SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

Metro Rail Project

RTD

CONSTRUCTION SAFETY AND SECURITY MANUAL

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH GRANTS FROM THE STATE OF CALIFORNIA, THE CITY OF LOS ANGELES, THE LOS ANGELES COUNTY TRANSPORTATION COMMISSION AND THE U.S. DEPARTMENT OF TRANSPORTATION, URBAN MASS TRANSPORTATION ADMINISTRATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED.

MONTH OF SEPTEMBER YEAR 1986

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

REV. 2
MARCH 1987

CONSTRUCTION MANAGER — PDCD

A JOINT VENTURE OF THE RALPH M. PARSONS COMPANY, DILLINGHAM CONSTRUCTION, INC. AND DE LEUW, CATHER & COMPANY

LOS ANGELES METRO RAIL PROJECT

Southern California Rapid Transit District

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MONTH February YEAR 1985

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

Revision No. 1 September, 1986

Revision No. 2 February, 1987

CONSTRUCTION SAFETY AND SECURITY MANUAL

FOREWORD

The Metro Rail Implementation Program includes nine (9) Construction Management Manuals. This Construction Safety and Security Manual is noted as Manual No. 3. The other eight manuals that are available for appropriate reference are:

1 - Organization and Responsibilities Manual

2 - Administration Procedures Manual

4 - Quality Assurance/Quality Control Procedures Manual

5 - Contracts and Procurement Manual

6 - Project Controls Procedures Manual

7 - Construction Operations Procedures Manual

8 - Resident Engineer Manual

9 - Inspector Guidelines Manual

Revisions to each manual are identified by a number located in the right-hand margin. This number corresponds to the revision date(s) noted on the title page.

Procedural manuals have the revision number identified in the heading of each procedure.

INTRODUCTION

Prime responsibility for ensuring the implementation and compliance with the RTD Safety program lies with the TSD, Director of Construction Management. The Construction Manager (CM) consultant has been assigned the day-to-day management of the projects Safety and Security program as set forth in this Construction Safety and Security Manual.

The purpose of this Manual is to highlight loss prevention and the information herein must not be construed to represent all such material contained in the safety rules and regulations as stated by the California Division of Occupational Safety and Health Administration (Cal-OSHA) and other entities, such as the Federal or State governments or the County and City of Los Angeles. This Manual is to be used as a supplement and guide for the Contractors to follow in the establishment of their safety and security program as required for the Metro Rail Project.

No declaration, act, or omission of the CM Safety and Security Manager, or the RTD's Safety Department, or its representatives, other than by written order, will be deemed to exempt, either wholly or in part, expressly or by implication, any Contractor or the Contractor's place of employment, on RTD contracts, from full compliance with the terms of any safety order as stated by the Federal government, the State of California, or the County and City of Los Angeles applicable to the Contractor's work package on the Metro Rail Project.

The Construction Safety and Security Manual is an RTD contract document and Contractors are required to ensure that all employees, visitors, subcontractors, and their suppliers/vendors, while on the work site and in the conduct of RTD contracts, comply with the provisions of this Manual and the minimum standards set forth under the California Administrative Code, Title 8, Industrial Relations, Chapter 4; Division of Industrial Safety. Where work is performed under pressure in excess of atmospheric pressure, the Compressed Air Safety Order shall apply. Cal-OSHA has classified MOS-1 of the Metro Rail Starter Line as "Gassy"; therefore, all Cal-OSHA requirements for working in a gassy environment apply and are to be adhered to as a minimum safety standard as applicable.

Any specific operation, machine, and process not covered in these orders will be governed by other applicable Federal regulations; the RTD, and the County and City of Los Angeles.

A permit for a variation from these orders must be approved by Cal-OSHA, Federal, City, and County of Los Angeles, and CM, as applicable, in writing prior to use of any variation. The permit will be posted for all employees to see.

The Contractor is required to know the safety regulations as they apply to the operations. The provisions of this Safety and Security Manual will be

strictly enforced along with the regulations issued by Federal, State, and the County and City of Los Angeles, where applicable. Noncompliance with this Manual will be treated the same as noncomoliance with any contract provision. Willful or repeated noncompliance will result in the suspension of part or all of the work.

References to personnel, departments, and sections are within the CM organization unless otherwise stated.

CONSTRUCTION SAFETY AND SECURITY MANUAL

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ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
Cal-OSHA	California Division of Occupational Safety and Health Administration
CM	Construction Manager, PDCD, a Joint Venture of The Ralph M. Parsons Company, Dillingham Construction, Inc., and De Leuw, Cather and Company
DCM	Deputy Construction Manager
DIA	District Insurance Administrator
fc	Footcandles
IARC	International Agency on Researching Cancer
LEL	Lower Explosive Limit
NESC	National Electrical Safety Codes
NTP	National Toxicology Program
NFPA	National Fire Protection Association
RE	Resident Engineer
RTD	Southern California Rapid Transit District
UL	Underwriters' Laboratories

SECTION 1

AUTHORITY AND RESPONSIBILITIES

1.1 AUTHORITY AND RESPONSIBILITIES

CM shall have overall responsibility for all construction safety and health matters on the project site, and shall hold each Contractor, manager, supervisor, foreman, and employee responsible for all safety, health, and contractual duties. Each Contractor shall also be held accountable for the safe and healthful performance of work by each of the subcontractors, regardless of tier. The authority of the CM's Safety and Security Manager and Contractors' safety representatives are covered as subsequent paragraphs of this Manual.

1.1.1 SAFETY AND SECURITY MANAGER

The Safety and Security Manager shall report directly to the Construction Manager and shall be responsible for the daily management of the project's Safety, Security, and Health Program, development of the project safety plans, constructibility reviews to ensure safety considerations, safety of construction activities, and compliance with safety requirements. CM's safety organization and its relationship to RTD, DIA and Contractor safety and security are shown in Figure 1.1.

The Safety and Security Manager shall have the authority to issue stop-work orders to any Contractor or subcontractor who fails, or refuses, to take prompt corrective action when given notice of noncompliance with any of the applicable safety requirements. The Safety and Security Manager shall also have the authority to approve safety plans required of the Contractors.

The Safety and Security Manager and staff shall perform the following functions:

(1) Review all safety programs of Contractors and the qualifications of the Contractor's Safety Representative. Both the safety program and the Safety Representative shall be approved prior to the Contractor commencing work on the project.

(2) Maintain a documentation file of all safety inspections and of all written notices to the Contractors.

(3) Report, in writing, to the Construction Manager's office so that the Construction Manager is kept well informed at all times of the safety progress of the project.

(4) Receive copies of the Contractor's initial and subsequent accident reports and injury reports for review and analysis.

(5) Report damage to property belonging to the general public, regardless of amount, as reported by Contractor or person(s) involved.

(6) Prepare and transmit to CM, RTD, and DIA monthly reports, graphs, and charts showing Contractor accident frequency, severity, manhours of downtime or delay, as well as project overall safety progress.

(7) Provide technical assistance to Contractors and field safety personnel.

(8) Inspect work areas on a daily basis, at a minimum.

(9) Monitor the Contractor's weekly on-the-job safety meetings and employee indoctrinations.

(10) Attend Contractor's weekly safety meetings on a rotating and routine basis.

1.1.2 DISTRICT INSURANCE ADMINISTRATOR (DIA)

The DIA supports and assists the CM in safety program development, monitoring of all project related safety programs and development of appropriate emergency response plans and activities.

1.1.3 CONTRACTOR'S SAFETY REPRESENTATIVE

The Contractor is required to assign a Safety Representative. The Safety Representative is responsible for the safe and healthful performance of work by his/**her** work force and that of **the** subcontractors.

Safety Representative's qualifications shall be, as a minimum, the requirements established by Cal-OSHA Tunnel Division. The Contractor's Safety Representative shall prepare all accident or injury reports required by the Contractor, RTD, Cal-OSHA, the insurance company or other State, County, City, or Federal authorities and shall send a copy of all reports to the Safety and Security Manager. The Safety and Security Manager shall be informed immediately of all accident and injury reports that involve:

(1) Fatal, lost-time, or restricted-duty accidents to the Contractor or subcontractor employees.

(2) Damage to installations or Contractor property of $1,000 or more, or any loss involving the District Insurance Administrator (DIA) regardless of cost.

(3) Equipment or materials furnished by RTD that have been stolen or damaged by accident, regardless of the cost to replace or repair.

(4) Any damage that shall result in contract time extension.

The Contractor's Safety Representative shall make continuous work area inspections and shall conduct toolbox and foreman safety meetings and safety indoctrinations of all new employees. The Contractor's Safety Representative shall also attend a weekly safety meeting with the Safety and Security Manager, ensure that all reports are prompt and correct, and investigate all accidents that may require further investigation by the Safety and Security

Manager, RTD, or the DIA. When necessary, the Contractor shall prepare reports to show steps taken to prevent accidents; develop job hazard analyses, fault tree analyses, and other forms of hazard analyses to determine accident causes and methods for accident prevention for specific situations, and improve and upgrade the safety and security in the Contractor's areas of responsibility.

1.2 GENERAL SAFETY REQUIREMENTS

RTD's Safety and Security Program is designed to form the basis for specific safety programs for each Contractor.

(1) Each Contractor shall develop a specific **written** safety and security program for his work on the project **for submittal to and approval of the CM.** 2 2 2

(2) Each Contractor is required to post the Cal-OSHA poster, "Safety and Health Protection on the Job" **and other required Cal-OSHA posters.** 2

(3) Each Contractor shall maintain Cal-OSHA records and submit all Cal-OSHA reports, with copies of records and reports, to the Safety and Security Manager.

(4) Each Contractor is required to provide a qualified, full-time Safety Representative to administer the Contractor's and subcontractors' safety programs.

(5) Where a Contractor is required to work on premises belonging to other than RTD, the Contractor must comply with that organization's safety requirements.

1.2.1 CAL-OSHA PERMIT OR REGISTRATION REQUIREMENTS

All Contractors are reminded that each Contractor is required to obtain permits from the California Division of Occupational Safety and Health for the following types of construction operations prior to the start of such operations, as well as obtaining any permit required by the City and County of Los Angeles or contracting officer, as applicable:

(1) Construction of trenches or excavations 5 feet or deeper into which a person shall be required to descend.

(2) The construction of any building, structure, scaffolding, or falsework three stories high or the equivalent height.

(3) The demolition of any building, structure, or the dismantling of scaffolding or falsework more than three stories high or the equivalent height.

(4) Operation of diesel engines underground. 2

(5) Be currently registered with the Division (Labor Code 6501.5) prior to doing any asbestos related work. 2 2

1.2.2 PUBLIC SAFETY REQUIREMENTS

(1) The Contractor shall take all necessary precautions to prevent injury to the public or damage to property of others, and take whatever security steps are necessary to prevent theft of, or vandalism to, property in the Contractor's care, custody, and control.

(2) Work shall not be performed in any area occupied by the public unless specifically permitted by the contract or in writing by the Contracting Officer.

(3) When it is necessary to maintain public use of work areas involving sidewalks, entrances to buildings, lobbies, corridors, aisles, stairways, and vehicular roadways, the Contractor shall protect the public with appropriate guardrails, barricades, temporary fences, overhead protection, temporary partitions, shields, and adequate visibility. This protection shall guard against harmful radioactive rays or particles, flying materials, falling or moving materials and equipment, hot or poisonous materials, explosives and explosive atmospheres, flammable or toxic liquids and gases, open flames, energized electrical circuits, arc welding (flash burn), or other harmful exposures. **Walkways, accessways and stairways shall be kept clear and free of hazards which could cause tripping and falling.** 2

(4) Appropriate warning signs and instructional safety signs shall be conspicuously posted, where necessary. In addition, a flagperson shall control the moving of motorized equipment in areas where the public could be endangered.

(5) The protection required to guard the general public from harm shall be in accordance with the laws of the City and County of Los Angeles or other political subdivisions involved.

(6) Temporary fencing shall be provided around the public area, except where a sidewalk shed or other fence is provided by the Contractor. Perimeter fences shall be at least 6 feet high, made of wood, metal, wire mesh, or a combination thereof. The fences shall be in accordance with the requirements of the City and County of Los Angeles. Guardrails shall be provided on both sides of temporary sidewalks.

(7) Warning signs and lights, including lanterns and electric lights, meeting the requirements of the City and County of Los Angeles, shall be maintained from dusk to sunrise along guardrails, barricades, temporary sidewalks, and at every public obstruction created by the Contractor. Lights shall be installed at both ends of the obstruction and additional lights, not over 20 feet apart, alongside the guardrail, barricade, temporary sidewalk, or obstruction.

1.2.3 OCCUPATIONAL SAFETY AND HEALTH OFFICE

The nearest office of the Division of Occupational Safety and Health is:

3460 Wilshire Boulevard
Los Angeles, California 90010
(213) 736-3024

Mining and Tunneling Unit

6150 Van Nuys Boulevard
Suite 310
Van Nuys, California 91401-3333
(818) 901-5420

1.2.4 REQUIRED CONTRACTOR POSTING

The following are the minimum requirements for posting on the Contractor's outside bulletin board:

a) **Cal-OSHA poster (English and Spanish)**

b) **Payday notice on Contractor's letterhead**

c) **Discrimination in Employment is Prohibited by Law**

d) **Emergency Phone Numbers**

e) **Wage and Hour Requirements (minimum wages)**

f) **Notice of Workers Compensation Carrier**

g) **Contractors Emergency Plan**

h) **Cal-OSHA GISO 3204 Right to Know**

i) **OSHA 200 Annual Summary - for Contractor and each Subcontractor once a year during the month of February**

SECTION 2

MONITORING AND CONTROLLING SAFETY AND SECURITY COMPLIANCE FOR CONSTRUCTION OPERATIONS

It is the responsibility of the Contractor(s) doing the work to ensure that the work is done safely and correctly according to the rules, regulations, and standards as they apply to the Contractor's work on the Metro Rail Project. Safety is a significant part of the work, and compliance therewith is required. For safety, Cal-OSHA regulations shall **apply** but other required City, County, and Federal regulations, permits, etc., must also be adhered to at all times. Where one conflicts with the other, the most stringent shall **apply.** 2 2

A program to monitor the Contractor's safety and security system shall be implemented. It shall include periodic audits by the CM and RTD Safety and Security staff.

The procedure for monitoring and controlling construction compliance on the Metro Rail Project shall ensure, as a minimum, that:

(1) Management is aware of the project's safety and security conditions and attitudes at all times during the course of construction.

(2) All persons employed on the project do their utmost to protect life, equipment, materials, installations, and property belonging to others from injury and damage.

(3) Work is performed safely.

2.1 RESPONSIBILITIES

2.1.1 SAFETY AND SECURITY MANAGER

The Safety and Security Manager and staff shall have the following responsibilities for monitoring the construction, work area, and personnel of every Contractor on the project:

(1) Ensure that the Contractor has complied with Cal-OSHA's permits and licenses for the specific work the Contractor is performing, as well as the licenses and permits required by the City and County of Los Angeles.

(2) Conduct periodic, unannounced inspections of all construction sites to determine Contractor compliance with safety requirements. Inspections shall include working conditions, sanitary conditions, work practices, and attitudes.

(3) Utilize a safety checklist during the inspection and compare it with both the previous inspection and the Contractor's Safety Representative's checklist of the previous or most recent project inspection. Repeat items of an unsafe nature shall be thoroughly discussed with the Contractor and supervisory personnel, with notations made accordingly.

(4) Investigate all accidents, particularly lost time or damages to Contractor equipment or installation in excess of $1,000; any accident involving the general public regardless of cost, equipment, and materials belonging to RTD. The investigation report shall be given to the Resident Engineer and a copy sent to RTD's Safety and System Assurance supervisor and CM for further distribution.

(5) Compile a comprehensive monthly (or more frequent) safety report, based on the Contractor's input, for distribution to all parties concerned. This report shall include, but shall not be limited to:

(a) Manhours worked by each Contractor and Subcontractor.

(b) Number of employee accidents:

- o Lost Time
- o Medical/No Lost Time
- o First Aid

(c) Number of accidents involving Contractor equipment.

(d) Number of accidents involving Contractor or RTD equipment or materials.

(e) Number of accidents involving installations belonging to RTD or Contractor.

(f) Type of accident (description and cost/downtime or lost time involved).

(g) Class of incident or loss: fire, collision, theft, etc.

(h) Any unsafe condition or practice that is not corrected at the time of inspection shall be reflected in the report, as well as any repeated problem.

(i) Bar charts or graphs comparing project safety with similar work on a state and national basis.

(6) Attend meetings on safety with supervisors and staff and with other safety, fire, and security groups as requested by the City, County, or State, whenever possible.

(7) Monitor security activities and review all reports of theft, vandalism, break-in, or attempted break-in. Review the daily log concerning security for any trend that may cause problems of any

nature to the jobsite and construction progress. Obtain copies of reports where any property is stolen or damaged in an attempted theft.

(8) Review security personnel qualifications for work responsibilities.

(9) Coordinate public relations aspects of safety programs and emergencies with Community Relations Manager, as appropriate. 2 2

2.1.2 CONTRACTOR RESPONSIBILITIES

The Contractor shall be responsible for the following actions:

(1) Conduct all operations in a safe, workmanlike manner for the benefit of persons and protection of property, assuming responsibility for the actions of Contractor's personnel, vendors, and subcontractors, regardless of tier.

(2) Provide a full-time Safety Representative. **Safety Representative to be approved by the Safety and Security Manager and where required by Cal-OSHA, Title 8, certified and approved by Cal-OSHA.** 2 2 2

(3) Ensure that employees, visitors (includes anyone that is not officially assigned to the site), subcontractor employees, and supplier employees, while on the worksite, comply with requirements of Cal-OSHA, the CM's Construction Safety and Security Manual, and any City, County, State, or Federal regulations as they apply to this project. All visitors shall sign a hold harmless agreement (supplied by the DIA) prior to entrance to the work area. The visitors shall be required to wear a red hard hat and be accompanied by a supervisor, at all times while on the site.

(4) Submit, within 30 days after receipt of a notice of award, the Contractor's safety and security program, in writing, to CM for review and acceptance. The Contractor's safety and security program shall be made for a specific contract and, where the Contractor may have more than one contract on the project, each contract shall have a safety program.

(5) No later than the tenth calendar day of each month, submit three copies of Cal-OSHA Form 200 to the Safety and Security Manager. The total manhours worked by the Contractor and each of the subcontractors (each Contractor/Subcontractor by name with manhours shown separately) during the previous month shall be indicated on the reporting form.

(6) Immediately advise the Safety and Security Manager of inspections to be conducted by Cal-OSHA or any other Federal, State, or County organization at the worksite and transmit copies of citations and violations to the Safety and Security Manager.

(7) Provide worksite first-aid facilities and qualified first-aid person(s) on site when work is in progress. This shall be included in the Contractors written Safety and Security Program. 2 2 2

(8) Include the arrangements made for a doctor, hospital, and ambulance in case of an emergency **in the written safety and health plan.** 2

(9) Develop and coordinate an emergency plan with the overall Project Emergency Plan. Keep all employees aware of the procedures, and conduct an emergency drill within 45 days after commencing work, using lights and warning systems.

(10) Hold a preconstruction safety meeting with Cal-OSHA and the Safety and Security Manager prior to starting work. Cal-OSHA shall establish the date and time of the meeting. (For convenience, there shall be one combined meeting.)

(11) Have an experienced **gas** tester **on each work shift,** certified by Cal-OSHA in gassy or extra hazardous classified tunnels. This person shall be qualified to do the gas testing, with the authority to shut down the tunnel or any work area when gas levels reach a dangerous level as defined by Cal-OSHA. The gas tester shall report to the Contractor's Safety Representative. 2

2.1.3 CONTRACTOR'S SAFETY REPRESENTATIVE'S RESPONSIBILITIES

The Contractor's Safety Representative shall be responsible for the following actions:

(1) Make thorough daily, or more frequent, safety inspections of the worksite, act immediately to eliminate unsafe conditions and unsafe acts, and record suggestions made and corrective action taken.

(2) Investigate worksite accidents and possible serious near misses of all types, making a written report with recommended immediate corrective action.

(3) Furnish job foremen with appropriate material for weekly toolbox safety meetings. Meeting items should include manhours worked with no lost time, Contractor/Subcontractor overall manhours worked with no lost time, total project worked with no lost time, and accidents with equipment or material damage. Discussions should also include near misses and any serious or potentially serious accident that may affect the crew. Historical facts may be used to improve the loss prevention program.

(4) Review safety meeting reports submitted by the foremen. Ensure that weekly safety meetings are held by the foremen and supervisory personnel.

(5) Assist in the preparation of accident investigations and reporting procedures. Reports should contain information from involved persons and actual eyewitnesses.

(6) Implement training programs for supervisors and employees as they apply to their specific responsibilities.

(7) Provide for control, availability, and use of safety equipment, including employee personal protective equipment, and ensure that all safety equipment used in tunnels or underground work is approved by the U.S. Bureau of Mines or acceptable by Cal-OSHA.

(8) Coordinate public relations aspects of the Contractor's safety program with RTD's **Local Government and** Community **Affairs** Department, or **its** designated representative. 2 2

(9) Forward copies of all necessary and required safety reports that must be sent to Cal-OSHA, City, County, State, and Federal agencies, as well as copies of all insurance reports, to the Safety and Security Manager.

(10) Ensure that every employee is aware of, and receives, first-aid treatment for all minor injuries, and ensure that a log is maintained.

(11) Conduct supervisory personnel safety meetings and assist the Contractors' foremen in conducting toolbox safety meetings.

(12) Ensure that all subcontractor employees comply with jobsite safety rules and regulations, and ensure that the subcontractors' reports are completed according to the rules and regulations stated in this Manual and according to the requirements of Cal-OSHA, DIA, and the City and County of Los Angeles.

(13) Ensure "No Smoking" restrictions, particularly below ground, are strictly enforced.

(14) Keep the Safety and Security Manager informed of any problem or potential problem area.

(15) Ensure that timely and accurate records are kept at all times in the tunnel by the gas tester and the Contractor's Safety Representative according to Cal-OSHA requirements. A copy of these records shall be kept outside the tunnel, and a report shall be made to the Resident Engineer of any problems. In case of serious accident or problem, the Safety and Security Manager shall be contacted immediately.

2.2 INSTRUCTION AND TRAINING

Every Contractor shall inaugurate and maintain an accident prevention program that shall be developed to fit the specific work and its hazards. The program shall stipulate that capable, responsible supervisors make regular inspections of all excavations, forms, scaffolds, stairs, ladders, structures, machinery, and equipment at frequent intervals; that immediate corrective measures be taken to eliminate the hazards directly under the control of the Contractor, and that violations of safety orders and safe

practices be reported to the Resident Engineer. The Code of Safe Practices, as stated by Cal-OSHA, shall be posted in a conspicuous location at each jobsite office. All safety suggestions shall be given prompt consideration by the employer and a written record shall be kept on file of the written suggestions, actions taken, and person or persons who submitted the suggestion/notification or action. These records shall be open to the RTD and CM, on request. Monthly meetings shall be held for supervisory personnel to discuss safety problems and accident prevention. Records of such meetings shall be kept stating the date, time, place, supervisory personnel present, subjects discussed, and action taken, if any.

Contractor foremen shall conduct toolbox or tailgate safety meetings with their crews on the first workday on the job and at least weekly thereafter. A record of all meetings shall be logged and maintained for inspection by Cal-OSHA and any other official body.

When an employee is first hired, the Contractor's person in charge shall determine the extent of the employee's work experience for the position. Also, all employees shall receive a copy of, and have their attention directed to, the provisions of the Safe Practices and Operations Code as developed by the Contractor according to guidelines established by Cal-OSHA, Appendix Plate A-3 of Title 8, Chapter 4, Subchapter 4 (Construction Safety Orders). In tunnel or underground work, refer to Division of Industrial Safety, Tunnel Safety Orders, Appendix A, p 706.13. All employees shall be instructed in the hazards of the job and safe performance of their duties and issued a Certificate of Training. Requiring an employee to sign a statement shall not suffice for actual instructions and evidence of required knowledge.

Cal-OSHA shall be notified and a prejob safety meeting shall be held with Cal-OSHA in attendance before work begins on any job.

A safety bulletin board shall be provided at all tunnels near the portal, shaft collar, or where personnel congregate before entering. The Safe Practices and Operations Code, general safety precautions, and other pertinent safety notices shall be posted on this bulletin board (see Appendix A, Division of Industrial Safety, Tunnel Safety Orders).

The employer shall permit only those employees qualified by training or experience to operate equipment and machinery. Where employees may be subject to known jobsite hazards such as flammable liquids and gases, poisons, caustics, toxic materials, and confined spaces, they shall be instructed in the recognition of the hazard, in the procedures for protecting themselves from injury, and in the first-aid procedures in the event of injury. Where the Tunnel Safety Orders are in effect, all supervisors, and at least one person on each tunnel crew, shall have had first-aid training within the past two years and shall be competent to give proper emergency treatment according to Safety Tunnel Orders 8421, Article 7.

Each employer shall require employees to use safety devices and safeguards as mandated by Cal-OSHA and this Manual, and shall adopt and use practices, means, methods, operations, and processes that are reasonably adequate to

render the employee, and place of employment, safe and healthful. All persons required to enter confined or enclosed spaces shall be instructed in the nature of the hazards involved.

Employees or visitors who refuse to use, or are not using, prescribed protective equipment shall be removed from the jobsite.

Classes shall be conducted on a periodic basis in safety, first aid, fire prevention, and other areas that shall benefit the Contractors and the construction industry. These classes shall be presented by RTD's insurance administrator, the insurance carrier, Cal-OSHA, or other outside agencies, approved by RTD and CM.

2.3 QUALIFICATION OF CONTRACTOR AND EMPLOYEES

The safety and health questionnaire in the Contractor's bid package must be completed by the Contractor.

When an employee first begins work on the Metro Rail Project, it is the Contractor's responsibility to ensure that the employee is knowledgeable of the work that is expected to be performed and is physically and mentally capable of performing the work expected. The Contractor must also ensure that the employee is properly versed in the hazards of the work and in the recognition of unsafe conditions and acts, and knows that any condition or practice that may cause injury to other employees or damage to materials and equipment must be reported to the Supervisor or the Safety Representative.

Being under the influence of, or the use or possession of substances that cause physical or emotional impairment on the job shall be cause for **immediate** removal of the individual(s) and shall not be tolerated on the jobsite.

Operators of hoisting equipment, **construction equipment**, and motor vehicles shall be qualified **and** licensed to operate the vehicle or equipment, where applicable.

If the use of explosives has been authorized in accordance with contract documents, the blaster shall have a current, valid license issued by Cal-OSHA and have current permits or licenses required by the Los Angeles City Fire Department.

The Contractor is required to provide a Cal-OSHA-certified gas tester on each work shift where the work is considered by Cal-OSHA to be gassy or extra hazardous. The gas tester may not be assigned any other duty that shall **interfere with the primary duties of gas testing.**

2.4 PERSONAL PROTECTIVE MEASURES

2.4.1 PERSONAL PROTECTION APPAREL

This is a hard-hat project and every person on the site shall wear a hard-hat. Each entry to the construction area shall be marked as a hard-hat area, reminding everyone to **wear** a hard-hat. There shall be no exceptions.

Every employee shall be provided with, and required to wear, acceptable head protection according to Cal-OSHA safety standards. This requirement applies to equipment operators, including crane operators, truck drivers, etc., (an exception is while inside a passenger-type vehicle or designated offices).

Visitors shall be issued a red, solid-colored hard hat and shall wear it on the jobsite. 2

An employee shall be issued ear protection to wear during the time the employee is exposed to a harmful sound pressure level. Any employee failing to wear ear protection shall be reported immediately, with a notation made on the employee's work file/medical record, and be subject to dismissal for failing to comply with the order. Visitors shall not be allowed on site unless wearing ear protection when required. Sound pressure level measurements shall be made by a qualified Contractor employee, recorded in the Contractor's Safety Representative's permanent log, and made available for review **by** CM and RTD safety personnel. 2

Eye protection shall be provided **to protect employees** from flying particles, hazardous substances, or injurious light rays. (Refer to **General Industry Safety Orders** for various lens densities for protection from injurious light rays or glare.) Particular attention shall be given to operations involving sandblasting, cleaning with air and water, guniting, welding, shotcreting, jackhammering, chipping, grinding, and drilling of metal. 2

Protective footwear and protection for the hands, where work involves hazardous exposure, shall be issued and worn **per Cal-OSHA standards.** Contractor employees shall be required to wear good, sturdy work shoes at all times while on the construction site. 2

Personal protective equipment shall be maintained in good, usable, and sanitary condition. Records shall be kept of the issuance of such equipment to each employee. Where there is a risk of injury from hair entanglement in moving parts of machinery, combustibles, or toxic contaminants, the employees shall confine their hair to eliminate the hazard.

Before being reissued to another employee or returned to storage, protective devices shall be cleaned, sterilized, inspected, and repaired, if needed.

Specialized **permissible** equipment such as miner's lights, flashlights **and gas detection equipment** used around explosives and in atmospheres likely to contain explosive vapors, dusts, or gases shall be **acceptable** by Cal-OSHA, Mine and Tunnel Division. 2

Employees exposed to vehicular traffic such as flagpeople, spotters, inspectors, and service people shall wear high-visibility reflective belts, vests, or jackets. Protective clothing and head-and-eye protection, appropriate to the hazard involved, shall be worn by employees when handling acids, caustics, hot liquids, and other hazardous materials, or when working in areas where there are gases and fumes.

Respiratory protection of a type **acceptable to Cal-OSHA** shall be provided for all employees subject to harmful concentration of dust, gases, fumes, 2

mists, or atmospheres deficient in oxygen (20% or less oxygen in atmosphere). The correct respirator or breathing apparatus shall be used for the environment encountered, i.e., oxygen deficiency, explosive gas, dust, etc. 2

Where respiratory protection is required, the Contractor shall have a written Respiratory Protection Program in accordance with applicable Cal-OSHA standards. 2 2 2

In addition to the requirements of Cal-OSHA Tunnel Safety Orders (8430[f]), oxygen breathing self-rescuers for employees in number and type as directed by Cal-OSHA shall **be provided in the immediate vicinity of the face and at the excavating machine operator's work area. They shall be properly maintained.** 2 2 2 2 2

2.4.2 NOISE CONTROL

Harmful sound-pressure levels in working areas shall be eliminated or minimized by planning and design. Control considerations include substitution with quieter sources, isolation, enclosures, baffling, muffling, resilient mounting, sound absorption, or other measures as appropriate. When the sound-pressure level in a working area exceeds 85 decibels (dB) overall, personal ear protection devices shall be required by all persons working in the area in excess of permissible noise exposure according to the list below (Cal-OSHA 1521, Section 5096(b) of the General Industrial Safety Orders):

dB	Hours of Work
85	8
90	6
92	4
95	3
97	2

When the sound-pressure level in a working area exceeds 115 dB, personal ear protection equivalent to the combination of ear plugs and ear muffs shall be required, regardless of the time exposed to the sound-pressure level of 115 dB. Where required by Section 5096(b) of the General Industrial Safety Orders, ear protection shall be provided by the employer, and the employer shall require employees to wear the ear protection.

The Contractor shall take all necessary precautions to prevent injury to the public or damage to the property of others. This includes excessive noise levels that may be considered as a proximate cause of damages or injury, or contributory to the cause of damage or injury. Early morning startup and night noises can cause poor public relations resulting in the delay of work due to harassing litigation and unnecessary shutdowns. The Contractor shall ensure compliance with State, City, and County of Los Angeles laws for noise curfews in effect in the immediate work areas that may involve the general public.

2.4.3 WORK IN CONFINED AND ENCLOSED PLACES

Enclosed spaces include storage tanks, process vessels with limited access, deep tanks, pits, vaults, station boxes, and other confined spaces with one side open to the air and ventilation or exhaust ducts, sewers, underground utility tunnels, or pipelines with limited ventilation. All enclosed spaces shall be tested for contaminants and absence of oxygen adequate to support life; periodic check tests shall be made to ensure an acceptable atmospheric condition. All enclosed spaces shall be tested prior to entry as well as reentry. **The Contractor shall comply with the requirements of General Industry Safety Orders, Article 108.** 2

Protective clothing and respiratory protection shall not be used as a substitute for cleaning and ventilating hazardous places of work. Persons working in confined or enclosed spaces shall have a safety harness and lifeline, with an attendant, and a continuous monitor with a visual and audible warning device if the atmosphere has oxygen deficiency, or contamination sufficient to require respiratory protection, or if ventilation is inadequate to maintain a safe level to perform the necessary work. The attendant shall not be assigned to any other duty.

When working in areas of limited access that could be flooded or filled with liquid or gas, a lockout procedure shall be used so that all lines leading into, or out of, enclosed spaces prevent flow or drainage into the spaces. The mere closing of valves shall not be satisfactory.

A positive procedure to eliminate or control hazards in confined or enclosed spaces shall be established by the Contractor prior to personnel entering the area. All employees working shall be made aware of the hazard and the procedure to be followed.

2.4.4 SAFETY LOCKOUT

A **written** safety lockout procedure shall be established prior to work on, or near, electrical equipment or lines, mechanical equipment, **conveyor systems,** pressure systems, and vessels, lines or equipment containing dangerous or hazardous material that can be energized, pressurized, activated, or released remotely or inadvertently. The procedure shall include provisions for lockout, tagging, blanking, or capping of controls, valves, and lines, or blocking of moving parts to prevent unauthorized operation. 2

A safety lockout procedure shall be required on all systems and equipment if unauthorized removal or return to service could result in injury, damage, loss of content, loss of protection, or loss of system operating capability. Where a safety lockout procedure is required, the foreman or leadperson shall be responsible for all clearances including the placing and removing of all locks, caps, and tags.

In tunnel or underground work, the Contractor shall inspect the roof, face, walls, and ground support system at the beginning of each shift and frequently thereafter. Any loose or dangerous ground shall be dislodged or adequately supported. Records shall be kept of such inspections by the

Contractor and a weekly report provided. The length of cracks or changes in movement of any surface shall be recorded each day and the differences shall be noted.

2.4.5 LASER PROTECTION

Lasers shall be located and targeted at levels above those of workers' sight, when possible. Eye protection shall be used when workers are exposed to laser sources greater than 5 mW (output should be on laser source) or to intensities greater than those permitted by the non-ionizing radiation standards of Cal-OSHA. **Standard warning placards shall be posted in areas where lasers are used.** 2 2

Under no circumstances shall a person be allowed to look into the laser source while using field glasses, binoculars, or survey equipment.

2.4.6 RADIOACTIVE MATERIAL

In the use, handling, or possession of radioactive material, the Contractor shall abide by regulations governing the use of **radioactive material.** These regulations are established by the State of California, Department of Public Health, Article 102, Standards for Protection Against Radiation; Labor Code Sections 6300 through 6604, and Health and Safety Code Sections 25800 through 25870. 2

2.5 FIRE PROTECTION

The Contractor shall comply with the recommendations of the National Fire Protection Association and applicable regulations of the City and County of Los Angeles and Cal-OSHA. Smoking shall not be permitted in the construction area unless designated as a specific smoking area. There shall be no exceptions. The specified smoking area shall be marked clearly, and all smoking and lighting materials shall be left in the area. The area shall be approved by Cal-OSHA, the Resident Engineer, and the Fire Department of the City and County of Los Angeles. "No Smoking" signs shall be posted in all prohibited areas. No smoking outside the specific permitted areas shall not be allowed, and any employee not complying shall be terminated immediately. 2

A survey shall be made of the suitability and effectiveness of fire prevention and protection measures and facilities existing at each project. Recommendations shall be retained on file at the project office, with a copy to the Safety and Security Manager.

Areas that have a high fire exposure shall be designated as hazardous and shall require a hot work permit issued by the Contractor's Project Manager **or Safety Representative** and approved by the Resident Engineer. The Cal-OSHA and City or County of Los Angeles fire regulations shall prevail. Leaving fires and open flame devices unattended is forbidden. 2

At least two means of exit, as remote as possible from each other, shall be provided for each floor of buildings, station boxes, or midline vent shafts that are equivalent to two stories below or aboveground. Precautions shall

be taken to protect form work and scaffolding from exposure to and spread of fire. Burning areas and dates of burn shall be established by written permit from local governing or regulatory officials.

Gasoline for vehicles and equipment shall be handled in an approved safety can (Cal-OSHA), and refueling shall be done with the equipment shut down. An approved fire extinguisher suitable for use on Class B (flammable liquids) fires, having a rating of at least 10-BC, shall be located within 50 feet of such equipment during refueling.

The Contractor shall conduct, or have conducted, an inspection of the entire operation immediately after the close of the normal workday (fire watch) to discover any smoldering or incipient fire and to correct any hazardous condition. Article 14 of the Cal-OSHA Tunnel Safety Orders shall be complied with, wherever applicable. Fires causing serious injury to personnel or threatening occupied tunnel workings shall be reported to the Safety and Security Manager, Cal-OSHA, RTD, and the DIA immediately upon discovery of the fire.

Suitable fire extinguishers or other fire protection equipment shall be provided at appropriate locations. This equipment shall be inspected at least monthly and maintained in operating condition at all times. **Los Angeles City or County** Fire Departments shall indicate **location of** water, standpipes, fire hoses, etc. The Contractor shall comply with City and County requirements on the use of standpipes, hoses, **or other fire protection equipment** in the tunnel.

All movable fire hazards shall be taken to a safe place or otherwise protected when welding, cutting, or heating occurs in tunnel work areas. Additional local ventilation shall be used during welding or cutting operations in confined spaces.

Fire extinguishers shall be provided and maintained in accordance with the recommendations of the National Fire Protection Association (NFPA), and the City and County of Los Angeles Fire Districts involved in the construction areas. Records shall be kept of services and maintenance of fire extinguishers on the jobsite and of all inspections on a monthly basis. (See Appendix 11, Inspection Schedule for Fire Protective Equipment.)

The Safety Representative shall check fire hazard areas during **daily** rounds of the project to assist in the overall fire prevention program. The security guard shall report any possible problem noticed during the security check. All fire fighting devices shall be compatible with equipment used by the local fire departments, and all safety and security personnel shall be trained in the proper use of the equipment. While welding or flame cutting is being done in compressed air work, a fire watch, with a firehose or approved extinguisher, shall stand by until the operation is completed.

Emergency telephone numbers and reporting instructions shall be posted conspicuously.

2.6 ELECTRICAL

2.6.1 TUNNELS, STATIONS, BOXES, AND GROUND LEVEL

All electrical work for the construction of this project shall be performed in accordance with the Electrical Safety Orders, Title 8, California Administrative Code, Chapter 4; Subchapter 4, the Construction Safety Orders; and Subchapter 20, Tunnel Safety Orders. Electrical wiring and equipment, which is to be used during construction work that shall extend over a period of more than 1 year, shall be installed to conform to the Electrical Safety Orders for permanent installations as covered in Title 8, Electrical Safety Orders. All work shall be performed by personnel familiar with code requirements and qualified for the class of work to be performed.

Live parts of wiring or equipment shall be effectively guarded to protect all persons or objects from harmful contact. Transformer banks or high-voltage equipment shall be protected from unauthorized access. Entrances not under constant observation shall be kept locked. Signs warning of high voltage and prohibiting unauthorized entrance shall be posted at entrances.

Built-up crossover protection shall be provided in all cases where operations require passage of foot traffic or equipment over energized lines. Gates or doors to enclosures for electrical equipment shall swing outward or provide clearance from installed equipment. Circuits and equipment shall be deenergized before work is started, and personnel shall be protected by safe clearance procedures and grounding. When there are no other means to do the work and when it is necessary to work on any energized line or equipment, adequate insulated or rated rubber gloves and other protective equipment shall be used as required **and shall be tested for leaks and insulating capabilities.** 2 2

Two or more workers shall be assigned to work on overhead lines in substations and power plants where the wiring is congested, where the work is at remote or isolated locations, at night, during inclement weather, or during the handling of energized conductors or apparatus. One employee shall be delegated to watch the movements of the employees doing the work so as to warn them if they get dangerously close to live conductors and render assistance in case of an accident.

Temporary power lines, switchboxes, receptacle boxes, metal cabinets, and enclosures around equipment shall be plainly marked to indicate the maximum operating voltage. Plugs and receptacles shall not be interchangeable between circuits with different voltage and current ratings. All circuits shall be protected against overload. All ground leads shall be in operational order. No ground wire shall be disconnected for any reason.

All electrical circuits shall be grounded in accordance with requirements of the National Electrical Code and the National Electrical Safety Codes (NESC). In addition, where hazardous concentrations of flammable gases, dust, or vapors exist, Article 59, item 2540.1, shall also be adhered to per NESC.

Portable and semiportable electrical tools and equipment shall be grounded by the use of a multiconductor cord having an identified grounding conductor and a multicontact polarized plug-in receptacle. Ground shall be provided for noncurrent-carrying metallic parts of such equipment as generators, switches, motor controller cases, fuse boxes, distribution cabinets, frames, tracks, motors of electrically operated cranes, electric elevators, metal frames of nonelectric elevators to which electric conductors are attached, and any other metal enclosure around similar electrical equipment.

Tools that are protected by an approved system of double insulation, or its equivalent, need not be grounded. Double-insulated tools shall be positively and distinctly marked and shall be of a type listed by the Underwriters' Laboratories, Inc. (UL) or Factory Mutual Laboratories. Temporary wiring shall be guarded or isolated by elevation to prevent accidental contact by workers or equipment.

The Contractor shall comply with the Grounding Requirements of the Cal-OSHA Electrical Safety Orders 2405.4, Subsections (c) or (d). In part, these Subsections state:

> "(c) All 120-volt, AC, single phase, 15- and 20-ampere receptacle outlets, which are not a part of the permanent wiring of the project and which are in use by employees, shall have Cal-OSHA-approved ground-fault circuit interrupters for personnel protection. Feeders supplying 15- and 20-ampere receptacle branch circuits shall be permitted to be protected by a ground-fault circuit interrupter approved by Cal-OSHA for the purpose.
>
> "Exception: Receptacles on a two-wire, single phase portable or vehicle-mounted generator rated not more than 5 kW, 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."
>
> "(d) The Contractor shall establish and implement an assured equipment grounding conductor program covering all 120-volt, AC, single-phase, cord set receptacles which are not of the permanent wiring of the project."

The Contractor must have on file, for inspection and copying by Cal-OSHA, CM, RTD, DIA, and any affected employee, a written description and specific procedures of the program described in (d) above. The Contractor shall designate a qualified person(s) to be responsible for this activity. A qualified person means one who, by reason of experience or instruction, has demonstrated familiarity with the operation to be performed and the hazards involved.

Vertical clearance above walkways shall be not less than 10 feet for circuits carrying 600 V or more.

Extension cords shall be of a type listed by the UL for the purpose for which they are intended. Extension cords with power outlets shall include a ground wire properly connected to the power outlet. Extension cords shall be protected against accidental damage that may be caused by traffic, sharp corners or projections, and pinching in doors or elsewhere. Extension cords shall not be fastened with staples, hung on nails, or suspended by wires. Bulbs attached to extension cords shall be protected by wire guards.

When temporary wiring is used in tanks or other confined spaces, an approved switch, properly identified and plainly marked, shall be provided at, or near, the entrance to such spaces for cutting off the current in emergencies. Overhead transmission and distribution lines shall be carried on towers and poles that provide safe clearances over roadways, structures, and other critical areas. All electrical power or distribution lines shall be placed underground in areas where there is extensive use of equipment having the capability of encroachment on the clear distances specified by Cal-OSHA.

Electricians working on or around circuits or equipment of 600 V or more shall be provided with, and shall use, hot-line tools. These hot-line tools shall be used only by reliable and experienced employees under the constant supervision of the foreman or by a thoroughly instructed and fully experienced leadperson, who shall give detailed instructions about the work performance and shall ensure that employees keep a safe distance from all line parts.

The electrician shall deenergize the circuit by opening the switch, and a lockout system shall be utilized. The foreman of the crew or trade going to work in the immediate area of the electrical hazard shall place a padlock on the open switch to prevent energizing the circuit and retain the key to the padlock until the crew has finished its work. Each foreman shall use a separate padlock and key to ensure the safety of the employees. Each foreman shall sign and personally attach an appropriate "Danger - Keep Out" tag on the locked out switch. Each foreman shall notify the electrician when the crew has finished its work. Only then shall the foreman remove the padlock and tag.

The Contractor shall not require or permit any employee to work in the proximity of energized high-voltage lines, unless, and until, danger from accidental contact with high-voltage lines has been effectively guarded against. The operation, erection, or handling of tools, machinery, apparatus, supplies, or materials or any part thereof over energized overhead high-voltage lines shall be prohibited (exceptions: (a) aircraft under Federal Aviation Administration regulations; (b) helicopter operation, Article 35, Construction Safety Orders, California Administrative Code, Title 8), and (c) tower cranes (hammerhead) installed and operating no closer than Cal-OSHA specified clearances).

Warning signs on all equipment that can be operated near high-voltage overhead lines shall state, "Unlawful to operate this equipment within 10 feet of high-voltage lines of 50,000 volts or less," and in smaller print the sign shall state, "For minimum clearance of high-voltage lines in excess of 50,000 volts see Article 37, Title 8, High-Voltage Electrical Safety Orders." All overhead high-voltage lines in a tunnel or station box in excess of 600 V shall be considered hot unless otherwise marked.

2.6.2 LIGHTING

Offices, workrooms, stairways, corridors, passageways, construction roads, working areas, and tunnels shall be adequately lighted while work is in progress or when needed to protect the general public and construction personnel from construction hazards. Minimum footcandles (fc) required for lighting are:

fc	Area
3	General construction, low activity
5	Outdoor active construction
5	Indoors (warehouses, hallways, and stairways)
10	General construction, shops, first aid, and offices

All lighting in compressed air chambers shall be exclusively by electricity, and two independent electric lighting systems with independent sources of supply shall be used. The standby or emergency source shall be arranged to become automatically operative if the regular source fails. All electric equipment and wiring for light and power circuits shall comply with requirements of the National Electrical Code, ANSI-CI-1971, for use in damp, hazardous, high-temperature, and compressed air environments. Tunnel lighting must be a minimum of 2 fc at floor and 5 fc at heading. Each worker shall have a portable, permissible hand or cap lamp wherever natural light is inadequate (Cal-OSHA Tunnel Safety Orders **Section 8415**). 2

All wiring shall comply with the latest edition of the National Electrical Code, Cal-OSHA, Federal, State, County and City of Los Angeles, and Cal-OSHA Tunnel Safety Orders where applicable. Consideration should be given to the selection and placement of lighting equipment that shall provide comfort, no direct glare, minimum reflected glare, efficiency for the purpose, no harsh shadows, well-lighted vertical and oblique surfaces, and safety to personnel in the presence of moisture or dangerous atmosphere.

2.7 USE AND HANDLING OF MATERIALS, EQUIPMENT, AND TOOLS

2.7.1 MATERIAL HANDLING, STORAGE, AND DISPOSAL

Unauthorized persons shall be prohibited from entering storage areas. No person shall be allowed in, or on, carriers while materials are being loaded or unloaded by cranes, dragline, or power shovel, except while hooking or unhooking loads.

Flammable liquids and grease shall be stored in a "No Smoking" area and separated by at least 50 feet from combustible materials. For additional requirements and restrictions, see fire ordinances of the City and County of Los Angeles.

Storing material on scaffolds or runways in excess of needs for normal placement operations, or in excess of safe load limits, is forbidden. Metal strapping and wires shall be cut only with a cutter that securely grips the strap or wire on both sides of the cut. When material is placed in, or

encroaches on, thoroughfares, it shall be located so as to present the least possible hazard to traffic and shall be adequately marked with proper warning signs, barricades, and lights.

All bags, containers, or bundles of materials shall be stacked, blocked, interlocked, and limited in their height so that they are stable and otherwise secured against sliding or collapse. Used lumber shall have all nails withdrawn before it is stacked for storage. The entire construction area shall be kept broom clean at all times.

Lumber shall be stacked so that it is stable and self-supporting. Bags of cement and lime shall not be stacked more than 10 bags high without setback, except when retained by walls of appropriate strength. The bags around the outside of the stack shall be placed with the mouths of the bags facing the center of the stack. During unstacking, the entire top of the stack shall be kept nearly level and the necessary setback maintained.

Loose bricks and concrete blocks shall be stacked on an even, solid surface. The masonry units in each course shall be laid at right angles to, and overlapping, the masonry units in the course below.

When a stack reaches a height of 4 feet, it shall be stepped back at the rate of 2 in. in every foot of height above the 4-feet level. Tops of stacks shall be nearly level and the stepback arrangement maintained during unstacking operations. Stacks shall not exceed 7 feet in height.

Pipes shall be stacked and blocked to prevent spreading or rolling. Separate stacks shall be made for each pipe size. Pipe, unless racked, shall not be stacked higher than 5 feet. Unloading of pipe, round piling, or poles shall be arranged so that no person is permitted on the unloading side of the carrier after the tie wires have been cut, or during the unlocking of the stakes.

Loose or light material shall not be stored or left lying on roofs or floors that are not closed in, unless safely secured. Tools, material, or debris shall not be strewn about in a manner that may cause tripping or other hazards. In tunnels and other underground work, oils and other dangerous flammable material shall be stored at least 100 feet from any shaft, exit, entrance, tunnel opening, or building over a tunnel opening and at least 100 feet from any powder magazine. LPG storage tanks shall be located away from tunnel openings to prevent the contents from flowing into the tunnel. For further requirements, see No. 8446 of Tunnel Safety Orders.

Oxygen bottles or cylinders shall be stored in areas away from oil and grease and protected against undue absorption of heat. Oxygen cylinders shall never be stored or transported near highly combustible materials, near other fuel gas cylinders, or near reserve stacks of carbide and acetylene, unless adequately separated.

Compressed gas cylinders in portable service shall be conveyed by suitable handtrucks, to which they are securely fastened, or safely carried where job conditions require. All gas cylinders in service shall be securely held in substantial fixed or portable racks, or placed so they shall not fall or be

knocked over. Gas cylinders transported by crane, hoist, or derrick must be handled in suitable cradles, nets, or skip boxes and shall **not** be lifted by magnet, rope, or chain slings. Cylinders must not be placed where they might form a part of any electric circuit. No attempt must be made to transfer acetylene from one cylinder to another or to mix gases in a cylinder. Empty cylinders shall be stored in an upright position where they shall not fall or be knocked over, and in areas according to the type of contents as marked on the cylinder. Empty cylinders shall be clearly tagged or marked as empty with valves cracked in an open position. For additional requirements and restrictions see Fire Ordinance for the City and County of Los Angeles.

2.7.2 WELDING AND CUTTING

The Contractor shall ensure that all employees are familiar with and comply with the following procedures when using welding and cutting equipment. Requirements as stipulated in Cal-OSHA Tunnel Orders shall be strictly enforced on all underground operations. Tunnel or underground welding, cutting, or other spark-producing operations shall be done only in atmospheres containing less than 20% lower explosive limit (LEL) and under the direct supervision of qualified persons. Tests for gas and vapors shall be made before the operation begins and continuously during the operation. Additional local ventilation is required when welding or cutting in confined spaces.

Eye protection shall be provided and worn **per Cal-OSHA standards for cutting and burning.** Eye protection shall be the proper lens shade for type of welding being done.

Welding and cutting operations shall not be permitted in, or near, rooms containing flammable or combustible vapors, liquids, or dust, as well as on, or inside, closed tanks or other containers that hold, or may have held, such materials until all fire and explosion hazards have been eliminated. Where welding or cutting must be done near combustible materials, special precautions shall be necessary to prevent sparks or hot slag from reaching such material and starting fires. If the work itself cannot be moved, the exposed combustible material should be relocated at a safe distance away, if possible. Otherwise, it should be covered with fireproof material.

When arc-welding in confined places, cover or arrange cables to prevent contact with falling sparks. Never change electrodes with bare hands or wet gloves, or when standing on wet floors or grounded surfaces. Keep welding cables dry and free of grease and oil to prevent premature breakdown of the insulation and keep cables stored in a dry, clean area when not in use. Cables shall be checked by the welder each time before use. Take special care to keep welding cables away from power supply cables or high-tension wires. Never coil or loop welding cable around the body. Worn cables shall be replaced or repaired.

Never put down a cutting torch until the gases have been completely shut off. Do not hang torches from a regulator or other equipment so that they come in contact with the sides of gas cylinders. If the flame has not been completely extinguished, or if a leaking torch ignites, it may heat the cylinder or even burn a hole through it.

Never merely turn off the gas supply at the torch. This leaves the hoses pressurized. Always cut the supply from the cylinder, bleed the lines, and with lines open, block off the regulator. Lines should then be coiled carefully while checking for weak spots in the lines; kinks should be avoided. Check the hose, connections on torch and cylinders, and regulator occasionally for leaks.

Use cylinders, particularly liquefied gases and acetylene, in upright position, secured against accidentally being knocked over. Unless cylinder valve is protected by a recess in the head, keep the metal cap in place to protect the valve when not in use. Do not use a cylinder of compressed gas without a pressure-reducing regulator attached to the cylinder valves unless cylinder is in a manifold group, in which case the regulator shall be attached to the manifold header.

Acetylene and liquefied fuel gas cylinders should be stored with the valve end up. If storage areas are within distances of 100 feet of each other and not protected by automatic sprinklers, the total capacity of acetylene cylinders stored and used inside a building should be limited to 2,000 cubic feet of gas. Quantities exceeding this total should be stored according to NFPA 58, Oxygen-Fuel Gas Systems for Welding and Cutting. Acetylene storage rooms must be well ventilated and open flames prohibited. No other material of any nature should be stored with them. Do not store empty or full oxygen cylinders in proximity to other flammable gases.

Cylinders stored in the open should be protected from contact with the ground and against extremes of weather and continuous direct rays of the sun. Cylinders are not designed for temperatures in excess of 130°F.

Accordingly, they should not be stored near sources of heat such as radiators or furnaces or near highly flammable substances.

Storage of cylinders should be planned so they shall be used in the order they are received from the supplier. Empty and full cylinders shall be stored separately, with empty cylinders being plainly identified. Cylinders that have held the same contents shall be grouped together.

2.7.3 PRESSURIZED EQUIPMENT AND SYSTEMS

Pressurized equipment and systems shall be inspected and tested before being placed in service, after alterations or modifications, and at intervals of not more than 6 months. Permanent installations shall be inspected and tested at least once annually in accordance with requirements of the American Society of Mechanical Engineers Code for Unfired Pressure Vessels and the American National Standards Institute (ANSI) B31.1-1973. Pressurized equipment shall be operated and maintained only by qualified and designated personnel of the Contractor using the system or equipment. Records shall be filed in the Contractor jobsite office and shall be available to RTD, the Safety and Security Manager, Cal-OSHA, and the DIA.

Compressed air tanks shall comply with all applicable safety orders of Article 3 of the Unfired Pressure Vessel Safety Orders, Title 8, California Administrative Code, applying to tank design, safety devices, and operating permits. When portable compressors on wheels stand unattached to other equipment, they shall be positively locked, blocked, or otherwise adequately prevented from rolling. The following specifications shall also apply:

(1) Fans shall be guarded with a shroud or side screens.

(2) Compressed air tanks shall be drained of liquid as recommended by the manufacturers' specifications. This shall normally be done not less than once a day, unless special design features require another time interval.

(3) Compressor safety valves shall be popped at least weekly and recorded in the equipment maintenance record by the Contractor's maintenance personnel.

Discharge from safety valves, relief valves, and blowoffs shall be oriented so that **they do** not constitute a hazard to employees. 2

Fired pressure vessels operating at a pressure in excess of 15 psi shall be inspected annually for conformity with the rules under which they were built. Inspections shall be made by the Contractor's qualified maintenance personnel, and records shall be entered on the equipment maintenance record. Compressed gas cylinders shall be constructed, inspected, and tested in accordance with Interstate Commerce Commission requirements. Handling and storage of compressed gas cylinders requirements as stated by Cal-OSHA **standards** shall be complied with. If there are conflicting requirements 2
with Federal, State, County, and City of Los Angeles, the more stringent regulation shall apply.

2.7.4 SLINGS, ROPES, AND CHAINS

All rope to be used for regular hoisting shall be wire rope providing a safety factor not less than 5 when new. This shall be calculated by dividing the breaking strength of the wire rope, as given in the manufacturer's published tables, by the total load to be hoisted including the total weight of the wire rope in the shaft when fully let out, plus a proper allowance for impact and acceleration. The acceleration allowance **shall** be in accordance with the manufacturer's recommendations, but in all 2
cases, the safety factor of 5 or more must be maintained.

For wire rope fastenings, see the chart in **General Industry Safety Orders,** 2
Title 8.

All wire rope used for hoisting and lowering employees shall be checked once every 3 months by cutting a section from the lower end of said rope not less than 5 feet in length and having it examined carefully, both externally and internally, for indications of wear, corrosion, fatigue, and breaks. Spliced wire rope shall not be used except that the end may be attached to the load by the thimble-and-splice method as described by Cal-OSHA.

All hooks used for the support of human loads, and loads that may pass over workers, shall be closed with swing or snap-type latches. The use of an open hook is prohibited.

Installation, maintenance, repair, and inspection of ropes, chains, slings, fittings, and connections shall be done only by a qualified person. When such equipment is in use, daily inspections shall be made and noted in the Inspection Log by a qualified person employed by the Contractor.

Hooks, shackles, rings, pad eyes, and other fittings that show excessive wear, elongation, or have been bent, twisted, or otherwise damaged shall be removed from service. Excessive wear is defined as the condition where the original strength has been reduced by 20%.

During operation, no less than two full wraps of wire rope on the drums of all hoisting equipment shall be required for the movement of materials. All personnel hoists shall comply with Article 14, Regulation 1604 (1604.1 through 1604.30) of the California Administrative Code, Title 8, Chapter 4, Subchapter 4, Construction Safety Orders. Hoisting ropes and similar moving ropes in exposed locations within 7 feet of the ground or floor, except for free end sections, shall be guarded, enclosed, or fenced with standard railings.

U-bolt clips shall have the U-bolt section on the dead or short end, and the saddle shall be on the live or long end of the rope. Spacing and number of all types of clips shall be in accordance with the clip manufacturer's recommendation. In no case shall less than three such clips be used. The clips shall be spaced at a distance equal to a distance of at least six times the diameter of the rope. All clip or clamp bolts shall be kept tight. Swagged, compressed, or wedge socket fittings shall be applied as recommended by the rope, crane, or fitting manufacturer.

For safe capacity, load limit, safe working loads for shackles, strength of eye hooks, efficiency of wire rope connections, and wire rope clips, refer to the Division of Industrial Safety, Construction Safety Orders, Appendix C, Plates C-1 through C-10.

Wire rope slings shall be made from improved plow steel, or its equal, in lieu of plow steel and mild plow steel. The strands shall be preformed wire rope. The core shall be an independent wire rope in lieu of fiber. Use of defective slings is forbidden. Proper storage shall be provided for slings, chains, and wire rope while not in use.

Safety factors and load limits for manila, nylon, polyester, and polypropylene rope slings are shown in the Construction Safety Orders, Appendix, Plate C-8, a, b, c, d, and Plate C-9.

Manila or synthetic fibers may be used in hoisting or load-carrying service, except that such fibers shall not be used to support scaffolds upon which workers are using welding or burning equipment, other open flame equipment, sandblasting equipment, or chemicals, i.e., acids, strong alkali, drying oils, thinners, or paints.

Fiber rope shall be protected from abrasion by padding where it is fastened or drawn over square corners or sharp, abrasive surfaces. When a fiber or synthetic fiber rope has been in use for 6 months or longer, even though it shows no signs or indications of wear or damage, it shall be limited to one-half the breaking strengths shown in Cal-OSHA tables.

Chains, hooks, rings, oblong links, pear-shaped links, coupling links, and other attachments used in hoisting or load-carrying service shall be made of alloy steel or equal. Alloy steel chains shall not be annealed. 2

Chains shall be removed from service when there is permanent deformation caused by wear and overloading and when the original length of chain is exceeded by more than 5%; when links are badly bent, twisted, nicked, and gouged, and when there is binding at the bearing point of any link. Chains used in load-carrying services shall be inspected before each initial use and weekly thereafter. (See the Appendix for documentation of safety factors on ropes, slings, and chains.)

2.7.5 HAND TOOLS, ELECTRICAL TOOLS, AND POWDER-ACTIVATED TOOLS

All hand tools shall be kept in good repair and used only for the purpose for which intended.

The Contractor shall not permit any employee to use a powder-activated tool until the employee has received training as prescribed by the manufacturer and carries a valid operator's card for that tool. A person who is receiving training may be permitted to operate a powder-activated tool when under the direct supervision of a qualified instructor. (An instructor is one authorized by the tool manufacturer.) The tool shall be used only on flat surfaces in which no possibility of shooting through the material is present.

Each powder-activated tool must be approved by Cal-OSHA and meet the design requirements of ANSI A10.3-1972. Each approved powder-activated tool shall bear some legible and permanent indication as to its model and serial number. This shall serve as a means of identification for checking approved tools.

The powder-activated tool shall be serviced and inspected for worn or damaged parts at regular intervals as recommended by the tool manufacturer. All worn or damaged parts shall be replaced by a qualified person and records kept accordingly.

The powder-activated tool shall not be used in an explosive or flammable atmosphere. Eye or face protection shall be worn by operators and assistants when the powder-activated tool is in use.

Powder load packages shall provide a visual number-color indication of the powder level. Only load packages designated for use in that specific tool shall be used. No interchanging of cartridges shall be allowed.

A sign at least 7 in. x 10 in. using bold face type no less than 1 in. in height, shall be posted conspicuously within 50 feet of the area where the tools are being used. The sign shall bear wording similar to the following: POWDER-ACTIVATED TOOL IN USE. Signs shall be removed promptly when no longer applicable.

Concrete troweling machines, the powered (electrical or otherwise), rotating-blade type that are guided manually, shall be equipped with a control or switch that shall automatically shut off the power whenever the operator's hand is removed from the equipment handle.

Tools shall not be left on scaffolds, ladders, or overhead levels. When airhose, water hose, electric cable, or other equipment of this type is used on staging by a worker, it shall be securely fastened to a substantial anchorage independent of the worker.

All pneumatically driven nailers and staplers that operate at more than 100 psi shall have a safety device on the muzzle to keep the tool from operating unless the muzzle is in contact with the surface to prevent accidental discharge. When not in use, the nailers and staplers shall be disconnected from the air supply.

Oxygen or other gasses shall not be substituted for compressed air to drive pneumatic tools. 2 2

All air hoses exceeding 1/2-in. inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure or disconnect.

All handheld powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than 2 in. in diameter, disc sanders, belt sanders, reciprocating saws, saber saws, and other similar operating powered tools shall be equipped with a momentary contact on-off control, and may have a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on. All prescribed safeguards shall be in place during operations of handheld power tools. Spring-activated guards shall not be blocked or otherwise circumvented.

All other handheld powered tools such as circular saws, electric, hydraulic, or pneumatic chain saws, and percussion tools without positive accessory holding means, shall be equipped with a constant pressure switch that shall shut off the power when the pressure is released, with the exception of concrete vibrators, concrete breakers, powered tampers, jackhammers, rock drills, and similar handheld power tools.

At no time shall the manufacturer's safe operating procedures for hoses, valves, pipes, filters, and other products be exceeded or ignored. The ends and each joint of airhoses 1 in. in diameter or over shall be chained or secured, as necessary, to prevent whipping in the event of a disconnected hose, unless a suitable ball check device or equivalent is provided at the air source.

2.7.6 MOTOR VEHICLES - MACHINERY AND MECHANIZED EQUIPMENT

Cal-OSHA Tunnel Safety Orders shall be adhered to at all times in all underground work on the project depending on the classification of the tunnel as it relates to the gaseous conditions encountered and reported by the geologist and determined by Cal-OSHA. Every Contractor is expected to be well aware of the requirements and conditions as set forth in these regulations.

The use of fuel-burning or internal combustion engines, or locomotives, underground is prohibited, except for diesel engines when and where permitted in writing by Cal-OSHA Senior Tunnel Engineer and under conditions specified for each section or specific areas of the project (Cal-OSHA Tunnel Safety Orders, Article 7, Regulation 8470).

Transportation of explosives underground, if not on a rail truck, shall be by a truck-type vehicle other than those with dump bodies. They shall be especially equipped for transporting explosives and shall be carefully maintained. They shall be equipped with closed compartments for the explosives. The compartments shall be lined with nonconductive materials.

Each side, front, and rear of every truck-type vehicle, when transporting explosives, shall bear a sign with the word "EXPLOSIVES" in letters not less than 4 in. high with a 5/8-in. stroke on a background of sharply contrasting color. The truck-type vehicle, when transporting explosives underground, shall be equipped with a flashing red light visible from the front and rear.

Trackless vehicles that are transporting explosives shall not contain rock or other material or equipment, except those used in blasting. Only the vehicle operator and blaster shall be permitted to ride on any vehicle transporting explosives.

Explosives that are transported manually from one area to another shall be placed in suitable bags or other containers for such transportation. Detonators and primers shall be transported in separate bags or containers from other explosives.

A. Safety Requirements for Traffic Control and Haulage Vehicles

Where there is reason to believe that a serious hazard exists to employees because of traffic or haulage conditions, a system of traffic control may be required that is satisfactory to CM, RTD, Cal-OSHA, Los Angeles Police Department, County Sheriff, and California Highway Patrol (see State Department of Transportation Manual of Traffic Control). No vehicle shall be driven at a speed greater than is reasonable and proper, with suitable regard for weather, traffic, type of motor vehicle, and any other existing condition.

All haulage vehicles shall be equipped with brakes that are adequate to stop and hold the vehicle stationary on any grade that it can climb under its own power within the limit of traction of the braked wheels. Each braking device shall be in compliance with the current applicable California Vehicle Code and shall be maintained in good condition.

Vehicles hauling hazardous materials shall be covered, as necessary, to prevent spillage.

Every truck with a body capacity of 2-1/2 yd^3 or more that is used to haul dirt, rock, concrete, or other construction material shall be equipped with a warning device that operates automatically while the vehicle is backing. The warning sound shall be of such magnitude that it will normally be audible from a distance of 200 feet. Where conditions warrant, a flagperson in clear view of the operator, shall direct the backing operations.

B. Miscellaneous Construction Equipment

Before any equipment is put into use on the job, the Contractor shall determine that it is in safe operating condition. In addition, the operator shall check the safe operating condition of the equipment before commencing work each day. Records of tests and inspections made by a competent mechanic who performs such service shall be available on the project site.

During course of construction, any equipment found to be in an unsafe operating condition shall be tagged "OUT OF SERVICE - DO NOT USE" by the Contractor at the operator's position, and its use shall be prohibited until the unsafe condition has been corrected.

Equipment, machines, and motor vehicles shall be operated only by qualified and authorized personnel.

All belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating, or moving parts of equipment and machinery shall be guarded if such parts are exposed to contact by persons or otherwise create a hazard. All hot surfaces of equipment and machinery shall be suitably guarded or insulated.

Platforms, footwalks, steps, handholds, guardrails, and toeboards shall be provided on equipment and machinery as necessary to ensure safe footing and accessways.

All mobile equipment shall have adequate headlights and taillights when operating in darkness. Rollover protective devices shall comply with Cal-OSHA Article 10, Regulation 1596, and shall be installed in an approved manner.

C. Hoisting Equipment

On the hoist that handles personnel, the hoist control shall return to the stop position when the hand of the operator is removed from the control lever. The brakes shall be applied automatically and the power cut off whenever the control lever is in the stop position. All hoisting equipment shall be tested before it is placed in operation to verify that it performs properly. Cal-OSHA shall witness and approve this test.

The Contractor shall comply with Cal-OSHA requirements for testing and recording maintenance on, and inspection of, all hoisting equipment.

Climbing tower and traveling hammerhead cranes shall be designed, assembled, erected, tested, inspected, operated, maintained, repaired, and dismantled in accordance with manufacturers' recommendations, or the requirement of Cal-OSHA, whichever is the more stringent. A copy of each manufacturer's manual, written in English, shall be available to CM or CM representative at all times.

Construction, operation, and maintenance of hoists shall be in accordance with ANSI's Safety Requirements for Personnel Hoists, A10.4-1975; Safety Requirements for Material Hoists, A10.5-1975, and manufacturers' specifications. Permanent elevators shall comply with requirements of ANSI's Safety Code for Elevators, A17.1-1971, Inspector's Manual of Elevators, A17.2-1973, and California Administrative Code requirements.

Emergency hoisting facilities shall be readily available at shafts more than 50 feet in depth, unless hoisting facilities are provided that are independent of electrical power failures.

Continuous hoist maintenance and monthly inspections shall be established and enforced by the Contractor. This inspection program shall cover, but is not limited to, such parts as ropes, sheaves, brakes, clutches, safety dogs, guides, shaftway closures, and general structural stability. Records shall be kept for all inspections and required maintenance. The records shall be maintained at the jobsite until completion of the project.

D. Miscellaneous Tunnel and Station Lightning Arrestor and Inspection

For protection of equipment, electrical machinery, and employees underground, each wire in each power or main lighting circuit that leads underground and extends over the surface of the ground 500 feet or more from the generating station or the substation shall be equipped with a lightning arrestor with proper ground connections at the generating station or substation and also at, or near, the point where the circuit enters underground. The lightning arrestor shall be connected to the secondary side of the transformers that feed circuits leading underground, unless the portion of the secondary circuit aboveground is less than 50 feet long, in which case the arrestor may be connected to the primary side of the transformer.

2.7.7 SCAFFOLDS, PLATFORMS, RAMPS, FLOOR AND WALL OPENINGS, FORM, AND FALSEWORK

It is preferred that scaffolds, platforms, ramps, runways, temporary floors, temporary stairs, or other temporary structures be provided to support workers, materials, or equipment when necessary at elevated workplaces. Such structures shall be designed, constructed, and maintained to provide a safety factor not less than 4. They shall be kept free of grease, mud, and any other substance that could create a safety hazard. Abrasive materials shall be used on slippery surfaces to ensure safe footing. Scaffolds and work platforms shall be adequately secured at appropriate levels and outriggers extended and stabilized where used.

Safety belts or harnesses having lifelines connected to a safety line with a rope grab, or other suitable fall-arresting devices, shall be used on all swinging scaffolds and boatswain chair operations. The safety line shall be secured to prevent whipping of the line by strong winds.

Safety nets shall be used where no other means are practical. They shall comply with applicable Cal-OSHA standards at all times. The Resident Engineer shall approve nets prior to installation and use.

Stairs, ramps, runways, ladders, or other safe means of access shall be provided to all work areas. Where a built-in ladder is part of a scaffold system, it shall conform to requirements for ladders as stated by Cal-OSHA.

Employees, the public, and property shall be protected from falling objects. The overhead protection shall be not less than 7 feet nor more than 9 feet above the protected surfaces and of sufficient strength to withstand the load or impact likely to be imposed. Where the City or County of Los Angeles requirements are more stringent, the Contractor shall comply accordingly.

Bridges, ramps, and temporary decking used jointly by pedestrians and motor vehicles shall have travelways for each. All floor and roof openings for stairwells, pits, shaftways, and openings in shaftway enclosures shall be provided with adequately secured guardrails constructed in accordance with Cal-OSHA standards. A temporary plank floor shall be provided in all shaftways and for skeleton beam construction where the permanent floor or floor forms are not yet in place.

The exposed edges of floors 6 feet or more above any adjoining surface and the roof around the exterior or interior perimeter of buildings shall be protected by a 3/8-in.-diameter wire rope, or equal. Such protection shall be secured along the inside of columns or on shores or posts not to exceed 10 feet apart. It shall be maintained in a taut position not over 45 in. or not less than 42 in. above the floor. Strips of cloth or weatherproof fabric approximately 2 in. wide and 12 in. long shall be hung from the cable at approximately 5-foot intervals. The completed installation shall be able to withstand a load of 200 lb applied in any direction at any point along the cable. The cable shall remain in place until more suitable barricade or railing is provided.

Stairway and ladderway entrances shall be offset, or provided with a gate, to prevent anyone walking directly into the opening. Fixed ladders shall not extend more than 20 feet without a platform break or cage enclosure. Every hatchway and chute floor opening shall be guarded by a hinged floor opening cover, and the floor opening shall be guarded with railings permanently attached so as to leave only one exposed side.

All wall openings shall be guarded if the lower edge of the opening is within 4 feet of the adjacent floor or other surface.

The construction, maintenance, and use of temporary metal access stairways or stair towers shall be in accordance with recommendations of the Steel Scaffolding and Shoring Institute, Cal-OSHA, and RTD and approved by the Resident Engineer.

In construction of jobsite scaffolding, refer to diagrams and requirements as specified by Cal-OSHA, Construction Safety Orders. There shall be no exceptions to these requirements where applicable.

Safe means of access shall be provided to all work areas. Accessways shall be kept clear of operating or construction materials, or debris that would obstruct a passage or cause a tripping hazard. Accessways shall be kept clear of mud, grease, or other material that may hinder safe passage. Sand, cinders, or other material to control slipping hazards shall be used on slippery surfaces that cannot be avoided or cleared.

All obstructions or projections into an accessway or passageway shall be conspicuously marked or removed. Obstructions or projections into accessways or passageways that are pointed, sharp, or of any other shape that may cause lacerations, contusions, or abrasions shall be covered with resilient materials if they cannot be removed.

Entrances, portals, or other primary accessways or passageways shall have overhead protection equal to 2-in. solid planking, whenever work is performed over the entrance or if there is unsecured material above that cannot be removed or relocated.

Ramps, steps, or walkways complete with guardrails, intermediate rails, and toeboards shall be provided for temporary access to buildings or structures under construction.

2.8 COMPRESSED AIR AND TUNNEL WORK

Where tunnel work is carried out under air pressure in excess of atmospheric pressure, the Cal-OSHA Compressed Air Safety Orders apply and shall take precedence over any Tunnel Safety Orders that are in conflict. The Division of Industrial Safety's Tunnel Safety Orders, Title 8, Chapter 4, Subchapter 20, establish minimum safety standards in places of employment at tunnels, shafts, raises, underground chambers, and premises appurtenant thereto during excavation, construction, alteration, repair, renovation, and demolition.

The Safety and Security Manager, the DIA, and Cal-OSHA shall be notified of contract award, and a prejob safety meeting shall be held with the Contractor and subcontractors before work begins on any job on the Metro Rail Project.

Cal-OSHA shall classify all tunnels or portions of tunnel contracts into one of the following classifications:

(1) Nongassy
(2) Potentially gassy
(3) Gassy
(4) Extra hazardous

For MOS-1, Cal-OSHA has classified tunnels as gassy.

2.8.1 OPERATION OF GASSY AND EXTRA HAZARDOUS TUNNELS

Cal-OSHA shall be advised before electrical equipment is installed or used in places containing methane gas or other explosive gases. Any installation or operation shall comply with Title 24, Part 3, California Administrative Code, and may be subject to special orders issued by the Division of Industrial Safety, State of California.

Tunnels shall be constructed in accordance with Cal-OSHA Tunnel Safety Orders, Chapter 2, Gassy and Extra Hazardous Tunnels. Sections 7965 to 7976, 7980, 7984, 7985, and 7996 shall also apply.

Smoking shall be strictly prohibited, and the employer shall be responsible for collecting all personal sources of ignition, such as matches and lighters, from all persons entering the tunnel or performing underground work. Welding, cutting, or other spark-producing operations shall only be done in atmospheres containing less than 20% LEL and under the direct supervision of a qualified person. Tests for gas and vapors shall be made before these operations start, and shall be made continuously during operations.

Automatic and manual gas-monitoring equipment shall be provided for the heading and return air in tunnels using mechanical excavators. The monitor shall signal both audibly and visually, the heading and shall shut down electrical power in the tunnel, except for ventilation equipment, when 20%, or more, LEL is encountered or assumed to be present. In addition, a manual shutdown control shall be provided near the heading.

In tunnels driven by conventional drill-and-blast methods, the air shall be tested for gas prior to reentry after blasting and continuously when workers are working underground. Records of gas tests and airflow measurements shall be maintained on the surface by the employer and shall be made available on request to CM, RTD, and Cal-OSHA. Ventilation systems shall exhaust flammable gas or vapors from the tunnel, shall be provided with explosion-relief mechanisms, and shall be constructed of fireproof materials.

A refuge chamber or alternate escape route shall be maintained within 5,000 feet of the face of a tunnel classified as gassy or extra hazardous or according to any specific requirements stated by Cal-OSHA Tunnel Division. Workers shall be provided with emergency rescue equipment and trained in its use. Refuge chambers shall be equipped with a compressed air supply, a telephone, and a means of isolating the chamber from the tunnel atmosphere. The emergency equipment, air supply, and rescue chamber installation shall be acceptable to the Cal-OSHA Tunnel Division. A general plan of action for use in time of emergency shall be prepared by the Contractor of every tunnel under construction or major repairs, posted in areas where employees congregate (Tunnel Safety Orders, Article 9, 8426), and coordinated with CM's Project Emergency Plan.

2.8.2 OTHER TUNNEL OPERATIONS

Fresh and pure drinking water shall be available to employees during working hours. Unless employees are required to use outside toilet facilities exclusively, an ample number of dry or water closets shall be provided at all main working areas. Separate facilities shall be provided for men and women, where required.

Clear, unobstructed walkways shall be maintained throughout the tunnel. The walkway shall be located on the lighted side of the tunnel, unless other conditions preclude using this side.

2.8.3 SAFETY TRAINING REQUIREMENTS FOR GASSY AND EXTRA HAZARDOUS TUNNELS

The Contractor shall provide all employees working in a tunnel classified as "Gassy" or "Extra Hazardous," as specified by Cal-OSHA, with not less than eight hours of a tunnel safety training program, prior to the employee commencing work. A Certificate of Completion shall be issued to those successfully completing this course. This program shall be approved by U.S. Department of Labor, Mine Safety and Health Administration, or Cal-OSHA Mining and Tunnel Division.

A person that holds a Certificate of Completion of an approved safety course in Gassy and Extra Hazardous Tunnel Operations within the prior 12 months shall not be required to take this training program, but shall be required to take a four hour refresher course within 24 months of the certificate date and every 24 months thereafter. The eight hour tunnel safety training program shall include, but not be limited to, the following subjects:

(1) Mine Gases

Explosive and toxic effects. Means of detection, identification, analysis, and legal requirements for each gas found in the tunnel atmosphere and methods used to control tunnel (mine) gases.

(2) Personal Protective Equipment

Various devices used, why they are needed, where they are needed, and how to care for the equipment.

(3) Fire Safety

Procedures to prevent fires and protect life and property when fires do occur.

(4) First Aid

Specific measures to apply to a wide variety of specific injuries and disorders. Basic CPR (Cardio-Pulmonary Resuscitation) and methods to stop bleeding and control shock.

(5) Tunnel Accident Prevention

Introduction to the causes and prevention of tunnel accidents.

(6) Tunnel Rescue and Emergency Training

Show in a step-by-step manner, the proper use of breathing apparatus.

2.9 USE AND HANDLING OF EXPLOSIVES

2.9.1 EXPLOSIVES

Cal-OSHA **General Industry Safety Orders, Group 18** shall be adhered to. 2

Blasting at tunnels, construction, demolition, and similar operations or projects requires licensed blasters with a current, valid California Blaster's License. The license, or a copy of the license, must be physically present on the site and shown on request. The Contractor shall also obtain permits and licenses as required by the City and County of Los Angeles.

In the event of a blasting accident or an unusual occurrence affecting the safety of workers in which explosives are involved, whether or not personal injury is sustained, the employer shall forward a report of the incident, within 24 hours, to Cal-OSHA, with a copy to the Safety and Security Manager who will, in turn, notify RTD and the DIA.

When appropriate, owners, occupants, and the public shall be notified of the nature of operations to be undertaken, as well as the controls to be established, only by RTD's Office of Community Relations or designated representative. The Contractor shall refrain from any comment that is not approved by CM and RTD, where the general public is involved.

All damages to the general public caused by blasting operations, whether real or alleged, shall be reported immediately to the Safety and Security Manager, and a written report shall be made within 24 hours of the Contractor being made aware of the potential damages or claim by the general public. The Construction Manager shall notify RTD and the DIA immediately after notification by the Contractor.

2.9.2 DEMOLITION

Demolition includes all operations performed in connection with the dismantling, demolishing, and removal of existing buildings, structures, and their equipment and utilities. The Contractor shall submit a plan of procedures for the demolition of a structure to CM for review prior to commencing work. For regulations relating to permits for demolition, refer to Article I, Section 1503 of the Cal-OSHA Construction Safety Orders, and the County and City of Los Angeles, where required.

Prior to starting demolition operations, all structural floor members shall be thoroughly inspected by the Contractor's properly qualified persons to determine that they are safe before workers are sent overhead to work. During demolition, continuous inspections shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, walls, or loosened material. No worker shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means. No worker shall be required or permitted to stand or work on the top of any wall more than 7-1/2 feet high on either side, unless protected by railed platforms, safety belts, or equivalent protection (see Article 31, 1735(d), Cal-OSHA Construction Safety Orders).

Provisions for dust control shall include the use of water to keep material or debris sufficiently wet, or other equivalent steps taken to prevent dust from rising (see Construction Safety Orders, Article 31, 1735, City and County of Los Angeles, environmental regulations). Suitable fire extinguisher equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use. (Reference Article 36, Cal-OSHA Construction Safety Orders; Cal-OSHA Tunnel Safety Orders, Article 14, pp 684.25 and 684.26; RTD's Fire/Life Safety Committee, and the City and County of Los Angeles Fire Marshal.

2.9.3 TUNNEL AND SHAFT WORK

In tunnel or underground work, the Contractor shall inspect the roof, face, walls, and ground support system at the beginning of each shift and frequently thereafter. Any loose or dangerous ground shall be dislodged or adequately supported. Records shall be kept of such inspections by the Contractor and a weekly Report provided. The length of cracks or changes in movement of any surface shall be recorded each day and the differences noted.

A weekly inspection of all shafts shall be made by a qualified contractor person, and reports made and kept on file for review by the CM staff, RTD personnel, the DIA and Cal-OSHA. (See Appendix A-23 for Shaft Inspection Report Form).

The crane, hoist, or elevator operator shall make a daily inspection of all hoisting machinery or equipment and related safety appliances. Any hazard noted should be corrected immediately and so documented.

2.9.4 HAZARDOUS SUBSTANCES (GENERAL)

Prior to performing any work involving hazardous substances, the Contractor shall develop a Hazard Communication program in accordance with the requirements of Section 5194, General Industry Safety Orders. This applies to any hazardous substance which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions or use of use or in a reasonably forseeable emergency.

Section 5194 General Industry Safety Orders refers to labeling, MSDS', employee information and training, etc.

The source list of hazardous substances now includes the Director's List of Hazardous Substances (Section 339); OSHA's "Toxic and Hazardous Substances," 29 CFR, Part 1910, Subpart Z; ACGIH's "Threshold Limit Values for Chemical Substances in the Work Environment," 1984; NTP's "Third Annual Report on Carcinogens," 1983; IARC's "Monographs," Vols, 1-34; and any other substance which is a physical or health hazard. 2 2 2 2 2 2

SECTION 3

MEDICAL, EMERGENCY, AND ACCIDENT REPORTING

3.1 MEDICAL FACILITIES AND REQUIREMENTS

At all shafts and tunnels, a sufficient number (as specified by Cal-OSHA) of the Contractor's foremen and workers shall be certified in first aid by the U.S. Bureau of Mines, or the American Red Cross, or equivalent training, shall be available to render first aid. At least one person in each remote crew shall be trained in first aid. All supervisors, and at least one person on each tunnel crew, shall have had first aid training within the past two years and be competent to give proper emergency treatment. Each Contractor shall provide all required first aid and medical services for job-associated injured or ill employees, and shall comply with Cal-OSHA Tunnel Safety Order 8420.

For other than tunnel work, each Contractor shall have a properly qualified, designated, and equipped first aid attendant available onsite during all working hours. The minimum of first aid supplies shall be determined by an employer-authorized, licensed physician, or in accordance with the minimum requirement established by Cal-OSHA, Article 1512, Construction Safety Orders, or No. 8420 of the Tunnel Safety Orders, whichever is applicable.

The Contractor shall post at every telephone and bulletin board, and ensure that each supervisor is aware of, the location of the nearest available hospital, ambulance, fire department, and Paramedics.

Every injury shall be reported and entered in the Cal-OSHA log, and an annual summary of injuries must be reported during the month of February.

3.2 ACCIDENT, INJURY, AND ILLNESS REPORTING

3.2.1 WORKMEN'S COMPENSATION CLAIMS

Workmen's compensation claims shall be reported in accordance with Construction Insurance Specification requirements as indicated in the Contract Specifications.

3.2.2 SUPERVISOR'S REPORT OF ACCIDENT

A form shall be submitted by the Contractor for each job-related accident involving:

(1) Lost-time injury to a Contractor's employee or any subcontractor, regardless of tier.

(2) Any injury to persons not directly connected to the project, including any alleged injury reported by any person from the general public.

Submittal shall be made as soon as possible, but no later than, 48 hours after the accident. Pertinent facts that are not immediately known shall be submitted as soon as available in a supplemental report. The involved Contractor shall retain the original report and submit copies to the Resident Engineer, the Safety and Security Manager, and the DIA. These forms shall be supplied by the DIA.

3.2.3 REPORT OF ACCIDENT OR DAMAGE TO EQUIPMENT OR PROPERTY

A report shall be prepared to report damage to equipment or property. This report shall be prepared from information gathered during investigations or from direct reports of the persons involved. The report shall be prepared completely and promptly by the Contractor/Subcontractor, who shall retain the original and submit copies to the Resident Engineer, the Safety and Security Manager, and the DIA. Reports shall be completed on forms provided by the DIA.

When there is alleged damage to private property, the property owner shall be referred to the Resident Engineer who, in turn, shall have the Contractor's Safety Representative complete the proper reporting form. Originals of this form shall be sent to the DIA, the Contractor/Subcontractor alleged to have been involved, and the Safety and Security Manager. Opinions shall not be expressed to the owner, nor admissions made of responsibility. The responsible party shall be determined by the insurance investigation, or a court of law. If the situation merits an immediate contact, the Resident Engineer shall telephone the DIA for further handling of the problem. For additional requirements by the DIA, see Construction Insurance Specifications.

3.2.4 MONTHLY INJURY AND ILLNESS EXPERIENCE SUMMARY

A form shall be submitted monthly by the Contractor to report accidents. It shall be the Contractor's responsibility to ensure that the Contractor's report includes the subcontractor reports. The Contractor shall retain the original report and submit copies to the DIA and the Safety and Security Manager. This report must be provided no later than the tenth day of the month. If the tenth day is a nonworking day, the report must be provided before the last working day prior to the tenth day of the month. Copies of all reports to Cal-OSHA, the DIA, or other involved agencies shall be sent to the Safety and Security Manager.

3.2.5 SUPERVISORS' AND FOREMEN'S SAFETY MEETING REPORT

This report shall be prepared after each toolbox and supervisors' safety meeting, and copies shall be sent to the Safety and Security Manager and the DIA.

3.3 POISONOUS AND HARMFUL SUBSTANCES

A Cal-OSHA-approved gas tester, hired by the Contractor, shall, as required by Cal-OSHA, identify and measure atmospheric impurities. All dust, mists, fumes, gases, or other atmospheric impurities in areas where persons are employed shall be brought within safe limits by elimination, ventilation, or

filtration. Where such methods are impractical, appropriate protective equipment shall be provided. (Safe limits shall be those recommended by the latest edition of Threshold Limit Values, published by the American Conference of Governmental Industrial Hygienists.) Where irritant or toxic substances may come into contact with skin or clothing, protective equipment and sanitary facilities shall be provided. CM shall perform random checks to verify adequacy of the Contractor's measurements.

After the installation of contaminant controls, and periodically thereafter, the design and efficiency of the control equipment, devices, or methods shall be verified by the Contractor, and records shall be kept on the project site. These records shall be made available to the Resident Engineer, the Safety and Security Manager, and RTD's representatives, upon request.

Air-cleaning equipment shall be located to permit the removal of dust or other collected material without creating a hazard, and to allow for cleaning and repairing the apparatus without recontaminating the general atmosphere.

Operations or processes that generate different kinds of dust, fumes, or vapors shall not be connected to the same exhaust systems when the mixture may result in the formation of toxic, flammable, or explosive compounds. The Contractor shall provide a separate exhaust system during the course of construction to be used to remove contaminants from the Contractor's enclosed work area; this system shall be separate from the project's main ventilation system.

Contaminated materials removed by exhaust systems shall be disposed of in such a manner that they do not reenter the worker's breathing zone or create a hazard to other employees or to the public. Dust from equipment, sawing, grinding, and other dust-producing activities shall be controlled to ensure visibility and safe operations and to minimize nuisance dust in the immediate and adjacent areas. Dust from roadway traffic, storage areas, or bulk stockpiles shall be controlled within approved limits for visibility by application of hygroscopic materials, watering, or surface binders, and according to the regulations of the City and County of Los Angeles and the State Highway Patrol. Controlled reversible ventilation of sufficient capacity shall be provided on all tunneling and underground excavation operations by the Contractor.

Carbon tetrachloride shall not be used as a fire-extinguishing agent. Its use as a solvent, or for any other purpose, is prohibited on all work, plant, facilities, and equipment, except under the direct and immediate supervision of a qualified person, approved by the Resident Engineer.

Heating devices or melting kettles shall be placed on a level, firm foundation and protected against traffic, accidental tipping, or similar hazards. Such devices or kettles shall not be left unattended when in use. Enclosed areas in which hot substances are being heated or applied shall be ventilated. A compatible fire extinguisher shall be available at all locations where heating devices or melting kettles are in use. Containers used in the handling and transportation of hot substances shall not be filled higher than 4 in. from the top.

Ladles, equipment, and material shall be moisture-free before being used or placed in heated material. Joints, cracks, or other surfaces that may be contacted by hot liquids shall also be free of moisture.

Proper runways or passageways, clear of obstructions, shall be provided for all persons carrying hot substances. Hot substances shall not be carried up or down ladders. Hoisting gear used in handling hot substances shall be adequate for loads imposed and shall be securely and substantially braced and anchored. Guardrails or suitable warnings shall be provided to ensure that no person enters the area under, or around, the hoisted load.

Protection against contact, radiant heat, glare, fumes, and vapors shall be provided for all persons handling hot substances. Buckets or vessels for handling hot substances shall be substantially constructed and free from any soldered joint or attachment.

SECTION 4

EMERGENCY PLANNING

4.1 EMERGENCY PLAN - GENERAL

The Contractor shall prepare a general plan of action for use in an emergency, subject to approval by CM, and the procedure shall be compatible with CM's overall Project Emergency Plan. The plan shall outline the duties and responsibilities of each person so that each one shall know what is expected of him or her in the event of a fire, explosion, or other emergency.

The plan shall be posted on the safety bulletin board and in the project office. In addition, the plan shall be discussed thoroughly with each employee when joining the project as part of the indoctrination program, and periodically at toolbox and supervisors' safety meetings. This emergency plan is a part of the Contractor's overall safety plan, and copies of the plan shall be given to the Safety and Security Manager. The Contractor's plan shall be a part of the Project Emergency Plan and shall include such items as ventilation controls, fire fighting equipment, rescue procedures, evacuation plans, and communications, as furnished and supplied by the Contractor.

4.1.1 EMERGENCY PLAN - TUNNEL

In addition to the General Emergency Plan, the Contractor shall prepare an emergency plan to address the unique situations encountered during tunnel construction. The plan shall address at a minimum:

a) **General plan of action for use in time of emergency.**

b) **Outline the duties and responsibilities of key personnel for handling fire, explosion, collapse or other emergencies.**

c) **A positive method of communicating to all workers (above and below ground) as to what is expected of each worker in the event of an emergency.**

d) **Ventilation control, fire fighting equipment, rescue and evacuation procedures, communications, etc.**

A trained rescue team of a least five employees shall be provided at tunnels with 10 or more employees underground at any one time, **or where flammable or noxious gases are encountered or anticipated in hazardous quantities.** Permissible self-contained oxygen-breathing apparatus, in number and type as Cal-OSHA directs, shall be provided and properly maintained **for use by mine rescue personnel.** A sufficient supply of replacement parts and regenerating material shall be maintained onsite.

Where **the apparatus is required,** there shall be enough physically fit and trained personnel outside the tunnel to provide one or more crews of five people, within reach by telephone or other means and available for service at the tunnel within 30 minutes. Training shall be given annually and shall be equivalent to that offered by the U.S. Bureau of Mines. These employees shall be required to practice the use of breathing apparatus for at least 30 minutes each month.

No employee who is physically unfit, or who has not had the required training, shall be allowed to use permissible self-contained breathing apparatus for rescue crew work.

Refer to Section 2.4.1 of the PDCD Safety and Security Manual for Self-Rescuers.

The emergency plan shall be approved and the rescue team shall have completed the initial training prior to "turning under".

Whenever any working place in a tunnel is being advanced within 200 feet of areas that contained or may contain dangerous accumulations of water, gas, petroleum products, or mud, test holes of sufficient depth shall be drilled in advance of such workings to ensure that at least 20 feet of tested ground remains beyond the face. Test holes 20 feet deep shall also be drilled at 45-degree angles into the walls, roof, and floors, when necessary.

Workers shall be removed to safe locations at least 2,000 feet from the blasting site before blasting in areas where dangerous accumulations of water, flammable or toxic gas, mud, or petroleum products could be encountered. The tunnel shall be tested and examined by certified persons (Contractor's gas tester) before other workers reenter the tunnel.

4.1.2 TUNNEL COMMUNICATION SYSTEM

During the construction of tunnels that shall be more than 2,000 feet long, there shall be at least one underground telephone when the length reaches 1,000 feet. Other phones shall be added as the work progresses so that there is never less than one phone to serve each length-zone of 2,000 feet and one for any remaining zone exceeding 1,000 feet in length. The phones shall be conveniently located, properly identified, and tested by the Contractor once each shift. Arrangements shall be such that calls are answered promptly. A telephone or communication system shall be provided by the Contractor when more than five workers are underground.

Telephone systems shall be independent of the tunnel power supply and shall be installed by the Contractor so that the destruction of one telephone shall not interrupt the use of other telephones on the same system. Each telephone shall be equipped with an audible bell and signal light.

Equivalent communication systems may be used when accepted by Cal-OSHA.

4.1.3 EMERGENCY REPORTING PROCEDURES

In planning for emergency action, it is imperative that a well-established emergency reporting procedure be followed. This procedure shall concern

construction accidents, potential accidents involving workers, the public, fires, criminal activity, bombs, and other types of threats.

The Resident Engineer shall be notified immediately of an accident or other emergency and shall be apprised of all details known at the time. The Contractor, if on the scene, shall call for Police, fire, or ambulance assistance, as appropriate. In the event that the Contractor is not available, the Resident Engineer shall make such calls. The Resident Engineer shall then notify the Safety and Security Manager, giving as many details as possible. In turn, the Safety and Security Manager shall notify the Deputy Construction Manager (DCM) for Operations. At the DCM's discretion, the Construction Manager and the appropriate RTD representatives shall be advised, depending on the nature of the occurrence. The Safety and Security Manager, or the Manager's representative, shall proceed to the scene and provide needed assistance and begin an investigation of the incident as soon as possible. All actions of the Safety and Security Manager shall be coordinated with RTD's Safety Department, the DIA, and Cal-OSHA's local office. **The Safety and Security Manager will coordinate with the Community Relations Manager as required.** 2 2

All jobsite personnel shall be instructed to refer any and all inquiries about the incident or accident to the Construction Manager, or CM representative. The Construction Manager, or CM representative, shall advise RTD of the extent of injuries or damages resulting from the occurrence and actions proposed to avoid such future problems.

Procedures shall be provided for emergency response at all times, including nonwork periods at night, weekends, and holidays. It is essential that the response be on a 24-hour basis. In the event that the CM offices do not operate on a 24-hour, 7-day basis, provision for notification of responsible personnel shall be included in the procedure.

All CM and Contractor personnel shall be trained in the proper response to bomb threats and other terrorist-type activities. Procedures for handling such threats shall be established in coordination with RTD and municipal authorities. A sample procedure follows, and a form for recording a bomb threat by phone is presented in the Appendix. Evacuation procedures shall be developed by the Contractor and approved by the Resident Engineer at each construction site as work commences **(refer to PDCD/RTD Metro Rail Emergency Response as shown in the Appendix).** 2 2

4.2 BOMB THREAT PROCEDURE

Any employee receiving information indicating that a bomb has been placed in any part of the RTD Metro Rail system shall immediately notify the Resident Engineer, who shall direct the responsible Contractor to turn on all lights in the tunnels, stations, building, and other areas to aid the Police in their search.

The person with information about a bomb shall also notify the Safety and Security Manager of the details of the threat as soon as possible. The Safety and Security Manager shall assist in making calls to the Contractors if more than one area of the system is involved.

In the event that the Contractors choose to evacuate personnel after being advised of a bomb threat, CM personnel shall assist by directing employees to an assembly point at a safe distance from the threatened area. Any RTD or CM employee who is directed to evacuate shall do so without delay. Each person shall scan the immediate work area and evacuation route to see if any unusual or unfamiliar object, package, or container is visible. All objects are to be left untouched and reported to the Resident Engineer after evacuation.

The Resident Engineer or another CM person shall ascertain as quickly as possible that all RTD and CM personnel and visitors known to be in the area are accounted for. The Safety and Security Manager, or designee, shall be advised when all personnel are accounted for.

A person who receives bomb threat information shall complete a report of the incident while the conversation is still fresh in that person's mind. See Form A-49 in the Appendix.

SECTION 5

PROJECT SECURITY

5.1 SECURITY PROGRAM

"Security" refers to the protection of both RTD property and the property of the Contractor from theft, vandalism, pilfering, etc. It is the Contractor's sole responsibility to provide protection for any property (including equipment or supplies) under his care, custody and control which would interrupt or endanger the construction of this project. The Contractor's method of protection shall be described in his written program subject to review and approval by the CM.

The Contractor's security program shall be included as a part of the written program described in Section 1.2(1) and 2.1.2(4) of the Safety and Security Manual. It shall be the responsibility of the Contractor to provide the above protection until final completion of the project and acceptance by RTD.

A complete survey must be made of exposures to determine necessary controls (physical and personnel) to provide security and protection of both RTD and Contractor property, yards, work areas, offices, and parking areas under the care, custody and control of the Contractor.

5.2 PHYSICAL CONTROLS

The Contractor shall provide necessary perimeter barriers or fencing and adequate lighting to secure areas and property, etc. as required in Section 5.1. These physical controls shall appear in the written Safety and Security Plan and be approved by the CM.

(1) Perimeter barriers, fencing, and adequate lighting.

(2) Locating electrical, water, and other facilities where they shall be protected against tampering or located in an area free from exposure.

(3) Protection of entry openings such as windows, air ducts, sewers, and access to tunnels.

5.3 PERSONNEL CONTROL

Badges, I.D.'s, etc., establish proper personnel identification for entrance to all secured areas. This also provides positive control for admission to parking areas and other classified areas. The Contractor's method of employee identification shall be included in the written Safety and Security Program.

5.4 COMMUNICATIONS

Telephones shall be the prime method of communications for contacting specific local emergency forces such as fire, ambulance, etc. Emergency phone numbers shall be posted conspicuously near all job phones. Employees shall be instructed in proper telephone procedures for reporting emergencies.

In addition to the above, all underground work shall comply with Section 8428 of the Tunnel Safety Orders. Mobile radios or telephones may be utilized as a secondary means of communication. **A positive method of communications shall be included in the Contractors Safety and Security Program.** 2 2 2

5.5 SECURITY PERSONNEL CONTROL

On all tunnel, cut and cover, shaft, and Stage I and Stage II station contracts, the Contractor shall provide full time security protection when there are no regularly scheduled shifts. 2 2 2

The personnel control procedure will include, but will not be limited to:

(1) **Careful Pre-employment screening of the Contractor Security Personnel.** 2 2

a) **Security Personnel shall be qualified, trained and experienced in this type of work. Resumes of Security Personnel, who will be assigned to the Metro Rail Project, shall be submitted to the CM for review and approval. If armed Security Personnel are used, they shall also show written proof that they are currently certified by the State of California to carry weapons.** 2 2 2 2 2 2 2

(2) **Contractor Security Personnel shall be qualified, trained and experienced.** 2 2

(3) **An outside Security** service, **if used, shall** be qualified, trained **and** experienced. 2

5.6 SPECIALIZED EQUIPMENT - EMERGENCY SITUATIONS

Security personnel will assist, **when requested,** in all emergency situations, including: 2

(1) Fire
(2) Explosion
(3) Explosion followed by fire
(4) Earthquake
(5) Earthquake followed by panic
(6) Civil commotion
(7) Strike
(8) Power failure in any tunnel

(9) Accidents
(10) Bomb or other terrorist threats

The security personnel will assist, **when requested,** in the following actions to ensure a safe jobsite: 2

(1) Assist in the safe evacuation and care of personnel.

(2) **Communicate with** local police forces. 2

(3) Secure the area to prevent additional injury or damages.

(4) Preserve the scene to permit effective investigations.

(5) Assist the **Contractor** Safety and Security **Representative** in the investigative activity to bring any case to its logical conclusion and to prevent future emergencies. 2

(6) Assist fire or other emergency systems in controlling the specific problem and **assist in crowd control or dispersal.** 2

The Contractor **shall** develop **a** complete security system designed to fit the contract package. The Contractor should follow these guidelines and detail a security program accordingly. 2

The Contractor's written security plan **shall be part of the safety plan and shall** be submitted to CM **per Section 2.1.2 (4) and shall be approved by the CM** prior to **the Contractor** commencing work. 2 2 2

SECTION 6

EMERGENCY OPERATIONS PLAN

6.1 INTRODUCTION

Most emergencies occur with little, if any, warning. In some cases, the emergency may have a rapid development and have the potential for considerable destruction of property and lives. These guidelines have been developed for the Los Angeles Metro Rail Project to assist each Contractor in developing a specific emergency plan as required by Section 4 of this Manual, which is incorporated with the Contract by Article 17.A of the General Conditions.

The Contractor shall obtain the **Construction Manager's (CM)** approval for an Emergency Operations Plan prior to commencing work on the project. The Contractor shall also review and update the plan on a monthly basis. If there are no changes, a written statement to CM to that effect is still required. 2

The requirements and guidelines contained herein shall be used in preparation of the Contractor's plan. The guidelines are minimum requirements and are not to be construed as all encompassing in the development of the Contractor's plan. Additionally, the Contractor is required to meet all Cal-OSHA regulations if they are more stringent.

The Emergency Operations Plan developed by the Contractor must address fires, explosions, earthquakes, storms, surface and subsurface flooding, failure or collapse of structures, power failures, and civil disturbances.

Special training for employees in "Work in Gassy Tunnels" is required as stated in Section 2.8.3 of this Manual.

6.2 OBJECTIVES

The objective of the Emergency Operations Plan is to establish guidelines or procedures to:

(1) Maintain close liaison between local authorities and private organizations to facilitate a coordinated response to specific emergencies.

(2) Develop specific procedures for the provision of necessary equipment and personnel required for emergency care and for the relocation of injured personnel to a safe area for further treatment.

(3) Stabilize conditions at the site during emergencies until the arrival of local authorities.

(4) Conduct emergency drills as required.

6.3 ORGANIZATION AND RESPONSIBILITIES

6.3.1 ORGANIZATION

A Safety Committee shall be established at each construction site. The Committee members are responsible for requesting and coordinating all necessary assistance in an emergency.

The Committee shall consist of the following members:

(1) The Contractor's Site Manager shall be the Chairman.

(2) The Contractor's Superintendent(s).

(3) The Contractor's Site Safety Representative.

(4) The Contractor's first aid or medical person.

(5) The Contractor's Emergency Operations Plan Coordinator.

(6) **Construction Manager's** Resident Engineer (RE), and the Safety and Security Manager, or their designees, shall be "ex officio" members of the Committee.

(7) Contractor's Site Security Manager.

6.3.2 RESPONSIBILITIES

A. CONTRACTOR'S SITE MANAGER

The Site Manager is responsible for developing and implementing the Emergency Operations Plan and assigning a qualified Superintendent, a Site Safety Representative, and a first aid or medical attendant to the committee. The Site Manager is also responsible for coordination with the RE.

B. CONTRACTOR'S SUPERINTENDENT

The Superintendent shall act as the Emergency Operations Plan Team Captain. The Superintendent is responsible for verifying that all personnel have been removed from the emergency area. A "sign in" log shall be used to determine who was "underground" and to verify that each person has been removed. The Superintendent is also responsible for determining the extent and cause of damage, and identifying and securing the emergency area and adjacent areas that may prevent a potential hazard to personnel, general public, equipment, materials, installations, or adjacent property belonging to others.

C. CONTRACTOR'S SITE SAFETY REPRESENTATIVE

The Site Safety Representative is responsible for inspecting special rescue equipment and tools on a daily basis and weekly testing to ensure proper working conditions and conducting emergency training programs as required by the RTD Construction Safety and Security Manual and Cal-OSHA Tunnel Division.

D. SAFETY AND SECURITY MANAGER

The Safety and Security Manager, or designee, shall be responsible for approving decisions or changes in the Contractor's plan made by the Safety Committee. The Safety and Security Manager shall also be responsible for evaluating the incidents and their cause, and for verifying that corrective action was taken. The Safety and Security Manager shall review the Safety Committee's minutes from the meetings and keep the CM advised of any potential problem.

E. RESIDENT ENGINEER

The Resident Engineer is responsible for approving the Contractor's Emergency Operations Plan and keeping CM, the Safety and Security Manager and the RTD apprised of incidents and corrective action required to preclude the recurrence of reportable emergency situations.

F. CONTRACTOR'S EMERGENCY OPERATIONS PLAN COORDINATOR

The Emergency Operations Plan Coordinator is responsible for maintaining a log on every incident and for initial telephone contact with outside agencies (when practical), conveying a brief description of the problem or type of emergency involved, and precise directions on how to get to the location of the emergency. The Emergency Operations Plan Coordinator shall also assist the outside agency, as required, after arrival on the site.

G. CONTRACTOR'S SITE SECURITY

The Contractor's Site Security is responsible for the security of the jobsite and assisting the Contractor's Site Manager in all areas during and under emergency situations. The Contractor's Site Security shall abide by, but is not limited by, the specific items of these guidelines.

6.4 EMERGENCY OPERATIONS PLAN

6.4.1 GENERAL

Each prime or general Contractor is responsible for the safety of its own personnel and those of the subcontractors and their vendors working at the construction site. The Contractor shall develop and implement an Emergency Operations Plan which, as a minimum, shall meet the requirements stated in these guidelines. The Emergency Operations Plan shall cover potential emergencies that may occur. Procedures to implement the plan shall be established. A sign in/out procedure for ALL personnel going underground shall be implemented. **(See Section 6.3.2[B]).**

6.4.2 EMERGENCY OPERATIONS PLAN TEAM

An Emergency Operations Plan Team shall be designated for each shift. The Contractor shall provide personnel assigned to the Emergency Operations Plan Team with written notification of their assignment, their duties and responsibilities, and listing of outside emergency agencies (with specific

names and phone numbers where possible). The Team personnel shall be issued a special badge, hard hat decal or other visible identification to be worn on the site at all times.

Each Emergency Operations Plan Team shall have a team captain appointed by the Contractor's Site Manager. The team captain may, in turn, appoint co-captain(s) to assist during emergencies.

6.4.3 EMERGENCY EQUIPMENT LOCATION AND USE

The on-site special equipment and tools needed for rescue shall be identified and their location specified in the Contractor's Emergency Operations Plan. The same equipment shall be used for training the Emergency Operations Plan Team(s). Tools and equipment shall be inspected, cleaned and placed back in full operational condition after any use (training or actual emergency). The Contractor's Site Safety Representative shall inspect the special tools and equipment. The Contractor shall keep a log showing the date, time and badge number of the person conducting the inspection. If the equipment is not operational, corrective action must be taken immediately or the equipment tagged "unusable" and removed from the jobsite with the defective equipment being replaced at the time it was found to be defective. Equipment shall be inspected not less than daily and tested not less than weekly with log entries accordingly.

6.4.4 PROCEDURES

The Contractor shall develop procedures covering the various emergencies that may occur. Specific examples delineating the depth of coverage for typical emergencies are shown in Section 6.5.

6.4.5 ORIENTATION, TRAINING, AND CERTIFICATION

A. ORIENTATION

Orientation of Contractor personnel on the Emergency Operations Plan and the specific implementing procedures shall be conducted within 30 calendar days after Contract Award.

B. TRAINING

The Contractor shall provide initial training, as necessary, for the certification, or recertification, of the members of the Emergency Operations Plan Team. All personnel shall receive training in working in a gassy tunnel and in Emergency Operations Plan Procedures before starting work as specified in RTD's Construction Safety and Security Manual Section 2.8.3.

The Contractor shall conduct emergency response drills at least every three months throughout the period of construction. If personnel do not perform to the satisfaction of the RE during the drill, additional drills shall be required. All Contractor Emergency Operations Plan Team members shall be trained in First Aid and have a current First Aid Card.

C. CERTIFICATION

All members of the Contractor's Emergency Operations Plan Team must be approved by, and have a current certificate indicating completion of a program approved by the U.S. Bureau of Mines or Cal-OSHA Tunnel Division. Certifications shall be posted on bulletin boards, in the Contractor's jobsite office, and at locations above and below ground. **This certification applies only to tunnel construction operations.** 2 2

D. REPORTING

The Emergency Operations Plan Coordinator shall follow the reporting procedures outlined, or use the attached reporting form, in preparing Emergency Operations Plan reports. The Emergency Plan reports shall be forwarded to the Safety and Security Manager no later than the day following the incident. This emergency report is in addition to the monthly Emergency Operations Plan Log that is to be sent to the Safety and Security Manager through the RE, no later than the 15th day of the following month.

6.5 EMERGENCY OPERATIONS PLAN GUIDELINES

The various kinds of emergencies and specific minimum actions to be taken by the Emergency Operations Plan Team are as follows:

6.5.1 FIRE AND SMOKE IN TUNNEL

(1) Remove all personnel to a safe area.

(2) Call the Fire Department.

(3) If safe to do so, remove any hazardous material to a safe location away from the incident.

(4) Take steps to contain the fire using site emergency equipment until arrival of the Fire Department.

6.5.2 STRUCTURE FAILURE, INCLUDING CAVE-IN OR MOVEMENT OF ADJACENT STRUCTURES, DAMAGES TO STRUCTURES

(1) Where cave-in below ground causes movement of structures above ground, or may create a serious hazard for personnel and/or the general public above ground, the Contractor's Site Manager shall direct the necessary steps to be taken for the protection of personnel who are in the endangered area.

(2) The Contractor's Site Manager shall instruct the Emergency Operations Plan Coordinator to contact the needed outside agencies, i.e., Fire Department, Police Department (Traffic Control), and/or utility companies that may have damaged facilities due to the specified hazard or problem.

(3) All persons entering project shall be identified and logged in and out.

(4) All unauthorized personnel shall be kept outside the construction site.

(5) All communications with the press shall be through RTD. 2

6.5.3 EARTHQUAKE

(1) Upon first notice of earthquake, the Emergency Team captain and co-captains shall start procedures for an orderly evacuation of all personnel from the unprotected areas to an area of safety, or where possible, to a specified area that has been predetermined as an "Earthquake Shelter" area.

(2) All underground personnel shall be moved in an orderly manner to a specified area. The Emergency Team captain, or co-captain, shall notify the RE and Contractor's Site Manager when all underground personnel are in the designated area.

Until receiving further instructions from the Contractor's Site Manager, personnel shall remain in designated area(s).

(3) After every earthquake, a team made up of the RE, Contractor's Site Manager, Contractor's Site Safety Representative, Contractor's Emergency Team captain and the Safety and Security Manager, or designee, shall make a thorough inspection of the entire underground work area to determine extent of damages. The RE shall notify RTD's Insurance Manager of any possible insurance involvement.

6.5.4 GAS OR TOXIC SUBSTANCES

(1) All personnel **involved in underground construction** shall be trained in the use of self-contained breathing apparatus. 2

(2) When the methane gas monitoring system alarm sounds, personnel in the area shall move immediately away from the area to a predesignated safe area. The Emergency Team captain shall notify the RE and Contractor's Site Manager of the conditions. The RE shall notify the Manager of Safety and Security. **The Contractor shall notify Cal-OSHA.** 2

6.5.5 FLOODING

(1) In case of a sewage spill or line break, all personnel who have been contaminated shall be removed to a safe place and examined by medical personnel. Contaminated clothing shall be removed.

(2) In the event of flooding due to groundwater releases, the Emergency Team captain and co-captain shall move personnel to the nearest point of safety until water subsides. In case of stranded or injured personnel located in hazardous or high exposure areas, the Emergency Team shall set up rescue procedures to remove these persons to a place of safety.

(3) The RE and Contractor's Site Manager shall be notified and kept informed of the situation at all times. If outside assistance is needed, the Emergency Operations Plan Coordinator shall request assistance from the proper agency.

(4) In the case of strong winds or cloudburst-type rain, the surface area of the site shall be secured to prevent excessive water draining into the excavation or underground areas, or wind damage to equipment, materials, structures, and tools. Any material, sheeting, plywood or other items that have the possibility of becoming a wind blown hazard to the site, adjacent property or the general public, the item shall be secured in a manner so as to prevent it from becoming such a hazard.

6.5.6 INTRUSION

(1) Above Ground

Should unauthorized person or persons be on the jobsite, contact site security or the police to have then removed.

(2) Below Ground

Summon Site Security and Contractor's Site Manager, and if the person refuses to leave, call the police.

(3) If an uncontrolled vehicle penetrates barricades or fencing and comes to a stop on construction premises, have the Emergency Operations Plan Coordinator contact police. If fire, injury or death occurs, the Emergency Coordinator shall call 911, advising dispatcher of the situation.

(4) During nonworking hours, Site Security personnel **shall request local authorities (RTD Police) to** remove drunks, street people, or any other **unauthorized** person from the premises. Removal of any person from the site by Contractor personnel shall only be done through request and not by force. 2 2 2

6.5.7 EXPLOSION

(1) Remove personnel and hazardous materials, where possible, away from the area to the nearest place of safety.

(2) Call the Fire Department and the police **(911).** 2

(3) Secure/isolate the immediate area of the explosion.

(4) Where explosion is caused by methane gas, Cal-OSHA Tunnel Division shall be notified.

6.5.8 BOMB THREATS

(1) If threat is made by phone, the call shall be given to the Emergency Coordinator, when possible. All such calls should be treated as a serious threat. All persons answering the phone shall be familiar with this procedure and PDCD Form 185, Bomb Threat Checklist.

(2) The person answering the bomb threat call shall use the Bomb Threat Checklist, PDCD Form 185, to get as much information from the caller as possible. All personnel that answer the phones should study this form and be prepared to detect as many items as possible listed while talking to the person making the threat.

(3) While talking to the person on the phone, he/she should give a note to someone to call 911 advising of the bomb threat and the fact that the person making the threat is on the line, giving the 911 dispatcher the phone number that is in use.

(4) Upon completion of the phone call, the person taking the call shall immediately notify the RE and the Contractor's Site Manager. The Contractor's Site Manager shall evacuate the endangered area. Under no circumstances shall anyone search for the alleged bomb.

(5) When using the Emergency 911, all reports shall be brief and any additional information obtained after the original call shall go directly to the emergency group responding, i.e., Fire Department, Police Department, Sheriff, etc.

6.5.9 CIVIL DISTURBANCE

(1) If a threat is made by phone, follow the procedures outlined in 6.5. above.

(2) If a threat is visually observed:

(i) Secure jobsite to prevent unwanted intrusion;
(ii) Remove employees to a safe location;
(iii) Call 911 and report incident, remain on the line to relay specific details and receive instructions.

SECTION 7

REFERENCE MATERIAL

BIBLIOGRAPHY

1. American National Standard Safety Requirements for Construction of Tunnels, Shafts and Caissons.

2. The Business Roundtable - Improving Construction Safety Performance, Report A-3, January 1982.

3. Cal-OSHA State of California Administrative Code Title 8; Industrial Relations, Chapter 4, Subchapter 4, Construction Safety Orders:

   D.1 Article 1, #1503 - Permit for Variation from These Orders
   D.2 Article 3, #1509 - Accident Prevention Program
   D.3 Article 3, #1510 - Safety Instructions for New Employees
   D.4 Article 3, #1511 - General Safety Precautions
   D.5 Article 3, #1512 - First Aid Medical Attention
   D.6 Article 4, #1530 - Dust, Fumes, Mists, Vapors, and Gases
   D.7 Article 4, #1532 - Confined Spaces
   D.8 Article 6, #1540 - Excavations, Trenches, and Earthwork
   D.9 Article 8, #1550 - Explosives (Certification of Blaster)
   D.10 Article 10, Haulage and Earth Moving
   D.11 Article 11 through Article 32

4. Cal-OSHA Title 8, Industrial Relations, Chapter 4, Division of Industrial Safety, Subchapter 20, Tunnel Safety Orders:

   E.1 Article 3 - Accident Prevention Program (Tunnel Work)
   E.2 Article 6 - Illumination and Lasers
   E.3 Article 7 - First Aid (Tunnel Requirements)
   E.4 Article 9 - Emergency Plan
   E.5 Article 10 - Rescue Apparatus
   E.6 Article 13 - Ground Control
   E.7 Article 14 - Fire Prevention and Control
   E.8 Article 18 - Walkways and Access
   E.9 Article 19 - Hoisting and Shafts
   E.10 Articles 20, 21, 22, and 23 - Explosives
   E.11 Article 24 - Licensing of Blaster

5. Fundamentals of Industrial Hygiene - Stress, Chemical, Biological, Ergonomic, Physical

6. Total Environmental Control - Fletcher/Douglas

ORGANIZATIONS

1. American Concrete Institute
2. American National Red Cross
3. America National Standards Institute
4. American Petroleum Institute
5. American Society of Mechanical Engineers
6. American Society for Testing and Materials
7. American Welding Society
8. Associated General Contractors of America
9. Building Officials Conference of America
10. E.I. du Pont de Nemours & Company
11. Energy Research Development Administration
12. Federal Fire Council
13. Federal Safety Council
14. Industrial Hygiene Foundation of America, Inc.
15. Institute of Makers of Explosives
16. Interstate Commerce Commission
17. National Bureau of Standards
18. National Fire Protection Association
19. National Safety Council
20. Underwriters' Laboratories, Inc.
21. U.S. Army Corps of Engineers
22. U.S. Department of Interior, Bureau of Mines
23. U.S. Government, General Services Administration

APPENDIX

FORMS AND OTHER DOCUMENTATION

This Appendix includes the following safety and security forms and other documents:

SAFETY AND HEALTH QUESTIONNAIRE FOR CONTRACTOR BID PACKAGE

(1) Contractor _____
Location _____

(2) List your firm's interstate modification rates for the following years:

1984 _____ 1983 _____ 1982 _____

(3) Please use your 1983 OSHA Log and Summary of Occupational Injuries and Illnesses to complete the following totals (if your firm worked on more than one construction project, use a composite of all logs and summaries).

(a) Total number of recorded cases _____

(b) Lost workday cases:

(i) Total number _____
(ii) Incidence rate _____

(c) Lost workdays:

(i) Total number _____
(ii) Incidence rate _____

(d) Total number of fatalities _____

(4) Total field construction manhours worked in 1983 (include craft and field staff and clerical manhours) _____

(5) Check the type of work that is the major portion of your firm's construction work:

Industrial plant _____

Heavy (civil, nonhighway) _____

Other (briefly describe) _____

(6) Distribution of OSHA 200 Log and Summary of Occupational Injuries and Illness:

	Monthly	Quarterly	Annually	No
Project Superintendent	_____	_____	_____	_
Vice President of Construction	_____	_____	_____	_
President of Firm	_____	_____	_____	_

SAFETY AND HEALTH QUESTIONNAIRE (Contd)

(7) Safety Meetings

	Yes	Frequency	No
Field construction staff	___	_____	___
Foremen	___	_____	___

(8) Craft toolbox safety meetings on this project will be held at least once every 10 working days. Does your firm require such meetings more often? _____ How often? _____

(9) Does your firm give each new hire an initial safety and health orientation? _____ List specific subjects included in each orientation on the back of this form.

(10) Does your firm give a safety and health orientation for newly hired or promoted foremen? _____ List specific items included in each orientation on the back of this form.

(11) Does your firm have a written safety and health program? _____ Does this program include specific safety and health practice rules? _____ List major revision items required, if any, on the back of this form.

(12) List key personnel for this project by names and positions and the incidence rates (percent) of lost workday cases on the three previous projects to which each was assigned as a key person.

Name	Position	Incidence Rates (%)

(13) Cost accounting for accidents:

(a) Reported to _____

(b) Method of accounting by project

	Yes	Monthly	Quarterly	Annually	No
(i) Total costs	___	$_____	$_____	$_____	___
(ii) Subtotal costs	___	$_____	$_____	$_____	___
by Superintendent	___	$_____	$_____	$_____	___
by Foreman	___	$_____	$_____	$_____	___

INSPECTION CHECKLIST

A check in the NO column indicates nonconformance to an OSHA general policy or safety standard; the user should refer to the published OSHA standards for specific details for compliance.

The user is cautioned that this checklist does not apply to every type of operation and, therefore, does not list items covering every hazard relating to physical or occupational disease exposure. It contains items where OSHA citations have been issued most frequently for your industry in general.

General	Yes	No
Prejob safety meetings held with subcontractors.	___	___
Monthly safety meetings held, including supervisor of subcontractors.	___	___
Safety meetings held with work crews once each week (it is suggested that the meeting be held on the first working day of the week).	___	___
Competent contractor personnel assigned responsibility to inspect jobsite for safety.	___	___
"Safety and Health Protection on the Job" posted.	___	___
Management safety policy directives posted.	___	___
Safety bulletins and accident-prevention material posted.	___	___
Copies of log of job injuries (OSHA Log 100) at jobsite.	___	___
Copies of supplemental record of job injuries (OSHA Log 101 or equivalent) at jobsite.	___	___
Copies of annual summary of job injuries (OSHA Log 102) posted (during the month of February for the preceding year).	___	___
Worker injury information (notes of investigations, etc.) kept at jobsite.	___	___
Minutes of jobsite safety meetings recorded and kept at jobsite.	___	___
In case of telephone communication failure, nearby emergency communication means have been investigated.	___	___
Explosives permit posted (if required).	___	___

INSPECTION CHECKLIST (Contd)

	Yes	No
First Aid, Medical Attention		
Qualified first-aid-trained personnel on jobsite (supervisors trained in first aid).	___	___
Approved first-aid kit maintained and regularly inspected for adequacy.	___	___
Listing of emergency hospital, ambulance, and medical doctors (including telephone numbers and addresses) posted.	___	___
Hand and Power Tools		
Handheld power tools (saws, air impact) equipped only with constant-pressure switch.	___	___
Handheld power tools (drills, tappers, fastener drivers, disc and belt sanders, angle grinders) provided with momentary-contact on-off switch with lock-on control, only if the tool can be turned off by a single motion of the same finger(s) that turned it on.	___	___
Devices provided on air-driven power tools from becoming accidentally disconnected from hose.	___	___
Air-driven nailers operating at more than 100 psi provided with safety device on muzzle to prevent ejection unless muzzle is in contact with work surface.	___	___
Compressed air used for cleaning purposes limited to 30 psi.	___	___
Air hoses exceeding 1/2-in. inside diameter provided with safety device preventing pulling of trigger until safety device is manually released.	___	___
Power tools provided with safety shield/guard, and operator shows evidence of special training.	___	___
Portable power circular saws provided with properly functioning automatic-return lower guard and fixed upper guard.	___	___
All fixed power woodworking tools provided with a disconnect switch that can be locked or tagged in the OFF position.	___	___
Defective tools and equipment tagged as unsafe, or physically removed from jobsite, or controls locked in OFF position.	___	___

INSPECTION CHECKLIST (Contd)

	Yes	No
Electrical		
For exposed or concealed power circuits where accidental contact by tools or equipment may be hazardous, warning signs posted and all workers advised of hazard.	___	___
Regular inspection made to ensure grounding of noncurrent-carrying metal parts of portable and/or plug-connected equipment.	___	___
Temporary lights equipped with guards to prevent accidental contact with bulb.	___	___
Receptacles and attachment plugs not interchangeable on circuits of different voltages, and current ratings comply with NEMA configurations.	___	___
Ladders		
Ladders regularly inspected and destroyed or repaired when found defective.		
Side rails extend 36 in. above landing, or grab rails provided.	___	___
Top of ladders tied in to prevent displacement.	___	___
Double-cleat ladders provided for working areas having 25 or more workers and where two-way traffic is expected.	___	___
Double-cleat ladders not exceeding 24 ft in length.	___	___
Single-cleat ladders not exceeding 30 ft in length.	___	___
Cleats inset into edges of side rails, or filler blocks used.	___	___
All job-built ladders constructed to conform with standards.	___	___
Scaffolding		
All open sides and ends of platforms more than 6 ft above ground or floor level provided with toprails (42 in. high), midrails, and toeboards (4 in. high).	___	___

INSPECTION CHECKLIST (Contd)

	Yes	No
Where workers pass under scaffolds, screens provided between toeboards and guardrails extending along entire opening.	___	___
Platform planks laid together tightly, preventing tools and other objects from falling through.	___	___
Scaffolds guyed or tied to structure.	___	___
Scaffolding set plumb with adequate foundation bearing plates.	___	___
Platform planks extend over end supports not less than 6 in., no more than 12 in.	___	___
Overhead protection on scaffolds where workers are exposed to overhead hazards.	___	___
Ladders used to gain access to scaffold work platforms.	___	___
Horse scaffolds not more than two tiers or 10 ft in height.	___	___
Horse scaffolds spaced not more than 8 ft.	___	___
Toprails, midrails, and toeboards provided on horse scaffolds more than 6 ft above ground or floor level.	___	___
Roofs more than 10 ft from ground to eaves, with slope greater than 3 in./12 in. without a parapet, provided with catch platform having toprail, midrail, and toeboard, unless workers protected by safety belt attached to lifeline.	___	___
Crawling board provided on roof extending from ridge to eaves and with lifeline strung beside board for a handhold.	___	___
Roofing brackets provided and secured in place by either support ropes or nailing.	___	___
Floor and Wall Openings		
Wall openings (30 in. high, 18 in. wide, or greater), from which there is a drop of 4 ft or more and bottom of opening less than 3 ft above working surface, provided with guardrails.	___	___

CHECKLIST - SETUP OF MEDICAL FACILITIES

The following checklist should be used as a guide on all jobs to make certain that adequate medical facilties are available for employees. Some items may apply only to larger construction projects.

	Yes	No
OSHA posters located where all employees can read them.	___	___
OSHA log current and available.	___	___
The District Insurance Administrator's placard nearby.	___	___
Available doctors, with telephone numbers, posted in project office.	___	___
Telephone number of the nearest available ambulance posted.	___	___
Telephone number of the fire department posted.	___	___
Arrangements made to advise the available doctors of the job and to determine procedures to contact the doctors on the last hour shifts.	___	___
Arrangements made to have the nearest available ambulance service make a dry run to the job, for familiarization and to avoid delay during an emergency.	___	___
Hospital or emergency station within 15 minutes of jobsites.	___	___
Cards made up and distributed to all supervisors and foremen, showing telephone numbers of doctors, hospitals, ambulances, fire departments, etc.	___	___
Have sketches made up and distributed to all supervisors and foremen showing directions to nearest doctor and hospital.	___	___
Employees instructed in the proper reporting procedure for accidents.	___	___
First-aid kits provided for each pickup truck assigned to a supervisor, foreman, project office, or fixed plant location.	___	___
Snakebite kits provided as part of first-aid kits in areas where they may be required.	___	___
Centrally located stretchers and blankets provided.	___	___
First-aid training or education program in effect. Certified first-aid persons present at each jobsite.	___	___

PDCD

CONSTRUCTION SAFETY SURVEY

REPORT NO. _____

CONTRACT NO. _____

CONTRACTOR _____

S/S #3

ITEM NO.	RECOMMENDATION	SAFETY REGULATION REFERENCE	ACTION TAKEN AND/OR DATE COMPLETED

SURVEY MADE BY:

_____ (SIGNATURE)

TITLE _____

DATE _____

SIGNATURE OF CONTRACTOR'S PROJECT MANAGER

_____ DATE _____

SIGNATURE OF RESIDENT ENGINEER

_____ DATE _____

SAFETY INSPECTION CRITERIA

	Equipment	Frequency
(1)	Cranes (Certified, California Construction Safety Order No. 1588.2)	Initially
(2)	Cranes	Daily, monthly, and annually
(3)	Air compressors	Initially and monthly
(4)	Welding machines	Initially and monthly
(5)	Vibrators	All - initially Electrical - daily Pneumatic - monthly Engine drives - monthly
(6)	Trucks (1 ton or larger)	Initially and daily by driver
(7)	Vehicles (less than 1 ton)	Initially and weekly
(8)	Electrical tools	Initially, then daily by craftsman Electrical - monthly
(9)	Pneumatic tools	Monthly
(10)	Powder-actuated tools	Initially before each use
(11)	Wire rope	Initially and monthly

PDCD

EQUIPMENT INSPECTION REPORT

CONTRACTOR _____ DATE _____
JOB NO. _____ CLIENT _____ LOCATION _____
EQUIPMENT _____ MAKE _____ MODEL _____
PARSONS NO. _____ ☐ OWNED ☐ RENTED RENTAL EQPT NO. _____ SERIAL NO. _____
MOTOR _____ METER READING _____ SUPPLIER _____

AIR COMPRESSORS	CONDITION			REMARKS
	GOOD	FAIR	POOR	
FUEL SYSTEM				
IGNITION SYSTEM				
COOLING SYSTEM				
GENERAL OPERATION				
FAN				
CLUTCH				
AIR CLEANER				
INTERSTAGE COOLER				
UNLOADER				
SAFETY VALVE				
REGULATOR				
STARTER				
FILTER				
AIR RECEIVER				
CARRIAGE				
TIRES				
WHEELS				
PAINT				

COMMENTS

WELDING MACHINES	CONDITION			REMARKS
	GOOD	FAIR	POOR	
MOTOR				
FUEL SYSTEM				
IGNITION SYSTEM				
COOLING SYSTEM				
ENGINE OPERATION				
GENERATOR				
CONTROLS				
INSTRUMENTS				
GOVERNOR				
IDLE				
SKIDS				
CARRIAGE				
TIRES				
WHEELS				
PAINT				

COMMENTS

PUMPS	CONDITION			REMARKS
	GOOD	FAIR	POOR	
PUMP OPERATION				
MOUNTING				
SKIDS				
HOSE				
TIRES				
WHEELS				
PAINT				

COMMENTS

VIBRATORS	CONDITION			REMARKS
	GOOD	FAIR	POOR	
ENGINE OPERATION				
CASING				
CORE				
HEAD				

COMMENTS

OTHER EQUIPMENT	CONDITION			REMARKS
	GOOD	FAIR	POOR	

COMMENTS

TOOLS SUPPLIED BY SUPPLIER

COMMENTS

I ACKNOWLEDGED THIS INSPECTION REPORT TO SHOW THE CONDITION OF THE ABOVE EQUIPMENT. THIS REPORT SHALL BE USED AS REFERENCE TO DETERMINE THE REPAIRS TO BE MADE DURING THE RENTAL PERIOD AND AT THE TERMINATION OF THE RENTAL PERIOD.

INSPECTED BY: _____

POSITION OR TITLE: _____

DISTRIBUTION: SUBCONTRACTORS AND OTHER CONTRACTORS

ORIGINAL: CONTRACTORS FILE
COPY: MANAGER OF SAFETY, PDCD
COPY: FIELD SAFETY ENGINEER

PDCD

WIRE ROPE INSPECTION RECORD

HOIST MAKE_____ MODEL_____ CAP_____ DATE_____ 19___

RMP NO._____ R.E. NO._____ SERIAL NO._____ JOB NO._____

☐ RENTED (Name of Owner)_____ JOB LOCATION_____

OTHER RIGGING: Identify wire rope by diameter and use, and sling by diameter and length.

* INSTRUCTIONS: (Also, see Replacement Requirements on back of form.)

A. Actual number. If none, so indicate.
B. Amount of wear for worst wire and overall rope. If nil, or none, so indicate.
C. State specific condition; if none, so indicate.
D. Indicate condition of lubrication, presence and type of corrosion, or heat damage from any source. If none, state OK.
E. Indicate any cracks, severe cuts, abrasions, or faulty operation and identify item. If none, state OK

HOIST: Type and diameter of hoist rope OTHER RIGGING a. Diameter b. Use	*(A) Number of broken wires per:		*(B) Reduction of wire rope dia (wear or core damage)		*(C) Kinked, crushed, cut, loss of lay, etc.	*(D) Inadequate lubrication, evidence of heat damage	*(E) End Tackle (sockets, eyes, clips, clamps, & wedges) for damage and breaks
	*(1) Lay	*(2) Strand	*(1) Indv Wire	*(2) Total Rope			

NOTE: Additional comments may be entered on back of form.

Inspected by:_____ Signature:_____

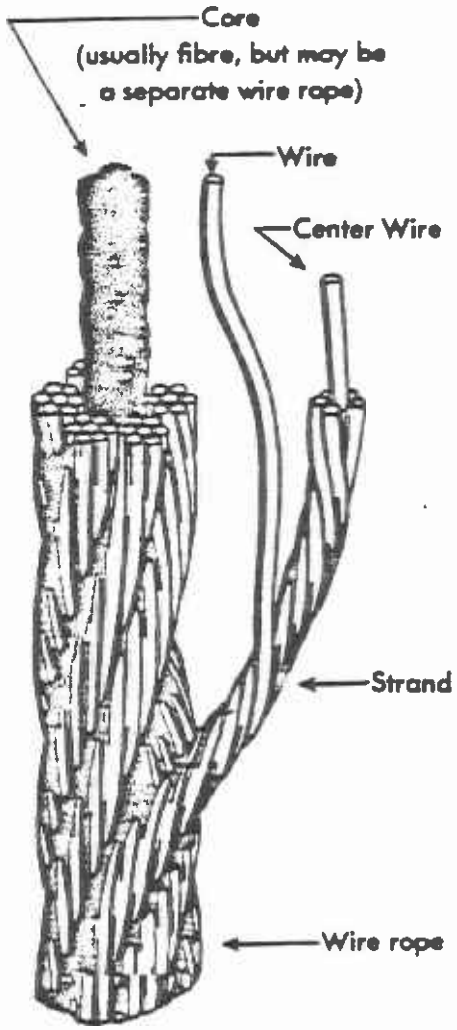
Position or Title:_____

DISTRIBUTION: **CONTRACTORS :**
Original: CONTRACTOR
Copy: PROJECT SAFETY, PDCD
Copy: Manager of Safety, PDCD

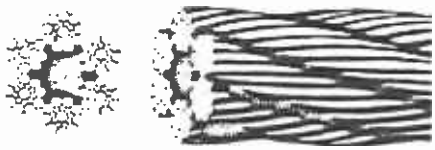
SUBCONTRACTORS :
Original: Manager or Superintendent - Jobsite
Copy: PDCD/SAFETY SUPERVISOR - JOBSITE

COMMENTS _____

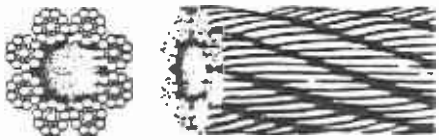
REPLACEMENT REQUIREMENTS FOR WIRE ROPE			
Inspected Item		RUNNING ROPES	STANDING ROPES
A	1	Six random breaks in one lay	More than two in one lay, except end lays
	2	Three breaks in one strand in one lay	More than one in end lays
B	1	1/3 diameter of individual outside wires	None normally expected
	2	1/64" for wire ropes through 5/16" 1/32" for wire ropes 3/8" through 1/2" 3/64" for wire ropes 9/16" through 3/4" 1/16" for wire ropes 13/16" through 1-1/8" 3/32" for wire ropes 1-1/4" through 1-1/2"	None normally expected, can occur from severe overloading
C	-	Evidence of severe distortion, especially loss of lay at end connections	
D	-	Especially at end connections.	
E	-	Damaged sockets, loose clips, loose wedges, damaged or cracked blocks, sheaves, hooks, etc.	Sockets, eyes, clips, and clamps damaged, worn, cracked, etc



This is a 6 x 7 rope
(6 strand of 7 wires each)



Wire Rope with Six Strands and 19 Wires



Wire Rope with Eight Strands and 19 Wires

6 x 36 Filler Wire—Regular Lay
Independent Wire Rope Core

Composition of a Wire Rope

A *wire rope* consists, in general, of a number of wire *strands* formed (in a spiral) about a central axis. Most ropes have six or eight strands supported by an axial member known as the *core*. There are other constructions but they are less common.

Each strand is composed of a number of individual wires which have been formed spirally about an axis. Usually the strand has an axial member referred to as a *center*.

What Wire Rope is Like

Wire rope is like a spring, string or wire.

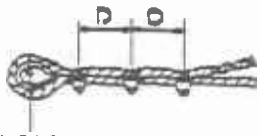
It is like a spring. So don't overload it above its elasticity, or it will be permanently deformed and rapidly lose strength.

It is like a string. Tie a pound weight to a string, gradually pull the string, and the weight is lifted. Give a jerk, and the string breaks.

It is like a wire. Bend a wire back and forth and it will eventually break, because of fatigue. Fatigue stresses can be set up in wire rope. By having good sheaves, and sheave alignment, and not too rapid acceleration or deceleration, these fatigue stresses can be reduced.

WIRE ROPE COMPOSITION

U-BOLT CLIP



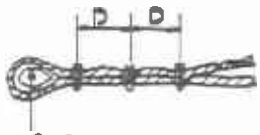
THIMBLE

U-BOLT OF ALL CLIPS ON DEAD END OF ROPE

NEVER STAGGER CLIPS

NEVER PUT U-BOLT OF CLIP ON LIVE END OF ROPE

FIST GRIP CLIP



THIMBLE

NOTE: D = 6 TIMES DIAMETER OF WIRE ROPE.

HOW TO ATTACH WIRE ROPE CLIPS

FOR BETTER OPERATING, A WIRE ROPE SHOULD BE WOUND ON DRUMS ACCORDING TO THE LAY OF THE ROPE AND THE DIRECTION OF TRAVEL OF THE DRUMS.

WINDING OVER DRUM

LEFT HAND

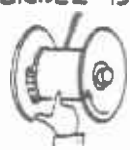
INDEX FINGER ON TOP, THUMB ON RIGHT

WINDING OVER DRUM

RIGHT HAND

INDEX FINGER ON TOP, THUMB ON LEFT

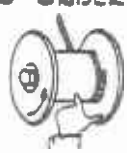
WINDING UNDER DRUM



LEFT HAND

INDEX FINGER ON BOTTOM, THUMB ON LEFT

WINDING UNDER DRUM



RIGHT HAND

INDEX FINGER ON BOTTOM, THUMB ON RIGHT

Note the convenient thumb rule for determining the proper side on which to fasten the rope. Clench the hand into a fist, but with the thumb and index finger protruding. Use the right hand for right lay ropes, and the left hand for the left lay ropes. The clenched fingers represent the barrel of the drum, and the index finger the live line leading from the drum. The thumb points in the direction of the proper dead end location.

WINDING WIRE ROPE ON A DRUM

Approx. Diam. of Rope (in.)	Safe Load for Single-Leg Vertical Sling (lbs.)	Safe Load for Two-Leg Sling at Angle with Horizontal **		
		60 degrees	45 degrees	30 degrees
3/16 (6 yarns)	80	135	110	80
1/4 (6 yarns)	105	180	150	105
5/16 (9 yarns)	180	310	250	180
3/8 (12 yarns)	240	415	340	240
7/16 (15 yarns)	315	550	450	315
1/2 (21 yarns)	475	820	670	475
9/16	620	1,075	875	620
11/16	790	1,370	1,115	790
3/4	970	1,675	1,375	970
13/16	1,170	2,025	1,650	1,170
15/16	1,335	2,400	1,960	1,385
1	1,620	2,800	2,290	1,620
1-1/16	1,890	3,275	2,675	1,890
1-3/16	2,160	3,740	3,050	2,160
1-1/4	2,430	4,200	3,435	2,430
1-5/16	2,700	4,675	3,820	2,700
1-1/2	3,330	5,765	4,700	3,330
1-5/8	4,050	7,000	5,725	4,050
1-13/16	4,770	8,260	6,750	4,770
2	5,580	9,665	7,900	5,580
2-1/4	7,380	12,775	10,435	7,380
2-5/8	9,360	16,200	13,235	9,360
3	11,520	19,950	16,300	11,520
3-1/4	13,860	24,000	19,600	13,860
3-5/8	16,380	28,375	23,150	16,380
4	18,900	32,725	26,725	18,900

*Safe loads are based on a safety factor of five. Minimum breaking strengths used to compute safe loads have been taken from Federal Specifications for Rope, Manila, published by Federal Specifications Board, U.S. Bureau of Standards, Washington, D.C. 20234. Maximum strength of splices for hook at one end and hook or ring at other end has been taken as 90 percent of the minimum breaking strength.

SAFE LOADS* IN POUNDS FOR NEW, STANDARD, MEDIUM LAY, THREE-STRAND MANILA ROPE SLINGS (SPLICED FOR HOOK AT ONE END AND HOOK OR RING AT OTHER END)

**Values shown for two-leg slings shall be increased 50 percent for three-leg slings and 100 percent for four-leg slings.

Chain Size in Inches	Single Sling at 90°	Angle of Loading of Two-Leg Sling** 60°	45°	30°
1/4	3,250 lbs.	5,650 lbs.	4,550 lbs.	3,250 lbs.
3/8	6,600	11,400	9,300	6,600
1/2	11,250	19,500	15,900	11,250
5/8	16,500	28,500	23,300	16,500
3/4	23,000	39,800	32,500	23,000
7/8	28,750	49,800	40,600	28,750
1	38,750	67,000	54,750	38,750
1-1/8	44,500	77,000	63,000	44,500
1-1/4	57,500	99,500	81,000	57,500
1-3/8	67,000	116,000	94,000	67,000
1-1/2	79,500	137,000	112,000	79,500
1-5/8	85,000	147,000	119,000	85,000
1-3/4	94,000	163,000	132,000	94,000

*The included angle between the inclined branch of the sling and the horizontal line (or plane) of the load.
**For three and/or four-leg alloy sling assemblies, multiply the loads listed by 1.5.

SAFE LOAD STRENGTHS OF ALLOY CHAIN SLINGS IN RELATION TO ANGLE OF LOADING*

Chain Size in Inches	Maximum Allowable Wear in Fractions of Inches
1/4	3/64
3/8	5/64
1/2	7/64
5/8	9/64
3/4	5/32
7/8	11/64
1	3/16
1-1/8	7/32
1-1/4	1/4
1-3/8	9/32
1-1/2	5/16
1-3/4	11/32

MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK

Diameter of Rope (in.)	Diameter of Sheave (in.)
3/4	3-1/2
7/8	4-1/4
1	4-3/4
1-1/4	6-1/4
1-3/8	8

SHEAVE SIZES FOR FIBER ROPES OF VARYING THICKNESS

Diam. (in.)	Circum-ference (in.)	Average weight per 100 ft. (pounds)				*Average breaking strength (pounds)			
		Manila	Nylon	Dacron	Polypro.	Manila	Nylon	Dacron	Polypro.
3/16	5/8	1.5	1.0	1.35	.71	450	1,100	860	800
1/4	3/4	2.0	1.6	2.16	1.10	600	1,850	1,380	1,300
5/16	1	2.9	2.6	3.1	1.84	1,000	2,850	2,100	1,900
3/8	1-1/8	4.1	3.8	4.3	2.85	1,350	4,000	2,950	2,750
7/16	1-1/4	5.3	5.4	6.5	3.70	1,750	5,500	4,100	3,500
15/32	1-3/8	6.2				2,250			
1/2	1-1/2	7.5	6.5	8.2	4.75	2,650	6,200	5,300	4,200
9/16	1-3/4	10.4	8.5	10.2	6.1	3,450	8,350	6,800	5,000
5/8	2	13.3	10.5	13.3	7.7	4,400	10,500	8,800	5,800
3/4	2-1/4	16.7	15.0	17.4	11.0	5,400	14,200	12,000	8,200
13/16	2-1/2	19.5				6,500			
7/8	2-3/4	22.5	20.5	25.0	15.4	7,700	19,000	16,300	11,500
1	3	27.0	27.0	30.5	18.7	9,000	24,600	19,800	14,000
1-1/16	3-1/4	31.3				10,500			
1-1/8	3-1/2	36.0	35.0	40.5	23.7	12,000	34,000	25,900	18,300
1-1/4	3-3/4	41.8	40.0	45.0	27.2	13,500	38,000	27,600	20,700
1-5/16	4	48.0	45.0	54.4	30.8	15,000	43,000	29,300	23,500
1-1/2	4-1/2	60.0	56.0	67.0	39.0	18,500	55,000	41,400	29,700
1-5/8	5	74.4	67.0	82.0	47.9	22,500	64,000	49,800	36,300
1-3/4	5-1/2	89.5	79.5	99.0	58.3	26,500	77,500	61,200	43,900
2	6	108.0	96.0	117.0	69.0	31,000	91,000	73,200	53,000
2-1/8	6-1/2	125.0	110.0	138.0	81.7	36,000	105,000	84,200	62,000
2-1/4	7	146.0	130.0	159.0	93.5	41,000	125,000	97,200	70,000
2-1/2	7-1/2	167.0	150.0	182.0	108.0	46,500	145,000	111,000	80,500
2-5/8	8	191.0	165.0	205.0	121.0	52,000	165,000	123,600	90,000
2-7/8	8-1/2	215.0			137.0	58,000			102,000
3	9	242.0	210.0	260.0	153.0	64,000	205,000	156,000	114,000
3-1/4	10	299.0	260.0	315.0	191.0	77,000	250,000	192,000	137,000
3-5/8	11	367.0	310.0	380.0	232.0	91,000	300,000	234,000	162,000
4	12	436.0	370.0	455.0	275.0	105,000	350,000	276,000	190,000

*Recommended safe working load is 20% of the minimum breaking strength.

BREAKING STRENGTHS AND WEIGHT OF MANILA, NYLON,
DACRON, POLYPROPYLENE, THREE-STRAND, STANDARD LAY ROPE

Rope Diameter in Inches	Single Leg						Two-Leg Bridle or Basket Hitch											
	Vertical			Choker			Vertical*			30°			45°			60°		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
	6 x 19 Classification																	
3/8	1.3	1.2	1.1	.98	.93	.86	2.6	2.5	2.3	2.3	2.1	2.0	1.8	1.8	1.6	1.3	1.2	1.1
1/2	2.3	2.2	2.0	1.70	1.60	1.50	4.6	4.4	3.9	4.0	3.8	3.4	3.2	3.1	2.8	2.3	2.2	2.0
5/8	3.6	3.4	3.0	2.70	2.50	2.20	7.2	6.8	6.0	6.2	5.9	5.2	5.1	4.8	4.2	3.6	3.4	3.0
3/4	5.1	4.9	4.2	3.80	3.60	3.10	10.0	9.7	8.4	8.9	8.4	7.3	7.2	6.9	5.9	5.1	4.9	4.2
7/8	6.9	6.6	5.5	5.20	4.90	4.10	14.0	13.0	11.0	12.0	11.0	9.6	9.8	9.3	7.8	6.9	6.6	5.5
1	9.0	8.5	7.2	6.70	6.40	5.40	18.0	17.0	14.0	15.0	15.0	12.0	13.0	12.0	10.0	9.0	8.5	7.2
1-1/8	11.0	10.0	9.0	8.50	7.80	6.80	23.0	21.0	18.0	19.0	18.0	16.0	16.0	15.0	13.0	11.0	10.0	9.0
	6 x 37 Classification																	
1-1/4	13.0	12.0	10.0	9.9	9.2	7.9	26.0	24.0	21.0	23.0	21.0	18.0	19.0	17.0	15.0	13.0	12.0	10.0
1-3/8	16.0	15.0	13.0	12.0	11.0	9.6	32.0	29.0	25.0	28.0	25.0	22.0	22.0	21.0	18.0	16.0	15.0	13.0
1-1/2	19.0	17.0	15.0	14.0	13.0	11.0	38.0	35.0	30.0	33.0	30.0	26.0	27.0	25.0	21.0	19.0	17.0	15.0
1-3/4	26.0	24.0	20.0	19.0	18.0	15.0	51.0	47.0	41.0	44.0	41.0	35.0	36.0	33.0	29.0	26.0	24.0	20.0
2	33.0	30.0	26.0	25.0	23.0	20.0	66.0	61.0	53.0	57.0	53.0	46.0	47.0	43.0	37.0	33.0	30.0	26.0
2-1/4	41.0	38.0	33.0	31.0	29.0	25.0	83.0	76.0	66.0	72.0	66.0	57.0	58.0	54.0	47.0	41.0	38.0	33.0

A = Socket of swaged terminal attachment
B = Mechanical sleeve attachment
C = Hand-tucked splice attachment

*If slings are used to handle loads with sharp corners, pads or saddles should be used to protect the rope. The radius of bend should not be smaller than 5 times the diameter of the rope. If the radius of bend is smaller, a choker hitch rating should be used.

NOTE 1. This table is based on: . . . a safety factor of 5 . . . sling angles formed by one leg and a vertical line through the crane hook . . . uniform loading.

NOTE 2. For 3-leg bridle slings, multiply above safe load limits for 2-leg bridle slings by 1.5; and for 4-leg bridle slings, multiply by 2.0.

NOTE 3. For fiber core slings having (A) and (C) attachments, multiply the above values by 0.93; for fiber core slings with (B) attachments, multiply the above values by 0.91.

SAFE LOAD LIMITS OF WIRE ROPE SLINGS IN TONS,
USING PREFORMED IMPROVED PLOW STEEL IWRC ROPE

Socket preheat temperature	Zinc pouring temperature	Wire rope size range
150°F	900°F	1/4" to 1/2" incl.
100°F	900°F	5/8" to 2" inc.

Use 1.1.1 Trichloroethane as the degreasing material for cleaning wire rope ends prior to socketing.

Probable efficiency of a new and properly prepared zinc socket is 100 percent.

The use of babbitt is prohibited for poured sockets.

RECOMMENDED PRACTICE: POURED SOCKET TERMINALS FOR WIRE ROPE

Wire rope construction	Recommended sheave diameter	Minimum sheave diameter
6 strands of 7 wires	72 times rope diameter	42 times rope diameter
6 strands of 19 wires	45 times rope diameter	30 times rope diameter
6 strands of 37 wires	27 times rope diameter	18 times rope diameter
8 strands of 19 wires	31 times rope diameter	21 times rope diameter
18 strands of 7 wires	51 times rope diameter	34 times rope diameter

SHEAVE DIAMETERS FOR OPERATING WIRE ROPES

Fitting	Efficiency
Wire Rope Sockets, Spelter (zinc) attachment	100%
Compression fittings (swaged or pressed)*	100%
Compressed sleeve attachment*	100%
Wedge Sockets	80 to 90%
Clips	75 to 80%
Spliced in Thimbles:	
3/8" - 5/8" inclusive	90-95%
3/4" - 1-1/8" inclusive	85-90%
1-1/4" - 1-1/2" inclusive	80-85%
1-5/8" - 2" inclusive	75-80%
2-1/8" and up	70-75%

*Factory attached.
Note. The above table is for static load efficiencies only and does not reflect the effectiveness of these attachments under all types of live loading in service.

APPROXIMATE EFFICIENCY OF FITTINGS (WIRE ROPE)

Rope diameter (in.)	Nominal size of clips (in.)	Number of clips	Torque to be applied to nuts of clips (ft.-lbs.)
5/16	3/8	3	25
3/8	3/8	3	25
7/16	1/2	4	40
1/2	1/2	4	40
5/8	5/8	4	65
3/4	3/4	4	100
7/8	1	5	165
1	1	5	165
1-1/4	1-1/4	5	250
1-3/8	1-1/2	6	375
1-1/2	1-1/2	6	375
1-3/4	1-3/4	6	560

The spacing of clips should be six times the diameter of the wire rope. To assemble a satisfactory end to end connection, the number of clips indicated above should be increased by two, and the proper torque remain unchanged.

NUMBER OF CLIPS AND THE PROPER TORQUE NECESSARY TO ASSEMBLE WIRE ROPE EYE LOOP CONNECTIONS WITH A PROBABLE EFFICIENCY NOT MORE THAN 80 PERCENT

PDCD

LOG OF DAILY CRANE SAFETY INSPECTIONS

CRANE MAKE_____ MODEL_____ CAP_____ MONTH OF_____ 19__

RMP NO._____ R.E. NO._____ SERIAL NO._____ JOB NO._____

☐ RENTED (Name of Owner)_____ JOB LOCATION_____

OPERATOR_____ SHIFT: ☐ DAY ☐ EVENING ☐ NIGHT

OK-NO DEFICIENCIES F-REPAIRS REQUIRED R-REPLACEMENT REQUIRED A-ADJUSTMENT REQUIRED
X-DEFICIENCY PREVIOUSLY NOTED ASTERISK (*) – MULTIPLE DEFICIENCIES – SEE COMMENTS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

1. STRUCTURAL: Outriggers, main and jib booms for damage or malfunction.
   Dated Comments:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

2. WIRE ROPE & REEVING: Running lines for damage or wear; reeving for correctness.
   Dated Comments:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

3. HOOKS: Cracks or distortions.
   BLOCKS: Cracks in housing; binding swivel; broken or worn sheaves.
   Dated Comments:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

4. ELECTRICAL SYSTEMS: Malfunctions
   Dated Comments:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

5. SAFETY DEVICES AND INDICATORS: Load indicator (if required by regulation), hook latch, boom angle indicator, backup alarm, etc., for correct operation.

Dated Comments.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

6. AIR & HYDRAULIC SYSTEMS: Leaks, damage, and deterioration.
Dated Comments:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

7. CONTROLS: Wear, lubrication, adjustment, and interference.
Dated Comments:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

8. MISCELLANEOUS: Tires for underinflation and severe cuts; steps and handholds for damage; critical dents in carrier; cracked or broken windows, etc.

Dated Comments:

DISTRIBUTION:

	CONTRACTOR	SUBCONTRACTORS AND OTHER CONTRACTORS
ORIGINAL:	DURING INSPECTION MONTH, RETAIN IN CAB OF CRANE BEING INSPECTED; COMPLETED LOG AT END OF MONTH: TO CM/SAFETY SUPERVISOR	DURING INSPECTION MONTH, RETAIN IN CAB OF CRANE BEING INSPECTED; COMPLETED LOG AT END OF MONTH: TO MANAGER OR SUPERINTENDANT
COPY:	MANAGER OF SAFETY- PDCD	PDCD/SAFETY SUPERVISOR.

NOTE: ORIGINAL OF ALL COMPLETED LOGS AND RECORDS OF CRANE SAFETY INSPECTIONS SHALL BE RETIANED ON THE JOBSITE WHERE INSPECTIONS WERE MADE AND SHALL BE IMMEDIATELY AVAILABLE FOR EXAMINATION BY PDCD UNTIL COMPLETION OF CONTRACT BY THE CONTRACTOR INVOLVED.

PDCD

CRANE SAFETY INSPECTION RECORD

NAME OF CONTRACTOR _____

CRANE MAKE _____ MODEL _____ CAP _____ DATE _____ 19___

RMP NO. _____ R.E. NO. _____ SERIAL NO. _____ JOB NO. _____

☐ RENTED (Name of Owner) _____ JOB LOCATION _____

TYPE OF INSPECTION ☐ REGULAR MONTHLY ☐ REGULAR ANNUAL ☐ MAJOR REPAIR REINSPECTION
☐ MONTHLY FOR CRANE IDLED FOR 1 MONTH, SCHEDULED FOR SERVICE
☐ ANNUAL FOR CRANE IDLED FOR 6 MONTHS

ITEM	INSPECTION CRITERIA	MO	ANN	O K	NOT O K
1	CONTROLS				
A	SUPERSTRUCTURE				
(1)	Load hoist boom hoist swing and boom telescope controls return to neutral automatically	X	X		
(2)	Each control is identified by function and by direction of control	X	X		
(3)	Forces required to operate				
a	Hand levers 35 lb (16 kg) or less	X	X		
b	Foot pedals 50 lb (110 kg) or less	X	X		
(4)	Control length of movement				
a	Two-way levers 14 in (36 cm) or less from neutral	X	X		
b	One-way levers 24 in (61 cm) or less	X	X		
c	Foot pedals 10 in (25 cm) or less	X	X		
(5)	Swing control provides smooth starts and stops with varying degrees of acceleration and deceleration	X	X		
B	ENGINE				
	The following controls are provided and operative				
(1)	Ignition switch	X	X		
(2)	Accelerator or throttle	X	X		
(3)	Diesel engine emergency cutout or stop	X	X		
(4)	Gear selector	X	X		
2	SAFETY DEVICES AND INDICATORS				
A	CRANE HOOK SAFETY LATCH — See Item 3 "HOOKS AND BLOCKS"	X	X		
B	LOAD INDICATING DEVICE (Where Required)				
(1)	Device is approved	X	X		
(2)	Operates at all loads and radii	X	X		
(3)	Accuracy is within the manufacturer s specifications	X	X		
C	BOOM ANGLE INDICATOR				
(1)	Operates freely at all positions	X	X		
(2)	Readable from operator s position at all angles	X	X		
(3)	Error is less than 5 degrees at any angle	X	X		
(4)	Unsafe high-boom angle or stop position	X	X		
D	SPIRIT LEVEL				
(1)	Spirit level complies with the crane manufacturer's specification	X	X		
(2)	Clearly visible from the operator s station	X	X		
E	BOOM LENGTH INDICATOR (Hydraulic Crane Only)				
(1)	Readable from the operator s station	X	X		
(2)	Indicates full range of boom length in 1-ft or in ½, ¼, or 1 m increments	X	X		
F	BOOM HOIST DISCONNECT (Hydraulic Crane Only)				
(1)	The boom hoist disconnect, shutoff or hydraulic release automatically stops boom hoist when the boom reaches a predetermined high angle	X	X		
(2)	Stop-setting is in accordance with the crane manufacturer s specifications	X	X		
G	LOAD DRUM ROTATION INDICATOR				
(1)	Indicator operates freely	X	X		
(2)	Indicator is easily accessible from the operator s station	X	X		
H	CRANE HORN				
(1)	Mounted outside the operator s cab	X	X		
(2)	Control is easily accessible from the operator s station	X	X		
(3)	Audible at twice maximum length of the boom while a rated load is being hoisted	X	X		
I	BACKUP ALARM				
(1)	An alarm other than the crane or carrier horn, is provided	X	X		
(2)	Alarm is audible at 200 ft (approximately 60 m)	X	X		
3	HOOKS AND BLOCKS				
A	SAFETY LATCHES Safety latches are present and functioning properly	X	X		
B	VISIBLE CRACKS Examine hook for visible cracks Use dye-penetrant or magnetic-particle inspection	X	X		
C	THROAT OPENING Spread is less than 15 percent in excess of normal throat opening (see operator s manual)	X	X		
D	TWIST Twist is less than 10 degrees beyond the plane of unbent hook	X	X		

ITEM	INSPECTION CRITERIA	MO	ANN	O K	NOT O K
4	AIR AND HYDRAULIC SYSTEMS				
A	HOSES, FITTINGS, AND TUBING				
(1)	Surface of flexible hose and junction of hose with metal end-fittings are free of signs of oil leakage	x	x		
(2)	Outer covering of flexible hoses is free of blistering or deformations	x	x		
(3)	Hydraulic oil leakage at threaded or clamped joints is eliminated after normal tightening or after using other normal procedures	x	x		
(4)	Excessive abrasion or scrubbing	x	x		
B	PUMPS AND MOTORS				
(1)	Looseness of bolts or fasteners	x	x		
(2)	Leakage at joints between sections	x	x		
(3)	Leaks at shaft seals	x	x		
(4)	Unusual noise or vibration	x	x		
(5)	Loss of operating speed	x	x		
(6)	Hydraulic oil operating temperature	x	x		
C	VALVES				
(1)	Crack in valve housing	x	x		
(2)	Improper return of spool to neutral position	x	x		
(3)	Leak at spool or joint	x	x		
(4)	Sticking spool	x	x		
(5)	Maximum setting of relief valve at or below the pressure specified by the crane manufacturer (see operator's manual as applicable)	x	x		
(6)	Relief valve fails to obtain correct pressure settings	x	x		
(7)	Safety relief valve vented to safe area	x	x		
D	CYLINDERS				
(1)	Drifting caused by oil leaking across pistons	x	x		
(2)	Rod seal leaking	x	x		
(3)	Leak at welded joint	x	x		
(4)	Scored, nicked, or dented cylinder rod	x	x		
(5)	Dented case (barrel)	x	x		
(6)	Loose or deformed rod-eye connecting joint.	x	x		
E	FILTERS				
(1)	Rubber particles on filter, indicating possible deterioration of "O" ring or other rubber component	x	x		
(2)	Metal chips or slivers on filter, indicating possible failure in pump, motor, or cylinders	x	x		
F	AIR SYSTEM				
(1)	Air reservoirs are free of water	x	x		
(2)	Moisture drained from reservoirs is free of oil	x	x		
5	WIRE ROPE AND REEVING				
A	Inspection of wire ropes and end connections shall be recorded on the *Crane Wire Rope Inspection Record* which is part of this *Crane Safety Inspection Record*. (See items 16 and 17 on DS-431 E).	x	x		
B	HOIST ROPE Construction recommended by the crane manufacturer	x	x		
C	END CONNECTIONS In accordance with the crane manufacturer's recommendations	x	x		
D	Equalizer used with multi-part line	x	x		
E	Eye splices made in accordance with the manufacturer's recommendations	x	x		
F	Where used U-bolts have the saddle on the live, or long, end, the U-bolt is on the dead, or short, end	x	x		
G	WIRE ROPE CLIPS Drop-forged	x	x		
H	Swaged compressed, or wedge-socket fittings Applied as recommended by the crane manufacturer	x	x		
I	Two or more wraps of wire rope remain on the hoist drum with the boom at maximum extension and at lowest permissible angle	x	x		
J	Wire rope is attached to the drum in accordance with the manufacturer's recommendations (see operator's manual)	x	x		
6	ELECTRICAL SYSTEMS				
A	CARRIER CAB (in the crane cab if only one cab for the rig) Check proper functioning of the following carrier electrical items				
(1)	Ignition switch	x	x		
(2)	Headlight switch	x	x		
(3)	Headlight dimmer switch	x	x		
(4)	Turn signal actuating lever	x	x		
(5)	Windshield wiper control	x	x		
(6)	Fuel gauge	x	x		
(7)	Transmission neutral light	x	x		
(8)	Engine coolant temperature gauge	x	x		
(9)	Oil pressure gauge	x	x		
(10)	Tachometer	x	x		
(11)	Ammeter	x	x		
(12)	Dome light (where provided)	x	x		
(13)	Dashboard instrument light	x	x		
(14)	Running light switch	x	x		
(15)	Stop light switch	x	x		
(16)	Emergency blinker light switch	x	x		
B	CRANE CAB				
(1)	Torque converter temperature gauge is operable	x	x		
(2)	Crane horn switch is easily accessible and operable	x	x		
C	BATTERY				
(1)	Holding frame is secure	x	x		
(2)	Fluid levels are correct	x	x		
(3)	Cell-caps are securely in place	x	x		

ITEM	INSPECTION CRITERIA	MO	ANN	O.K	NOT O.K
7	SHEAVES AND DRUMS				
	A Minimum ratio of load hoist drum and sheave pitch diameter is not less than 18 to 1		X		
	B Load hoist drums are the type and size recommended by the crane manufacturer (see operator's manual)		X		
	C Drums and sheaves are free of cracks and excessive wear		X		
	D Where required sheaves have slack rope guards		X		
	E All sheave bearings can be and are lubricated, or they are permanently lubricated		X		
8	STRUCTURE AND BOOMS				
	A STRUCTURE				
	(1) No deformation, cracks, or excessive corrosion on any part of the crane that would significantly affect the crane's operation		X		
	(2) Access platforms 4 ft (1-2 m) or more from bottom of wheels or tracks are provided with a handrail 30 to 34 in (76-87 cm) above the platform		X		
	(3) Handrails and handholds are provided for access to cabs and have at least 3-in (7.6 cm) clearance from obstructions		X		
	(4) Handrails are firm and will hold at least 200 lb (91 kg) pressure from any direction		X		
	(5) Handholds are firmly secured to withstand 200 lb (91 kg) pressure from any direction		X		
	(6) Platforms have antiskid surfaces		X		
	B BOOMS				
	(1) Boom, sections, and jibs (as applicable) are marked with proper identification for use as recommended by the manufacturer		X		
	(2) Boom elevation cylinders are provided with operable load check or similar holding devices (hydraulic crane only)		X		
	(3) Boom stops function properly		X		
	(4) Boom stop attachments are secure		X		
	(5) Jib boom is provided with proper jib boom stops		X		
	(6) On telescoping booms, the retract function is capable of controlling 110% of the rated load that can be retracted (hydraulic crane only)		X		
9	BRAKES AND CLUTCHES				
	A BRAKES				
	(1) Thickness of lining is within the manufacturer's specification for continued use		X		
	(2) Travel brake holds crane at all operational grades		X		
	(3) Service brake stops machine within 32 (10 m) ft while traveling on ground at 15 mph (24 kph)		X		
	(4) Service brake holds crane stationary during working cycles		X		
	(5) Travel brakes remain engaged when power is lost		X		
	(6) Swing brake is operational in both directions		X		
	(7) Swing brake stays engaged without attention of the operator, it cannot be accidentally engaged or disengaged		X		
	(8) Swing brake adjustability		X		
	(9) Service brake adjustability		X		
	(10) Friction brakes are provided with rain guards		X		
	B FRICTION CLUTCHES (On Drums Only)				
	(1) Thickness of clutch facing within the crane manufacturer's specifications		X		
	(2) Broken, damaged, or weakened clutch plate springs or other parts		X		
	(3) Adjustability of clutch		X		
	(4) Protection of the clutch from rain		X		
	C PAWLS AND RATCHETS				
	(1) Wear on ratchet tips		X		
	(2) Spring tension on pawls		X		
	(3) Broken or damaged parts		X		
	(4) Ratchet action		X		
	D UNDERCARRIAGE				
	(1) Wheel tightness	X	X		
	(2) Front wheel bearing adjustment	X	X		
10	TIRES AND TRACKS				
	A RUBBER-TIRED CRANES				
	(1) Tires are free of slow leaks		X		
	(2) Tires are free of deep sidewall or tread cuts and are free of bulging		X		
	B CRAWLERS				
	(1) Wear on chain-drive sprockets and chain		X		
	(2) One track engaged at all times		X		
	(3) Condition of treads and attachments		X		
11	PINS, BEARINGS, ROLLERS, SHAFTS, GEARS, AND LOCKS				
	A Remove or uncover as necessary to check for wear, cracks, or distortion. Indicate items needing repair or replacement		X		
	B LUBRICATION		X		
12	ENGINE AND HOISTS				
	A ENGINE				
	(1) Operating within the manufacturer's specifications		X		
	(2) All guards in place		X		
	(3) All wires secured		X		
	(4) Hoses and metal tubing secure and protected from damaging contact with moving parts		X		
	(5) Exhaust pipes protected where required to prevent accidental contact with the oiler, operator, or others		X		

ITEM	INSPECTION CRITERIA	MO	ANN	O K	NOT O K
	(6) Exhaust gases vented away from areas of exposure to persons		X		
	(7) Fuel tanks equipped with self-closing cap		X		
	(8) Gasoline fuel tanks (where applicable) equipped with a flame arrester		X		
	(9) Engine enclosure in place and secured		X		
	(10) Belt drives have proper tension to prevent slippage		X		
	(11) Engine coolant is at proper level		X		
	(12) Chains properly adjusted		X		
	B HOISTS				
	(1) Hoists operate in smooth manner at all speeds		X		
	(2) Adequate hoisting power maintained		X		
13	CHAIN DRIVES Refer to section on engine and tracks		X		
14	OUTRIGGERS				
	A Outriggers can be held at an extended position while traveling		X		
	B Power-actuated jacks (where used) are provided with means to prevent loss of support of load		X		
	C Means are provided for secure fastening of outrigger floats when not in use.		X		
15	MISCELLANEOUS ITEMS				
	A SIGNS				
	(1) The maximum rated capacity of the crane is marked on both sides of the boom		X		
	(2) A chart of the correct standard hand signals for controlling the crane operations is posted in the operator's cab, constantly visible to the operator the chart is also posted on both sides of the outside of the crane cab. Standard hand signals for the crane operation are those shown in the appropriate American National Standard for the type of crane in use		X		
	(3) The signs for standard hand signals are durable		X		
	(4) All signs are securely anchored to prevent displacement		X		
	(5) Controls (see Item 1A(2)) are marked to indicate function and direction of control		X		
	(6) Proximity warning sign 10 ft (3 m) minimum: One 5 x 7-in (13 x 18 cm) minimum sign in the operator's cab, one 10 x 14-in. (25 x 36 cm) minimum sign on the outside front of the crane cab.		X		
	B LOAD CHART				
	(1) The proper load chart is easily accessible or visible to the operator at his station		X		
	(2) The load chart is that provided by the crane manufacturer		X		
	(3) The load chart is durable, it may be printed or embossed on metal, encased or laminated in plastic.		X		
	(4) The load chart is securely attached in the operator's cab and is easily visible to the operator		X		
	C LUBRICATING POINTS				
	(1) All lubricating points are accessible without the necessity of removing guards or other parts		X		
	(2) All lubricating fittings are operable		X		
	D WINDOWS				
	(1) All windows are safety glass		X		
	(2) Opening front windows of the operator's cab have an operable device to hold them open without attention		X		
	(3) Windows are free of cracks and vision-obstructing objects stickers, clouding, etc		X		
	E NONELECTRICAL GAUGES AND CONTROLS				
	Crane or carrier cab				
	(1) Air pressure gauge	X	X		
	(2) Oil pressure gauge	X	X		
	(3) Tachometer		X		
	(4) Outrigger controls	X	X		
	F TOOL BOX A metal receptacle is secured to the crane for storing tools and lubricating equipment		X		
	G CAB DOORS				
	(1) All doors are restrained from accidental opening		X		
	(2) The operator's cab door opens outwards or slides rearward to open		X		
	H PASSAGEWAY A clear passageway is provided from the operator's station to an exit door	X	X		
	I OPERATOR'S CAB ILLUMINATION The light in the operator's cab is sufficient to enable the operator to see clearly enough to perform his work		X		
	J CAB ROOF				
	(1) Where necessarily accessible for rigging or service requirements, an access ladder or steps are provided		X		
	(2) Ladders or steps are provided by the crane manufacturer or others and are in accordance with the Society of Automotive Engineers J185 Access Systems for Construction and Industrial Equipment				
	(3) Accessible areas of the roof are capable of supporting a 200-lb (91 kg) load without permanent distortion.		X		
	K GUARDS				
	(1) Exposed moving parts that constitute a hazard under normal operating conditions are guarded	X	X		
	(2) All guards are securely fastened	X	X		
	(3) Where a man can step on a guard, it is capable of supporting, without permanent distortion, the weight of a 200-lb (91 kg) man	X	X		
	L. TAILSWING GUARD Where the cab rotates and the counterweight swings beyond the crane, the crane is equipped with necessary portable standards and warning barricade tape or similar material to barricade the tailswing area of the crane	X	X		
	M. FIRE EXTINGUISHER: Rated 5BC or greater, secured on the crane, and easily accessible to the operator.	X	X		

16. CRANE WIRE ROPE INSPECTION

* INSTRUCTIONS (Also see Replacement Requirements below.)

A Actual number. If none, so indicate

B Amount of wear for worst wire and overall rope. If nil or none so indicate

C State specific condition. If none so indicate

D Indicate condition of lubrication, presence and type of corrosion, or heat damage.

E Indicate any cracks, severe cuts, abrasions, or faulty operation and identify item. If none, state OK.

Wire Rope Type, Diameter & Use	*(A) Number of broken wires per		*(B) Reduction of wire rope dia (wear or core damage)		*(C) Kinked, crushed, cut, loss of lay, etc	*(D) Inadequate lubrication, evidence of heat damage	*(E) End Tackle (sockets, eyes, clips, clamps & wedges) for damage and breaks
	*(1) Lay	*(2) Strand	*(1) Indv Wire	*(2) Total Rope			

17 REPLACEMENT REQUIREMENTS FOR WIRE ROPE

Inspected Item		RUNNING ROPES	STANDING ROPES
A	1	Six random breaks in one lay	More than two in one lay except end lays
	2	Three breaks in one strand in one lay	More than one in end lays
B	1	1/3 diameter of individual outside wires	None normally expected
	2	Metric 0.4mm for wire ropes through 8.0mm 0.8mm for wire ropes 9.6 through 12.7mm 1.2mm for wire ropes 14.3 through 19.1mm 1.6mm for wire ropes 20.7 through 28.6mm 2.4mm for wire ropes 31.8 through 38.1 mm American 1/64" for wire ropes through 5/16" 1/32" for wire ropes 3/8" through 1/2" 3/64" for wire ropes 9/16" through 3/4" 1/16" for wire ropes 13/16" through 1-1/8" 3/32" for wire ropes 1-1/4" through 1-1/2"	None normally expected, can occur from severe overloading
C	–	Evidence of severe distortion, especially loss of lay at end connections	
D	–	Especially at end connections	
E	–	Damaged sockets, loose clips, loose wedges, damaged or cracked blocks, sheaves, hooks etc	Sockets, eyes, clips, and clamps damaged, worn, cracked etc

COMMENTS: (Identify by Item Numbers)_____

INSPECTED BY: _____

Position or Title: _____

DISTRIBUTION:

	PRIME CONTRACTOR	SUBCONTRACTORS AND OTHER CONTRACTORS
ORIGINAL:	DURING INSPECTION MONTH, RETAIN IN CAB OF CRANE BEING INSPECTED: COMPLETED LOG AT END OF MONTH: TO RCM/SAFETY SUPERVISOR	DURING INSPECTION MONTH, RETAIN IN CAB OF CRANE BEING INSPECTED: COMPLETED LOG AT END OF MONTH: TO MANAGER OR SUPERINTENDANT
COPY:	MANAGER OF SAFETY - PDCD	PDCD/SAFETY SUPERVISOR.

NOTE: ORIGINAL OF ALL COMPLETED LOGS AND RECORDS OF CRANE SAFETY INSPECTIONS SHALL BE RETAINED ON THE JOBSITE WHERE INSPECTIONS WERE MADE AND SHALL BE IMMEDIATELY AVAILABLE FOR EXAMINATION BY PDCD UNTIL COMPLETION OF CONTRACT BY THE CONTRACTOR INVOLVED.

PDCD

CRANE ACCIDENT INVESTIGATION REPORT

CRANE MAKE _____ MODEL _____ CAP _____ DATE _____ 19___

RMP NO. _____ R.E. NO. _____ SERIAL NO. _____ JOB NO. _____

☐ RENTED (Name of Owner) _____ JOB LOCATION _____

A DESCRIPTION OF ACCIDENT

1 Date and time of accident ___/___/___ at _____ AM PM Name of Operator _____

2 Description.

3 Sketch (Plan and elevation showing positions of the crane and involved items or persons immediately before and after the accident. Check here ☐ if continued on an attached sheet.)

B INJURIES

Name	Injury	Employer

☐ Continued on attached page

C PROPERTY DAMAGE (other than damage to crane)

☐ Continued on attached page

D. CRANE DAMAGE AND REPAIR (Initial assessment of damage and repair required; do not wait for final estimate.)

☐ Continued on attached page

E. BASIC DATA

1 Weather and wind conditions _____

2. Crane support

a. Outriggers ☐ out and locked. ☐ partially out and locked. ☐ out, but not locked: ☐ partially out, but not locked Comments:

b Crawler tracks extendable. ☐ extended. ☐ not extended. ☐ partially extended. Comments:

c. Crane mats used ☐ not used ☐ Comments.

3 Boom: Model No _____ Length _____ Radius _____
Jib Model No _____ Length _____ Offset _____ degrees
Change of radius from pickup to point of extension when accident occurred _____
Comments:

Degrees of swing from angle of pickup to angle where accident occurred _____
Comments:

Boom angle indicator: Type _____, operable at time of accident _____?

4. Rigging

a Describe and sketch

b. Attach copy of capacity chart. Was the capacity chart data visible to the operator at time of accident? _____ Was it legible? _____

5 Load

a. Was load involved in the accident? _____ if involved. and weight. size. or configuration was crucial or contributory to the accident. have weight. size and configuration certified. State results of certification and attach copy.

b. What item or material comprised the load?

c. Show computations to determine load percentage of rated capacity:

6. Crane Mechanical Functions

a. Identify crane mechanical function that failed. and was it contributory to the accident?

b. When was the involved crane function last inspected? _____. What, if any, were the deficiencies noted, and were they corrected?

7 Cause

a. Preliminary determination

b. Preliminary indicated corrective action

c. Final determination of cause: ☐ Preliminary determination affirmed. ☐ not affirmed. If not affirmed, state final determination

d. Final corrective action: ☐ Preliminary indicated corrective action affirmed. ☐ not affirmed. If not affirmed, state final corrective acti
☐ recommended and/or ☐ taken.

Investigator or Investigation Team

Signature(s)	Name(s)	Position(s)

DISTRIBUTION:

PRIME CONTRACTOR
ORIGINAL. PDCD/SAFETY SUPERVISOR.
COPY: MANAGER OF SAFETY - PDCD

SUBCONTRACTORS AND OTHER CONTRACTORS
ORIGINAL: MANAGER OR SUPERINTENDANT
COPY: PDCD/SAFETY SUPERVISOR.

WEEKLY SHAFT INSPECTION REPORT

Date _____ Contract No. _____

Name of Inspector _____

Contractor _____

REMARKS

Firefighting Equipment _____

Timbers _____

Guides or Track _____

Shaft Rope Idlers or Deflection Sheaves _____

Safety Gates or Guardrails _____

Safety Hand on Cages or Skips _____

Daily Inspection and Maintenance of Safety Dogs _____

On Cage or Skip _____

Sunday _____ Monday _____ Tuesday _____

Wednesday _____ Thursday _____ Friday _____

Saturday _____ Additional Remarks _____

_____

_____

Skip or Cage Coupling _____ Manway _____

Top Sheave Wheel _____ Ladders/Platforms _____

Overwinding Devices _____ Date Hoisting Rope Was Last Cut Off _____

Shaft Clearance _____ Length of Hoisting Rope Removed _____

Chutes _____ Hoisting Rope _____

Chute Gates _____ Bell Signal System _____

Telephone System _____

Each problem and its correction must be recorded

PDCD

REPORT OF SAFETY MEETING

CONTRACTOR: _____ DATE OF MEETING: _____

JOB NO.: _____ CLIENT: _____

LOCATION: _____

TYPE OF MEETING: ☐ CRAFT ☐ FOREMEN ☐ STAFF TIME: _____ LENGTH: _____ (MIN.)

NAME AND TITLE OF LEADER: _____

TOPICS: (Attach typed copy of prepared topic, if provided; Otherwise, list prepared topic and others here.)

NAMES AND TITLES OF PERSONS WHO ATTENDED MEETING: (List names in two columns; Use reverse side of form for additional names, if required.)

REPORT PREPARED BY: _____

TITLE: _____

DATE OF REPORT: _____

PDCD Form 159 (2/85)

ORIGINAL - JOB FILES
COPY TO PDCD SAFETY MGR.
COPY TO PDCD SAFETY SUPERVISOR

S/S #3

INSPECTION SCHEDULE FOR FIRE-PROTECTIVE EQUIPMENT*

ITEM OF INSPECTION	Inspection Interval	Procedure Reference
Automatic and Manual Protective Equipment		
Main generator CO_2 system, oil storage room CO_2 system, oil purification room CO_2 system	M-SA	1
Sprinkler system	Bimonthly	2
Fire doors and shutters	M-SA	3
Portable Protective Equipment		
Carbon dioxide (CO_2) extinguisher, portable and wheeled type	M-SA	4
Dry chemical extinguishers, portable and wheeled type	M-SA	5
Loaded stream type extinguisher	M-SA-A	6
Foam extinguishers portable and wheeled type	M-SA-A	7
Soda and acid extinguishers, portable and wheeled type	M-SA-A	8
Water type extinguishers	M-SA-A	9
Fire pails, drums, tanks	W	10
Transformer fog system	D-SA	11
Fire hose	M-A	12
Fire alarm system		
Area fire signal	D-M	13
Station fire alarm	M	14

*Source: Army Corps of Engineers, General Safety Requirements, Revised March 1, 1967 385-1-1.

FREQUENCY OF INSPECTION

Procedure Reference	Inspection Interval	Procedure
1. Main generator CO_2 system, oil storage CO_2 system and oil purification CO_2 system.	Monthly	Check electrical control circuits to see that same are in the ON position. Check all indicating lights.
	Semiannually	Check every cylinder to see that it is mounted properly and weigh to see that it has full charge. Check in detail the tripping devices in accordance with the equipment manufacturers manual and recommendations.
2. All water spray systems	Bimonthly	Make visual inspection of water spray system water supply control. Start fire pumps, thereby building up pressure on water lines and flush out lines by opening flushing valve at end of line. Check fire pumps for leakage and proper operation.
3. Fire doors and shutters	Monthly	Inspect and manually operate fire doors and dampers. Make repairs as needed.
	Semiannually	Test automatic operation of automatic fire doors and dampers. Lubricate rollers and clean out channels.

FREQUENCY OF INSPECTION (continued)

Procedure Reference	Inspection Interval	Procedure
4. Carbon dioxide (CO_2), extinguishers, portable and wheeled type	Monthly	Check all extinguishers for proper location. Make sure that extinguisher is not subjected to high temperatures or located in direct rays of sun. Check lead wire seal and plastic seal on pressure release disk, if damaged or broken, check charge. Check hoses, nozzles, shells, brackets, and supports for deficiencies and correct.
	Semiannually	Weigh all extinguishers to insure full charge. Recharge if loss is 10 percent or more of rated capacity. Lubricate wheels on wheeled type.
5. Dry chemical extinguishers, portable and wheeled type	Monthly	Check all extinguishers for proper location. Make visual inspection and, if any show signs of having been used, check charge and restore to normal. Check hoses, nozzles, brackets, and supports for deficiencies and correct. Pressurized units-check gauge pressure for full charge.
	Semiannually	Non-Pressurized units-remove cartridges and weigh. Examine chemical to see that it is freely running, powdery condition. DO NOT MIX THE VARIOUS TYPES OF DRY CHEMICALS. Wheeled type-check racks and lubricate wheels.

FREQUENCY OF INSPECTION (continued)

6. Loaded stream type extinguishers.	Monthly	Check all extinguishers for proper location. Make visual inspection and, if any show signs of having been used, check charge and restore to normal. Check hoses, nozzles, brackets, and supports, and correct deficiencies.
	Semiannually	Weigh cartridge and replace if loss exceeds stamped instructions. See that material is at the proper level. Examine inside of extinguisher and filler neck for corrosion, dents, and other damage.
	Annually	Stored-pressure units will be checked for pressure indication in operable range. All extinguishers except stored-pressure type must be discharged and recharged, and inspected annually.
7. Foam extinguishers, portable and wheeled	Monthly	Check all extinguishers for proper location. Make visual inspection and, if any show signs of having been used, check charge and restore to normal. Check condition of tank, hoses, nozzles, orifices, brackets, and supports for deficiencies and correct.

FREQUENCY OF INSPECTION (continued)

		Semiannually	Remove caps and examine tank interior visually for corrosion and damage. Check quantity of contents, inter-chamber stopper for freedom of movement, and gasket and filler collar for breaks, grooves, dents, or other damage. Lubricate wheels on wheeled type.
		Annually	Discharge and recharge all foam types annually.
8.	Soda acid extinguishers, portable and wheeled type	Monthly	Check all extinguishers for proper location. Make visual inspection and if any show signs of having been used, check charge and restore to normal. Check tanks for external damage, corrosion, and leaks. Check hoses, nozzles, orifices, brackets, and supports and correct deficiencies.
		Semiannually	Remove cap and blow through nozzle to insure waterway is unobstructed. Use a short hose or tube for mouthpiece. Check tank interior, gaskets, and filling collar for corrosion, breaks, dents, foreign material, or other damage. Remove acid bottle and check quantity of soda solution by filler mark. Check for soda cake on bottom using small

FREQUENCY OF INSPECTION (continued)

8. (continued) Soda acid extinguishers, portable and wheeled type		wooden rod or stick and recharge if excessive. Do not scratch lead coating on interior of extinguisher. Check quantity of acid. Excess indicates water absorption and need for fresh acid. Inspect acid bottle stopper for freedom of movement, acid bottle for cracks, and cage holder for weak spots. Lubricate wheels on wheeled type.
	Annually	Discharge and recharge all soda acid types annually.
9. Water type extinguisher (a) Pump type (b) Plain water, calcium chloride type (c) Extinguishers using and acid reaction to expel liquid	Monthly	Check all extinguishers for proper location, leaks, damage, and clear orifices. Operate pumps in pump types.
	Semiannually	Tighten packing gland on pump type to stop leaks. Oil pump pumper rod. Remove and weigh carbon dioxide cartridge. If weight is less than allowance specified on container, replace cartridge. Inspect interior, gaskets, and filler collar for corrosion, breaks, dents, or other damage.
	Annually	Extinguishers of the acid reaction type must be discharged and recharged annually and all parts carefully inspected.

FREQUENCY OF INSPECTION (continued)

10. Fire pails, drums, tanks	Weekly	Check items for condition and proper location. Remove trash and refill if necessary. Check antifreeze solution as required.
11. Transformer fog system	Daily	See that pilot lights are burning indicating that power is on and system is ready for automatic operation. Make visual inspection of nozzle piping at transformers.
	Semiannually	Make complete overall test while transformer bank is out of service. Operate tripping devices and actually operate the entire system to see that it is operating properly. Make thorough inspection of each head and coverage of spray.
12. Fire hose	Monthly	Make a visual inspection of nozzle, hose, and connections. Be sure hose is hung in proper position for use in case of fire. Defective hose is to be discarded and replaced with new hose.
	Annually	Test flow from hydrant and test hose.
13. Area fire signal	Daily	Test operate fire signal.
	Monthly	Service fire signal and controls.

FREQUENCY OF INSPECTION (continued)

14. Stations fire alarms	Monthly	Check system for proper operation. Check controls, relays, bells, gongs, and other equipment. If the station automatic telephone system is used for fire alarm purposes, check in accordance with inspection and test of station telephone system.

S/S #3

PDCD

FIRST AID TREATMENT LOG

☐ PDCD
☐ SUBCONTRACTOR
☐ OTHER CONTRACTOR ____________

JOB NUMBER ____________ CLIENT ________________________ LOCATION ____________

DATE TIME	NAME	CRAFT	BADGE OR BRASS NO.	DESCRIPTION OF INJURY OR ILLNESS	TREATMENT	RTW - RETURNED TO WORK DR - SENT TO DOCTOR O - OTHER (EXPLAIN)		INITIAL
/ / :								
/ / :								
/ / :								
/ / :								
/ / :								
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DISTRIBUTION AND RETENTION REQUIREMENTS

FIRST AID TREATMENT LOG FOR PDCD

- ORIGINAL

  At first aid station on the jobsite during progress of work

COPY *To Manager of Safety,*

COPY

In permanent job records sent to storage at time of job completion

FIRST AID TREATMENT LOG FOR SUBCONTRACTORS AND OTHER CONTRACTORS

- ORIGINAL

  At first aid station on the jobsite until subcontractor's completion of work

  To subcontractor at time of job completion

- COPY

  In permanent job records sent to storage at time of overall job completion

  To Manager of Safety, PDCD

PDCD

SUPERVISOR'S REPORT OF ACCIDENT

1. Contract Number	2. Date of accident - Time - AM or PM
3. Project Section	4. Location of accident
5. Reporting organization	6. Contractor or Subcontractor involved
7. Injury ☐ Lost time ☐ Critical ☐ Fatal	8. Damage* ☐ Fire ☐ Property ☐ Equipment
9. Injured person and address	10. Occupation of injured Employer Address ☐ Male ☐ Female Age
11. Nature of injury	12. Date stopped work / 13. Date returned
14. First aid by	15. Ambulance
16. Hospital	17. Attending Physician
18. Witnesses or persons responding, including addresses	
19. Fire Department	20. Police Department
21. Equipment and/or materials involved	
22. Primary cause of accident	
23. Secondary cause	
24. Contributing factors	
25. Supervisor's corrective action	Supervisor's signature
26. Project Supt.'s corrective action	Project Supt.'s signature
27. Date this report	*Attach a list of damaged property and/or equipment excluding motor vehicles. Indicate owner's names and addresses.

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28. Safety regulations involved Part_____ Chapter _____ Par._____

29. Photographs attached

30. Sketch showing location of nearby structures, materials, equipment, etc., with approximate scale of distances.

31. Narrative description of events previous, during and immediately after the accident.

PDCD

ACCIDENT INVESTIGATION REPORT

CONTRACTOR

JOB NO. _____ CLIENT _____ LOCATION _____

TYPE OF REPORT

- ☐ OCCUPATIONAL INJURY OR ILLNESS
- ☐ NON-OCCUPATIONAL INJURY OR ILLNESS
- ☐ PROPERTY DAMAGE
- ☐ VEHICLE
- ☐ EQUIPMENT
- ☐ PRIVATE INDIVIDUAL
- ☐ PDCD
- ☐ SUBCONTRACTOR
- ☐ OTHER CONTRACTOR

NAME OF INJURED OR ILL PERSON _____ BADGE NO. _____

DATE OF INJURY OR ILLNESS _____ TIME _____ AM PM CRAFT _____

INJURY REPORT NO. _____ FOREMAN _____

OWNER OF DAMAGED PROPERTY _____

DESCRIPTION OF ACCIDENT OR OCCURRENCE _____

NATURE OF INJURY, ILLNESS OR DAMAGE _____

INJURED TAKEN TO _____

DAMAGED PROPERTY MAY BE SEEN AT _____

CAUSE OF ACCIDENT OR OCCURRENCE _____

ACTION TAKEN ☐ TO PREVENT SIMILAR ACCIDENT OR OCCURRENCE _____

ACTION RECOMMENDED ☐ _____

WITNESSES OR NAMES OF PERSONS WITH KNOWLEDGE OF THE ACCIDENT OR OCCURRENCE _____

INVESTIGATED BY _____ SIGNATURE _____

POSITION OR TITLE _____ DATE _____

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MANAGER OF SAFETY - PDCD

SUBCONTRACTORS AND OTHER CONTRACTORS
ORIGINAL: MANAGER OR SUPERINTENDANT
COPY CONTRACTOR/SAFETY SUPERVISOR

PDCD Form 162 (2/85)

S/S #3

S/S #3

PDCD

WEEKLY RECORD OF INJURY AND ILLNESS REPORTS

NAME OF CONTRACTOR _____ DATE OF RECORD: _____

JOB NUMBER _____ CLIENT _____ LOCATION _____ FOR WEEK OF: _____

(DUE TO PDCD BY SECOND WORKDAY FOLLOWING THE WEEK OF RECORD)

NAME OF INJURED OR ILL EMPLOYEE	DATE OF INJURY OR ILLNESS	OSHA CASE OR FILE NO. (IF ANY)	DESCRIPTION OF ACCIDENT AND OF NATURE OF INJURY OR ILLNESS

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PDCD

MONTHLY REPORT OF WORK
INJURY AND ILLNESS STATISTICS

NAME OF CONTRACTOR: _____ FOR MONTH OF: _____ 19____

LOCATION: _____ DATE OF REPORT: _____ 19____

CLIENT: _____ PREPARED BY: _____
(TITLE AND NAME)

☐ Single contractor report

☐ Composite report; list names of contractors in Remarks and attach copy of each contractor's single contractor report.

	TOTAL FOR MONTH	CUMULATIVE TOTAL
Lost Workday Cases		
*Lost Workdays		
**OSHA Citations		
Fatalities		
Manhours		
Incidence Rates:		
Lost Workday Cases		
Lost Workdays		

Remarks ☐ (Check, if continued on back of form):

* Lost workdays are those days that the employee would have worked but could not because of occupational injury or illness. The number of lost workdays should not include the day of injury. The number of days (consecutive or not) on which because of injury or illness: (1) the employee would have worked but could not, (2) the employee was assigned to a temporary job, or (3) the employee worked at a permanent job less than full time, or (4) the employee worked at a permanently assigned job but could not perform all duties normally assigned to it. (Note: Chargeable days shall not include weekends or holidays unless work was scheduled for those days.)

** Explain details of these incidents in the Remarks section.

Distribution

ORIGINAL: CONTRACTOR, CM

COPIES: MANAGER SAFETY, PDCD

JOB SAFETY FILE

COPY: SUB CONTRACTOR SUPERVISOR

LOWER-TIER SUBCONTRACTORS

PDCD Form 164 (2/85)

S/S #3

S/S #3

PDCD

QUARTERLY WORK INJURY / ILLNESS REPORT

REPORT PERIOD:_____ QUARTER, 19 ____

☐ PDCD
☐ SUBCONTRACTOR
☐ OTHER CONTRACTOR

NAME:_____ LOCATION:_____

JOB NO._____ CLIENT _____ DATE OF REPORT:_____ 19____

	*REGULATORY INSPECTIONS	FIRST AID CASES	MEDICAL TREATMENT CASES	*FATALITIES	LOST WORKDAY CASES		LOST WORKDAYS		MANHOURS WORKED
					AWAY FROM WORK	RESTRICTED	AWAY FROM WORK	RESTRICTED	
1ST QTR.									
2ND QTR.									
3RD QTR.									
4TH QTR.									

REMARKS:

*CONTRACTOR SHALL ATTACH DETAILED INFORMATION

SUBMITTED BY:_____

TITLE:_____

PDCD Form 165 (2/85)

EMPLOYEE RETURN-TO-WORK NOTICE

Name of Contractor _____

Contract Number _____

Employee Name _____

Date of Accident _____

Return-to-Work Date _____

Number of Days Lost _____

NOTE: If employee returns to work and additional time is then lost as a result of the accident, complete the following:

Additional Days Lost

From _____ To _____ Total _____

UNIT FIRST AID KITS

Mine Safety Appliances Company

Standard Type D Unit First Aid Kit

Ordering information

Order by Catalog No.

Size	Kit Complete	Refill	Case Only
10-unit	12035	12610	12020
16-unit	12036	12611	12024
24-unit	12037	12612	12027
36-unit	12038	12613	12030

Standard contents

D unit	10-unit	16-unit	24-unit	36-unit	Cat. No
Adhesive Bandages, nonadhering, 1" x 3" pad, 16 per pkg	2 pkg	2 pkg	3 pkg	4 pkg	12749
Ammonia Vials, 2 cc, 4 per pkg, with paper cups	—	—	1 pkg	2 pkg	2148
Ammonia Inhalants, ½ cc, 10 per pkg	1 pkg	1 pkg	1 pkg	2 pkg	2156
Compress Bandage, nonadhering, 4" pad, 1 per pkg	1 pkg	2 pkg	3 pkg	4 pkg	13004
Compress Bandage, nonadhering, 2" pad, 4 per pkg	1 pkg	2 pkg	3 pkg	4 pkg	13006
Foille* Ointment Tubes, 0.11 oz, 6 per pkg	1 pkg	1 pkg	1 pkg	2 pkg	12692
Foille Ointment Tubes, ½ oz, 2 per pkg	—	1 pkg	1 pkg	2 pkg	12627
Gauze Bandage, 4" x 6 yds, 1 per pkg	—	1 pkg	1 pkg	2 pkg	2143
Gauze Compress, 24" x 2 yds, 1 per pkg	—	—	2 pkg	3 pkg	2154
Merthiolate** Swabs, 0.5 cc, 10 per pkg	1 pkg	2 pkg	2 pkg	3 pkg	2898
Paper Cups, 10 per pkg	—	1 pkg	1 pkg	1 pkg	2142
Tourniquet and Forceps	1 pkg	1 pkg	1 pkg	1 pkg	2146
Triangular Bandage, nonsterile, 40", 1 per pkg	1 pkg	1 pkg	2 pkg	4 pkg	2144
Wire Splint, 3¾" x 30", 1 per pkg	—	—	1 pkg	1 pkg	2165

NOTE: The listing of the MSA unit first aid kits is not intended to imply that the kit manufacturer is favored above others. The list is for comparative purposes only to facilitate selection of equivalents from other manufacturers.

Recommended Usage:
10-Unit: small, or isolated crews
16 Unit: to 50 employees
24 Unit: 50 - 150 employees
36 Unit: 150 - 300 employees
Above 300 employees, bulk supplies are recommended.

PDCD STANDARD OCCUPATIONAL SAFETY AND HEALTH PRACTICE	NO. 653 UNIT FIRST AID KITS	APPROVED	REV.
	SHEET OF / DATE		0

Safety and Health Rules

1. REPORTING INJURIES AND ACCIDENTS

(a) Each occupational injury or illness shall be reported immediately to the first aid attendant and to your foreman to assure suitable first aid or medical attention.

(b) All accidents involving damage to equipment and materials, including motor vehicle accidents, shall be reported to your foreman or supervisor at once.

2. REPORTING UNSAFE OR HAZARDOUS CONDITIONS

Report unsafe or hazardous conditions to your foreman or supervisor so that corrective action can be taken to prevent accidents.

3. GOOD HOUSEKEEPING

Good housekeeping on the job is mandatory, and every employee must do his part daily in this activity to keep the job clean for safety and efficiency.

4. PERSONAL PROTECTIVE DEVICES

Hard hats are provided for every employee and shall be worn at all times except in the job office. Other protective equipment, such as goggles, face shields, toe guards and safety belts, shall be issued and used when required.

5. DRUNKENNESS AND USE OF NARCOTICS

Drinking intoxicants on the job is forbidden. Anyone who reports for duty under the influence of alcohol or narcotics shall not be permitted to work, shall be removed from the jobsite and be subject to termination.

6. SANITATION

Employees shall use the toilets provided.

7. HORSEPLAY OR FIGHTING

Indulgence in practical jokes, horseplay, scuffling, wrestling or fighting is strictly prohibited.

8. LIFTING

When lifting, take a position over the load and lift with the leg muscles. Get help for heavy or awkward loads, or use a lifting device.

9. STARTING AND OPERATING MACHINES

Employees shall not start or operate any mechanical equipment unless qualified and authorized to do so.

10. MACHINERY AND TOOL GUARDS

Machinery and tool guards are provided for protection against revolving or reciprocating parts. These guards shall be in place before the machine or tool is used and shall not be removed or made inoperative.

11. SCAFFOLDS

(a) Scaffolds shall be substantially constructed to carry the loads imposed upon them and to provide a safe work platform. All scaffolds more than 10 feet high shall have approved guard rails on all exposed ends and sides. Toeboards and screens shall be provided on a scaffold if persons are required to pass under it.

(b) Only approved scaffolds shall be used. Barrels, boxes and other makeshift substitutes for scaffolds shall not be used.

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12. LADDERS

Only approved ladders shall be used. Job-made ladders shall be substantially constructed in accordance with an approved design. Portable straight or extension ladders shall be placed at a safe angle and shall be secured to prevent displacement; the top of each ladder giving access to a work area or platform shall extend at least thirty-six inches above that level.

13. EXCAVATIONS AND TRENCHES

(a) Trenches in unstable or soft material, five feet or more in depth, shall be shored or sloped in an approved manner.

(b) Trenches in hard compact material shall be shored or otherwise protected when five feet or more deep and eight feet or more long.

(c) Sides of trenches may be sloped in lieu of shoring above the five foot level but the slope may not be steeper than one foot rise for each one-half foot horizontal.

(d) There shall be ladders in each trench four feet deep or more where employees are working to provide safe

exits from the trench. There shall be no more than twenty-five feet of lateral travel distance to the nearest ladder.

(e) Excavated material or other material shall not be stored nearer than two feet from the edge of any excavation.

(f) Excavations and trenches shall be inspected daily by a competent person. If there is evidence of slides or cave-ins, all work in the exposed area shall cease until necessary precautions have been taken for the protection of employees.

14. FLOOR OPENINGS HOLES AND EDGES

(a) Floor openings or holes shall be protected by approved guard rails or covers. If covers are used, they shall be strong enough to support the loads to be imposed upon them and shall be secured to prevent accidental displacement.

(b) The open edges of all floors six feet or more above the next floor or level shall be guarded by an approved barricade secured to prevent accidental displacement.

15. HAND TOOLS

(a) Worn or broken hand tools shall be turned in for repair or replacement. A dull or broken tool is unsafe.

(b) Hand tools shall be used for their intended purpose only. The design capacity of hand tools shall not be exceeded by unauthorized attachments.

16. POWER TOOLS

(a) Electrically powered tools and equipment shall be grounded at all times when in use.

(b) Air hose connections shall be secured to prevent accidental separation.

(c) Operating switches or levers requiring constant pressure for operation shall not be tampered with to make the tool operate without constant hand or finger pressure.

(d) Grinding wheel speeds shall conform to the manufacturer's recommended speeds.

17. EXPLOSIVE-ACTUATED TOOLS

(a) Only authorized and properly-trained employees may use explosive-actuated tools; all such tools shall be used in accordance with manufacturer's instructions and applicable regulations.

(b) Safety goggles shall be worn by the operator and shall be an approved type.

18. ELECTRICAL EXTENSION CORDS

Only approved types of electrical extension cords shall be used; they shall be properly grounded. Damaged or inoperative cords shall be immediately turned in for repair or replacement.

19. WELDING CABLE

Welding cable shall be connected or spliced in an approved manner. There shall be no exposed metal parts in any splice.

20. TEMPORARY ELECTRIC POWER

All temporary electric power lines shall be handled as if they were energized.

21. GAS CYLINDERS

(a) Gas cylinders must be upright when in use, secured to prevent falling, and protected from extreme heat and from being struck by moving equipment and falling objects.

(b) If transported by crane, hoist or derrick, gas cylinders must be handled in a suitable cradle, net or skip box, never by wire or fibre rope, web or chain sling, or by dragging. Regulators shall be removed.

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(c) Oxygen cylinders must never be stored near highly combustible materials, especially oil and grease, or near fuel gas cylinders.

(d) Caps should be replaced on cylinders that are empty and such cylinders shall be marked "Empty".

22. EXPLOSION AND GAS HAZARD

(a) No work involving a source of ignition shall be attempted near any pit, manhole, open sewer, drain vent, pipe trench, or any enclosed space where there is reason to believe that flammable vapors may be present, until a test has been made with an approved hydrocarbon vapor detector, and when said test indicates the atmosphere is safe for hot work.

(b) At locations similar to the ones above where there is reason to believe that toxic gas may be present, a similar test with an approved toxic gas detector shall be made, and no work shall be performed in the location until said test indicates toxic gas concentrations lower than the maximum permissible for that gas or until approved protective measures have been taken.

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(c) In areas where flammable or toxic vapors or gases may occur, all the work shall be done in accordance with Hazardous Area Work Procedures.

23. FIRE PREVENTION AND CONTROL

Each employee shall comply with the Fire Prevention and Control Procedures. There shall be no unauthorized open fires.

24. TEMPORARY HEATERS

(a) Temporary heaters, other than salamanders where permitted, shall have a pilot and automatic valve which will shut off and prevent the flow of fuel when the pilot is unlit or goes out.

(b) Temporary heaters shall be installed, serviced and relocated by authorized employees only; installation, service and relocation shall be in accordance with manufacturer's instructions. the Fire Prevention and Control Procedures and applicable regulations.

25. FUELING EQUIPMENT

(a) No gasoline or diesel engine shall be fueled while it is running.

(b) If fuel cans are used for refueling, they shall be approved metal safety fuel cans with a flash arresting screen, spring closing lid and spout cover that will safely relieve internal pressure if the can is exposed to fire.

(c) There shall be no smoking or open flames within twenty-five feet of fuel storage tanks, fuel pumps or refueling operations.

(d) All fuel storage tanks shall be properly grounded in an approved manner; such electrical grounds shall not be removed without authorization.

26. VEHICLE OPERATION

(a) Each vehicle driver and operator of rubber tired construction equipment shall comply with job speed limits and traffic control procedures.

(b) No vehicle with an obstructed view shall be backed up unless it is equipped with an operating back-up alarm signal that is audible above the surrounding noise or when an observer signals that it is safe to do so.

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(c) No employee may be transported in a vehicle unless approved seating is available to him.

27. CRANE OPERATION

(a) The Resident Construction Manager or someone officially designated by him shall review the specific operation of a crane when the crane must operate in the vicinity of an overhead power line where ANY part of the crane can come within ten (10') feet of the overhead line. This must be done prior to the crane moving into the exposed area.

(b) The Resident Construction Manager or someone officially delegated by him shall review the specific operation of a crane prior to any lift that exceeds 80% of the rated capacity for the radius of boom. The review shall be documented in accordance with procedures established by the Construction Division.

(c) Outriggers shall be used at all times, except when traveling. If the crane is traveling with a load, every reasonable effort shall be made to keep the outriggers extended as far as is practical.

(d) Hand signals to crane and derrick operators shall be those prescribed by the applicable American National Standards Institute standard for the type of crane in use. An illustration of the signals shall be posted at the job site.

(e) Overhead lines within the work area shall be marked with warning signs, six (6) to eight (8) feet above the ground.

(f) Rigging and boom changes shall be made by a competent mechanic under the supervision of a qualified supervisor.

State of California
Agriculture and Services Agency
Department of Industrial Relations
DIVISION OF INDUSTRIAL SAFETY

455 Golden Gate Avenue
San Francisco, California 94102

3460 Wilshire Boulevard
Los Angeles, California 90010

SAFETY REPRESENTATIVE APPLICATION

FULL NAME OF APPLICANT _____ _____ _____
First Middle Last

APPLICANT'S ADDRESS _____ _____ _____ _____
City & State ZIP Phone

REPRESENTING _____
Company/Self

COMPANY ADDRESS _____ _____ _____ _____
City & State ZIP Phone

TYPE OF SAFETY REPRESENTATIVE CERTIFICATION REQUESTED

( ) A. UNDERGROUND MINING AND TUNNELING

( ) B. TUNNEL CONSTRUCTION

( ) C. UNDERGROUND MINING

List at least 2 years of underground qualifying experience and experience in mine or tunnel safety.

From Mo. Yr.	To Mo. Yr.	Job Title and Duties	Employers (Name, Address and Phone Number)

Applicant must appear in person to be certified as a safety representative. A certification will be issued only to persons possessing sufficient knowledge to perform the duties of a safety representative. The license will be issued after the applicant has passed the examination and a background check has been made to determine the applicant's qualifications.

Labor Code, Section 8003. Violation of regulations, rules, orders, or special orders adopted by the board or division as a condition of certification shall be punishable by suspension or revocation of certification unless such violation is responsible for death or injury to employees, in which case it shall be punishable as a misdemeanor.

The application fee is $15.00 for the Safety Representative Certification and $5.00 for renewals. Make checks or money orders payable to the Department of Industrial Relations.

APPLICANT'S SIGNATURE _____

15-167

PDCD Form 167 (2/85)

S/S #3

S/S # 3

SAFETY AND HEALTH PROTECTION ON THE JOB

State of California
Department of Industrial Relations

The California Occupational Safety and Health Act of 1973 provides job safety and health protection for workers. The Department of Industrial Relations has primary responsibility for administering the CAL/OSHA program. Job safety and health standards are promulgated by the Occupational Safety and Health Standards Board. Employers and employees are required to comply with these standards. Enforcement is carried out by the Division of Occupational Safety and Health within the Department of Industrial Relations.

EMPLOYERS AND EMPLOYEES

California law requires every employer to provide employment and a place of employment which are safe and healthful for the employees therein. Employers and employees are required to comply with the occupational safety and health standards contained in Title 8 of the California Administrative Code and all rules, regulations and orders pursuant to Division 5 of the California Labor Code which are applicable to their employment and actions on the job.

COMPLIANCE WITH JOB SAFETY AND HEALTH REQUIREMENTS

To ensure compliance with State job safety and health requirements, the Division of Occupational Safety and Health conducts periodic jobsite inspections. The inspections are made by trained safety engineers and industrial hygienists.

The law provides that an authorized representative of the employer and a representative of the employees be given an opportunity to accompany the safety engineer/industrial hygienist for the purpose of aiding the inspection. Where there is no authorized employee representative, the safety engineer/industrial hygienist talks with a reasonable number of employees about the safety and health conditions in the workplace.

Every employee has the right to bring unsafe or unhealthful conditions to the attention of the safety engineer/industrial hygienist making the inspection. In addition, any employee who believes unsafe or unhealthful conditions exist at the worksite has the right to notify the Division of Occupational Safety and Health. The Division upon request will withhold the names of employees who submit or make statements during an inspection or investigation.

If the Division of Occupational Safety and Health believes that an employer has violated a safety and health standard or order, it issues a citation to the employer. Each citation specifies a date by which the alleged violation must be corrected. The law provides for mandatory penalties against employers of up to $2,000 for each serious violation and for optional penalties of up to $1,000 for each general violation. Penalties of up to $2,000 per day may be proposed for failure to correct serious violations and up to $1,000 per day may be proposed for failure to correct general violations by the abatement date. Also any employer who willfully or repeatedly violates any occupational safety and health standard or order may be assessed civil penalties of not more than $20,000 for serious violations and $10,000 for general violations.

A willful violation that causes death or permanent impairment of the body of any employee results, upon conviction, in a fine of not more than $10,000 or imprisonment of not more than six months, or both. A second conviction, after a first conviction, doubles these maximum penalties.

While governmental entities may be cited on the same basis as other employers, and abatement dates set, civil penalties will not be assessed.

An employer who receives a citation, Order to Take Special Action or Special Order must post it prominently at or near the place of the violation for three working days, or until the unsafe condition is corrected, whichever is longer, to warn employees of danger that may exist there. Any employee may protest the time allowed for correction of the violation.

COMPLAINTS

Employees or their representatives who believe unsafe or unhealthful conditions exist in their workplace have the right to file a complaint with any office of the Division of Occupational Safety and Health and thereby to request an inspection. The Division keeps confidential the names of complainants unless they request otherwise.

An employee may not be fired or punished in any way for filing a complaint about unsafe or unhealthful working conditions or using any other right given to employees by the CAL/OSHA law. An employee of a private employer who believes that he/she has been fired or punished for exercising such rights may file a complaint about this discrimination with the nearest office of the Department of Industrial Relations—Division of Labor Standards Enforcement (State Labor Commissioner) or with the San Francisco office of the U.S. Department of Labor, Occupational Safety and Health Administration. Employees of state or local government agencies may file discrimination complaints only with the State Labor Commissioner. See addresses below.

OTHER EMPLOYEE RIGHTS

Any employee has the right to refuse to perform work which would violate the CAL/OSHA Act or any occupational safety or health standard or order where such violation would create a real and apparent hazard to the employee or other employees.

Employers who use any substance listed as a hazardous substance in Section 339 of Title 8 of the California Administrative Code or subject to the Federal Hazard Communication Standard (29 CFRS 1910.1200) must provide employees with information on the contents of material safety data sheets (MSDS) or equivalent information about the substance which trains employees to use the substance safely.

Employers shall make available on a timely and reasonable basis a material safety data sheet on each hazardous substance in the workplace upon request of an employee collective bargaining representative, or an employee's physician.

Employees have the right to see and copy their medical records and accurate records of employee exposure to potentially toxic materials or harmful physical agents.

Any employee has the right to observe monitoring or measuring of employee exposure to hazards conducted pursuant to CAL/OSHA standards. Employers must tell their employees when they are being, or have been, exposed to concentrations of harmful substances higher than the exposure limits allowed by CAL/OSHA standards, and the corrective action being taken.

For information and assistance, contact the nearest office of the Division of Occupational Safety and Health. See addresses below.

The law requires each employer in California to post this poster conspicuously in each workplace.

CONSULTATION SERVICE

In order to encourage voluntary compliance, CAL/OSHA provides free, upon request, a full range of occupational safety and health consulting services. The CAL/OSHA Consultation Service is separate from CAL/DSIA enforcement activities.

A-44

PROTECCION DE LA SEGURIDAD Y SANIDAD EN EL TRABAJO

Estado de California
Departamento de
Relaciones Industriales

La Ley de la Seguridad y Sanidad de Empleo en California de 1973 provee protección de seguridad y salud para los trabajadores. El Departamento de Relaciones Industriales tiene la responsabilidad principal de administrar el programa CAL/OSHA. Las normas de seguridad y sanidad son promulgadas por la Junta para Normas de Seguridad y Sanidad en el empleo. Los patrones y los empleados deben cumplir con estas normas. La División de Seguridad y Salud en el Trabajo, del Departamento de Relaciones Industriales, tiene la responsabilidad de hacer cumplir dichas normas debidamente.

PATRONES Y EMPLEADOS

La ley de California requiere que cada patrón debe ofrecer empleo y un lugar de trabajo que sean seguros y saludables para los empleados y que cada patrón y empleado cumplan con las normas de seguridad y sanidad especificadas en el Título 8 del Código Administrativo de California, así como todas las reglas, los reglamentos y órdenes de acuerdo con el Código de Trabajo de California, División 5, que sean pertinentes a su lugar de empleo y a sus propias acciones en el mismo.

ACATAMIENTO DE LOS REQUISITOS DE SEGURIDAD Y SANIDAD

Para asegurar el cumplimiento de los requisitos de seguridad y sanidad en el trabajo, la División de Seguridad y Salud en el Trabajo del Estado de California lleva a cabo inspecciones del sitio de trabajo periódicamente. Las inspecciones son llevadas a cabo por ingenieros entrenados en seguridad y por higienistas industriales.

La ley provee que se dé una oportunidad a un representante autorizado del patron y a un representante de los empleados para acompañar al ingeniero o al higienista para ayudar en la inspección. Donde no haya un representante autorizado de los empleados, el ingeniero especialista en seguridad o el higienista industrial hablará con un número razonable de empleados acerca de las condiciones de seguridad y sanidad en el lugar de trabajo. Todo empleado tiene el derecho a dejar saber al ingeniero o al higienista que lleva a cabo la inspección acerca de condiciones peligrosas o insalubres. Además, cada empleado tiene derecho a notificar a la División de Seguridad y Salud en el Trabajo si cree que existen condiciones peligrosas o insalubres en el lugar de trabajo. A solicitud, la División no divulgará los nombres de los empleados que someten o hacen declaraciones durante una inspección o investigación.

Si la División de Seguridad y Salud en el Trabajo cree que algún patrón ha violado una orden de seguridad o de sanidad, extiende una citación al patrón. Cada citación especificará la fecha antes de la cual la violación deberá ser corregida. La ley provee multas mandatorias contra el patrón hasta $2,000 por cada violacion y multas opcionales hasta $1,000 por cada violación general. Multas hasta de $2,000 al día por no corregir violaciones serias pueden ser propuestas y hasta de $1,000 al día por no corregir violaciones generales a tiempo. Además, cualquier patrón que voluntariamente y repetidamente viole cualquier norma/orden de seguridad o de salud en el trabajo, puede ser fijado multas de no más de $20,000 por cada violación grave y $10,000 por violaciones generales.

Una violación voluntaria da un patrón, que causa la muerte o incapacidad permanente al cuerpo de un empleado, al ser condenado el patrón resulta en una multa de no más de $10,000 o una sentencia de cárcel de no mas de 6 meses, o ambas penalidades. Una segunda condena, después de la primera, dobla estas multas y penalidades máximas.

Todo patrón que recibe una citación, Orden Para Tomar Medidas Especiales, o Una Orden Especial deberá colocarla muy visiblemente en el lugar de la violación (o cerca del mismo) durante tres días laborables o hasta la fecha en que la condición insegura sea corregida, cualquiera de las dos que ocurra más tarde, para prevenir a los empleados acerca del peligro que pueda existir en tal sitio. Todo empleado podrá protestar el tiempo permitido para corregir la violación.

QUEJAS

Los empleados o sus representantes que creen que existen condiciones peligrosas o insalubres en su lugar de trabajo tienen derecho a presentar una queja en cualquiera de las oficinas de la División de Seguridad y Salud en el Trabajo y de tal modo solicitar una inspección. Los nombres de los empleados que inician una queja se consideran confidenciales, a no ser que los empleados lo soliciten de otra manera.

Un empleado no puede ser despedido ni castigado de ninguna manera por iniciar una queja sobre condiciones inseguras o insalubres, o por valerse de cualquier otro derecho que la Ley CAL/OSHA concede a todo empleado o trabajador. Un empleado de un patrón privado que crea que ha sido despedido o castigado por ejercer tales derechos puede presentar una queja acerca de esta discriminación en la oficina más cercana del Departamento de Relaciones Industriales—División de Cumplimiento de Normas del Trabajo (Administrador Laboral del Estado), o con la oficina de San Francisco del Departamento de Trabajo del Gobierno Federal, Administración de Seguridad y Salud Ocupacionales. Las quejas de discriminación de empleados de agencias gubernamentales locales o del estado sólo pueden hacerse ante el Administrador Laboral del Estado. Vea las direcciones abajo.

OTROS DERECHOS DEL EMPLEADO

Cualquier empleado tiene derecho a rechazar un trabajo en cuyo desempeño se viole el Código Laboral del Estado o cualquier orden o norma de seguridad y salud en el trabajo, siempre que tal violación podría crear un riesgo real y aparente al empleado o a otros empleados.

Los patrones que usen cualquiera de las sustancias incluidas en la lista de sustancias peligrosas en la Sección 339 del Título 8 del Código Administrativo de California o sujeto a la Regla de Comunicación de Peligros requerida por el gobierno federal (Hazard Communication Standard—29 CFR § 1910.1200) deberán dar información a sus empleados sobre el contenido de los Papeles "MSDS", o información equivalente, acerca de la sustancia. Estos papeles contienen datos sobre los riesgos a la salud y los procedimientos seguros al trabajar con sustancias tóxicas.

A solicitud de un empleado, su representante de negociación colectiva o su médico, todo patrón deberá proporcionar, en forma oportuna y razonable, un Papel "MSDS" sobre cada sustancia peligrosa en el lugar de trabajo.

Los empleados tienen derecho a examinar y copiar sus registros médicos así como los registros exactos sobre cómo han estado expuestos a posibles materiales tóxicos o agentes físicos dañinos.

Los empleados tienen derecho a presenciar la inspección o verificación y medición que se lleve a cabo, conforme a las normas de CAL/OSHA, acerca de su posible exposición a un riesgo. Los patrones deberán decirles a sus empleados cuando están, o han estado, expuestos a sustancias dañinas mayores que los límites de exposición que permiten las normas de CAL/OSHA, así como decirles la acción correctiva que se está tomando.

Para más información y ayuda, comuníquese con la oficina más cercana de la División de Seguridad y Salud Ocupacionales. Vea las direcciones abajo.

La ley requiere a cada patrón en el Estado de California colocar este aviso visiblemente en cada lugar de trabajo.

SERVICIO DE CONSULTAS

A fin de estimular el cumplimiento voluntario, CAL/OSHA proporciona gratis a solicitud una amplia variedad de servicios consultivos sobre la seguridad y sanidad en el trabajo. El Servicio de Consultas CAL/OSHA es independiente de las actividades de cumplimiento desempenadas por CAL/OSHA.

PDCD

SUPERVISOR'S REPORT OF LOSS OR DAMAGE

(Damages or loss to property owned by RTD or CM caused by fire, theft, vandalism, collision, earthquake, water, storm, etc., regardless of cost to repair or replace, while property is in the care, custody, or control of the contractor.)

CONTRACTOR _____ ☐ (CHECK IF CONTINUED ON BACK OF FORM)

1. CONTRACT NO.	2. DATE AND TIME OF LOSS
3. LOCATION OF ACCIDENT (BE SPECIFIC)	
4. NAME OF REPORTING SUPERVISOR	5. CONTRACTOR(S) OR SUBCONTRACTOR(S) INVOLVED
6. LOSS ☐ FIRE ☐ THEFT ☐ OTHER (EXPLAIN)	7. DAMAGE ☐ TOOLS ☐ MATERIAL ☐ EQUIPMENT ☐ INSTALLATION
8. DESCRIPTION OF ITEM(S) DAMAGED OR STOLEN	9. COST ☐ ACTUAL COST ☐ ESTIMATE REPAIRS $ _____ REPLACE $ _____ ACTUAL CASH VALUE $ _____ TIME TO REPAIR OR REPLACE (DAYS OR MANHOURS) _____
10. PROPERTY OF ADVERSE PARTY	11. NAME OF OWNER / 12. COST TO REPAIR $ _____
13. REPORTED BY NAME, EMPLOYER, BADGE NO.	
14. NAME OF INSURANCE COMPANY NOTIFIED	15. PRESENT LOCATION OF RTD PROPERTY INVOLVED (IF KNOWN)
16. WITNESS(ES)	ADDRESS(ES) AND TELEPHONE NUMBER(S)
17. FIRE DEPARTMENT NOTIFIED	18. POLICE DEPARTMENT NOTIFIED (ALL THEFT LOSSES MUST BE REPORTED TO POLICE)
19. EQUIPMENT, TOOLS, AND/OR MATERIALS INVOLVED	
20. PRIMARY CAUSE OF LOSS	
21. SECONDARY CAUSE	
22. CONTRIBUTING FACTORS	
23. SUPERVISOR'S CORRECTIVE ACTION _____ SUPERVISOR'S SIGNATURE/DATE	
24. PROJECT SUPERINTENDENT'S CORRECTIVE ACTION _____ PROJECT SUPERINTENDENT'S SIGNATURE/DATE	
ATTACH A LIST OF DAMAGED PROPERTY AND/OR EQUIPMENT, INCLUDING MOTOR VEHICLES. INDICATE OWNER'S NAME(S), ADDRESS(ES), AND TELEPHONE NUMBER(S).	

PDCD Form 168 (2/85)

S/S #3

PDCD

DAILY LOSS CONTROL LOG

(Losses caused by fire, theft, vandalism, collision, earthquake, water, storm, etc. with cost to repair or replace less than $1,000 but more than $100)

☐ PDCD
☐ CONTRACTOR
☐ OTHER CONTRACTOR _____

CONTRACTOR _____

JOB NO. _____ CLIENT _____ LOCATION _____

DATE / TIME	SPECIFIC TYPE OF LOSS	DESCRIPTION OF PROPERTY DAMAGED AND/OR STOLEN	DESCRIPTION OF DAMAGES	NAME OF OWNER (RENTAL, LOAN, OR BORROWED)		DOWN-TIME (HOURS)	COST ($) TO REPLACE	COST ($) TO REPAIR
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PDCD Form 169 (2/85)

S/S #3

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PDCD

WEEKLY LOSS CONTROL REPORT

(Information taken from Daily Loss Control Log)

(DUE TO PDCD BY SECOND WORKDAY FOLLOWING THE WEEK OF RECORD)

S/S #3

CONTRACTOR _____ DATE OF RECORD _____

JOB NO. _____ CLIENT _____ LOCATION _____ FOR WEEK OF _____

DATE OF LOSS	DESCRIPTION OF PROPERTY DAMAGED AND/OR STOLEN	BRIEF DESCRIPTION OF LOSS	COST TO REPAIR OR REPLACE ($)

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PDCD Form 170 (2/85)

DISTRIBUTION — ORIGINAL: PDCD SAFETY AND SECURITY MANAGER COPY: CONTRACTOR JOB FILE

PDCD

MONTHLY LOSS CONTROL REPORT

(Losses Caused by Fire, Theft, Vandalism, Collision, Earthquake, Water, or Storm)

CONTRACTOR _____ FOR MONTH OF _____ 19__

LOCATION _____ DATE OF REPORT _____ 19__

CLIENT _____ PREPARED BY _____
NAME AND TITLE

☐ SINGLE CONTRACTOR REPORT

☐ COMPOSITE REPORT (LIST NAMES OF CONTRACTORS IN REMARKS AND ATTACH COPY OF EACH CONTRACTOR'S SINGLE CONTRACTOR REPORT)

	THIS MONTH		CUMULATIVE (YEAR TO DATE)	
	NUMBER OF LOSSES	TOTAL COST ($)	NUMBER OF LOSSES	TOTAL COST ($)
FIRE				
THEFT				
COLLISION				
VANDALISM				
EARTHQUAKE				
WATER DAMAGE				
WINDSTORM				
OTHER				

REMARKS ☐ CHECK, IF CONTINUED ON BACK OF FORM

DISTRIBUTION

ORIGINAL: CONTRACTOR

COPIES: PDCD SAFETY AND SECURITY MANAGER
PDCD JOB SAFETY FILE
SUBCONTRACTOR SUPERVISOR (WHEN APPLICABLE)
LOWER-TIER SUBCONTRACTORS (WHEN APPLICABLE)

PDCD Form 171 (2/85)

S/S #3