent dangerous equipment and similar hazards. If you have additional questions please contact Mr. T in the Technical Support Group of this office.

RECORD ID 1273

STANDARD NUMBER 1926.451(a)(13)
INFORMATION DATE 830225

ABSTRACT This interpretation letter addresses ladder use with scaffolding. Safe access other than by ladder is acceptable during assembly and disassembly of scaffolds. Scaffold end frames are acceptable access if the rungs designed for this purpose are continuous and evenly spaced not exceeding 16 1/2 inches. Ladder and fixed ladder standards do not apply to scaffolds. Portable wood or metal ladders used for access shall comply with 1926.450.

(NOTE: This standard has not been amended since 1974.)

INTERPRETATION 29 CFR 1926.451(a)(13)

February 25, 1983

This is in response to your letter of February 8, 1983, requesting a clarification of 29 CFR 1926.451(a)(13). The response to your five points is as follows:

1. It is not practical or intended that employers provide ladder access at all times for employees assembling or dismantling scaffold components; however, other safe access must be provided.

2. End frames are acceptable for access if the rungs are designed by the scaffold manufacturer as an access ladder, and they are arranged in such a way that they form a continuous series of steps from the scaffold top to its bottom. Maximum spacing between rungs shall not exceed 16 1/2 inches.

3. Portable wood or metal ladders used to provide safe access must comply with 29 CFR 1926.450(a)(3) and (4).

4. The fixed ladder standards do not apply to scaffolds.

5. The ladder standards do not apply to scaffold structures when they are built into the scaffold components.

RECORD ID 1447

STANDARD NUMBER 1926.451(c)(13); 1926.451(d)(10)
INFORMATION DATE 790705

ABSTRACT This interpretation letter addresses height requirements for guardrails and guidance on cross bracing. The height of guardrails will be approximately 42 inches. Cross bracing of a platform's open side does not provide the equivalent protection of a guardrail.

(NOTE: This standard was last amended in 1974.)

INTERPRETATION 29 CFR 1926.451(c)(13); 1926.451(d)(10)

July 5, 1979

MEMORANDUM

SUBJECT: Clarification of 29 CFR 1926.451(c)(13) and (d)(10)

Generally, the approximate 42 inch height requirement for guardrails means 42 inches plus or minus 3 inches, however, the top rail may be higher with the inclusion of an additional midrail. The open side of a platform is one unprotected by guardrails or equivalent protection. Cross bracing installed at the open side of a platform does not provide the equivalent protection of a guardrail, therefore it is still considered an open side.

RECORD ID 1707

STANDARD NUMBER 1926.451(d)(7)
INFORMATION DATE 831013

ABSTRACT This interpretation letter applies to free standing scaffold. Such scaffold shall be considered safe when the total height is equal to or less than four times the minimum or least base dimension. 1926.451(d)(7) requires the scaffold to be secured to the building or structure at intervals not to exceed 30 feet horizontally and 26 feet vertically to prevent movement of the scaffold. The Directorate of Field Operation has notified the OSHA field staff that a free standing scaffold shall be considered safe when the total height is equal to or less than four times the minimum or least base dimension.

(NOTE: This standard was last amended in 1974.)

INTERPRETATION 29 CFR 1926.451(d)(7)

OCT 13, 1983

This is in response to your letter of September 28, 1983, concerning a possible misinterpretation of our scaffold standards.

29 CFR 1926.451(d)(7) requires the scaffold to be secured to the building or structure at intervals not to exceed 30 feet horizontally and 26 feet vertically to prevent movement of the scaffold. The Directorate of Field Operation has notified the OSHA field staff that a free standing scaffold shall be considered safe when the total height is equal to or less than four times the minimum or least base dimension.

SOURCE LETTER

September 28, 1983

Subject: Request for Program Directive

The organization is comprised of manufacturers of scaffolding, shoring and forming equipment. The main purpose of the (organization) is to promote the safe use of that equipment. The institute accomplishes that function through the development of various safety publications, as well as serving on various ANSI Committee such as A10.8 of which we are Secretariat.

We have recently been apprised of a possible misinterpretation of OSHA Part 1926.451(d)(7). (company), a (state) contractor, was cited by OSHA for not tieing in scaffold that was in excess of 30 feet in length.

Mr. B, a (state) Hearing Officer, referred to the Texas Masonry Decision regarding the same Section and gave an interpretation as follows:

> "A reading of the Standard indicated clearly that scaffold 2 feet high and 30 feet long would have to be secured to the building as the scaffold 26 feet wide and 26 feet tall."

While not contesting the citation further, (company) did request an interpretation from the (city) Region office. Mr. B of the office responded as follows:

> "Consensus recommend that an unsecured, free standing scaffold be considered safe only when the total height is equal to or less than four times its minimum or least base dimension (width)."

Mr. B's interpretation, we feel is correct. Additionally, in the latest draft revisic e and Coupler Scaffold Section of ANSI A10.8, this situation is dealt with by the following lan

"Anchor running scaffold to the wall or structure when the height exceeds four times the minimum scaffold base dimension. The first vertical and longitudinal tie shall be placed at this point. Vertical ties shall repeated at intervals not greater than 26 feet. The top shall be placed no lower four times the base dimension from the top of the completed scaffold. Longitudinal ties shall be placed at each end and at intervals not greater than 30 feet. Anchors must prevent the scaffold from tipping into or away from the wall or structure."

To clarity and further misinterpretations, the (organization) is requesting that a OSHA program directive be issued along the lines of the (city) Regional offices interpretation.

We would be pleased to assist in any fashion or answer any additional questions you may have regarding this request. Copies of pertinent information are enclosed.

RECORD ID 1805

STANDARD NUMBER 1926.451(i)(2)
INFORMATION DATE 850304

ABSTRACT This interpretation letter addresses requirements for hangers for two-point suspension scaffolds. Hangers of two-point suspension scaffolds shall be made of mild steel, or other equivalent materials, having a cross-sectional area capable of sustaining 4 times the maximum rated load, and shall be designed with a support for guardrail, intermediate rail, and toe board. Hangers should be designed, fabricated, and inspected under the direction of a qualified person or engineer. Hangers may be load tested to 1-1/2 times the maximum rated load.

(NOTE: This standard was last amended in 1974).

INTERPRETATION 29 CFR 1926.451(i)(2)

MAR 4, 1985

This is in response to your letter of January 11, 1985, requesting a clarification of the safety requirements for two-point scaffolding in the construction standards.

29 CFR 1926.451(i)(2) requires that the hangers of two-point suspension scaffolds shall be made of mild steel, or other equivalent materials, having a cross-sectional area capable of sustaining 4 times the maximum rated load, and shall be designed with a support for guardrail, intermediate rail, and toe board.

The construction scaffolding standards do not specifically address the conditions mentioned in your letter. However, we will offer our guidance in this matter as follows:

- A hanger should be designed by a qualified person or engineer.
- The hanger should be fabricated, inspected, and verified that it meets the design by a qualified person or engineer.
- The hanger is ready for use after passing inspection by a qualified person or engineer and being verified that it meets design criteria.
- Hangers should not be load tested to 4 times the maximum rated load before being used at the job site. This type of load testing could fatigue the hanger and cause a failure of the hanger at a later date. Hangers may be load tested to 1-1/2 times the maximum rated load (uniform load) before using at the job site without any damage to the hanger.

RECORD ID 1781

STANDARD NUMBER 1926.451(i)(8)
INFORMATION DATE 861030

ABSTRACT This interpretation letter clarifies 1926.451(i)(8). 1926.451(i)(8) requires each employee to have an approved life belt and lifeline when working from a tow point suspension scaffolding. The standard does not allow two or more employees to use a common lifeline.

(NOTE: This standard was last amended in 1974.)

INTERPRETATION 29 CFR 1926.451(i)(8)

OCT 30, 1986

This is in response to Mr. F's letter of October 14, 1986, requesting a clarification of 29 CFR 1926.451(i)(8) in our construction standards. Mr. F asked that our response be mailed to you.

29 CFR 1926.451(i)(8) requires that each employee shall be protected by an approved safety belt and attached to a lifeline. The lifeline shall be securely attached to substantial member of the structure (not scaffold), or to securely rigged lines which shall safely suspend the employee in case of a fall. We interpret the above mentioned requirement to mean that each employee must have an approved life belt and lifeline. 29 CFR 1926.451(i)(8) does not allow two or more employees to use a common lifeline.

RECORD ID 2075

STANDARD NUMBER 1926.451(s)(5)
INFORMATION DATE 840716

ABSTRACT A ladder jack scaffold with a platform width of 12 inches is a de minimis violation assuming employees working 10 or more feet above the ground are protected by standard guardrails or wear appropriate fall protection equipment. The lanyard and fall prevention devices must be suspended or secured from a structural member other than the scaffold.

(NOTE: This standard has not been amended since 1974. The sections referenced in the first interpretation letter do not agree with the section designations in the 1990 edition of Title 29 CFR.)

INTERPRETATION 29 CFR 1926.451(s)(5)

July 16, 1984

This is in response to your correspondence of June 15, 1984, making application for a variance of 29 CFR 1926.451(s)(5). Your letter was forwarded to this office for a clarification of the above mentioned requirement.

29 CFR 1926.451(a)(5) requires that wood platform planks shall be not less than 2 inches nominal in thickness. Both metal and wood platform planks shall overlap the bearing surface not less than 12 inches. The span between supports for wood shall not exceed 8 feet. Platform width shall be not less than 18 inches.

The width of the platform for your ladder jack scaffold is 12 inches. When your employees are working on your ladder jack scaffold 10 feet or more above the ground or floor if they are protected by standard guardrails or each employee wears a safety belt tied to a lanyard and fall prevention device that will limit the fall to 6 feet the violation would be a de minimis violation. However, the lanyard and fall prevention device must be secured to a structural member other than the scaffold or attached to a lifeline suspended from a structural member other than the scaffold.

De minimis violations are technical violations of standards which have no direct or immediate relationship to safety and health. Whenever de minimis conditions are found during an inspection, they are documented in the same way as any other violations, but a de minimis notice is not issued and penalties are not proposed.

SOURCE LETTER

June 15, 1984

Re: Request for Variance

Pursuant to the provisions of Section 6 of the Act and 29 U.S.C. section 1905.10 et seq., (company) , of the above address, hereby makes application for a variance of the following standard: 29 C.F.R. section 1926.451(s)(5) concerning the necessity for the width of the platform for the ladder jack scaffold to be 18".

The name and address of applicant is listed above. The applicant is a sole proprietorship, and a small businessman, who installs new roofs and sidings on residential homes. Commercial buildings are not done. Only a few employees work for the employer in addition to the owner himself. The work sites are generally in (county), (state) and vary with whose house is being worked on.

The variances sought for the standard pertain to the width of platforms or ladders, and ladder jack scaffolds.

Attached hereto is a representation of a qualified person having firsthand knowledge of the facts represented, that applicant is unable to comply with the standard or portion thereof and acknowledging this detailed statement of the reasons therefore.

The following is a statement of the steps the applicant has taken and will take, with specific dates where appropriate, to protect employees against the hazard covered by the standard. The width of the platform for the ladder jacks applicant uses is 12 inches. This is the limit that can be used safely on the job. I have good class A ladders and the bearing surface on the ladder jacks is 10-1/8 inches. I cannot use pipe scaffold, since I cannot compete with other siding contractors as it would take too long to put it up, plus customers would not allow their yards to be torn up by this method. Also, many times there are porches, awnings and steps in the way. I will set guardrails on the platform when it is more than ten feet above ground. No hired employee will be allowed to work over 20 feet on the ladder jack scaffold. This will take effect immediately. We have met and discussed this matter with Mr. V and Mr. M of the (city), (state) office of OSHA who understand the problems and have conferred with me about the variance.

The applicant is unable to comply with the standard because of unavailability of materials and equipment needed to come into compliance with the standard, as mentioned above.

Applicant is taking all available steps as set forth above to safeguard his employees against the hazards covered by the standards.

Applicant requests a hearing on the above variance.

Applicant has informed any affected employees of the application by posting a statement giving a summary of the application and specifying that a copy of the application may be examined at the place or places where notice to employees are normally posted.

The employees have been informed of the application and of their right to petition the Assistant Secretary for a hearing.

APPLICATION FOR INTERIM ORDER

For all of the reasons set forth above, application is also made for an Interim Order to be effective until a decision is rendered on the application for the variance currently filed herewith. All of the statements applicable to the permanent variance request are incorporated herein.

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