SAFETY MANUAL
FOR

Plote Construction, Inc.

PLOTE CONSTRUCTION, INC. ---------- SAFETY PROGRAM

The following is a check list of items which the Safety Director and or the Project Superintendent MUST DO in order to comply with the intent of our Corporate Safety Program.

Failure to comply with these items may result in OSHA citations, assessment of monetary penalties and undermine our defense in litigation matters arising from our construction operations as they relate to our Corporate Safety program.

1) Take the time to read Sections 1 Safety Policy, Section 2 Program Objectives, and Section 3 Functions and Responsibilities

2) Section 4 requires the Safety Director provide each Project Superintendent with a copy of this safety program and a current addition of the OSHA SAFETY AND HEALTH STANDARDS. These Standards are in a state of constant change and update. The Safety Director must take this into consideration and keep himself and the management appraised of any changes in the standards.

3) Section 6 requires the Project Superintendent and Safety Director instigate procedures in regard to the Hazard Communication Policy. Namely, assignment of a Competent Jobsite Safety Person. Establishment of a Chemical Inventory, Container Labeling, Employee Training, Personnel Protective Equipment acquisition and utilization, dissemination of information and signature of acknowledgement of training by each employee.

4) Section 7 First Aid & Medical Facilities, requires a written procedure by the Project Superintendent and Safety Director.

5) Section 8 Accident Reporting Investigation and Record Keeping out lines reporting which is required by law and subject to penalty for noncompliance

6) Section 10 Safety Education contains a statement which must be signed by each employee and a schedule of safety meetings which must be maintained.

7) Section 13 Personal Protective Equipment requires the Project Superintendent and Safety Director administrate all aspects of this section.

8) Section 20 Confined Space Entry requires the Project Superintendent and Safety Director establish a written procedure.

9) Section 25, Fleet Loss Control Program, requires the Safety Director establish procedures in compliance with this section.

10) Section 26, Lock Out/Tag Out require the Project Superintendent and Safety Director establish procedures in compliance with this section.

11) Section 36, Assured Grounding Program requires the **Safety Director** train employees in regard to compliance, testing, and record/color code requirements.

12) Section 40, Excavations/Trenches. This work is an operation which **OSHA** has targeted due to the serious nature of the work and the risk of fatal injury. The **Project Superintendent** and **Safety Director** must appraise their-self of the requirements on this section and provide for the **Competent Person and Persons Qualified in Structural Design** as required by this section.

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1. SAFETY POLICY

MEMO TO ALL PLOTE CONSTRUCTION, INC.

EMPLOYEES SUBJECT: PLOTE CONSTRUCTION,

INC. SAFETY PROGRAM

The safety of everyone concerned on our construction projects 1s of prime importance to PLOTE CONSTRUCTION, INC.

The prevention of accidents by means of safety procedures will benefit all by avoiding needless personal injury and suffering and by reducing property damage and loss of time.

The following accident prevention program is formulated to accomplish these goals. It is my intention to personally follow this plan. I will therefore, expect and require your full cooperation in its implementation.

Yours truly,

President

2. INTRODUCTION

ACCIDENT PREVENTION PROGRAM

PROGRAM OBJECTIVES

This accident prevention program is established in order to exercise all available means of eliminating or controlling hazards and thus (a) minimize personal injuries and/or property loss; (b) achieve greater efficiency and, (c) reduce direct and indirect costs.

The effectiveness of this program will depend upon the active participation and wholehearted support and cooperation of supervisors and employees, and the coordination of their efforts in carrying out the following basic procedures.

(a) Plan all work to minimize personal injuries, property damage and loss to productive time.

(b) Maintain a system of prompt detection and correction of unsafe practices and conditions.

(c) Establish and conduct safety training programs to educate, stimulate and maintain the interest and cooperation of all employees in maintenance of a safe work place and safe work practices.

(d) Insistence upon the proper use of personal protective equipment, mechanical safety devices and guards. And the use of the proper tools and equipment to do the job.

(e) Require each subcontractor's superintendent and job supervisors to be familiar with all applicable Federal, State and Local statues, regulations and contract requirements pertaining to safety in the operations to be performed.

3. FUNCTIONS AND RESPONSIBILITIES

3.1 MANAGEMENT

Has full responsibility for safety.

Holds executives responsible for the safety of all employees.

Authorizes necessary expenditures for safety.

Passes on safety policies as formulated by Safety Department and Executives.

Participates in the safety program as recommended by the Safety Department and various executives.

3.2 SAFETY DIRECTOR

Serves in a staff capacity with line authority.

Coordinates safety activities.

Keeps and analyzes accidents reports.

Conducts activities for stimulating and maintaining interest of employees.

Serves as safety committee secretary.

Supervises and appraises accident investigation.

Plans and directs regular programs of safety inspection.

Checks for compliance with applicable safety laws and codes.

Checks for compliance with applicable safety laws and codes.

Issues regular reports showing safety performance and accident trends.

3.33 SUPERINTENDENTS

Responsible for all jobsite safety activity.

Requires all supervisors in their charge to comply with corporate safety policies.

3. FUNCTIONS AND RESPONSIBILITIES (continued)

Reviews and passes on all safety recommendations as submitted by the Safety Department regarding conditions and work practices on their jobsites.

3.4 SUPERVISORS

Inspect for compliance with safety work practices

Train workers in their charge to work safely

Responsible for obtaining prompt first aid to injured

Report and investigate all accidents and correct causes

Hold crew safety meetings weekly

Discuss safety with individual employees

3.5 EMPLOYEES

Work in accordance with accepted safe practices

Report unsafe conditions and practices to their Supervisor, Superintendents or Job Site Safety Engineer.

Observe safety rules and regulations

Make safety suggestions

Does not undertake jobs he or she do not understand

Report all injuries to their Supervisor - no matter how slight

3.6 SUBCONTRACTORS

Subcontractors are required to adhere to all corporate and jobsite safety rules and regulations.

4. OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION

The OSHA Safety and Health Standards (29CFR 1926/1910) issued by the U.S. Department of Labor, Occupational Safety and Health Administration Revised 1991OSHA 2207 are hereby incorporated in the Safety Program for PLOTE CONSTRUCTION, INC.

The Corporate Safety Director shall be responsible for providing each job site superintendent with a fully bound and current copy of these OSHA standards for use on the project site.

5. DRUG POLICY/GENERAL REQUIREMENTS

As a condition of employment each employee shall agree to participate in a non-discriminatory *Drug /* Alcohol Testing Program.

Results of testing may provide cause for specific disciplinary action up to and including termination.

If drugs or drug paraphernalia are found on a construction site the job site Superintendent shall be notified and proper law enforcement authorities shall be contacted.

6. HAZARD COMMUNICATIONS POLICY/GENERAL REQUIREMENTS

The purpose of this section is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employees. This transmittal of information shall be accomplished by means of this comprehensive hazard communication program.

Chemical Inventory

The Project Superintendent or his designate (competent jobsite safety person) (CJSP) shall maintain a chemical inventory by copies of any material safety data sheets that are received with incoming shipments of sealed containers of hazardous chemicals, and shall obtain a material safety data sheet for sealed containers of hazardous chemicals received without a material safety data sheet. If an employee request the material safety data sheet said designate shall ensure that the material safety data sheets are readily accessible during each work shift to employees when they are in their work areas.

Container Labeling

A chemicals on site will be stored in their original or approved containers with a proper label attached, except small quantities for immediate use. Any container not properly labeled shall be given to CJSP for labeling or proper disposal

Workers may dispense chemicals from original containers only in small quantities intended for immediate use. Any Chemical left after work is completed must be returned to the original container or the CJSP for proper handling.

No unmarked containers of any size are to be left in the work area unattended.

PLOTE CONSTRUCTION, INC. shall rely on manufacturer applied labels whenever possible, and will ensure that these labels are maintained. Containers that are not labeled or on which the manufacture's label has been removed will be relabeled.

PLOTE CONSTRUCTION, INC. shall ensure that each container is labeled with the identity of the hazardous chemical contained and any appropriate hazard warnings.

SAFETY DATA SHEETS (SDS)

Employees working with a hazardous Chemical may request a copy of the material safety data sheet. Requests for SDS's should be made to the CJSP.

SDS should be available and standard chemical reference may also be available on the site to provide immediate reference to chemical safety information.

An emergency procedure to gain access to SDS', information will be established.

SDS (continued) EMPLOYEE

TRAINING

Employees will be trained to work safely with hazardous chemicals. Employee training will include:

Methods that may be used to detect a release of a hazardous chemical(s) m the workplace.

Physical and health hazards associated with chemicals

Protective measures to be taken

Safe work practices, emergency responses and use of personnel protective equipment.

Information on the Hazard Communication Standard including

Labeling and warning systems
An explanation of Safety Data Sheets

PERSONNEL PROTECTIVE EQUIPMENT (PPE)

Required PPE is available from the CJSP. Any employee found in violation of PPE requirements may be subject to disciplinary actions up to and including discharge.

EMERGENCY RESPONSE

Any incident of over exposure or spill of a hazardous chemical/substance must be reported to the CJSP at once.

The immediate supervisor will be responsible for insuring that proper emergency response actions are taken in leak/spill situations.

HAZARDS OF NON-ROUTINE TASKS

Supervisors will inform employees of any special tasks that may arise which would involve possible exposure to hazardous chemicals.

Review of safe work procedures and use of required PPE will be conducted prior to the start of such tasks. Where necessary, areas will be posted to indicate the nature of the hazard involved.

INFORMING OTHER EMPLOYERS

Other on site employers are required to adhere to the provisions of the Hazard Communication Standard.

SDS (continued)

Information on hazardous chemicals known to be present will be exchanged with other employers. Employers will be responsible for providing necessary information to their employees.

Other on site employers will be provided with a copy of PLOTE CONSTRUCTION, INC. hazard communication program.

POSTING

PLOTE CONSTRUCTION, INC. has posted information for employees at this jobsite on the Hazard Communication Standard. This information can be found at the CJSP office trailer.

Each employee shall sign a copy of the following:

TRAINING SESSION ON
HAZARD COMMUNICATION

I know where the Safety Data Sheets for my work are kept.

I understand the safe work procedures and precautions to be taken when working with these products including use of protective equipment and/or apparel.

I know where emergency supplies are kept.

I know where the emergency phone number and Hazard Communication Information is posted.

I am aware that I may review copies of the hazardous chemical list, the company's written program and SDS's.

Employee Signature_____Date_____

_ Job Location or Name _____

7. FIRST AID AND MEDICAL FACILITIES CONSTRUCTION STANDARDS 1926.23

Refer to subpart D 1926.50 Medical Services and First Aid.

The Corporate Safety Director shall establish a written procedure unique to the project which will insure prompt first aid shall be administered in the event of job site injury.

This procedure shall include the following:

Name and phone number of Ambulance service to be used

Name address and phone number of nearest hospital to be used

Special reporting of accidents as required by the project contract

8. ACCIDENT REPORTING INVESTIGATION AND RECORD KEEPING

8.1 Reporting Serious Accidents

Notify PLOTE CONSTRUCTION, INC. Safety Director of all serious injuries and or accidents. In the event of a serious accident in which an employee dies or 5 or more employees require hospitalization the accident must be reported to the nearest Area Director of the Occupational Safety and Health Administration within 24 hours.

The Project Superintendent shall notify

Area Director Occupational Safety and Health Administration
Owners designated representatives.
Business Manager of employee's local union.
The Corporate Safety Director shall notify
The Insurance Carrier Claims adjuster

8.2 Investigating Serious Accidents An investigation shall be conducted as soon as possible after the accident. The investigation must be fact finding, not fault finding. Members of the investigating team should include the Project Safety Representative, The Project Superintendent or his designee, the responsible Area Superintendent and the employee's supervisor. PLOTE CONSTRUCTION, INC. Safety Director may also participate.

The purposes of the investigation are to learn the true cause so that similar accidents can be prevented, and to determine facts bearing on legal liability.

A description of the operation being performed at the time of the accident is essential. All personnel assigned to the operation and all witnesses to the accident shall be interviewed and statements taken.

A private place such as an enclosed office or conference room should be used for these discussions. If the Workers Compensation insurance adjuster is present, the Safety Representative and the adjuster may interview the employees jointly. The interviewer(s) must obtain first-hand facts and not hearsay. The information obtained must be recorded and signed by each person involved and should include the following information;

Date and time of accident/interview Names addresses and occupations of victim(s) (if known) co-workers and/or witnesses. Where were you when the accident took place, What activity was being performed prior to and at the time of the accident? What materials, equipment, or conditions were involved? Include all unsafe conditions and/or unsafe acts. To the best of the witnesses knowledge, was there a previously known and/or reported problem or condition associated with the accident.

8. ACCIDENT REPORTING INVESTIGATION AND RECORD KEEPING (continued)

8.3 Photographs and Drawings

Drawings should be marked up and/or sketches prepared to indicate the location of the accident. All measurements such as time, distance, etc., must be accurate. Sufficient photographs should be taken as soon as possible since conditions often change rapidly. The back of each photograph should contain the following information; Description and location of the principal item(s), date and time, name of photographer. Use a felt tipped or medium ball point pen.

8.4 Evidence

As soon as possible after the accident, the area must be secured in order to prevent any alteration of the scene prior to the investigation. If equipment tools or materials are involved in the accident, they shall be removed from service and placed in safekeeping. If this is impractical, the area shall be cordoned off and a security guard posed to prevent unauthorized personnel from entering the area. The guard shall be withdrawn only upon instructions from the Project Superintendent.

8.5 Interim Reports

The Safety Representative shall report the progress of the investigation daily to the Safety Department. The investigation report should be prepared and distributed as soon as possible. Distribution of the report will vary with each situation and should be discussed with the Safety Department.

8.6 Completed Investigation Report

The completed investigation report shall be signed off on by the Project Superintendent. It shall be submitted to the Safety Department for permanent record and notice to the proper insurance carriers and authorities.

8.7 O.S.H.A. Investigations

Copies of any O.S.H.A. investigations shall be signed off on by the Project Superintendent and shall be submitted to the Safety Department for permanent record and possible legal defense.

8. ACCIDENT REPORTING INVESTIGATION AND RECORD KEEPING (continued)

8.9 Forms to be completed regardless of the severity of injury.

In all accidents involving injury to our employee's the standard worker compensation form used by the State of Jurisdiction shall completed by the employee's supervisor and sent to the Safety Department for submittal to the insurance carrier in accordance with the worker compensation policy requirements. Note the owners rep. may also require a copy. Both copies are to be signed off on by the Project Superintendent.

Reports of general liability claims, builders risk claims and automobile liability claims should be in letter form and submitted to the Safety Department for submittal to the proper insurance carrier. The automobile liability report should included a copy of the police report or the police file number and information for obtaining copies.

9. FIRE PROTECTION AND PREVENTION

Refer to Subpart F-Fire Protection and Prevention 1926.150 Fire Protection

Fire Prevention

Flammable and combustible liquids

1926.153 Liquefied petroleum gas (LP Gas)

1926.154 Temporary Heating Devices

1926.155 Definitions applicable to Subpart F

Refer to Subpart I-Welding & Cutting 1926.352 Fire Prevention

10. SAFETY EDUCATION

10.1 Safety Orientation of the New employee;

To qualify for employment, the following terms must be read, understood and obeyed;

1. Federal, State, Client and Company Safety and Health Rules & Regulations shall be followed.

2. Personal protective equipment issued to you must be returned to the company before picking up final paycheck.

3. Hazard Communication information will be read, if not already understood, and the precautions for the specific material shall be closely followed.

4. I agree to participate in a non-discriminatory Drug/Alcohol Testing Program

5. Upon signing Employment Terms, I agree to be searched and have my personal belongings inspected if requested as per Drug Policy.

6. Drug testing will be done at contractor designated medical facility. Upon completion of employee test, I will report to the jobsite and will commence work until test reports are received.

7. It is understood that if my test results are positive, I will not be permitted to work on any PLOTE CONSTRUCTION, INC. job site.

8. Upon receiving test results, contractor will advise employee business agent (if positive)

9. I have received a hard hat, safety glasses, monogoggles and a copy of the company's safety booklet which I have read and understand.

10. I have received instructions and understand the Ground Fault Interrupter System and Assured Equipment Grounding Program.

I agree to abide by the above statements and regulations set forth in the company's safety booklet. I also understand that this is a drug and alcohol free workplace. Any employee found under the influence of, using or possessing drugs or alcohol will be dismissed immediately.

HIRE IN DATE_____ SIGNED_____

10 SAFETY EDUCATION (continued)

10.2 Safety Orientation of Craft Supervisor

The Supervisor shall avail himself to the education and training programs in the recognition, avoidance and prevention of unsafe conditions provided by the Corporate Safety Department.

This training shall be designed to provide the Supervisor with the support necessary to instruct workers in their charge.

Such training shall include:

> 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. Proper methods to handle or use poisons, caustics, and other harmful substances if so required. In job site areas where harmful plants or animals are present, employees who may be exposed shall be instructed regarding the potential hazards, and how to avoid injury, and the first aid procedures to be used in the event of injury. Employees required to handle or use flammable liquids, gases, or toxic materials shall be instructed in the safe handling and use of these materials and made aware of the specific requirements contained in Subparts D, F, and other applicable subparts of the OSHA standards. All employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken and in the use of protective and emergency equipment required. The employer shall comply with any specific regulations that apply to work in dangerous or potentially dangerous areas. Confined or enclosed space means any space which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere.

Confined or enclosed spaces include, process vessels, bins, boilers, ventilation or exhaust ducts sewers, underground utility vaults, tunnels, pipelines, and open top spaces more than 4 feet in depth such as pits, tubs, vaults, and vessels.

10.3 Tool Box/Change Trailer Safety meetings.

These meetings shall be held on a weekly basis. The supervisor shall instruct employee's in their charge in regard to safety subjects which are pertinent to work being performed at the site. The Corporate Safety Department Shall furnish outlines of topics to be discussed. Each employee and supervisor in attendance shall sign off on these verifications of instruction. Signed copies of these meetings shall be kept on file at the job-site.

10 SAFETY EDUCATION (continued)

10.4 Superintendents, General Supervisor, Supervisors

A monthly supervisor Safety Lecture/Discussion shall be conducted by the Safety Department. Safety performance and general jobsite safety conditions, any safety memos, notices or information that comes from the insurance carrier and or Corporate office shall be discussed.

10.5 Specialized Training

The Corporate Safety Director in conjunction with the Project Superintendent shall arrange for any specialized training to assure competent persons are readily available in the work force to supervise the work as required by the OSHA Safety and Health Standards.

11. HOUSEKEEPING

CONSTRUCTION STANDARDS 1926.25

During the course of construction, alteration, or repairs, form and scrap lumber with protruding nails, and all other debris, shall be kept cleared from work areas, passageways and stairs, in and around buildings or other structures.

Combustible scrap and debris shall be removed at regular intervals during the course of construction. Safe means shall be provided to facilitate such removal.

Containers shall be provided for the collection and separation of waste, trash, oily and used rags and other refuse. Containers used for garbage and other oily, flammable, or hazardous wastes, such as caustics, acids, harmful dusts, etc. shall be equipped with covers. Garbage and other waste shall be disposed of at frequent and regular intervals.

12. SANITATION

CONSTRUCTION STANDARDS 1926.27

Refer to Occupational Safety and Health Construction Standards 1926.27, Subpart D, 1926.51.

13. PERSONAL PROTECTIVE EQUIPMENT

CONSTRUCTION STANDARDS 1926.28

Refer to Occupational Safety and Health Construction Standards 1926.28 and Subpart E. 1926.100, 1926.101, 1926.102, 1926.103, 1926.104, 1926.105, 1926.106, 1926.107

In addition special contract conditions may require more stringent use of Personal Protective Equipment than required by OSHA. These conditions must be reviewed by the Safety Department and Project Superintendent on a project by project basis.

13.6 RESPIRATORY PROTECTION PROGRAM (continued)

POLICY STATEMENT:

Due to the nature of petrochemical and industrial construction, a variety of chemical elements and compounds are airborne in the plant environment. Whenever possible, engineering controls or administrative controls will be used to decrease the amounts of airborne contaminates in the work environment. The Occupational Safety and Health Administration (OSHA) has set maximum exposure standards for many of these airborne materials. The following guidelines establish a consistent method by which respiratory protection shall be selected, issued, and used to protect employees from respiratory exposure to dusts, fumes, mists, and irritating and/or toxic vapors and gases. A method of reviewing the respiratory protection program will be presented.

The site Safety Engineer has the responsibility of administering this program and making recommendations as the needs of the program change. However, successful implementation of the Respiratory Protection Program will depend on a cooperative effort from many persons in the plant, especially front - line supervisors and employees.

Signed_____

__ President

13.6 RESPIRATORY PROTECTION PROGRAM (continued)

13.6 RESPIRATORY PROTECTION PROGRAM (continued)

VIII. Respirator Use Under Special Conditions

1.0 Dangerous Atmospheres

2.0 Low and High Temperatures

3.0 Fires and Smoke

IX. Training

1.0 Format

2.0 Record Keeping

X. Program Evaluation

1.0 Industrial Hygiene (Outside)

2.0 Random Inspections

3.0 Annual Review

Appendix:

Specific Hazards, Locations, and Appropriate Respirator Use

II. DEFINITIONS

Air - Line Respirator

A supplied-air respirator wherein respirable air is supplied to a respiratory-inlet covering by means of a small diameter hose connected to a positive pressure supply of respirable air.

Air-Purifying Respirator

A respirator designed to remove contaminants from ambient air prior to its inhalation.

Approved

Tested and listed as satisfactory by the Bureau of Mines (BM) or jointly by the Mining Enforcement and Safety Administration (MESA) and the National Institute for Occupational Safety and Health (NIOSH), or jointly by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH).

Atmosphere - Supplying Respirator

Respirator that procedures clean, breathable Grade D air from an independent source. These include supplied-air respirators and self-contained breathing apparatus (SCBA).

Canister (air-purifying)

A container with a filter, sorbent, catalyst, or any combination thereof, which removes specific contaminants from the air drawn through it.

Cartridge (air-

purifying) A small

canister.

Confined Space

An enclosure such as a storage tank, process vessel, boiler, silo, tank car, pipeline, tube, duct, sewer, underground utility vault, tunnel, or pit having limited means of egress and poor natural ventilation and which may contain hazardous contaminants or be oxygen deficient.

Emergency Respirator Use

Wearing a respirator when a Hazardous atmosphere suddenly occurs that requires immediate use of a respirator either for escape from the hazardous atmosphere or for entry into the hazardous atmosphere to carry out maintenance or some other task.

Exhalation Valve

A device that allows exhaled air to be expelled from a respirator while preventing outside air from entering the respirator through it.

A medium that remove particles from air passing through it.

Full Face piece

A tight-fitting device that covers the wearer's nose, mouth, eyes and face and which makes an airtight fit with his/her face.

Half-Mask Face piece

A tight-fitting device that covers the wearer's nose and mouth and which makes an airtight fit with his/her face.

Inhalation Valve

A device that allows respirable air to enter the respiratory-inlet covering of a respirator and which presents air from leaving the covering through the intake part.

Oxygen-deficient Atmosphere

Ambient air corrected to standard temperature and pressure having less than 19.5% by volume of oxygen.

Particulate Matter

Finely divided solid or liquid particles suspended in air.

Powered Particulate-filter Respirator

An air-purifying respirator that employs a blower to pass ambient air through a filter that removes particulate matter and supplies respirable air to a respiratory-inlet covering.

Positive-pressure Respirator

A respirator in which the air pressure inside the respirator inlet covering is positive in relation to the air pressure of the outside atmosphere during exhalation and inhalation.

Resistance

Opposition to the flow of air, as through a canister, cartridge, particulate filter, orifice, valve, or hose.

Respirator

A device designed to protect the wearer from inhalation of harmful atmospheres.

Routine Respirator Use

Wearing a respirator as a normal procedure when carrying out a regular and frequently repeated task.

Self-contained Breathing Apparatus

An atmosphere-supplying respirator wherein a supply of air is carried by the wearer. The respirator provides respiratory protection in atmospheres immediately hazardous to life or health including atmospheres deficient in oxygen.

Self-rescue Mouthpiece Respirator

An air-purifying respirator designed for self-rescue from immediately dangerous atmospheres of gases and vapors. A nose clip is used to prevent nasal breathing.

Single-use Particulate-filter Respirator

An air-purifying respirator which removes particulate matter from ambient air prior to inhalation and which is designed to be discarded after a single use or after one day's use.

Supplied-air Respirator

A respirator which uses a central source of breathing air that is delivered to the wearer through an air supply line or hose.

III. RESPIRATOR SELECTION PROCEDURE

This section deals with respirator use during usual working conditions. The occasional unusual conditions are addressed in section (VI.) "Respirator Use Under Special Conditions."

1.1 Hazard Identification

1.2 Special airborne hazards are listed in the Appendix. Any person who is aware of a new or unaddressed airborne hazard in the plant should immediately notify the Safety Engineer. After emergency precautions have been taken to provide employees with immediate respiratory protection in the affected area, the following steps will be implemented.

2.1 Hazard Evaluation

2.2 Evaluation of the airborne contaminant will be conducted by an outside industrial Hygiene staff. The results of analysis of industrial hygiene sampling will then be compared with OSHA regulations to determine if additional respiratory protection is required.

3.1 Selection of Appropriate Respirator

3.2 Specific respirator applications for usual conditions are listed in the Appendix. Only approved respirators are available at the job site. (See definitions) These respirators are selected by comparing their protective ratings with the industrial hygiene monitoring results. In cases where unusual situations may occur causing atmospheres which are immediately dangerous to life or health, a self-contained breathing apparatus will be available in that area for entering that atmosphere.

IV. MEDICAL EVALUATION OF EMPLOYEES FOR RESPIRATOR USE

Use of respirator will usually increase the physiological stress on the user. Another contributing stressor may be the psychological effects of a mask over the face as well as the knowledge that the atmosphere outside the mask may be immediately hazardous to life or health. For these reasons, the physician on retainer may disqualify a person for respirator wear. The following factors may apply to such a decision:

A. Emphysema
B Chronic obstructive pulmonary disease
C. Bronchial asthma
D. Evidence of reduced pulmonary function
E. Coronary artery disease or cerebral blood vessel disease
F. Severe or progressive hypertension
G. Epilepsy, grand mal or petit mal
H. Anemia, pernicious
I. Diabetes, insipidus or mellitus
J. Pneumomediastinum gap
K. Communication of sinus through upper jaw to oral cavity
L. Breathing difficulty when wearing a respirator
M. Claustrophobia or anxiety when wearing a respirator
N. Facial deformities which could preclude a tight seal.

1.1 Pre-employment Screening

1.2 Pre-employment screening for respirator use includes a pulmonary function study and chest x-ray. The physician will also note any factors in the medical history that disqualify a prospective employee for respirator wear.

2.1 Medical Status Review

2.2 Any employee who is showing objective signs of difficulty in breathing may be asked to take a pulmonary function test and chest x-ray to ascertain their ability to use a respirator safely.

2.3 All employees who regularly work in certain areas will offered a pulmonary function study and chest x-ray on the following schedule:

a. Over 40 years of age: Yearly.
b. Between 30 and 40 years of age: Every two years.
c. Less than 30 years of age: Every three years.

2.3 The physician or retainer may recommend further pulmonary studies if problems are detected in the pulmonary function study or chest x-ray.

V. RESPIRATOR TYPES AND ISSUE

1.1 Air-Purifying Respirators

1.2 Half-mask respirators will be issued at the Safety Training area. Appropriate fit-testing and respirator training can be conducted at the time of issue for new employees. Records of fit testing and training are maintained by the Safety Engineer. Cartridges and filters for half-masks can be obtained from the Safety Engineer when replacement cartridges or filters are required.

1.3 Full face piece respirators will be issued at the Safety Training Area. Cartridges, canisters or filters for these masks will be available from the Safety Engineer.

1.4 Single-use particulate filter respirators (Dispensable dust/mist respirators) will be available from the Safety Engineer or through supervisors in areas where their use is frequent.

1.5 Self-rescue mouthpiece respirators (air-purifying escape respirators will be issued by the Safety Engineer to employees. Visitors and delivery persons will be issued these respirators as necessary. NOTE: When issued, the protective plastic bag is punctures or removed so that the unit may be carried on the belt at all times at the job site. THE DATE THE BAG IS OPENED WILL BE MARKED ON THE RESPIRATOR BODY. THESE RESPIRATORS WILL BE DISCARDED AFTER ANY USE OR AT SIX MONTHS WHICHEVER OCCURS FIRST.

1.6 Powered Air-Purifying respirators will be issued by the Safety Engineer. These devices are also known as "airhat."

2.0 Atmosphere-Supplying Respirators

2.1.0 Supplies-air Respirators

2.1.1 Pressure-demand airlines respirators will be issued by the Safety Engineer. NOTE: THESE RESPIRATORS ARE NOT TO BE USED IN ATMOSPHERES IMMEDIATELY DANGEROUS TO LIFE OR HEALTH. THIS IS BECAUSE THERE IS NO MEANS OF ESCAPE IF THE AIR SUPPLY IS INTERRUPTED.

2.1.2 Pressure Demand "Air Work Mask" respirators are a combination respirator which functions like a pressure demand airline device with the added benefit of a 15-minute air cylinder for escape from the work area if the airline supply is interrupted. These respirators are issued by the Safety Engineer.

2.2.1 Self-Contained Breathing Apparatus (SCBA)

2.2.2 Thirty-minute pressure-demand SCBA's are designed for working in atmospheres immediately dangerous to life or health.

2.2.3 Less than 30-minute SCBA's are designed for escape only from atmospheres immediately dangerous to life or health.

VI. FIT TESTING

(NO FACIAL HAIR PERMITTED ON MASK-SEAL AREA)

1.1 Half-mask Respirators will be fit-tested annually by the Safety Engineer. A qualitative fit test will be conducted using banana oil and organic vapor cartridges first, then using irritant smoke and MSA type S filter cartridges. A variety of half masks are available for use if a fit cannot be achieved with the standard issue MSA half-mask. The type and size of mask issued will be recorded as well as the date. A card will be issued to each recipient of a half-mask indicating the size, brand, and date of issue. Each issued mask will be marked to identify the wearer.

1.2 Field testing the fit of half-mask respirators is accomplished by the following two procedures. Once learned, these tests are quickly and easily done and should be performed prior to each use of the half-mask.

1.2.1 Negative Pressure Test

This test (and the positive pressure test) should be used only as a very gross determination of fit. The wearer should use this test just before entering the hazardous atmosphere. In this test, the user closed off the inlet of the canister, cartridge(s) or filter(s) by covering with the palms or squeezing the breathing tube so that it does not pass air; inhales gently so that the facepiece collapses slightly; holds breath for about 10 seconds.

If the facepiece remains slightly collapsed and no inward leakage is detected, the respirator is probably tight enough. This test, of course, can only be used on respirators with tight-fitting facepieces. Although this test is simple, it has severe drawbacks; primarily that the wearer must handle the respirator after it has supposedly been positioned on this face. The handling can modify the facepiece seal.

1.2.2 Positive Pressure Test

This test, similar to the negative pressure test, is conducted by closing off the exhalation valve and exhaling gently into the facepiece. The fit is considered satisfactory if slight positive pressure can be built up inside the facepiece without any evidence of outward leakage. For some respirators, this method requires that the wearer remove the exhalation valve cover; this often disturbs the

respirator fit even more than does the negative pressure test. Therefore, this test should be used sparingly if it requires removing and replacing valve cover. The test is easy for respirators whose valve cover has a single small port that can be closed by the palm or a finger.

2.1 Full-Face Masks are fit tested during SCBA training and should be field fit tested by the wearer immediately before entering a hazardous atmosphere.

2.2 Full-face masks for cartridge use will be fit tested with the same technique as for half-masks.

2.3 Full-face masks for atmosphere-supplied applications are fit tested by covering the air inlet tube and inhaling gently. The mask should stay positioned against the face for at least 10 seconds. This is also the appropriate field fit test for full-facemasks.

3.1 Single-Use Particulate-Filter Respirators (Disposable Dust/Mist Respirators)

3.2 These respirators are fit tested according to manufacturer's recommendations.

VII. MAINTENANCE OF RESPIRATORY PROTECTIVE EQUIPMENT

1.0 Inspection

1.1.1 SCBA Inspection

1.1.2 SCBA inspection will be done monthly. Each unit will be inspected per manufacturer's recommendations. Pressure check and basic functioning will be part of each inspection. These inspections will be directed by the Safety Engineer. Each inspection will be recorded on tags attached to each SCBA. A record book of inspections will be kept by the Safety Engineer.

1.1.2. SCBA pressure check will be conducted weekly under direction of each area supervisor. A record of these pressure checks and the psi readings will be maintained by the area supervisor

1.1.3 SCBA inspection after use of the unit will be conducted by the Safety Engineer. NOTE: THE SAFETY ENGINEER IS TO BE NOTIFIED WHENEVER AN SCBA OR SCBA-ESCAPE UNIT IS USED. THE USED RESPIRATOR SHOULD BE BROUGHT TO THE SAFETY ENGINEER AS SOON AS POSSIBLE FOR REPLACEMENT.

1.2.1 Air-Purifying Respirator Inspection

1.2.2 Employees who have been issued a half-mask will be trained on inspection techniques for their mask. The mask should be inspected prior to each day's use, after use and during cleaning. The following check lists are provided as a general guide for employee inspection of their respirator:

a. Rubber face piece - check for:
-excessive dirt (clean all dirt from face piece)-cracks, tears, or holes (obtain new face piece)-distortion (allow face piece to "sit" free from any constraints and see if distortion disappears; if not, obtain new face piece)
-cracked, scratched, or loose fitting lenses (contact Safety Engineer to see if replacement is possible; otherwise, obtain new face piece)

b. Head straps - check for:
-breaks or tears (replace head straps)
-loss of elasticity (replace head straps)
-broken or malfunctioning buckles or attachments (obtain new buckles)
-excessively worn serrations on the head harness which might allow the face piece to slip (replace head strap)

c. Inhalation valve, exhalation valve - check for:
-detergent residue, dust particles, or dirt on valve or valve seat (clean residue with soap and water)
-cracks, tears, or distortion in the valve material or valve seat (contact Safety Engineer for instructions.
-missing or defective valve cover (obtain valve cover from Safety Engineer)

d. Filter Element(s) - check for:
-proper filter for the hazard
-approval designation
-missing or worn gaskets (contact Safety Engineer for replacements)
-worn threads - both filter threads and face piece threads (replace filter or face piece, whichever is applicable)
-cracks or dents in filter housing (replace filter)
-deterioration of gas mask canister harness (replace harness)
-expiration date of canister or cartridge if applicable.

e. Corrugated breathing tube (canister mask)- check for:
-cracks or holes (replace tube)
-missing or loose hose clamps (obtain new clamps)
-Broken or missing end connectors (obtain new connectors).

1.2.2 Disposable dust/mist filter respirators should be inspected prior to use for the following:

-holes in the filter (obtain new disposable respirator)
-straps for elasticity and deterioration, if applicable (obtain new disposable respirator).

1.2.3 Self-rescue mouthpiece respirators

Each employee will inspect their escape respirator daily. Respirators issued by the Safety Engineer will be inspected at the time of issue. The manufacturer recommends: "Examine each part of the respirator for defects (such as a missing, torn or distorted exhalation valve; a cracked or distorted respirator body; or a torn or distorted mouthpiece section), and discard the respirator, if defects are found. Discard after any use.: Because this device is designed for emergency use, it must be inspected monthly if it is not routinely inspected daily. A record of monthly inspection will be kept by the Safety Engineer and on the box (es) of respirators.

1.2.4 Powered Air-purifying Respirators (Airhats) will be inspected prior to each use by the wearer. NOTE; INSPECTION PROCEDURES ARE DESCRIBED IN A SPECIAL MANUAL PROVIDED WITH THE AIRHAT.

2.0 Repair of Respiratory Protective Equipment

2.1.1 Air-Purifying Respirators

2.1.2 Half-mask respirators and full-face piece respirators that are found to be defective will be returned to the Safety Engineer for repair or replacement.

2.1.3 2 Cartridges or canisters should be replaced when the wearer begins to notice gas or vapor penetrating the mask. NOTE; LEAVE THE AREA WHEN THIS OCCURS. IT MAY ALSO INDICATE A HIGHER CONCEN- TRATION OF CONTAMINANT THAN THE MASK WAS DESIGNED FOR.

2.1.4 3 Filtering devices and masks should be replaced when the wearer notices increased effort it required for inhalation.

2.2.1 Atmosphere-supplying Respirators

2.2.2 All equipment involved in the high-pressure side of the respirator circuit will be sent to the manufacturer-approved repair location.

2.2.3 All equipment involved in the low-pressure side of the respirator circuit will be repaired or replace by the Safety Engineer.

3.0 Cleaning and Disinfecting

3.1.1 Half-mask and Full-face piece Masks Respirators - Air-Purifying

3.1.2 Respirators issued to individuals should be washed and disinfected daily or after eight (8) hours of use. Each area that uses individual issue respirators will maintain equipment for washing and rinsing the respirators. MSA Cleaner-Sanitizer II is a stock item for this purpose. Respirators should air-dry in their normal position in a dust-free area. NOTE: CARTRIDGES MUST BE REMOVED PRIOR TO WASHING THE RESPIRATOR.

3.1.3 2 Respirators returned from employees will be returned to the Safety Engineer for inspection, cleaning and disinfecting prior to re-issue.

3.2.0 Powered Air-Purifying Respirators ("Airhats")

Air hats will be cleaned and disinfected between individual uses. "Sprafect" is a stock item for this purpose and should be used according to manufacturer's directions.

3.3.0 Atmosphere-supplying Respirators will be returned to the Safety Engineer after use for inspection, cleaning, disinfecting and re-issue.

4.0 Storage

4.1.0 Individual-issue respirators will be stored in a clean area or in zip-lock bags after use and between uses. These masks should be dry before placing in bags. They will be stored in their normal position so as not to be distorted.

4.2.0 All masks in storage for re-issue or emergency use will be in plastic bags.

4.3.0 SCBA respirators will be stored in provided black plastic cases or in wall- mounted yellow cases. All SCBA units in black plastic cases will be placed in clear plastic bags. Place the plastic case in the bag with the opening side of the case positioned toward the opening of the plastic bag, then tuck the bag opening under the plastic case. DO NOT USE any type of wire tie to close the bags. The 55-gallon clear plastic bags are available from the Safety Engineer.

4.4.0 Single-use particulate-filter respirators (disposable dust/mist filter masks) will be stored in plastic bags until issue. After issue, these masks will be stored in a clean area, a plastic bag, or disposed.

4.5.0 Powered air-purifying respirators (Air hats) will be stored in clean areas or in clean plastic bags.

VIII. RESPIRATOR USE UNDER SPECIAL CONDITIONS

1.1 Dangerous Atmospheres: An atmosphere is considered dangerous if any of the following conditions exist:

Oxygen content is less than 19.5%

An air contaminant is present at levels that will cause serious injury or death within a short time. (i.e. Hydrogen Sulfide)

An air contaminant is present that will cause delayed serious health effects. (i.e. Asbestos)

1.2 General: Before entry into a hazardous atmosphere with any respirator, this section (VIII) should be reviewed as well as the "Confined Space Entry" procedure when applicable. The Confined Space Entry (Tank Entry) procedure takes precedence when a confined space is involved.

1.3 Escape or Egress Respirators are never to be used for any purpose other than escape.

1.4 The preferred respirators in all dangerous atmosphere applications are:

1.4.1 Pressure-demand SCBA

1.4.2 Pressure-demand SCBA "Air Work Mask" respirator with fully chargers 15-minute egress air bottle.

a. These "Air Work units" are available from the Safety Engineer.

1.5 Pressure-Demand Airline Respirators (without an integral escape air supply) are not approved for use in dangerous atmospheres as defined in the beginning of this section (VIII). In situations where limited space makes use of the Pressure-Demand SCBA or SCBA "Air Work Mask" not feasible, the Safety Engineer should be consulted.

1.6 When a dangerous atmosphere must be entered, or when the atmosphere is even suspected to be dangerous, a standby observer with the correct respirator for entry into the atmosphere MUST be stationed at the nearest fresh air base to stay in communication with the worker(s) entering the dangerous atmosphere.

1.7 The standby observer will maintain communication with the worker by vision, voice or signal line as appropriate.

1.7 The standby observer must have suitable rescue equipment for the situation. It is the foreman's responsibility to instruct the standby observer in the correct use of rescue equipment appropriate to the job and area.

1.8 The standby observer must have a method of communication with persons other than the worker in the event of an emergency.

1.8.1 The preferred method is the "Safety alarm air horn" available from area superintendent. (DO NOT test the air horn or discharge it unless an emergency exists and help is needed.)

1.8.2 An option for communication is another person at the fresh air base of the standby observer who can go for help in an emergency.

1.8.3 The last option for communication is a telephone that can be reached without leaving the area.

1.9 Emergency Response Actions by Standby Observer

If the worker in the dangerous atmosphere communicates distress to the standby observer, or if the standby observer sees the worker collapse or the standby observer can no longer get communication response from the worker, the following actions should be taken.

1.9.1 Signal for additional help by one of the methods of communications previously described.

1.9.2 If possible, use the harness or wristlets system to pull the worker from the dangerous atmosphere to fresh air without entering the dangerous atmosphere.

1.9.3 DO NOT ENTER the dangerous atmosphere UNTIL backup help arrives.

1.9.4 Put on the SCBA when backup help arrives and proceed as outlined previously by the foreman to remove the disable employee to fresh air.

1.9.5 Immediately initiate First Air, checking initially for breathing and pulse (heartbeat).

If not breathing, begin mouth-to-mouth resuscitation.
If heart has stopped, only persons qualified in CPR should administer CPR.

Oxygen by mask may be necessary as well as treatment for shock.

2.1 Low and High Temperatures

2.2 Low Temperature Problems

2.2.1 Fogging of lens on full face piece

masks Solutions: -Anti-fogging

solution.

-Also available are nose cups that direct exhaled air away from lens.

2.2.2 2 Frozen exhalation valve

Solutions: -Run warm air or water over valve (Not over 120 F)
-Store mask in warmer area.

2.3 High Temperature Problems

2.3.1 Increased stress on the user.

Solutions: -Use lightweight air bottles (available from Safety Engineer)
-Use air-line respirators in non-dangerous atmospheres.
-A "vortex tube" may be used in conjunction with an air-line respirator to cool the breathing air.

3.1 Fires and Smoke

3.2 Persons directly involved in fighting incipient-stage fires should wear SCBA respirators as soon as possible.

3.3 Until the SCBA respirators are on and functioning, these people should stay upwind of any smoke or fumes from the fire to avoid inhaling these contaminants.

3.4 Using a SCBA respirator does NOT prepare any person for entering a smoke-filled room or building and this should not be attempted. Only extensively trained professional fire fighters should attempt this.

3.5 Even while wearing the SCBA, heavy smoke should be avoided due to the compounded safety hazards of vision loss and heat.

3.5 All persons without SCBA respirators at the scene of a fire will stay well clear of downwind smoke and fumes due to potential hazards associates with inhaling these substances.

IX. TRAINING

1.1 Format

Supervisors and employees will be trained annually in Respiratory Protection. This training will be conducted under the direction of the Safety Engineer. The training will cover the following areas and will be adapted to the needs of each job site.

A. Instruction in the nature, extent, and effects of respiratory hazards to which the person may be exposed

B. An explanation of why engineering controls are not being applied or are not adequate.

C. An explanation of the selection of a respirator.

D. A discussion of the operation, capabilities and limitations of the respirator.

E. Instruction in inspecting, donning, checking the fit and wearing the respirator.

F. An opportunity for each respirator wearer to handle the respirator, learn how to don and wear it properly, check its seals, wear it in a safer atmosphere and wear it in a test atmosphere.

G. An explanation in the maintenance and storage of the respirator.

H. Instruction in how to recognize and cope with emergency situations.

I. Instruction in the facility's tank/confined space entry procedures.

J. Other special training as needed for special use.

2.0 Record Keeping

Each person trained will sign a class log. This log will become part of the permanent record and will be maintained in the Safety files.

X. PROGRAM EVALUATION

1.1 Industrial Hygiene

A program of regular monitoring of all air contaminants will be part of the evaluation of the effectiveness of the program.

1.2 Monitoring results will be compared against the current respiratory protection program to assess the need for changes.

1.3 The Safety Engineer will make specific recommendations for either engineering controls, administrative controls, or respiratory protection equipment.

2.1 Random Inspections

Random inspections are required by law and will occur at times other than the annual review.

2.2 Random inspections will cover all parts of the Respiratory Protection Program as it applies to the specific area.

2.3 Results of the inspection will be provided to the area Supervisor and Superintendent as well as to corporate management.

2.4 Results of inspections will become permanent records to show regulation compliance.

3.1 Annual Review

The Respiratory Protection Program will be reviewed annually for necessary changes. This review should include the following points:

3.2 Random inspection results and improvements or lack of improvement in compliance.

3.3 Wearer acceptance interviews in each area for feedback from employees. These interviews should cover the following areas:

A. Comfort of present equipment.

B. Interference factors encountered such as breathing effort, vision problems, communication problems, restriction of motion and interference with job performance.

3.3 Supervisor and Superintendent responses to the program will be solicited by letter for the annual review.

3.4 The annual review results will be sent to all Supervisors and corporate management.

EXHIBIT

Atmospheric Contaminants to be protected against	Colors Assigned *
Acid gases	White
Hydrocyanic acid gas	White with 112-inch yellow stripe completely around the canister near the bottom.
Chlorine gas	White with 1/2-inch yellow stripe completely around the canister near the bottom.
Organic vapors	Black
Ammonia gas .	Green
Acid gases and anunonia gas	Green with 1/2 inch white stripe completely around the canister near the bottom
Carbon monoxide	Blue
Acid gases and organic vapors .	Yellow
Hydrocyanic acid gas and chloropicrin vapor	Yellow with 1/2 inch blue stripe completely around the canister near the bottom
Acid gases, organic vapors, and ammonia gases . .	Brown
Radioactive materials, excepting tritium and noble gases	Purple (Magenta)
Particulate (dusts, fumes, mists, fogs, or smokes) in combination with any of the above gases or vapors .	Canister color for fpgs. pr contaminant, as designated above, with 1/2 inch gray strip completely around the canister near the top
All of the above atmospheric contaminants	Red with 1/2 inch gray stripe completely around the canister near the top.

* Gray shall not be assigned as the main color for a canister designed to remove acids or vapors

NOTE: Orange shall be used as a complete body, or stripe color to represent gases not included in this table. The user will need to refer to the canister table to determine the degree of protection the canister will afford.

14. CLOTHING

Personal Clothing & Minimum Working Attire

The upper torso must be covered by a suitable shirt with a minimum of **4"** sleeves. Tank Tops, Sleeveless Shirts, etc., are forbidden on any project.

Full trousers must be worn that cover the lower body. No cut off trousers, shorts, etc., are permitted at any time.

Tenuis type shoes, (sneakers) are forbidden on all projects.

Dress for your particular job ..... dressing safely will help you work safely.

Do not wear oil soaked or too loose clothing.

15. NOISE EXPOSURE

Construction Standards 1926.101

Refer to Occupational Safety and Health 1926.52, 1926.101,
Table D-2 Permissible Noise Exposure, page 20. Our company rule regarding use of protective equipment is **(85 decibels or greater) WEAR IT.**

16. IONIZING RADIATION (X-RAY)

Construction Standards 1926.53

Reference subject standard which requires Licensed or competent persons under direction and supervision of the licensee shall perform such work.

17. NON-IONIZING RADIATION (Lasers)

Refer to OSHA Construction Standards 1926.54 which requires "Only qualified and trained employees to be assigned to install adjust, and operate laser equipment.

18. FLOOR AND WALL OPENINGS

Refer to OSHA Standards 1926.500/Subpart M pg 185

19. TEMPORARY BUILDINGS AND TRAILERS

Refer to OSHA Standards 1926.151 (b), Temporary Buildings, page 106

Protecting Office Trailers from High Winds
Tiedowns offer the most consistent and effective means for minimizing office trailer damage from high winds. Two types of ties are needed: (1) The Over the Top tie, and (2) the Frame Tie. The first keeps the unit from overturning, and the second prevents it from being blown off the supports.

Frame ties can also reduce the chance of overturn, but many office trailers do not have enough internal strength to transmit high wind loads to the supporting steel frame. Thus, installation solely of frame ties will secure the frame, but the unit resting on the frame may blow away. Therefore, the Defense Civil Preparedness Agency recommends use of both over the top ties and frame ties to secure 10, 12, and 14 ft. wide office trailers. Double units, 24 ft. wide are quite stable, and do not require use of over the top ties ... only frame ties.

Ties are made of wire rope or rust resistant steel strap which tie the mobile home and its steel frame to anchors embedded in the ground. The cable or strap is secured to the anchor with a yoke-type fastener and tensioning device, or with clamps and turnbuckles.

Commercially available ties, consisting of galvanized steel strap-ping (114 x .035") with a minimum breaking strength of more than 4,750 lbs., or galvanized steel cable (7/32" 7 x 7, or 14" 7 x 19), with a breaking strength of more than 4,800 lbs., are acceptable. Anchorage requirements presented in this section assumes that either of these ties will be used.

The over the top tie is secured to an anchor on each side of the office trailer. Frame ties connect the steel beam supporting the unit to the anchors. Several of each type of tie, with connections and anchors, must be used for an effective tie down of the whole unit.

Over the Top ties should be located within 2 feet of each end of the office trailer, and others as needed at intervals between at stud locations. Commercially available adapters or wood blocks should be used to prevent sharp bends in over the top ties, and to keep them from cutting into the unit when tension is applied.

10 TO 14 FEET WIDE
TIEDOWN ANCHORAGE REQUIREMENTS

WIND VELOCITY	30 TO 50 FEET		50 TO 60 FEET		60 TO 70 FEET	
	FRAME	**TOP**	**FRAME**	**TOP**	**FRAME**	**TOP**
70 mph	3	2	4	2	4	2
90 mph	5	4	6	4	7	4
110 mph	7	6	9	6	10	7

20. CONFINED SPACE ENTRY (INCLUDING MANHOLES)

Refer to OSHA Construction Standards 1926.2l(b) 6, 1926.353 (b), and 1926.352 (g)

In addition by contract with the owner conditions of confined space entry may be expanded. A review of contract documents by the Project Superintendent and Safety Director shall be required to assure such additional requirements are met. Upon review of all contract requirements a written procedure shall be established on a project to project basis. This procedure shall address prevention of risk of injury or illness that is encountered because of the presence in the atmosphere of poisonous, irritant, toxic or flammable elements, compounds, or substances, or because of deficiency of oxygen. Testing Equipment and testing method shall be specified as well as method of ventilation, record keeping of readings and entry authorizations.

21. TEMPORARY HEATING DEVICES

Refer to OSHA Construction Standards 1926.154

22. LIOUEFIBD PETROLEUM GAS ON CONSTRUCTION SITES Refer to OSHA Construction Standards 1926.153

23. **FLAMMABLE AND COMBUSTIBLE LIQUIDS**

Refer to OSHA Construction Standards 1926.152

24. SIGNS, BULLETIN BOARDS AND POSTERS

Refer to OSHA Construction Standards 1926.200

25. FLEET LOSS CONTROL

PROGRAM To All Authorized Employee's

The Corporate Safety Director shall be assigned the responsibility of implementing and overseeing the fleet safety program.

No employee shall operate a corporate vehicle he or she is not properly licensed and qualified to operate.

ALL Employees shall operate corporate vehicles in a safe and courteous manner. Employees

shall wear seat belts, when operating or a passenger, in a corporate vehicle.

Drivers shall be qualified through an initial Motor Vehicle Record (MVR) check and an annual MVR check thereafter.

The objective of the MVR is to identify any unusual violation trends such as speeding, vehicle accidents, reckless driving, driving under the influence, etc.. If an unusual trend is identified, then appropriate corrective action shall be implemented.

At no time will an employee operate a fleet vehicle while under the influence of Alcohol, Drugs, or Prescribed medication by a licensed physician that may impair his or her driving ability.

Any time that your license has been suspended or revoked, the employee shall notify the company and will not be allowed to operate Company Vehicles until a valid license is presented.

Only employees authorized by the company may operate vehicles. No spouse, family members or friends are authorized to operate vehicles. It is the company's policy to restrict authorization to employees 21 years of age and older.

Employees shall be responsible for scheduling of maintenance and repair of their assigned vehicle.

A vehicle maintenance/inspection report record shall be established for each vehicle in accordance with the manufactures recommendations. These records shall be available at the jobsite office and a record log shall be kept in each vehicle. All inspection required by government regulations shall be filed in the vehicle log and central file.

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26. SIGNALING VEHICULAR TRAFFIC

Refer to OSHA Construction Standards 1926.201 (a)

27. LOCK OUT/TAG OUT PROCEDURE

Refer to OSHA Construction Standards 1926.417

It should be noted certain contracts may require additional procedures which are specified by the Owner or Owners Representative.

The Project Superintendent and Corporate Safety Director shall be responsible for producing a written lock out tag out procedure for each project which complies with all OSHA and Contractual requirements.

THE FOLLOWING IS A SAMPLE PROCEDURE

A. PRELIMINARY ENERGIZING

1) Electrical contractor (XYZ CORPORATION) will run electrical feed to energize MCC (Master Control Circuit) panels.

2) As each panel is energized, XYZ representative (JIM JONES) will see that the breaker is locked with a XYZ lock in the "off"position.

3) The General Contractor site safety representative (TOM SMITH) will then be informed of panel energizing so he can verify by panel number, and record that lock has been placed on corresponding panel switch in "off" position.

4) Before any lock is removed for more than a momentary test sequence, the General Contractors site safety representative must be notified and given reason so that it can be duly noted in Lock Out/Tag Out Log.

5) Keys to MCC panel room will be held only by the General Contractor's site safety representative and XYZ ELECT personnel. Doors will be kept shut and locked when XYZ electricians are not at work and "unauthorized" employees will be forbidden access.

B. EQUIPMENT CIRCUIT ENERGIZING

1) Prior to any equipment "tie-ins", a Meggar Test will be performed to assure satisfactory continuity and identify any shorts in the circuits. This test will also verify correct circuit to panel connection yet to be performed.

2) Just prior to equipment circuit "tie-in" to energize panel. the General Contractors site safety representative will be notified so that anyone working on the equipment or related systems can be cleared from contact.

27. LOCK-OUT/TAG-OUT PROCEDURE (continued)

3) At time of "tie-in", "Bump Test" to determine motor rotation and equipment circuit to break panel relations will be performed.

4) Upon completion of the "tie-in" and these tests, the circuit will be turned over to the General Contractor.

5) At this time, the General Contractors site safety representative will place lock adapters and locks with tags on each panel in place of XYZ ELECT's lock.

6) The correspondence equipment power isolation switch will then be tested momentarily to verify that the circuit is de-energized.

7) After is has been concluded from this test that the relative circuit is deenergized, the respective isolation, switch will be placed in the "off" position and REFAX lock adapter and lock with tag will be placed and appropriately logged in the Lock Out/Tag Out Log.

8) Other contractors and crafts must place locks with tags identifying the person/company and reason for locking out the circuit can now do so if their people have work to perform on the system.

C. EQUIPMENT ENERGIZING (TEST) PROCEDURE

1) Prior to <u>any</u> equipment being energized, the circuit and system will be cleared of all tools, workers, and related hazards.

2) Those contractors/crafts involved will meet with the General Contractors site representative to discuss purpose of test, duration and agree on safe procedure.

3) After item #1 is complete, an appropriate number of safety/watch person(s) will be assigned to keep unauthorized personnel out of area.

4) Lock(s)/Tag(s) and lock adapter will now be removed, (and switched to "on" position) first from the panel* in the MCC room, and then at the equipment power isolation switch.

5) This will all take place in the presence of the involved contractor/craft representative and the General Contractors site safety representative, who will record the activity in the Lock Out/Tag Out Log.

6) After test is complete, lock adapter, lock(s) and tag(s) will be replaced in reverse order of removal.

* Double check that this is the correct panel to be energized.

D. FINAL ENERGIZING PROCEDURE

1) 30lb,B:C dry chemical portable fire extinguishers need to be discretely located at an easy to reach location both the MCC panel switch room and at the corresponding pump motor, equipment systems, etc.

2) All related contractors will confirm that their work is complete and that their tools have been removed.

3) The General Contractors supervision will verify this and resolve any discrepancies prior to notifying the Owners Operations of readiness to activate the system.

4) Owners operations will be notified of our being ready for "start-up" . their assistance will be requested, so as not to damage any equipment or initiate any unforeseen problems.

5) When a schedule had been established, all related systems will be rechecked for readiness to be operated, with respective problems addressed.

6) As requested by the client when ready, items C-(1-5) will be initiated. It should be remembered that only authorized/necessary personnel be allowed in the unit at this time.

E. OTHER TYPES OF LOCK OUT/TAG OUT (NON-ELECTRICAL):

1) The same format for control of energy/sources (as used for electrical) will be used throughout.

2) The only differences will be in the type of isolation devices (valves, blinds, disconnect, etc.) and when no alternative exists, use of tags, car seals, etc., as lock out devices.

3) When a stored energy source is "tied-in" to the unit or made a part thereof, this format will be followed with activities recorded in the log.

F. EMPLOYEE TRAINING:

1) Prior to these procedures being executed, contractor/employees will be informed of the Lock Out/Tag Out Program, details involved and their responsibilities.

2) Above all, contractors/employees will be informed of the importance of **not** removing any locks and/or tags installed by others, unless they have been authorized by that person.

Doing so could very likely result in their termination and/or removal from the site. **If** their inappropriate action results in an injury or death of a fellow worker, **criminal charges** may be also lodged.

28. STORAGE OF MATERIALS

Refer to OSHA Construction Standards 1926.250, .953(c), .957(f)

29. ENVIRONMENTAL CONSIDERATIONS

Refer to OSHA Construction Standards 1926.50 through 1926.57

30. **MATERIAL HANDLING (BY HAND)**

Refer to OSHA Construction Standards 1926.953

31. MATERIAL HANDLING (BY MECHANICAL MEANS)

Refer to OSHA Construction Standards 1926.953

32. **TOOLS**

Refer to OSHA Construction Standards 1926.951

33. ABRASIVE BLASTING

Contact with the Safety Department.

34. COMPRESSED GAS CYLINDERS

Refer to OSHA Construction Standards 1926.350

35. WELDING CUTTING - GAS AND ELECTRIC

Refer to OSHA Construction Standards 1926.350, .352, .353, .354

36. ELECTRICAL SAFETY

Refer to OSHA Construction Standards 1926.400

36.6 Ground Protection Program

PLOTE CONSTRUCTION, INC. shall designate one or more competent persons to implement the Ground Protection Program. Compliance shall be accomplished by use of a Ground Fault Circuit Interrupter System as its primary source for providing temporary electrical power on our construction projects. If use of the GFI System is not practical for a given application, an assured equipment grounding conductor program shall be utilized to provide protection to employees on the construction sites. Each employee shall receive instruction regarding the system in use on the project at the time of hire.

(a) Ground Fault Interrupter System

All 120-volt, single-phase, 15- and 20- ampere receptacle outlets on the construction site, which are not a part of the permanent wiring of the building or structure and which are in use by employees of PLOTE CONSTRUCTION, INC.
INC. shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

(b) Assured Equipment Grounding Conductor Program

Scope:

This program defines the mm1mum requirements to assure the installation and maintenance of equipment grounding conductors in accordance with the applicable requirements of the National Electric Code and O.S.H.A Safety and Health Standards.

Purpose:

The purpose of this program is to ensure the proper installation, maintenance, inspection and testing of equipment grounding conductors on construction sites in order to minimize injuries due to electrical ground faults.

Installation:

All equipment grounding conductors shall be installed as follows:

All 120 volt , single phase, 15 and 20 ampere receptacles shall be of the grounding type, and their grounding contacts shall be grounded by connection to the equipment grounding conductor of the circuit supplying the receptacles in accordance with the applicable requirements of the National Electric Code.

36. ELECTRICAL SAFETY (continued)

All 120 volt flexible cord sets (extension cords) shall have an equipment grounding conductor which shall be connected to the grounding contacts of the connection(s) on each end of the cord.

The exposed noncurrent-carrying metal parts of 120 volt cord and plug-connected tools and equipment that are likely to become energized shall be grounded by the use of a grounding conductor in the supply cord and shall be connected to the grounding contact in the attachment plug, in accordance with the applicable requirements of the National Electric Code.

The employee shall be instructed that each cord set, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each days use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.

The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded:

(1) All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.

(2) Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

All required tests shall be performed:

(1) Before first use;

(2) Before equipment is returned to service following any repairs;

(3) Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over) and

(4) At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months

36. ELECTRICAL SAFETY (continued)

(5) No employee shall use any equipment which has not met the requirements of this section.

Testing Equipment

All receptacles, attachment caps and plug and receptacle or cord sets shall be tested as in the following manner:

(1) While in service with receptacle circuit test.

(2) When not in service with a continuity tester. This will meet the test requirements of this Section. All equipment connected by cord and plug shall be tested for ground wire continuity with a volt-OHM meter or a continuity tester.

Test Verification Records

Test shall be documented by means of color coding. The following color coding system is suggested to verify that testing is current and that all receptacles, portable cords and tools have been inspected and tested as required.

COLOR CODING SCHEME

	CHECK ONE		
MONTH OR QUARTER	QUARTERLY	MONTHLY	CODING
JANUARY	WHITE	WHITE	1
FEBRUARY	WHITE	WHITE & YELLOW	2
MARCH	WHITE	WHITE & BLUE	3
APRIL	GREEN	GREEN	4
MAY	GREEN	GREEN & YELLOW	5
JUNE	GREEN	GREEN & BLUE	6
JULY	RED	RED	7
AUGUST	RED	RED & YELLOW	8
SEPTEMBER	RED	RED & BLUE	9
OCTOBER	ORANGE	ORANGE	10
NOVEMBER	ORANGE	ORANGE & YELLOW	11
DECEMBER	ORANGE	ORANGE & BLUE	12
CHECK OR REPAIR	BROWN	BROWN	0

37. **LADDERS**

Refer to OSHA Construction Standards 1926.450

38. **SCAFFOLDING**

Refer to OSHA Construction Standards 1926.451

39. **OPERATION OF MOTOR VEHICLES AND OTHER MOBILE EQUIPMENT**

Refer to OSHA Construction Standards 1926.600

40. EXCAVATIONS/TRENCHES

Refer to OSHA Construction Standards 1926.650, .651, .652

SUBPART P - EXCAVATIONS

Scope and application. This subpart applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

Refer to Subpart P 1925.650,(b) for further Definitions applicable to Subpart P

1926.651 GENERAL REQUIREMENTS.

(a) Subsurface encumbrances. All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported as necessary, to safeguard employees.

(b) Underground installations.

(1) The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening and excavation.

(2) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

(3) When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

(4) While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

40. EXCAVATIONS/TRENCHES (Continued)

(c) Access and egress

(1) Structural ramps.

(i) Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a **COMPETENT PERSON.** Structural ramps used for access or egress of equipment shall be designed by a **COMPETENT PERSON QUALIFIED IN STRUCTURAL DESIGN,** and shall be constructed in accordance with the design.

(ii) Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

(iii) Structural members used for ramps and runways shall be of uniform thickness.

(iv) Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

(v) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

(2) Means of egress from trench excavations. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are **4 feet (1.22m) or more in depth** so as to require no more than **25 feet of lateral travel for employees.**

(d) Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

(e) Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped in accordance with #1926.60l(b)(6), to provide adequate protection for the operator during loading and unloading operations.

(f) Warning system for mobile equipment. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

40. EXCAVATIONS/TRENCHES (Continued)

(g) Hazardous atmospheres

(1) Testing & Controls. In addition to the requirements set forth in subparts **D** and E of this part (29 CPR 1926.50-1926.107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply;

(i) **Where oxygen deficiency** (atmospheres containing less than 19.5 percent oxygen) **or a hazardous atmosphere** exists or **could reasonably be expected to exist,** such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in **the excavation shall be tested before employees enter excavations greater than 4 feet.**

(ii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection of ventilation in accordance with subparts D and E of this part respectively.

(iii) Adequate precaution shall be taken such as providing ventilation to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(2) Emergency rescue equipment.

(i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

(ii) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a life-line securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

40. EXCAVATIONS/TRENCHES (Continued)

(h) Protection from hazards associated with water accumulation.

(1) Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

(2) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

(3) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with paragraphs (h)(l) and (h)(2) of this section.

(i) Stability of adjacent structures.

(1) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

(2) Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

(i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

(ii) The excavation is in stable rock; or

(iii) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

(iv) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

(3) Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

40. EXCAVATIONS/TRENCHES (Continued)

(j)

Protection of employees from loose rock or soil.

(1) Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material, installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

(2) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

(k) Inspections.

(1) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

(2) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

(l)

(m) Fall protection.

(1) Where employees or equipment are required or permitted to cross over excavations, walkways or bridges with standard guardrails shall be provided.

(2) Adequate barrier physical protection shall be provided at all remotely located excavations. All wells, pits, shafts, etc., shall be barricaded or covered. Upon completion of exploration and similar operations, temporary wells, pits, shafts, etc., shall be backfilled.

1926.652 Requirements for protective systems.

(a) Protection of employees in excavations.

(1) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when:
(i) Excavations are made entirely in stable rock; or
(ii) Excavations are less than 5 feet (1.52 M) in depth and examination of the ground by a competent person provided no indication of a potential cave-in.

(2) Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

(b) Design of sloping and benching systems. The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (b)(l); or, in the alternative, paragraph (b)(2); or, in the alternative, paragraph (b)(3), or, in the alternative paragraph (b)(4), as follows:

(1) Option
Allowable configurations and slopes.
(i) Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal) unless the employer uses one of the other options listed below.
(ii) Slopes specified in paragraph (b)(l)(i) of this section, shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this subpart.

(2) Option
Determination of slopes and configurations using Appendices A and B. Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this subpart.

(3) Option
Designs using other tabulated data.
(i) Designs of sloping or benching systems shall be selected from and be in accordance with tabulated data, such as tables and charts.
(ii) The tabulated data shall be in written form and shall include all of the following:

(A) Identification of the parameters that affect the selection of a sloping or benching system drawn from such data.

(B) Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe.

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the date.

(iii) At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system.

After that time the data may be stored off the jobsite, but a copy of the date shall be made available to the Secretary upon request.

(4) Option

Design by a registered professional engineer.

(i) Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) under paragraph (b) of this section shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include at least the following:

(A) The magnitude of the slopes that were determined to be safe for the particular project.

(B) The configurations that were determined to be safe for the particular project; and

(C) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the Secretary upon request.

(c) Design of support systems, shield systems, and other protective systems. Designs of support systems shield systems, and other protective systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (c)(l); or, in the alternative, paragraph (c)(2); or, in the alternative, paragraph (c)(3); or, in the alternative, paragraph (c)(4) as follows:

(1) Option

Designs using appendices A, C and D. Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this subpart. Designs for aluminum hydraulic shoring shall be in accordance with paragraph (c) (2) of this section, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.

40. EXCAVATIONS/TRENCHES (Continued)

(2) Option

Designs Using Manufacturer's Tabulated Data.

(i) Design of support systems, shield systems or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

(ii) Deviation from the specifications, recommendations,and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

(iii) Manufacturer's specifications, recommendations and limitations, and manufacturer's approval to deviate from the specifications, recommendations and limitations shall be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy shall be made available to the Secretary upon request.

(3) Option

Design using other tabulated data.

(i) Designs of support systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and include all of the following:

(A) Identification of the parameters that affect the selection of a protective system drawn from such data;

(B) Identification of the limits of use of the data:

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

(4) Option

Design by a registered professional engineer.

(i) Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include the following:

(A) A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

(B) The identity of the registered professional engineer approving the design.

40. EXCAVATIONS/TRENCHES (Continued)

(iii) At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.

(d) Materials and equipment.

(1) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

(2) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

(3) When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

(e) Installation and removal of support

(1) General.

(i) Member of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

(ii) Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

(iii) Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

(iv) Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

(v) Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

(vi) Backfilling shall progress together with the removal of support systems from excavations.

40. EXCAVATIONS/TRENCHES (Continued)

(2) Additional requirements for support systems for trench excavations.

(i) Excavation of material to a level no greater than 2 feet (.6 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

(ii) Installation of support system shall be closely coordinated with the excavation of trenches.

(f) Sloping and benching systems. Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

(g) Shield systems

(1) General.

(i) Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

(ii) Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

(iii) Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

(iv) Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

(2) Additional requirements for shield systems used in trench excavations. Excavations of the earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

FOR ADDITIONAL INFORMATION REGARDING EXCAVATIONS REFER TO

1926.652. Appendix A to Subpart P, **Soil Classification**
1926.652. Appendix B to Subpart P, **Sloping and Benching**
1926.652. Appendix C to Subpart P, **Timber Shoring for Trenches**
1926.652. Appendix D to Subpart P, **Aluminum Hydraulic Shoring Trenches**
1926.652. Appendix E to Subpart **P, Alternatives to Timber Shoring**
1926.652. Appendix F to Subpart **P, Selection of Protective Systems**

41. CONCRETE AND MASONRY CONSTRUCTION

REFERENCE OSHA CONSTRUCTION STANDARDS 1926.700. 706

42. UNDERGROUND CONSTRUCTION, CAISSONS, COFFERDAMS AND COMPRESSED AIR

REFERENCE OSHA CONSTRUCTION STANDARDS 1926.800, 960