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PORT OF LAKE CHARLES

SAFETY & HEALTH MANUAL

Change/Cancellation Record

Document Title: Safety & Health Manual

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Revision 0 – Initial Issue June, 2005

Revision 1 – June 2009 – changes in policy to the following section:

Pages 27-28

2.3 PERSONAL PROTECTIVE EQUIPMENT
General
Hard Hats
Eye Protection
Footwear
Reflective Garments

Revision 2 – Mar 2010 – changes in policy to the following section:

Page 132

2.18 Mechanized Equipment/Motorized Vehicles
Subject: Vehicle Wheel Chocking Procedure

SAFETY & HEALTH MANUAL

Table of Contents

The Safety and Health Policy for the Port of Lake Charles has been established to promote compliance with the Port's Policy and Procedures regarding site safety, health, environment and security standards. It also serves to explain the rights and responsibilities of employees and contractors working on Port projects.

Please read these procedures and make sure that you fully understand all sections. More importantly, use them to ensure the safety and well-being of your employees.

Safety is an essential element of operations at the Port of Lake Charles. Each employee and contractor is responsible for carrying out his or her responsibilities written in this Safety manual. As an employee or contractor, you are expected to maintain these high standards.

Thank you for your cooperation!

Contact the Port of Lake Charles Director of Engineering at (337) 439-3661.

PURPOSE

The purpose of this Safety Manual is to outline a plan for preventing job-related accidents. The manual sets for the elements that all employees, contractors and subcontractors (of every tier) must include in their safety program. This manual is not all-inclusive. Other elements may be added or conveyed individually to employees and contractors to whom they expressly apply. Contractors, by nature of the specific type of work being performed, must integrate other essential elements within their own safety program.

The Port of Lake Charles safety staffs role in achieving employee and construction safety and health includes the oversight of site safety. This function does not supersede, override, or take precedence over that of construction contractors, who are ultimately responsible for the safety and health of their personnel and protection of their property. The key function of the port staff, as it relates to construction safety and health, is to monitor contractor compliance with safety and health standards required by law.

This manual sets forth basic responsibilities, guidelines, rules and regulations for all port personnel and those involved in construction at the Port of Lake Charles. The intent is to enhance and supplement any Safety and Health Standards that are required by contract documents, or by law, and are applicable to the project. The manual does not cover the full spectrum of published safety and health standards that are mandated by law. Consequently, contractors shall not assume that they are responsible only for those standards referenced in this manual or that those standards quoted are current. It is the Contractor's and each employee's responsibility to ensure that they comply with all safety directives required by law, and that their own safety program includes such compliance.

In the event of a conflict between the provisions of this manual and applicable local, State or Federal safety and health laws, regulations and/or standards, or contract documents, the more stringent shall apply. This manual is subject to revisions and updates as the project progresses.

GOAL

The goal of this Manual is to establish and maintain a safe working environment for our employees, contractors, visitors and public. It is the responsibility of each individual to assist in accomplishing the following objectives:

To strive toward the goal of zero accidents or injuries by carefully and systematically planning, implementing, and enforcing proper safety procedures to avoid bodily injury, property damage and loss of productivity.

To create a safety culture by increasing the safety and environmental awareness of employees through the establishment and maintenance of an employee Safety Training Program with assistance from Management and Labor. This shall include the orientation of all new employees, regular safety meetings, pre-task planning and ongoing safety training.

To minimize hazards/disruptions to the traveling public by controlling access to construction areas, following established safety procedures to avoid impacts to airport operational systems and secure work areas adjacent to those spaces frequented by the public.

To establish and maintain a system that promptly identifies and corrects unsafe practices or conditions.

To establish emergency procedures and communications that will minimize fire, policy or ambulance response time in the event of an occurrence.

In addition, as a minimum, follow the U.S. Labor Department Occupations Safety and Health Administration (OSHA) requirements, local and site-specific safety requirements "The safety of everyone at this facility depends directly upon individual effort and commitment to the goals and objectives of this program. We must all do our part and encourage and demand others to do theirs."

Adam McBride
Port Director

MISSION STATEMENT

The Port of Lake Charles is dedicated to the principle that a safe project is a good project. The Port is committed to the safety of its employees, the surrounding community and the environment.

While the port has the responsibility for conducting business in a manner that strives to prevent accidents, all employees, contractors and contractor employees share that responsibility. All employees and contractors are expected to work safely and contribute to the safety of others.

Contractors must make every reasonable effort to provide a safe and health work environment free of recognized hazards.

The effectiveness of this safety program depends on the combined efforts of the Port personnel, contractors and all Labor Organizations. To achieve this goal a safety committee has been established. This committee will meet monthly to monitor projects and provide input on safety and health issues.

1.0 PROJECT INFORMATION

This section outlines information that will assist in establishing emergency procedures and communicating with local authorities in such a way that:

- Minimizes fire, police or ambulance report time.
- Controls access to the construction site or project area by developing protection plans that secure the area.
- Provides a means to minimize or eliminate unsafe acts and conditions that may be encountered by contractors and the public.

1.1 EMERGENCY PROCEDURES

FIRE

Call 911 – from a Non-Port of Lake Charles phone

Call 493-3551 – from a Port of Lake Charles phone

NOTE: Using a Cell Phone to call 911 will result in delays!

In case of fire, injury or emergency at any building or location on the project, contact emergency services at the numbers listed and provide all details required. Stay on the line!

In the event of a fire, evacuate the area by following your emergency evacuation plan. In the event of injury to personnel, provide assistance as applicable. In either situation, station individuals who can assist incoming emergency response personnel to the location quickly. The contractor will be responsible for reporting pertinent information to arriving emergency response personnel.

Port Police Office: (337) 493-3551 or 436-3144

Police/Fire/Emergency: 911 (from a Non-Port Phone)

Port Police/Fire/Emergency: 493-3551 (from a Port Phone)

On-site loss of property or goods should be reported to the Port Police. Thefts will be prosecuted to the fullest intent of the law.

NOTE: These emergency numbers are posted at the job site.

SAFETY DEPARTMENT

Safety Officer: (337) 493-3588

NOTE: Contact your Supervisor before calling Safety Staff

Director of Engineering, Maintenance & Development: (337) 493-3526

EMERGENCY EVACUATION PLAN

The Port shall have in place written Site Specific Emergency Procedures/Plans. These plans shall include how personnel will deal with severe weather conditions, natural disasters such as hurricanes, emergencies involving Port of Lake Charles operations or a higher security alert status, and construction related emergencies. The plan shall include primary and secondary location/assembly points where personnel will meet following such conditions, and how personnel will be accounted for.

The Supervisor shall advise employees of these assembly points at their initial safety orientation. This information shall also be posted at the project site and updated as conditions change.

All inquiries from the media regarding any incident occurring on the site shall be referred to the Port of Lake Charles Director of Marketing and Trade Development at 493-3513.

1.2 CONTRACTOR SAFETY RESPONSIBILITY & REQUIREMENTS

The port is committed to the goal of having an injury-free project. To achieve this goal, the safety and health of all personnel must receive primary consideration in the planning scheduling and execution of work.

- The Contractor's Safety program shall include site-specific and health procedures. This project shall include all services required for the complete performance of contractor work and all related job-site work in accordance with the Scope of Work.

- The Contractor shall employ at the site a responsible, qualified safety representative whose duties include the protection of persons and property and administration of the Contractor's Safety Program. Document 00860, Safety Requirements outlines qualifications and duties of that individual.

- The Contractor shall comply with all applicable laws, regulations, ordinances, conditions of contract and rules or orders of any public authority having jurisdiction relating to the safety of persons or property.

- All Contractor employees, subcontractors and their employees shall be briefed on employee safety and health rules set forth in Sections II and III. These rules are a partial list of general regulations that shall apply to all work. Contractors shall adopt procedures with provisions for disciplinary action or discharge of employees who carelessly or callously disregard these rules or other applicable safety and health regulations. In addition, all contractor employees, subcontractor employees shall have in their possession a valid, up-to-date safety card from Safety Council Southwest Louisiana.

- Alcohol, drugs and weapons shall not be allowed onsite under any circumstances, and shall be cause or immediate removal of the employee.

- All contractors and subcontractors working on projects shall have a Substance Abuse Prevention Program.

- Prior to new hire's, start of work, all contractors' subcontract and tier subcontractors shall receive a basic safety orientation and the site specific course administered by the Safety Council Southwest Louisiana.

- The contractor shall conduct, a minimum, weekly safety meeting with their personnel. Minutes of these meeting shall be recorded and a copy kept on file for the Port Safety Department to review.

- The Contractor shall perform daily inspections of the project and correct substandard safety conditions and practices. These inspections shall be

documented on the Construction Safety Inspection Report found in Document 00860, Safety Requirements.

- The contactor has the primary responsibility for onsite safety for its employees performing work under this program.

- The contractor is responsible for handling on a daily basis, rubbish generated by its work. The contractor shall keep its work place clean.

The contractor shall be responsible for the following:

- All personnel to be properly trained and instructed in all jobs which require specific training and/or competency to meet all applicable OSHA regulations and standards, local, state and federal laws and the requirements herein.

- Where regulations require the designation of "Competent Persons" the contractor shall submit the names of those individuals, their qualifications, and the discipline they are deemed competent in. These disciplines include, welding, electrical, scaffolding, roofing, cranes, excavations, lift slab construction, steel erection, and underground construction.

- Prior to the performance of any work, all contractor employees shall know and understand all rules/requirements that apply to the work they are to perform.

- Employees acting in a supervisory capacity shall require all employees working under their supervision to comply with all applicable safety rules.

- Employees assume responsibility of their own well-being. Personal protective equipment must be provided and used where required and maintained in proper condition.

- Employees shall not engage in practical jokes, horseplay, fighting or the urging of other persons to take unnecessary chances.

- Employees shall only perform work for which they are properly qualified or equipped.

- Employees shall be trained for the proper storage and handling of hazardous materials (i.e., flammable, combustible, toxic) and hazardous wastes.

- Employees shall keep all work areas clear of debris and trash.

- All employees must always know where they are in relation to work in progress, and avoid hazardous situations around equipment or construction in progress.

- If for any reason, perimeter cables, barricades or any other safety related items are removed by the contractor during performance of work, it shall be the responsibility of that contractor to replace them promptly when leaving the area. Appropriate precautions shall be taken while the hazard exists.

- The contractor and its employees shall report all unsafe acts and conditions immediately to supervision (and then to the Port of Lake Charles Safety Staff) to ensure abatement.

- The contractor shall make 72-hour notification to the Port of Lake Charles resident engineer prior to any work involving water systems, water lines or fire alarm systems.

The following should be notified immediately in the event of a chemical or fuel spill.

<u>On Water</u>

- U.S. Coast Guard
- Director of Engineering, Maintenance & Development
- Port Police

<u>On Land</u>

- Director of Engineering, Maintenance & Development
- Port Police

- The contractor shall notify Port of Lake Charles Safety immediately in the event of a site inspection by LADOL or OSHA and provide a copy of any documentation, citations or correspondence received from them.

- The contractor shall assure that all vehicles and equipment working on Port of Lake Charles property are equipped with appropriate warning lights or flags.

- The contractor shall report all accidents or injuries requiring more than first aid treatment to Port Safety immediately. A written report shall be submitted within 24 hours using the Accident Investigation & Equipment Damage Reports found on pages 15-18 of this section.

- The contractor shall ensure that all subcontractors working under its direction comply with all applicable laws, regulations, ordinance, conditions of contract and rules or orders of any public authority having jurisdiction relating to the safety of persons or property.

- Job Safety Analysis (JSA) – The contractor shall complete a written JSA, for work to be performed, outlying the equipment to be used, the identified hazards that may exist or be created, and what procedures or safety equipment will be used to eliminate or reduce those hazards. Completed JSA's are to be reviewed with the workforce and shall contain their signatures as an acknowledgement. The contractor shall use the form provided on page 12 of this section.

- The contractor shall submit the names of CPR and First Aid Certified individuals to the Engineer.

- The contractor shall comply with the confined space entry requirements found in Section 3 of this manual.

PORT OF LAKE CHARLES
ACCIDENT INVESTIGATION REPORT

Project	Contract #	Contractor

Employee	Social Security

Occupation	Apprentice/Journeyman	Date/Time of Injury

Exact location of accident or exposure

Type of injury/illness & body parts injured

Specific task being performed at time of accident (Ex: Hooking up load, loading truck, etc.)

What occurred? Describe in sequence – Employee location and position

How he/she was doing the task

What occurred to trigger the accident

Any background information if necessary

Type of Accident			
	☐ Injury/First Aid	☐ Injury/Recordable	☐ Property Damage
	☐ Equipment	☐ Third Party	☐ Vehicle
	☐ Injury Lost Time	☐ Other	

Check Cause			
☐ Other Than	☐ Hoisting Equipment	☐ Exposure To	☐ Hand Power Tool
☐ Electrical Contact	☐ Mobile Equipment	☐ Fall Different Level	☐ Material Handling
	☐ Caught Between or Under	☐ Fall Same Level	☐ Struck By

What condition of tool(s), equipment or job site caused or contributed to the accident? Be specific

What did the employee do or fail to do that caused or contributed to the accident? Be specific

What caused or contributed to above unsafe condition? Check all that apply!

□ Defective Via Normal Use	□ Defective Via Abuse/Misuse	□ Safety Inspection Failure	□ Ventilation
□ Poor Housekeeping	□ Poor Illumination	□ Faulty Construction	□ Other
□ Exposure to Corrosion	□ Weather Conditions	□ Poor Preventive Maint.	□ Faulty Design
□ Misconduct of Others	□ Caused by Other Employee	□ Caused by Employee	

What caused or influenced above unsafe action(s)? Check all that apply! □ "Under the Influence"

□ Did Not Know Safe Procedure	□ Not Properly Trained	□ Unaware of Hazard	□ Fatigue
□ Ignored Known Hazard	□ Tried to Save Time	□ Tried to Avoid Discomfort	□ Attitude
□ Cause Other Than Above	□ Unable to Determine	□ Other Physical Condition	
□ Illness Influenced Action	□ Impaired Hearing	□ Impaired Vision	

What action has been taken or will be taken to prevent recurrence? Check all that apply!

□ Retraining of person(s) involved	□ Perform job safety analysis	□ Improved illumination
□ Discipline of person(s) Involved	□ Improve housekeeping	□ Use of proper material
□ Job reassignment of employee	□ Preventive instruction to others	□ Improve storage
□ Safety Guard/Device installed	□ Eliminate congestion	□ Reduction of noise/vibration
□ Redesign/Construct	□ Improved inspection procedure	□ Other
□ Standardized job procedure	□ Improve ventilation	□ PPE
□ Better prepare for weather required	□ Tool/Equipment Repair/Replace	

Equipment/vehicle involved – Description & Unit # (if applicable)

Equipment or property damage resulting

Describe details of corrective action taken or planned

Person responsible for planned corrective action

Witness

Investigated By – Name/Title/Date

EQUIPMENT OR VEHICLE PROPERY DAMAGE REPORT

Contractor		Contract No.	
Date of Accident		Time of Accident	
Location of Accident			
Equipment Involved (Description/Unit #)			
Damage Resulting from Accident:			
Were there personal injuries?	☐ YES ☐ NO		
Police/Fire Department report made?	☐ YES ☐ NO		
Were photographs taken?	☐ YES ☐ NO		
Estimated value of damage?	$		
Witness to accident?	☐ YES ☐ NO		
Name		Phone No.	
Name		Phone No.	
Weather Conditions			
Remarks			
Recommended Correction Action			
If more space is required, use the back of this form for additional information and sketches.			
Signed			
Title			

JOB SAFETY ANALYSIS WORKSHEET

Title of Job/Operation			
Company		Date	
Analysis Made By		Analysis Approved By	

Sequence of Basic Job Steps	Potential Accident Hazards	Recommended Safe Job Procedures

1. Struck By (SSB)	5. Caught On (ON)	9. Fall – Next Level (FNL)
2. Struck Against (SA)	6. Caught In (CI)	10. Overexertion (OE)
3. Overturn (OT)	7. Caught Between (CBT)	11. Exposure (E)
4. Contacted By (CB)	8. Fall-Same Level (FSL)	12. Falling Material (FM)

1.3 SAFETY COMMITTEE

The Port shall inform their employees of safety & health issues through meetings and ongoing training sessions.

Employee Safety Committees are an effective tool for managing and furthering the promotion of workplace safety. There shall be a designated safety committee composed of employer-selected and employee elected members. The tenure of those selected and elected employees shall be one (1) year maximum. The number of employees elected and the number of employees selected shall be equal in number. The committee shall have an elected chairperson. Should a vacancy occur on a committee, a new member would be elected or selected prior to the next scheduled meeting

The Safety Committee shall meet on a monthly basis at a date, hour, and location within reason, identified by the committee. The length of the meeting shall not exceed one (1) hour. Minutes of each committee meeting and the names of those attending shall be documented and filed for a period of at least one (1) year and shall be made available for review.

Safety and Health Committee shall address the following:

- A review of safety and health hazards as listed on inspection reports.
- An evaluation of accident investigations to determine if the cause of the unsafe act or condition was properly identified and abated.
- An evaluation of the accident and illness prevention program with discussion of recommendations for improvement where indicated.

Contractors with ten or less employees may elect to have supervisor-crew safety meetings in lieu of a Safety and Health Committee. These meetings shall be held, as a minimum, on a monthly basis to discuss safety issues that have arisen. Contractors with eleven or more employees shall have a designated safety committee.

2.0 EMPLOYEE SAFETY & HEALTH RULES

This section is designed to inform employees of mandatory, site-specific safety and health requirements while working on Port of Lake Charles projects.

All contractor personnel are required to comply with the minimal standards addressed in the following sections.

Safety Orientation & Training

- Basic Safety Rules
- Personal Protective Equipment
- Hazard Communication Program
- Fire Protection
- Cutting, Welding and Compressed Gas Cylinder Storage
- Flammable & Combustible Liquids
- Fall Protection
- Scaffolding
- Ladders & Stairways
- Floor & Wall Openings
- Steel Erection
- Cranes & Rigging
- Suspended Work Platforms
- Personnel & Material Hoists
- Aerial Lifts
- Forklift Procedures
- Mechanical Equipment & Motorized Vehicles
- Excavation & Trenching
- Electrical Safety Program
- Tools - Hand & Power
- Ergonomics
- Blood borne Pathogen Exposure Control Plan
- Hearing Conservation

2.1 SAFETY ORIENTATION & TRAINING

Scope

This section defines the minimum safety training requirements for all Port personnel.

Purpose

To minimize the possibility of injury to the general public, personnel, or visitors, as well as prevent damage to equipment and property.

Reference

As a minimum, OSHA 29 CFR Part 1926 regulations shall be followed.

Safety Orientation

All personnel shall receive a site safety orientation prior to commencing work. All contractor, subcontract, tier subcontractors and sub tiered contractors shall receive a basic safety orientation and the site-specific course administered by the Safety Council Southwest Louisiana.

Safety Training

Basic safety training as well as refresher training shall be provided to employees. Detailed records of training shall be maintained. Safety rules, procedures and requirements must be effectively conveyed to non-English speaking personnel.

Contractor Safety Representative Meeting

It is a requirement of Document 00860 – Safety Management, that the Contractor's Site Safety Representative attend the monthly Safety Committee meeting scheduled by the Program Safety Director. This meeting is held to discuss and resolve relevant issues related to safety and health. If the Contractor's Safety Representative cannot attend this meeting, they shall send a designate in their place.

Safety Orientation & Training Requirements

TRAINING REQUIREMENTS	OSHA REFERENCE	CERT. REQ'D	MINIMUM TRAINING FREQUENCY
Accident Prevention: Qualified Operators	CFR-1926.20 (b) (4)		
Safety Training & Requirements.	CFR-1926.21 (b)		
Access to Employee Exposure & Medical Records	CFR-1926.33(g)(1)		Upon employment, annually thereafter
Employee Emergency Action Plans	CFR-1926.35(e)		Upon development of plan, then when responsibilities or plan changes
First Aid	CFR-1926.50(c)	yes	Consistent w/first aid program requirements
Ventilation: Open Surface Tanks	CFR-1926.57(i)(9) (i)		
Hazard Communication	CFR-1926.59 (h)		At the time of initial assignment, then whenever new hazards are introduced
Lead	CFR-1926.62(l)		Prior to initial assignment, then annually (for employees exposed at/or above action level)
Process Safety Management of Highly Hazardous Chemicals	CFR-1926.64(g) & (h)	yes	Upon initial assignment, then every 3 years
Hazardous Waste Operations & Emergency Response	CFR-926.65(b)(1) (iv), (e), (q)	yes	Upon initial assignment, annually thereafter
Respiratory Protection	CFR-1926.103 (k)		Prior to use and then at least annually
Fire Protection: Fire Brigades	CFR-1926.150 (a)(5)		
Powder Actuated Tools	CFR-1926.302 (e) (1)	yes	
Welding: Fuel Gas	CFR-1926.350 (d)		
Welding: Arc Welding and Cutting	CFR-1926.351 (d)		
Welding: Fire Watch	CFR-1926.352 (e)		
Scaffolding: Aerial lifts	CFR-1926.453 (b)(2) (ii)		
Scaffolding: Employees Working on Scaffolding	CFR-1926.454 (a), (c)		Upon initial assignment, then when equipment changes & as needed
Scaffolding: Erection Crews	CFR-1926.454 (b), (c)		Upon initial assignment, then when equipment changes & as needed
Fall Protection	CFR- 1926.503	yes	Upon initial assignment, then when equipment changes & as needed
Powered Industrial Trucks (Forklifts)	CFR-1926.602 (d)	yes	Prior to use, every 3 yrs, after accident/near miss/unsafe operation/different type of truck
Steel Erection*	CFR-1926.761		
Underground Construction	CFR-1926.800(d), (g) (5)(iii &v)		Annually
Power Transmission and Distribution: Emergency Procedures	CFR-1926.950 (e)		
Stairways & Ladders	CFR-1926.1060		Prior to use, thereafter sufficient to maintain understanding & knowledge
Asbestos	CFR-1926.1101(k)(9), (o)(4)(I-ii)		Upon initial assignment, annually thereafter
General Industry Standards:			
Permit Required Confined Spaces	CFR-1910.146(g), (h), (I), (j)	yes	Prior to use, change in duty or deviation from procedures & with sufficient frequency to maintain understanding & knowledge
Lock-out/Tag-out of Hazardous Energy	CFR- 1910. 147(c)(7)	yes	Upon initial assignment, with changes in job assignment/new hazards are introduced for authorized/affected employees, & sufficient frequency to maintain, understanding & knowledge thereafter
Portable Fire Extinguishers	CFR-1910.157(g)		Upon initial assignment, annually thereafter
Employee Alarm Systems	CFR-1910.165(b)(4)		
Blood borne Pathogens	CFR-1910.1030(g)(2)		Upon initial assignment, annually thereafter

Safety Orientation & Training
Competent Person Requirements

COMPETENT PERSON REQUIREMENTS	OSHA REFERENCE	NAME OF COMPETENT PERSON	VERIFICATION REQUIRED
Accident Prevention	CFR-1926.20 (b) (2)		
Gases, Vapors, Fumes, Dust, and Mists	CFR-1926.55 (b)		
Hearing Protection	CFR-1926. 101 (b)		
Rigging Equipment	CFR-1926.251 (a)(6)		
Welding: Preservative Coatings	CFR-1926.354 (a)		
Assured Grounding Program	CFR-1926.404 (b)(iii)(B)		
Scaffolding	CFR-1926.451 (b)(10&11), (d) 10&18),(e)(9)(i), (fX3,7,12), (g)(2)		
Fall Protection	CFR-1926.502 (c)(4)(ii), (d)(19), (h)(1)(i), (k)(4) and .503(a)(2)		
Cranes and Derricks	CFR-1926.550 (a) (1,5 & 6)		
Excavations	CFR- 1926.651 (c)(1)(i), (h)(2-3), (k)(1); .652(a)(1)(ii), (d)(3)		
Steel Erection	CFR-1926.753(c)(1,2), .754(d)(1), .755(a)(4), .756(a)(2), .757(a)(2,4), .761(a)		
Underground Construction	CFR- 1926.803(a)		
Demolition	CFR-1926.850(a), 852(c), .859(g)		
Asbestos	CFR-1926-1101(o)(1-3)		
General Industry Standards:			
Slings	CFR-1910. 184(d), (e)(3)(i-iii)		

2.2 BASIC SAFETY RULES

All personnel at the Port are responsible for compliance with site safety policies/procedures.

General responsibilities include:

- Only qualified, trained personnel to operate aerial lifts, forklift, or motorized equipment and machinery.
- Ladders shall be properly constructed and kept in good repair. They shall be the proper length and type for the task and secured to prevent displacement.
- All scaffolding will be constructed in accordance with OSHA 29 CFR Part 1926, Subpart L.
- Compressed gas cylinders shall be stored upright, secured, and separated, with protective caps in place at all times when not in use. Gauges shall be removed prior to transportation of all cylinders.
- All guards for personnel or equipment protection shall be kept in place during usage and maintained in good mechanical order.
- Proper lighting and illumination of work areas shall be provided.
- Employees shall avoid working, driving, or walking under suspended loads.
- Equipment will be shut off when lubricated, refueled, or adjusted.
- All excavations shall meet OSHA 29 CFR Part 1926 requirements. Adequate access and egress must be provided for excavations that are 4 feet or more in depth.
- Safety, Danger, Warning, and Caution tags or signs shall be observed and complied with. Tags and signs shall not be removed unless authorized.
- Employees will maintain good general housekeeping in their work area and minimize all combustible debris in their work areas.
- Employees will use proper tools for each task and maintain these tools in safe operating condition.
- Employees will check for and correct any unsafe practices and conditions that exist in the performance of their work, and shall first report to their Supervisors and the Port Safety Staff any unsafe conditions created by others.

- Supervisors will conduct weekly Tool Box Safety meetings for all their employees on the job-site with attendance and subjects discussed documented.

- Illegal drugs, alcohol, or other dangerous substances shall not be allowed on Port property.

- All Contractors shall provide a Material Safety Data Sheet (MSDS) on any hazardous substance brought on to Port property. These sheets shall be submitted to the Engineer for review and documentation purposes, as specified in the Hazard Communication Program of this manual.

- Identify all overhead and known underground utilities prior to the start of any work.

- Provide appropriate first aid supplies for their employees and personnel qualified to administer first aid as required.

- Contractors must provide a copy of their written safety, fall protection, and hazard communication programs, as specified in the 00860 Specification (Appendix A), to Port Construction Safety through the Engineer. Subcontractors may be asked to submit written plans when requested by the Engineer. The safety program must be site-specific, identify the particular hazards to each trade, and provide precautions to perform the work safely. This program must be submitted before any work is performed on the jobsite and must include provisions for implementation on the project, including the safe work performance of any additional subcontractors.

- Traffic control and the use of flagmen shall be used at all times when working around roadways and/or where personnel may be walking or working.

- Firearms are strictly forbidden on Port property.

- The use of AM/FM radios or tape/CD's is prohibited along with the use of personal headsets.

- Employees shall not use makeshift work platforms such as 5-gallon pails or crates.

- Glass bottles are prohibited.

- Graffiti of any type will not be tolerated on Port property in conjunction with the Port Zero Tolerance Policy.

The following basic safety rules shall apply to operations involving transferring to and from boats, barges, and floating platforms:

- Transferring between boats, barges and floating platforms can be dangerous, particularly in rough weather. Be extremely cautious every time you make a transfer. Never become complacent about this. Being caught between vessels, even in calm seas, can be deadly.

- Boat captain must remain alert to move boat or to keep from crushing anyone in the water. Only one designated person to give orders for boat movement.

- Only one designated person to give orders for boat movement.

- Man overboard to swim in a direction to clear boat and platform. Then swim to nearest climb-out point.

- Do not ever fight a current.

- Life ring with line attached to be standing by close to point of departure from boats.

- Hold on to swing rope high enough up to ensure clearing boat landing.

- Use rope with a knot whenever available to prevent hands from slipping.

- Use both hands.

- Never attempt to carry anything.

- Time your swing to leave the boat when it is on the peak of a wave.

- Deck personnel on both vessels must assist in making transfers.

- Transferring personnel must all wear life jackets.

- Do not hurry transfer. Take your time!

- Bring vessels together side to side, bow to stern.

- Be prepared to stow or lash equipment/material after completion of transfer.

2.3 PERSONAL PROTECTIVE EQUIPMENT

Scope

This section defines the minimum safety requirement for the type, use, and maintenance of Personal Protective Equipment (PPE).

Purpose

To eliminate or reduce the potential of injury to employees and visitors performing work.

Reference

29 CFR 1926 Subpart E, and the Hearing Conservation section of this manual.

General

All employees are required to wear approved, non-metallic hard hats while on any dock or in any warehouse. All other locations will be at the supervisor's discretion. This includes contractors, subcontractors, vendors, suppliers and visitors. It is recommended that all employees wear (in lieu of hard hats) a cap for head covering when not required to wear a hard hat. All protective hard hats shall meet the requirements of ANSI Z89.1 Class A or ANSI Z89.2, Class B.

Exceptional Situations

- Hard hats are designed, tested, and certified to be worn in only one position — with the liner securely in place and the bill turned forward. The only time employees are allowed to "reverse", their hard hats are when their work creates an absolute need to turn the hat backwards. For example, when welding hoods or face shields are designed to attach to the backside, when connectors are receiving a hoisted load, or when surveyors are looking through a transit or level. When those tasks are completed, the hard hats are to be restored to their correct positions.

- Full-face protection, as provided by a full-face shield shall be required at all times when potential injury to the face itself exists. Work activities that require use of full face shields include, but are not limited to, grinding, "housekeeping blow downs" using compressed air, chipping concrete, cutting metal decking, chain saws, handling toxic or corrosive chemicals or liquids, using power-actuated tools, certain instances of drilling, and using jackhammers or air hammers.

- All employees shall wear mandatory eye protection at all times when on Port Industrial site properties. All eye protection equipment shall meet the requirements specified in American National Standards Institute, Z87.1-2003.

- Footwear with steel toes made of leather in the form of work shoes or boots shall be worn by all employees while on Port industrial site property. Protective footwear shall comply with ANSI Z41-1991.

  Note: Not required of Administration and Harbor Police employees

- Employees engaged in the use of soil compacting equipment shall utilize metatarsal protection.

- Hearing protection shall be worn when working in areas posted as hazardous noise areas or when working around or using equipment that presents high noise hazards as identified through the Hearing Conservation Program.

- Respiratory protection shall be worn when performing tasks that expose personnel to dust, gas, painting, oxygen deficiency, etc.

- 100% fall protection shall be utilized when working from unprotected elevations greater than four (4) feet in height. When tie-off is required, a full body harness with lanyard will be worn and used. Fall distance will be limited to a maximum of six (6) feet or less.

- Reflective garments compliant with ANSI/SEA 107-1999, class 11 or greater shall be worn by all employees exposed to vehicular traffic. Supervisor is required to use their discretion at all other times of application.

- Employees utilizing chain saws shall abide by all manufactures recommendations.

- When employees must remove formwork, handle material with sharp edges or those prone to splintering, gloves must be worn.

- Personnel engaged in the cutting, welding, or scarfling of steel shall utilize tight fitting goggles ANSI Z87.1-2003 compliant with appropriate shade of lenses for application.

- Welding Operations: the following filter lens shade numbers are recommended for protection against energy

Welding Operation	Shade No.
Shielded metal arc welding 1/16, 3/32, 1/8, 5/32 inch-diameter electrodes	10
Gas-shielded arc welding (non-ferrous): 1/16, 3/32, 1/8, 5/32 inch diameter electrodes	11
Gas-shielded arc welding (ferrous): 1/16, 3/32, 1/8, 5/32 inch diameter electrodes	2
Shielded metal-arc welding 3/16, 7/32, ¼ inch diameter electrodes	12
Shielded metal-arc welding 5/16, 3/8 inch diameter electrodes	14
Atomic hydrogen welding	10 to 14
Carbon arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, 1 inch to 6 inches	3 or 4
Medium cutting 1 inch to 6 inches	3 or 4
Heavy cutting, over 6 inches	4 or 5
Gas welding (light), up to 1/8 inch	4 or 5
Gas welding (medium) 1/8 inch to ½ inch	5 or 6
Gas welding (heavy) over ½ inch	6 or 8

Appropriate Project Attire

The following minimum dress requirements apply to all employees, contractors, subcontractors, vendors and visitors/guest.

- Tank tops, net shirts, cut-off shirts, or sleeveless shirts may not be worn. As a minimum, employees are required to wear a shirt top that is comparable to a T-shirt. Shirts must have a sleeve that covers the ball of the shoulder in the same manner as a T-shirt with a sleeve at least 4 inches long.

- Pants must be full length. Cut-off shorts and other such apparel are not permitted.

- Clothing and jewelry must not hang loose to the point where they can be caught in parts of moving machinery.

- Employees who perform welding and cutting, operate rotating machinery, or are exposed to chemicals, fire or other such hazards, must contain their beards and hair to a point where there is no danger of their hair catching fire, dipping into chemicals, or being caught in rotating machinery.

Personal Protective Equipment Assessment

The Safety Supervisor shall perform a Personal Protective Equipment (PPE) assessment for work performed. Employees will be trained in the proper use of PPE.

2.4 HAZARD COMMUNICATION PROGRAM

Scope

This section defines the minimum safety requirements for employees who use or store potentially hazardous materials on Port of Lake Charles property.

Purpose

The Hazard Communication Program is to inform all employees as well as other personnel working in close proximity of workplace chemical hazards including the labeling system and use of Material Safety Data Sheets (MSDS).

Reference

29 CFR Part 1926.59

General

Roles and Responsibilities

Employees who handle chemicals must:

- Participate in hazard communications training.
- Label secondary containers correctly.
- Handle, store, and dispose of chemicals appropriately.
- Wear appropriate protective equipment when handling hazardous chemicals.

Supervisors or foremen shall:

- Develop a site-specific hazard communications program.
- Make sure procedures are developed to obtain the necessary MSDS' and make them available during all the work shifts.
- Transmit new information to affected employees.
- Ensure that the MSDS book matches the Chemical Inventory List.
- Inform site personnel of possible hazardous exposures of chemicals in use.
- Provide hazard communication training to employees at time of hire and repeat when new (high use) chemicals come on site.

Safety Mangers or other individuals accountable for safety shall:

- Coordinate employee hazard communications training.
- Provide assistance in procuring MSDS' for all applicable chemicals, materials, or substances available for use at the work site.
- Review incoming MSDS' for new significant health and safety information.
- Review MSDS' to insure they are correct.
- Maintain a master set of MSDS'.
- Identify the location(s) of MSDS' on the site-specific plan.
- Maintain a master list of chemicals that are approved for use on the project.
- Release chemicals for use only after an MSDS have been obtained.

Program Element

A chemical inventory list shall be prepared with listings of all chemicals used by personnel working in these areas.

The following criteria will be used to determine if chemicals in use fall under the Hazard Communications Standard, and hence should be on any inventory list.

- Any substance that has permissible exposure limits (PEL) under OSHA 29 CFR 1910, Subpart Z, "Toxic and Hazardous Substances".

- Any substances that the American Conference of Governmental Industrial Hygienists (ACGIH) included in the latest edition of its annual threshold limit value (TLV) list.

- Any substance that the National Toxicology Program (NTP) or International Agency for Research on Cancer (IARC) found to be suspected or confirmed carcinogens.

The following products are usually hazardous and should be on a chemical inventory list.

Acids	Degreasing Agents	Industrial Oils	Process Chemicals
Adhesives	Detergents	Insecticides	Shellacs
Aerosols	Flammables	Janitorial Supplies	Solvents
Battery Fluids	Foaming Resins	Lacquers	Surfactants
Catalysts	Fungicides	Office Copier Chemicals	Varnishes
Caustics	Fuels	Paints	Water Treatments
Cleaning Agents	Herbicides	Pesticides	Wood Preservatives

- Chemical inventory lists must be updated, as new substances are added or deleted.

  NOTE: Outdated MSDS' will be archived for 30 years.

- Must correspond to MSDS' (for each chemical, material, or substance) that are kept on file and available for employees.

- Must be forwarded to the Engineer for review and compilation of a master list. A copy shall also be forwarded to the Port Safety Manager.

Container Labeling

Original Container Label

- All original containers of chemicals that contain any hazardous chemical components must retain the original label and information provided from the manufacturer or distributor.

- Supervisors or foremen will verify that all containers received for use will be clearly labeled as to:

  - The identity of the hazardous chemical.

  - Appropriate hazard warning (CAUTION, WARNING or DANGER written on the label to indicate a chemical is hazardous).

  - Name and address of the manufacturer.

Secondary Container Labeling

- All secondary or other containers must be labeled with at least the product name and any associated hazards such as flammable, combustible, toxic, corrosive and any special precautions such as "Do not store near heat" or "Do not mix with water".

- Secondary container label must be affixed when material is transferred from its original container to a secondary container such as a paint can, spray bottle, oil can, etc.

- Entering the following information completes the label.

- Chemical Name – Enter the name of the chemical and the CAS (Chemical abstract number) if the chemical contains only one ingredient. (Note: The use of the CAS is optional.)

- Hazard Rating – Enter the Health, Flammability and Reactivity hazard numbers. They are normally found on the MSDS. These hazard ratings are a number from 0-4. An explanation of the hazard rating is shown in the bottom left hand corner of the label. A more detailed explanation of ratings for each of the types of hazards is found on the next page.

"Reactivity" Hazard Rating Definition

0 - Minimal	Materials that is normally stable, even under fire conditions and which will not react with water.
1 – Slight	Materials that are normally stable but can become unstable at high temperature and pressures. These materials may react with water but will not release energy violently.
2 – Moderate	Materials that are normally unstable and will readily undergo violent chemical change but will not detonate. These materials may react violently with water.
3 – Serious	Materials that are capable of detonation or explosive reaction but require a strong ignition sourced or must be heated under confinement before ignition or materials that react explosively with water.
4 – Severe	These materials are readily capable of detonation or explosive decomposition at normal temperature and pressures.

Material Safety Data Sheets (MSDS)

- MSDS' provide pertinent information about hazardous substances, such as chemical composition, effects of exposure (via handling, storing, using or transporting), protective measures, and emergency procedures. An MSDS must be provided, free of charge by the manufacturer or distributor, of any hazardous substance. These sheets must be acquired and maintenance in an area that allows free access, 24 hours a day, by anyone potentially exposed to any hazardous substance in the work place.

- MSDS are to be archived for at least 30 years beyond the last known use or potential exposure to the substance to which they pertain.

Hazardous Non-Routine Tasks

- Employees are periodically required to perform hazardous non-routine tasks. Some examples of non-routine tasks include confined space entry and tank

cleaning. Prior to starting work, each affected employee will be given information by the supervisor or foreman about hazardous chemicals he/she can encounter during such activities. The information will include specific safety measure the employee requires their employees to utilize. This may include ventilation, respirators, or other protective equipment.

Education and Training

Prior to starting work and introducing a new chemical into any area of work, each employee in that workgroup will be given information and training on the new chemical hazard.

Both permanent and temporary employees must attend a training discussion that covers:

- Operations where the potential for exposure to hazardous substances exists.
- Physical and health risks of the hazardous chemical.
- Symptoms of overexposure.
- How to determine the presence or release of hazardous chemicals in the work area, and awareness of substances being used by others.
- How to reduce or prevent exposure to hazardous chemicals through use of control procedures, work practices, personal protective equipment and emergency response.
- Steps taken to reduce or prevent exposure to hazardous chemicals.
- Procedures to follow if employees are overexposed to hazardous chemicals.
- How to read labels and MSDS' to obtain hazard information.
- How to label secondary containers.
- The importance of returning unused substances to original containers to limit the number of containers of hazardous chemicals.
- Proper methods for disposal of hazardous chemicals.
- Location of MSDS files and the written Hazard Communication Program.
- Requirements of the OSHA Hazard Communication Standards.

2.5 FIRE PROTECTION

Scope

This section defines the minimum fire protection and prevention requirements such as fire fighting equipment and flammable and combustible material storage on Port of Lake Charles property.

Purpose

To minimize the possibility of personal injury, property damage, or impact to the public due to fire.

Reference

29 CFR Subpart F & Subpart J, NFPA, Cutting and Welding, Flammable and Combustible Liquids and Portable Heaters sections for this manual.

Definitions

- Approved – For the purpose of this section, means equipment hat has been listed or approved by a nationally recognized testing laboratory such as Factory Mutual Engineering, or the Underwriters Laboratory.

- Flame Resistant – Means so resistant to fire that for specific time and under conditions of standard heat intensity, it will not fail structurally and will not permit the side away form the fire to become hotter than a specific temperature.

- Portable Tank – A closed container having liquid capacity of more than 60 gallons, and not intended for fixed installation.

- Safety Can – An approved closed container of not more than 5 gallons capacity, having a spring-closing id and spout cover, designed to relieve internal pressure and equipped with an internal spark arrestor.

General

The Safety Manager shall develop a fire protection and prevention program.

Fuel Containers and Storage

- Warning signs prohibiting smoking and open flames shall be posted, maintained and enforced 25 feet around storage areas for fuel and other flammable and combustible materials.

- Only approved containers and portable tanks shall be used for the storage and handling of flammable and combustible liquids. All containers shall be labeled as to their content.

- All materials shall be stored handled and piled with due regard to fire characteristics.

- Fuel and oil spills shall be promptly cleaned up.

Fire Extinguishers

- All fuel powered equipment shall be provided with at least one 5 pound ABC rated fire extinguisher.

- At least one 10 pound ABC rated fire extinguisher shall be readily accessible to all welding or similar operations.

- All job site offices shall be equipped with at least one 10 pound ABC rated fire extinguisher.

- A fire extinguisher rated not less than 2A shall be provided fore ach 3000 square feet of the building area or major fraction thereof.

- Employees shall be trained in their use.

- Access for Fire Department vehicles and personnel to all fire systems shall be maintained at all times.

Fire Alarm System

- Priority should be given to activation of the building standpipe system.

- Priority shall be placed on installing an activating the permanent fire protection system.

- Until the permanent system is operating a communication program, altering employees to an emergency shall be in place. This plan will include an alarm such as a siren or air horn.

- Fire suppression systems, fire alarm systems and water systems shall not be made inoperable without providing 72-hour notice to Port Maintenance through the Engineer and without receiving approval prior to the work being performed.

- Any interruption to the permanent fire/security system shall require notification to Port Maintenance through the Engineer and an interim plan shall be formulated for these services.

- Nothing shall be secured to or hung from any part of the buildings fire suppressions system.

- Specific fire protection plans will be prepared for each floor area of the facility and include:

  - Provisions for adequate exits via stairs or ladders, etc. in case of an emergency.

  - Specific locations for fire extinguishers in accordance with OSHA requirements.

  - Provisions for adequate ventilation of areas where vapors or fumes may be present, especially in connection with the operation of temporary heating units.

- Only noncombustible panels, paint, flame resistant tarpaulins or approved materials of equivalent fire retardant characteristics shall be used in the construction of temporary barriers.

2.6 CUTTING, WELDING AND COMPRESSED GAS CYLINDER STORAGE

Scope

This section defines minimum safety requirements to be followed when welding, cutting and storing compressed gas cylinders.

Purpose

To eliminate the potential for fire or explosion, injury, affects to the general public or property damage.

Reference

NFPA and the Flammable & Combustible Liquids section of this manual.

Welding and Cutting

- Equipment such as leads, torches, regulators, gauges and hoses shall be inspected before each used and be in good operating condition. Equipment that is defective shall be removed from use.
- Torches shall be lit by means of a friction device and not by match or lighter.
- “Hot Work” shall not be performed within 35 feet of combustible material.
- Regulators shall be equipped with “flashback” protection devices as well as back flow protection devices.
- A suitable cylinder cart or truck shall be used to transport and store cylinders while in use.
- Individuals performing cutting and welding as well as any individual assisting that individual shall wear the proper eye and face protection. This shall consist of tight fitting goggles and/or face shield with the proper shaded lenses.
- The proper protective clothing shall be employed.
- At least one 10-pound ABC rated fire extinguisher shall be readily available to all welding and cutting operations.
- Proper ventilation shall be maintained.

- Barriers or screens shall be used to protect other workers, tenants, or the general public while such work is being performed.

General Storage Requirements

- Cylinders shall be kept clear of heat sources.

- Cylinders shall be stored in well-ventilated and protected locations at least 20 feet from highly combustible materials. Cylinders should be segregated into pre-assigned places away form elevators, stairs or gangways.

- Cylinders shall not be kept in unventilated enclosures such as lockers gang boxes or inside convex boxes. When stored, oxygen and acetylene cylinders shall be separated by a minimum of 20 feet or a 1 hour rated fire wall 5 feet in height.

- Empty cylinders shall have their valves closed, capped and tagged as empty.

- Storage of empty cylinders shall be speared from full-charged cylinders.

- Valve protection caps where the cylinder is designed to accept a cap shall always be in place and hand tight except when cylinders are in use.

- Compressed gas cylinders shall secured in an upright position at all time including when hoisted or transported.

- A fire extinguisher of properly rated capacity and type shall be placed no closer than 25 feet but no farther than 75 feet from compressed fuel gas storage places.

- Retention chains will be provided on storage racks and carts to allow compressed gas cylinders to be secured against a falling. Storage racks shall be posed with sign labels to clearly identify the content of gas in cylinders.

- A wrench or hand-turn shut-off valve must be present at all times when gas bottles are in use and caps are not in place.

- Cylinders shall not be permanently stored inside buildings.

2.7 FLAMMABLE AND COMBUSTIBLE LIQUIDS

Scope

This section defines the minimum safety requirements for the use and storage of flammable or combustible liquids on Port property.

Purpose

To prevent injury to personnel or the general public as well as fire or smoke damage to the facility.

Reference

29 CFR Subpart F & J, NFPA and the Fire Protection Section of this manual.

- All tanks, containers and pumping equipment (portable or stationary) used for the storage or handling of flammable and combustible liquids shall have an approved rating by UL, FM and shall be inspected and approved by the Safety Representative.

- All tanks and containers shall be properly labeled as to their contents and shall not be used for other purposes.

- A qualified person shall supervise all storage, handling or use of flammable or combustible liquids.

- All sources of ignition shall be prohibited in areas where flammable liquids are stored, handled and processed. Suitable “No Smoking” signs shall be posted throughout such areas.

- Flammable or combustible liquids shall not be stored in any enclosed building without approval of the Lake Charles Fire Department, Port of Lake Charles Management and Safety. Upon approval, those quantities shall be limited to an not greater than one days use.

- Bulk storage of flammable or combustible will not be allowed onsite without the approval of the Lake Charles Fire Department, Port Management and Safety.

- Buildings used for storing flammable liquids or gasses shall be of fire-resistance construction with protected wall openings and shall be located 50 feet from any adjoining sources of ignition or non-rated structures.

- ❖ Smoking or open flames within 35 feet of where flammable liquids or gasses are being used, stored or transferred or where equipment is being fueled are prohibited.

- ❖ All oxygen and acetylene bottles will be kept capped (except when gauges are in use) and secured in an upright position. Oxygen and Acetylene (fuel gasses) will be stored separately (20 feet apart minimum), or separated by a five foot high, 12 hour fire rated wall.

Paints and Painting (Flammable)

- ❖ Packages containing paints, varnishes, lacquers, thinners or other volatile painting materials shall be kept tightly closed when to in use and shall be stored in accordance with the NFPA recommendations.

- ❖ Containers of paints, varnishes lacquers, thinners and other flammable paint materials stored indoors shall be kept in metal storage cabinets meeting the requirements of the Uniform fire Code and NFPA 30.

- ❖ Paint-soiled clothing and drop cloths when not in use shall be stored in well ventilated self-closing steel cabinets or containers.

- ❖ Pain scrapings and paint saturated debris shall be removed daily from the premises. Off-site disposal shall be performed in accordance with all applicable laws and regulations.

- ❖ Ventilation adequate to prevent the accumulation of flammable vapors to hazardous levels shall be avoided in all areas where painting is done or paints are mixed.

- ❖ Smoking open flames exposed heating elements or other sources of ignition shall not be permitted in areas or rooms where spray painting is being conducted.

- ❖ Spray paint hoods, respirators and other clothing or equipment shall be in accordance with recommendations of NFPA.

2.8 FALL PROTECTION

Scope

This section defines the minimum safety requirements while performing work from heights.

Purpose

To prevent injury to employee exposed to falls while performing work from heights such as steel erection, concrete forming, accessing work areas or walking working surfaces.

Reference

29 CFR Subparts E&M and the sections on PPE, Floor and Wall Openings, and Ladders and Stairways on this manual.

Definitions

- Anchorage — A secure point of attachment for lifelines, lanyards, or deceleration devices that is capable of withstanding the forces specified in the applicable sections of OSHA.

- Approved — For the purpose of this policy, tested and certified by the manufacturer, or any recognized national testing laboratory, to possess the strength requirements specified in this section.

- Full Body Harness — A configuration of connected straps to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration device.

- Full Body Harness System — A Class III full body harness and lanyard which is attached to an anchorage meeting the requirements of; or attached to a horizontal or vertical lifeline, which is properly secured to an anchorage capable of withstanding the forces, specified in the applicable sections of OSHA.

- Catenary Line — See horizontal lifeline.

- Competent Person — An individual knowledgeable about fall protection equipment, including the manufacturers recommendations and instructions for the proper use, inspection, and maintenance; and who is capable of identifying existing and potential fall hazards; has the authority to take prompt corrective

action to eliminate those hazards; and is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

- Connector — A device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer, or it may be an integral component of part of the system (such as a buckle or D-ring sewn into a body harness, or a snap hook spliced or sewn to a lanyard or self-retracting lanyard).

- Continuous Fall Protection — The design and use of a fall protection system so that exposure to an elevated fall hazard does not occur. This may require more than one fall protection system or a combination of prevention or protection measures.

- Control Zone — The area between the warning line and unprotected sides and edges of the walking/working surface.

- Deceleration Device — Any mechanism, such as a rope grab, rip stitch lanyard, specifically woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

- Deceleration Distance — The additional vertical distance a falling employee travels excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

- Drop Line — A vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard or device.

- Failure — Load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

- Fall Arrest System — The use of multiple, approved safety equipment components such as body harnesses, lanyards, deceleration devices, drop lines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged to arrest a free fall. Compliance with anchorage strength requirements specified in the applicable sections of shall constitute approval of the anchorage.

- Fall Protection Work Plan — A written document in which the employer identifies all areas on the job site where a fall hazard of 10 feet or greater exists. The plan describes the method or methods of fall protection to be utilized to protect employees, and includes procedures governing the installation, use, inspection, and removal of the fall protection method or methods, which are selected by the employer.

- Fall Restraint System — An approved device and any necessary components that function together to restrain an employee so that the employee is prevented from falling to a lower level. When standard guardrails are selected, compliance with applicable sections governing their construction and use shall constitute approval.

- Fall Distance — The actual distance from the employee's support to the level where a fall would stop.

- Free Fall — The act of falling before a personal fall arrest system begins to apply force to arrest the fall.

- Free Fall Distance — The vertical displacement of the fall arrest attachment point on the employee's body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before it operates, and fall arrest forces occur.

- Hardware — Snap hooks, D rings, bucklers, carabineers, adjusters, and 0-rings that are used to attach the components of a fall protection system together.

- Horizontal Lifeline — A rail, rope, wire, or synthetic cable that is installed in a horizontal plane between two anchorage points and used for attaching a workers lanyard or lifeline device while moving horizontally. Horizontal lifeline is used to control dangerous pendulum like swing falls.

- Lanyard — A flexible line of webbing, rope, or cable point usually 2, 4, or 6 feet long used to secure a body harness to a lifeline or an anchorage.

- Leading Edge — The advancing edge of a floor, roof, or formwork, which changes location as additional floor, roof, or formwork sections, are placed, formed, or constructed. Leading edges not actively under construction are considered to be "unprotected sides and edges," and positive methods of fall arrest or fall restraint shall be required to protect exposed workers.

- Lifeline — A vertical line from a fixed anchorage or between two horizontal anchorages, independent of walking or working surfaces, to which a lanyard or

device is secured. Lifeline as referred to in this text is one that is part of a fall protection system used as back-up safety for an elevated worker.

- Locking Snap Hook — A connecting snap hook that requires two separate forces to open the gate (one to deactivate the gatekeeper and a second to depress and open the gate which automatically closes when released) and is used to minimize roll out or accidental disengagement.

- Low Pitched Roof — A roof having a slope equal to or less than 4 in 12.

- Mechanical Equipment — All motor- or human-propelled, wheeled equipment except for wheelbarrows, mops carts, robotic thermoplastic welders, and robotic crimpers.

- Positioning Belt — A single or multiple strap that can be secured around the worker's body to hold the user in a work position (i.e., a lineman's belt, rebar belt, or saddle belt).

- Positioning Device System — A body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

- Restraint Line — A line from a fixed anchorage or between two anchorages to which an employee is secured in such a way as to prevent them from falling to a lower level.

- Roll Out — Unintentional disengagement of a snap hook caused by the gate being depressed under torque or contact while twisting or turning. Roll Out is a particular concern with single-action snap hooks that do not have a locking gatekeeper.

- Roof — The exterior surface on the top of a building. This does not include floors or formwork that temporarily becomes the top surface of a building because a building has not been completed.

- Roofing Work — The hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including construction of the roof deck.

- Rope Grab — A fall arrester that is designed to move up or down a lifeline suspended from a fixed overhead or horizontal anchorage point, or lifeline, to which the belt or harness is attached. In the event of a fall, the rope grab locks onto the lifeline rope through compression to arrest the fall. The use of a rope grab device is restricted for all restraint applications.

- Safety Line — See Lifeline.

- Safety Monitor System — A system of fall restraint used in conjunction with a warning line system only, where a competent person, having no additional duties, monitors the proximity of workers to the fall hazard when working between the warning line and unprotected sides and edges, including the leading edge of a low pitched roof or walking/working surface.

- Self Retracting Lifeline — A deceleration device that contains a drum wound line, which may be slowly extracted from or retracted onto the drum under slight tension during normal employee movement and, after onset of a fall, automatically locks the drum and arrests the fall.

- Shock Absorbing Lanyard — A flexible line of webbing, cable, or rope used to secure a body harness to a lifeline or anchorage point that has an integral shock absorber.

- Snap Hook — A self-closing connecting device with a gatekeeper latch or similar arrangement that remains closed until manually opened. This includes single action snap hooks that open when the gatekeeper is depressed and double - action snap hooks that require a second action on a gatekeeper before the gate can be opened.

- Static Line - see Horizontal Lifeline.

- Strength Member — Any component of a fall protection system that could be subject to loading in the event of a fall.

- Steep Roof — A roof having a slope greater than 4 in 12 (Vertical to Horizontal).

- Unprotected Sides and Edges — Any side or edge (except at entrances to points of access) of a floor, roof, ramp or runway where there is no wall or guardrail system, as defined in 29 CFR 1926, Subpart M.

- Walking/Working Surface — For the purpose of this section, any area whose dimensions are 45 inches or greater in all directions, through which workers pass or conduct work.

- Warning Line System — A barrier erected on a walking and working surface or a low pitch roof (4 in 12 or less), to warn employees that they are approaching an unprotected fall hazard(s).

- Work Area — The portion of a walking/working surface where job duties are being performed.

- 100% Fall Protection – The use of a double lanyard system to ensure the fall arrest system remains in effect at all times when repositioning from one work location to another.

Fall Restraint, Fall Arrest Systems

Falls are ranked as the leading cause of death and serious injury in the construction industry. When exposed to a fall hazard when working from a height of four (4) feet or greater, 100% fall protection shall be insured. This can be accomplished through the use of fall restraint systems. For the purpose of this section, Fall Protection, where the use of fall arrest or position devices is discussed, protection shall be insured to employees at the height of six (6) feet or greater.

Fall restraint protection shall consist of one or more of the following:

- Standard guardrails as described in the following Sections of this manual: Scaffolding, and Ladders & Stairways.

- Harness attached to securely rigged restraint lines.

ANSI	Standard
Class Ill	full body harness
Class IV	suspension/position belt

- All harnesses and lanyard hardware assemblies shall be capable of withstanding a tensile loading of 4,000 pounds without cracking, breaking, or taking a permanent deformation.

- Rope grab devices are prohibited for fall restraint applications unless they are part of a fall restraint system designed specifically for the purpose by the manufacturer, and used in strict accordance with the manufacturer's recommendations and instructions.

- All components shall be compatible.

- Components of fall restraint systems shall be inspected prior to each use for mildew, wear, damage, and other deterioration. Defective components shall be removed from service if their function or strength is adversely affected.

- Anchorage points used for fall restraint shall be capable of supporting four times the intended load.

- Restraint protection shall be rigged to allow the movement of employees only as far as the sides and edges of the walking/working surface.

The use of a Warning Line System as prescribed in 29 CFR 1926, Subpart M, and supplemented by the use of a Safety Monitor System as prescribed therein to protect workers engaged in duties between the forward edge of the warning line and the unprotected sides and edges, including the leading edge, of a low pitched roof or walking/working surface is allowed only after first demonstrating, in writing to the Engineer, that the use of a fall arrest or restraint system is not feasible.

- ❖ Warning line and safety monitor systems as described in 29 CFR Subpart M are prohibited on surfaces exceeding a 4 in 12 pitch, and on any surface whose dimensions are less than 45 inches in all directions.

Fall Arrest Protection

Fall arrest protection shall consist of one or more of the following full body harness system:

- ➢ An approved Class Ill full body harness shall be used.
- ➢ Body harness systems or components subject to impact loading shall be immediately removed from service and shall not be used again for employee protection unless inspected and determined by a competent person to be undamaged and suitable for reuse.
- ➢ All safety lines and lanyards shall be protected against being cut or abraded.
- ➢ The attachment point of the body harness shall be located in the center of the wearers back near shoulder level, or above the wearer's head.
- ➢ Body harness systems shall be rigged to minimize free fall distance with a maximum free fall distance allowed of 6 feet, and such that the employee will not contact any lower level.
- ➢ Hardware shall be drop forged, pressed or formed steel, or made of materials equivalent in strength.
- ➢ Hardware shall have a corrosion resistant finish. All surfaces and edges shall be smooth to prevent damage to the attached body harness or lanyard.
- ➢ When vertical lifelines (drop lines) are used, not more than one employee shall be attached to any one lifeline.
- ➢ System strength needs in the following items are based on a total combined weight of employee and tools of no more than 310 pounds. If combined weight is more than 310 pounds, appropriate allowances must be made or the system will not be deemed to be in compliance.

- Full body harness systems shall be secured to anchorages capable of supporting 5,000 pounds per employee; except when self-retracting lifelines or other deceleration devices are used which limit free fall to two feet, anchorages shall be capable of withstanding 3,000 pounds.

- Vertical lifelines (drop lines) shall have a minimum tensile strength of 5,000 pounds (22.2 kN), except that self-retracting lifelines and lanyards that automatically limit free fall distance to two feet (.61 m) or less shall have a minimum tensile strength of 3,000 pounds (13.3 kN).

- Horizontal lifelines shall have a tensile strength capable of supporting a fall impact load of at least 5,000 pounds (22.2 kN) per employee using the lifeline, applied anywhere along the lifeline.

- Lanyards shall have a minimum tensile strength of 5,000 pounds (22.2 kN).

- All components of body harness systems whose strength is not otherwise specified in this subsection shall be capable of supporting a minimum fall impact load of 5,000 pounds (22.2 kN) applied at the lanyard point of connection.

- Snap hooks shall not be connected to loops made in webbing type lanyards.

- Snap hooks shall not be connected to each other.

- Not more than one snap hook shall be connected to any D-ring.

- Lanyards shall not be attached directly to a retractable device.

- System components shall be compatible.

- Components used for fall protection shall be designed for such use and shall not be used for other purposes.

<u>Safety Net Systems</u>

Safety net systems and their use shall comply with the following provisions.

- Safety nets shall be installed as close as practicable under the surface on which employees are working, but in no case more than 30 feet (9.1 m) below such level unless specifically approved in writing by the manufacturer. The potential fall area to the net shall be unobstructed.

Safety nets shall extend outward from the outermost projection of the work surface as follows:

Vertical distance from working level to horizontal plane of net.	Minimum required horizontal distance of outer edge of net from the edge of the working surface
Up to 6 feet	8 feet
More than 5 feet, up to 10 feet	10 feet
More than 10 feet	13 feet

- Safety nets shall be installed with sufficient clearance under them to prevent contact with the surface or structures below when subjected to an impact force equal to the drop-test specified.

- Safety nets and their installations shall be capable of absorbing an impact force equal to that produced by the drop-test specified.

  - Except as provided, safety nets and safety net, installations shall be drop-tested at the job site after initial installation and before being used as a fall protection system, whenever relocated, after major repair, and at 6-month intervals if left in one place. The drop-test shall consist of a 400 pound (180 kg) bag of sand 30 $\pm$ 2 inches (76 $\pm$ 5 cm) in diameter dropped into the net from the highest walking/working surface at which employees are exposed to fall hazards, but not from less than 42 inches (1.1m) above that level.

  - When it is unreasonable to perform the drop-test as required, the Safety Officer (or a designated competent person) shall certify that the net and net installation are in compliance by preparing a certification record prior to the net being used as a fall protection system. The certification record must include an identification of the net and net installation for which the certification record is being prepared; the date that it was determined that the identified net and net installation were in compliance and the signature of the person making the determination and certification. The most recent certification record for each net and net installation shall be available at the job site for inspection.

- Defective nets shall not be used. Safety nets shall be inspected at least once a week for wear, damage, and other deterioration. Defective components shall be removed from service. Safety nets shall also be inspected after any occurrence that could affect the integrity of the safety net system.

- Materials, scrap pieces, equipment, and tools which have fallen into the safety net shall be removed as soon as possible from the net, in addition, prior to the next work shift.

- The maximum size of each safety net mesh opening shall not exceed 36 square inches (230 cm^2) nor be longer than 6 inches (15 cm) on any side. The opening, measured center-to-center of mesh ropes or webbing shall not be longer than 6 inches (15 cm). All mesh crossings shall be secured to prevent enlargement of the mesh opening.

- Each safety net (or section of it) shall have a border rope for webbing with a minimum breaking strength of 5,000 pounds (22.2 kN).

- Connections between safety net panels shall be as strong as integral net components and shall be spaced not more than 6 inches (15 cm) apart.

Catch Platforms

- A catch platform shall be installed within 6 vertical feet of the work area.

- The width of the catch platforms shall equal the distance of the fall but shall be a minimum of 45 inches wide. The catch platform shall be equipped with standard guardrails on all open sides.

Positioning Device Systems

Positioning device systems and their use shall conform to the following provisions:

- Positioning devices shall be rigged such that an employee cannot free fall more than 2 feet (.61 m).

- Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (13.3 kN), whichever is greater.

- Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.

- Connectors shall have a corrosion-resistant finish. All surfaces and edges shall be smooth to prevent damage to interfacing parts of this system.

- Connecting assemblies shall have a minimum tensile strength of 5,000 pounds (22.2 kN).

- D-rings and snap-hooks shall be proof-tested to a minimum tensile load of 3,600 pounds (16 kN) without cracking, breaking, or taking permanent deformation.

- Positioning device systems shall be inspected prior to each use for wear, damage, and other deterioration and defective components shall be removed from service.

- Harnesses and components shall be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.

Drop lines or Lifelines

- Drop lines or lifelines used on rock scaling operations, or in areas where the lifeline may be subjected to cutting or abrasion, shall be a minimum of 7/8 inch, wire core manila rope. For all other lifeline applications, a minimum of 3/4 inch manila or equivalent with a minimum breaking strength of 5,000 pounds shall be used.

Safety Harnesses or Lanyards

Safety harnesses, lanyards, lifelines, or drop lines independently attached or attended shall be used while performing the following types of work when other equivalent type protection is not provided:

- Work performed in permit required confined spaces and other confined spaces shall follow the procedures as described in the Confined Spaces section of the Port of Lake Charles Safety Manual.

- Work on hazardous slopes or dismantling safety nets, working on poles or from boatswains chairs at elevations greater than six feet (1.83m), swinging scaffolds or other unguarded locations.

EMPLOYEE TRAINING

A qualified person(s) shall provide training required by this section.

- Fall Protection Training - All personnel exposed to fall hazards shall be trained.

The program shall include training and instruction in the following areas:

- The recognition and identification of fall hazards in the work area:

- The use and operation of guardrail systems (including perimeter safety cable systems), personal fall arrest systems, positioning device systems, fall restraint systems, safety net systems, and other protection to be used.

- The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used.

- The procedures to be followed to prevent falls to lower levels and through or into holes and openings in walking/working surfaces and walls.

- The procedures for the prompt, safe removal of injured workers or those suspended as a result of a fall.

- The fall protection requirements of this manual.

2.8.1 FALL PROTECTION WORK PLAN

A written fall protection work plan including each area of the work place where employees are assigned, and where hazards fall greater than ten (10) feet exist. A copy of the plan shall be submitted to the Seaport Safety Staff prior to work.. NOTE: if a situation arises, where safety requirements cannot be met, a meeting will be held with the Engineer and the Seaport Safety Manager and an alternate plan will be prepared.

The fall protection work plan shall:

- Identify all fall hazards in the work area.
- Describe the method of fall arrest or restraint to be provided.
- Describe the correct procedures for the assembly, maintenance, inspection and disassembly of the fall protection system to be used.
- Describe the correct procedures for the handling, storage and securing of tools and materials.
- Describe the method of providing overhead protection for workers who may be in or pass through the area below the work site.
- Describe the method for prompt safe removal of injured workers.
- Be available at the job site for inspection by the Safety Department.

Prior to permitting employees into areas where fall hazards exist the Supervisor shall:

- Ensure that employees are trained and instructed in the items described in this section.
- Inspect fall protection devices and systems to ensure compliance with 29 CFR 1926, Subpart M.

Training of employees is required and shall be documented and available at the job site.

2.9 SCAFFOLDING

Scope

This program defines minimum safety requirements to be followed when erecting, dismantling, moving, or altering scaffolding.

Purpose

To prevent injury to employees or visitors working on or around scaffolding.

Reference

29 CFR 1926, Subparts L & M as well as the Fall Protection section of this manual.

Definitions

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

- Qualified Person - means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated ability to solve or resolve problems related to the subject matter, work, or project. Scaffolds shall be designed by a qualified person, and constructed and loaded in accordance with that design.

General

- No scaffold shall be erected, moved, dismantled, or altered except under the supervision of a Qualified or Competent Person.

- All scaffolding and stair towers shall utilize the following tag system when being erected, altered, moved, or dismantled.

- All scaffolding shall have a color-coded tag, secured at the point of access signed by the Competent Person.

    - Green Tag — Scaffold meets and/or exceeds all applicable regulations thus is safe to use.

- Yellow Tag — WARNING — This scaffold does not comply with applicable regulations and has restrictions placed on it by the Competent Person. EXAMPLE: Fall arrest protection may be required.

- Red Tag — DANGER — This scaffold is not to be used except by the erecting crew performing installation, alteration, or dismantling activities.

❖ All scaffolds over 26 feet in height shall be tied in, beginning at this height and every 26 feet thereafter. Scaffold shall be anchored every 30 feet of length at the heights established in the preceding sentence. Scaffolds with a height to base width ratio greater than four to one (4:1) must also be secured from tipping.

❖ Scaffold footing shall be sound and rigid, capable of support weight. Unstable objects, such as bricks, shall not be used in the supports.

❖ Scaffolds in excess of 6 feet above the ground or floor level shall have top rail, intermediate rails, and toe boards on all open sides.

❖ Top rails shall be 2 x 4's or equivalent, 42 inches high with vertical supports not to exceed 8 feet. Toe boards shall be 2 x 4's. Rails may be tubing of equivalent strength. Toe boards may be plate.

❖ Scaffolds and components shall be able to support at least four times the intended load.

❖ Any component of a scaffold damaged or weakened for any reason shall be immediately repaired or replaced.

❖ The space between the bottom of the toe board and scaffold decking shall not exceed ½ inch.

❖ Maximum span for 2" x 12" planks shall be 8 feet.

❖ Scaffolds shall be kept free of ice, grease, mud, or any other material or equipment, which renders them unsafe or hazardous to personnel using them.

❖ Where walkways and work surfaces are slippery, abrasive material shall be used to ensure safe footing.

❖ An access ladder or equivalent safe means of access shall be provided at all work areas.

❖ Each end of planking on platforms shall be overlapped a minimum of 12 inches and secured from movement.

- Scaffold planks shall extend over their end support at least 6 inches, but not more than 12 inches.

- Width of all scaffolds shall be determined by their purpose, but in no case shall they be less than 18 inches. They shall be sufficiently wide to eliminate passageway congestion and facilitate material supply and personnel movement.

- Scaffolds supported by an outrigger boom, hoist, well pulley, or any other device or equipment used for hoisting material will be permitted, provided the platform of scaffold supports and the individual member to which each device is attached is reinforced and braced to withstand the additional loads imposed.

- Overhead protection shall be provided for personnel in a scaffold exposed to overhead hazards.

- Wire or wire rope used for scaffold suspensions shall be capable of supporting six times the intended load.

- Shore or lean-to scaffolds are prohibited.

- Scaffolds exceeding 125 feet in height shall be designed and erected under the supervision of a licensed professional engineer competent in this field.

- Narrow gauge scaffolds (30 inches wide or less) shall not have working platform erected above 4 feet unless equipped with outriggers.

- Casters shall be designed and capable of supporting the load imposed.

- Rolling scaffolds with personnel aloft are prohibited.

- When personnel work or pass under a scaffold, a screen of No. 18 gauge U.S. Standard wire ½ inch mesh or the equivalent shall be provided between the toe board and top rail.

Scaffold (Tubular Welded Frame)

- The scaffold and its component parts shall be designed to support four times the rated load.

- Scaffolds shall be braced, and the braces shall be part of the proper length so that the scaffold will remain plumb and rigid.

- Scaffold legs shall be set on adjustable bases or plain or other foundations adequate to support the maximum rated load.

- To prevent movement, the scaffold shall be secured to the building or structure at intervals not to exceed 30 feet horizontally and 26 feet vertically.

Scaffolds (Needle Beam)

- Wood needle beams shall not be supported by members less than 4 inches by 6 inches with greatest dimension placed in vertical direction. Metal beams or the equivalent may be used.

- Ropes and hangars shall be provided for supports. The span between supports on the needle beam shall not exceed 10 feet for 4x6-inch timbers. Rope support shall be equivalent to 1-inch diameter, first grade manila rope.

- The ropes shall be attached to the needle beams by a scaffold hitch or properly made eye splice. A bowline knot or a round turn and a half hitch shall tie the loose end of the rope.

- The scaffold hitch shall be arranged so as to prevent the needle beam from rolling or becoming otherwise displaced.

- The platform span between the needle beams shall not exceed 8 feet when using 2-inch scaffold planks. For spans greater than 8 feet, platforms shall be designed for the special span. The overhand of each of the platform planks shall not be less than 6 inches nor more than 12 inches.

- When needle beam scaffolds are used, the planks shall be secured against slipping.

- All unattached tools, bolts, washers, nuts, etc., used on needle beam scaffolds shall be kept in containers properly secured to prevent falling.

- A permanent structural member may support one side of a needle beam scaffold. The scaffold shall be securely attached.

- Any employee working on a needle beam scaffold who is not afforded a positive means to prevent falling (6 feet or more), shall be secured with a safety harness.

Scaffolds (Float)

- A float scaffolding shall be hung from overhead supports by means of ropes, and shall consist of a substantial platform having diagonal bracing underneath and resting upon, and securely fastened to two parallel plant bearers at right angles to the span.

- The platform shall not be less than 3 feet wide and 6 feet long, made of ¾- inch plywood equivalent to American Plywood Association Grade B-B, Group I, exterior or similar material.

- The two supporting bearers shall be 2" x 4" or 1" x 10" rough selected lumber or better. They shall be free of knots and shall project 6 inches beyond the platform on both sides and ends of the platform and extend 6 inches beyond the bearers.

- An edging of wood not less than 2" x 4" or equivalent shall be placed around all sides of the platform to prevent tools from rolling off.

- Supporting ropes shall be 1-inch manila rope or equivalent with connections so that the platform cannot slip, and shall be securely fastened to an overhead support.

- All employees working on floats shall wear a full body safety harness with lanyards tied off to an independent static line or structure of building that can sustain a 5,400-pound impact load and prevent a fall greater than 6 feet.

Swinging Scaffolds – Two Point Suspension

- Two-point suspension scaffold platforms shall not be less than 20 inches or more than 36 inches wide overall. The platform shall be securely fastened to the hangers by U-bolts or by other equivalent means.

- The hangars of two-point suspension scaffolds shall be capable of sustaining four times the maximum rated load, and shall be designed with a support for guardrail, intermediate rail and toe boards.

- Wire, synthetic or fiber rope capable of supporting at least six times the rated load shall suspend two-point suspended scaffolds. All other components shall be capable of supporting at lest four times the rated load.

- No more than two employees shall be permitted to work at one time on suspension scaffolds designed for a working load of 500 pounds. No more than three employees shall be permitted to work at one time on suspension scaffolds with a working load of 750 pounds. An approved full body safety harness attached to a deceleration lifeline shall protect each employee. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to rigged lines, which will safely suspend the employee in case of a fall.

- Two-point suspension scaffolds shall be securely lashed to the building or structure to prevent them from swaying.

- Light, metal-type platforms, when used, shall be tested and listed according to Underwriters Laboratories or Factory Mutual Engineering Corporation or some other recognized authority for suitable certification.

Scaffold Plank

- Plank shall be inspected on a daily basis. The planks shall conform to the established structural grades. Any split or damaged plank shall be removed from service.

- Scaffold lumber should not be used for other purposes. The ends of the plank may be painted a bright color for easy identification, and can be banded with strap iron bands to prevent splitting.

- Knots may be placed in center of wide face not larger than one quarter of plank width, with permissible size decreasing to 1/8 of plank width as they approach the edge. The sum of sizes of all knots in wide face in length equal to plank width shall not exceed one quarter of plank width.

- For planks conforming to above criteria except with grain slope not steeper than 1 in 20, knots in edge not larger than 1/24 thickness, knots in face not larger than 1/12 of plank width, the safe center loads shown in table may be increased 25 percent.

2.10 LADDERS & STAIRWAYS

Scope

This section defines minimum safety requirements to be followed when erecting.

Purpose

To prevent injury to employees while accessing the project elevated levels or performing work at heights.

Reference

29 CFR 1926 Subpart X, and the Fall Protection section of this manual.

Definitions

- Job-made Ladder — A ladder that is project fabricated, not commercially manufactured.
- Portable Ladder — A ladder that can be easily moved or carried.
- Step Ladder — A self-supporting, foldable, portable ladder.
- Fixed Ladder — A ladder that can not be readily moved or carried because it is an integral part of a structure or building.
- Extension Ladder — A portable ladder adjustable in length consisting of a base ladder with an adjustable extension section.

General

Only ladders, which are safe and in accordance with all applicable codes and standards shall be used.

The following are to be particularly noted:

- Ladders with broken or missing rungs or steps, broken or split side rails or other faulty or defective construction are prohibited. When ladders with such defects are discovered, they shall be immediately withdrawn from service.

- Extension ladders shall be equipped with anti-slip feet.

- Ladders made of conductive material shall not be used where electrical hazards exist.

- Manufactured portable ladders shall be in accordance with the provisions of the American National Standards Institute A14.1-1968, 29 CFR Part 1926.1050 - 1060, and Safety Code for Portable Wood Ladders.

- Ladders shall be placed on a substantial base, and the areas around the top and bottom of the ladder shall be kept free of debris. They shall also have unobstructed access at the top and base.

- Stepladders shall only be used as designated, completely opened with latches locked.

- Ladders shall not be placed in passageways, doorways, driveways, or any location where they may be displaced by activities or any other work, unless secured or protected by barricades or guards.

- Job-made ladders shall be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is approximately ¼ of the working length of the ladder.

- Ladders shall not be used in a horizontal position as platforms, runways, scaffolds, or structural members.

- When ladders are used for access to upper landing surfaces, ladder side rails shall extend not less than 36 inches (3 rungs) above a landing. When this is not practical, hand rails, which provide a secure grip for personnel moving to or from the point of access shall be installed.

- Job-made and extension ladders shall be tied, blocked, or otherwise secured to prevent them from movement at both the top and bottom.

- The fly section of an extension ladder shall not be used alone.

- The top two steps (one rung and top platform member) of stepladders are not to be stood upon.

- Ladders should be climbed on using both hands, facing the rungs. Tools should be retrieved by use of a rope haul or hoist.

Job-Made Ladders

- Job-made ladders shall be constructed for their intended use. If a ladder is to provide the only means of access or exit from a working area for 25 or more employees, or simultaneous two-way traffic is expected, a double-cleat ladder shall be installed.

- Double-cleat ladders shall not exceed 24 feet in length; single-cleat ladders shall not exceed 30 feet in length.

- The width of single-cleat ladders shall be at least 15 inches, but not more than 20 inches, between rails at the top.

- Side rails shall be parallel or flared top to bottom by no more than ¼ inch for each 2 feet of length.

- If possible, side rails should be continuous. If splicing is necessary to attain the required length, the splice must develop the full strength of a continuous side rail of the same length.

- 2 x 4 lumber shall be used for single cleat ladders up to 16 feet in length; 3-inch (or 2 x 6) lumber shall be used for single-cleat ladders from 16 to 30 feet in length.

- 2 x 4 lumber shall be used for side and middle rails of double cleat ladders up to 12 feet in length; 2 by 6-inch lumber shall be used for double-cleat ladders from 12 to 24 feet in length.

- Cleats shall be inset into the edges of the side 1/2 inch, or filler blocks shall be used on the rails between the cleats. The cleats shall be secured to each rail with three IOD common wire nails or other fasteners of equivalent strength. Cleats shall be uniformly spaced, 12 inches top to top.

- Damaged ladders shall be removed from service immediately and repaired or destroyed.

- Do not paint wooden ladders, other than for identification marking.

- The area at the base of ladders bring used to perform work shall be delineated to safe guard those working in the area.

- Ladders used in areas subject to vehicle traffic shall be delineated around the base.

Stairways

- A ladder or stairway shall be provided at all personnel points of access where there is a break in elevation of 19” or more, and no ramp, runway, slope, or ladder platform is provided.

- Stairways having four or more risers or rising more than 30 inches or whichever is less, shall be equipped with at least one handrail and one stair rail system along each unprotected side or edge.

Ramps and Inclined Walkways

- Ramps and inclined walkways shall be eighteen inches or more wide.

- They shall have standard railings when located four or more feet above the ground.

- They shall not be inclined more than twenty-four degrees and shall be cleated or otherwise treated to prevent slippage and secured to prevent displacement.

2.11 FLOOR *& WALL OPENINGS*

Scope

This section defines the minimum safety requirements for floor and wall opening protection.

Purpose

To prevent injury to employees and visitors from falling through or having materials fall through or from open sided floors, roof or wall openings or other open-sided walking or working surfaces.

Reference

29 CFR 1926, Subparts L, M, 0, R, and X, as well as the Fall Protection and Ladders & Stairways sections of this manual.

Definitions

- Floor Opening — An opening measuring 12 inches or more in its least dimension in any floor, roof, or platform, through which a person could fall.

- Floor Hole — An opening measuring less than 12 inches but no more than 1 inch in its least dimension in any floor, roof, or platform through which material but not persons may fall.

Guarding of Floor Openings (12" or greater)

- Floor openings into which persons can accidentally walk shall be guarded by a standard railing with toe boards on all sides, or a cover of standard strength and construction that is secured against accidental displacement.

- Ladder-ways. Standard railings with toe boards shall guard floor openings or platforms on all exposed sides except at the entrance to the opening. Passages through the railing shall either be offset or equipped with swing gate so that a person cannot walk directly into the opening.

Hatchways and chute floor openings shall be guarded by one of the following:

- Hinged covers of standard strength and construction and a standard railing with only one exposed side. When the opening is not in use, the cover shall be closed or the exposed side guarded by removable standard railings.

- A removable standard railing with toe boards on not more than two sides of the opening and fixed standard railings with toe boards on all other exposed sides. The removable railing shall be kept in place when the opening is not in use and shall be hinged or otherwise mounted so as to be conveniently replaceable.

All floor opening shall be capable of supporting the maximum potential load, but never less than 200 pounds.

- All covers shall be secured when installed to prevent accidental displacement by wind, equipment, or employees.

- All covers shall be marked with the word “hole” or “cover” in a high visibility paint to provide warning of the hazard.

- If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard and prevent exposure to the fall hazard, but perform no other duties.

- Any monitor or employee within 6 feet of the opening shall utilize a fall protection system.

- Wherever there is danger of falling through a skylight opening, and the skylight itself is not capable of sustaining the weight of a 200-pound person, standard guardrails shall be provided on all exposed sides or the skylight shall be covered.

- Conduits, trenches, and manhole covers and their supports, when located in roadways and vehicular aisles, shall be designed to carry a truck rear axle load of at least 2 times the maximum intended load.

Guarding of Floor Holes (12” or less)

- All floor holes shall be guarded with a cover.

- All floor hole covers shall be capable of supporting the maximum potential load, but never less than 200 pounds.

- ❖ All covers shall be secured when installed to prevent accidental displacement by wind, equipment, or employees.

- ❖ If the cover is not large enough to be marked with the word “hole” or “cover” to provide warning of the hazard it shall be marked with a high visibility paint to identify it.

- ❖ If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard and prevent exposure to the hazard, but perform no other duties.

Guarding of Wall Openings

Wall openings from which there is a drop of more than 4 feet, and where the bottom of the opening is less than 3 feet above the working surface, shall be guarded as follows:

- ❖ When the height and placement of the opening in relation to the working surface is such that either a standard rail or intermediate rail will effectively reduce the danger of falling, one or both shall be provided.

- ❖ The bottom of a wall opening that is less than 4 inches above the working surface (regardless of width) shall be protected by either a standard toe board or an enclosing screen of solid construction.

An extension platform outside a wall opening, onto which materials can be hoisted for handling, shall have standard guardrails on all exposed sides or equivalent. One side of an extension platform may have removable railings in order to facilitate handling materials.

Wall opening protection shall meet the following requirements:

- ❖ Barriers shall be of such construction and mounting such that, when in place at the opening, the barrier is capable of withstanding a load of at least 200 pounds applied in any direction (except upward), with a minimum of deflection at any point on the top rail or corresponding member.

- ❖ Screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 pounds applied horizontally at any point on the near side of the screen. They may be of solid construction of grillwork with openings not more than 8 inches long, or of slat work with openings not more than 4 inches wide with length unrestricted.

Guarding of Open-Sided Surfaces

- Every open-sided floor, platform or surface four feet or more above the adjacent floor or ground level shall be guarded by a standard railing, or the equivalent on all open sides, except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a toe board wherever, beneath the open sides, persons can pass, or there is moving machinery or equipment.

- Runways shall be guarded by a standard railing (or the equivalent on all open sides) 4 feet or more above the floor or ground level. Wherever tools or materials are likely to be used on the runway, a toe board shall also be provided on each exposed side.

- When operations, tool or material use or storage is such that a standard toe board does not provide protection, paneling, or screening from the floor to the intermediate rail or top rail shall be provided.

- Additional guarding shall be provided where employees entering upon runways become thereby exposed to machinery, electrical equipment, or other danger that is not a falling hazard.

- Regardless of height, open-sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, such as conveyors and similar hazards shall be guarded with a standard railing and toe board.

Standard Specifications

A standard railing shall consist of top rail, intermediate rail, toe board, and posts. It shall have a vertical height of 39 inches to 45 inches from upper surface of top rail to floor, platform, runway, or ramp level. Each length of lumber shall be smooth surfaced throughout the length of the railing. The intermediate rail shall be halfway between the top rail and the floor, platform, runway, or ramp. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.

Minimum requirements for standard railings under various types of construction are specified in the following:

- For wood railings, the posts shall be of at least 2 x 4 stock spaced not to exceed 8 feet; the top rail shall be of at least 2 x 4 stock; the intermediate rail shall be of at least 1 x 6 stock.

- For pipe railings, posts and top and intermediate railings shall be at least 1-1/2 inches nominal 00 diameter with posts spaced not more than 8 feet on centers.

- For structural steel railings, posts and top and intermediate rails shall be of 2-inch x 2-inch by 3/8 inch angles or other metal shapes of equivalent bending strength, with posts spaced not more than 8 feet on centers.

- For wire rope railings, the top and intermediate railings shall be at least 1/2 inch cable, or the equivalent with downward deflection of no more than three (3) inches. Posts shall be spaced not more than 8 feet on centers.

- The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail, with a minimum of deflection.

- Railings receiving heavy stresses from employees or material handling shall be provided additional strength by the use of heavier stock, closer spacing of posts, bracing, or by other means.

Other types, sizes, and arrangements of railing construction are acceptable, provided they meet the following conditions:

- A smooth surfaced top rail at a height between 39 inches and 45 inches above floor, platform, runway, or ramp level.

- Strength to withstand at least the minimum requirement of 200 pounds top rail pressure with a minimum of deflection.

- Protection between top rail and floor, platform, runway, ramp, or stair treads equivalent at least to that afforded by a standard intermediate rail.

- Elimination of overhanging rail ends unless such overhang does not constitute a hazard.

A standard toe board shall be 4 inches minimum in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place, with not more than 1/4 inch clearance above floor level, It may be made of any substantial material, either solid or with openings not over 1 inch in greatest dimension.

2.12 STEEL ERECTION

Scope

This section defines minimal safety requirements for personnel engaged in the construction, alteration, and/or repair of single and multi-story building, bridges, and other structures where steel erection occurs.

Purpose

The purpose of this section is to provide guidance to assure all measures are taken to protect personnel from the hazards associated with steel erection activities. The program is also intended to assure that steel erection activities do not create overhead hazards that may expose personnel to injuries, and equipment to property damage.

Reference

29 CFR 1926 Subparts R, J, & M, as well as Sections 2.8 Fall Protection of this manual.

Definitions

- Anchored Bridging — Steel joist bridging is connected to a bridging terminus point.
- Bolted Diagonal Bridging — Diagonal bridging bolted to a steel joist or joists.
- Bridging Clip — A device attached to the steel joist to allow bolting of the bridging to the steel joist.
- Bridging Terminus Point—A wall, a beam. Tandem joists (with all bridging installed and a horizontal truss in the plane of the top chord) or other element at an end or intermediate point(s) of a line of bridging which provides and anchor point for the steel joist bridging.
- Choker — A wire rope or synthetic fiber rigging assembly, which is used to attach a load to a hoisting device.
- Cold Forming — The process of using press brakes, rolls, or other methods to shape steel into desired cross sections at room temperature.
- Column — A load-carrying vertical member, which is part of the primary skeletal It framing system. Columns do not include posts.

- Competent Person — One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to persons, and who has the authority to take prompt measures to eliminate them.

- Connector — Construction personnel who, working with hoisting equipment, is placing and connecting structural members and/or components.

- Constructability — The ability to erect structural steel members in accordance with the Steel Erection standards without having to alter the over-all structural design.

- Construction Load — Any load other than the weight of the worker(s), the joists and the bridging bundle.

- Controlled Decking Zone (CDZ) — Any area where leading edge work such as decking takes place and controlled access is required.

- Controlled Load Lowering — Lowering a load by means of a mechanical hoist drum device, allowing a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist drive motor, rather than the load hoist brake, to lower the load.

- Controlling Contractor — A prime contractor or general contractor, which has the overall responsibility for the construction of the project (its planning, quality and completion).

- Critical Lift — A lift exceeding 75 percent of the rated capacity of the crane OR requires the use of more than one crane or derrick.

- Decking Hole — A gap or void more than 2 inches (5.1 cm) in its least dimension and less than 12 inches (30.5 cm) in its greatest dimension in a floor, roof, or other walking/working surface. Pr-engineered holes in cellular decking (for wires, cables, etc.) are not included in this definition.

- Derrick Floor — An elevated floor of a building or structure designated to receive hoisted pieces of steel prior to final placement.

- Double Connection — An attachment method where the connection point is intended for two pieces of steel, which share common, bolts on either side of a central piece.

- Double Connection Seat — A structural attachment, which, during the installation of a double connection, supports the first member while the second member is connected.

- Erection Bridging — The bolted diagonal bridging required to be installed prior to releasing the hoisting cables from the steel joists.

- Fall Protection Work Plan - A Written Document in which the employer identifies all areas on the Job site where a fall hazard of 10 feet or greater exists. The plan describes the method or methods of fall protection to be utilized to protect employees, and includes procedures governing the installation use, inspection, and removal of the fall protection method or methods, which are selected by the employer.

- Fall Restraint System — A fall protection system preventing the user from falling any distance.

- Final Interior Perimeter — The perimeter of a large permanent open space within a building, such as an atrium or courtyard. This does not include openings for stairways, elevator shafts, etc.

- Girt — A “Z” or “C” shaped member formed from sheet steel spanning between primary framing and supporting wall material.

- Headache Ball — A hook used to attach loads to the hoist load line of the crane.

- Hoisting Equipment — Commercially manufactured lifting equipment designed to lift and position a load of known weight to a location at some known elevation and horizontal distance from the equipments center of rotation. A “come-a-long”, which is used to facilitate movement of materials through leverage, is not considered hoisting equipment.

- Leading Edge — The unprotected side and edge of a floor, roof, or formwork for a floor or other walking/working surface (such as a deck), which changes location as additional floor, roof, decking, or formwork sections are placed, formed or constructed.

- Metal Decking — Commercially manufactured, structural grade, cold rolled metal panel formed into a series of parallel ribs; this includes metal floor and roof decks, standing seam metal roofs, other metal roof systems and other products such as checker plate, expanded metal panels and similar products.

- Multiple Lift Rigging (Christmas Tree Rigging) — A rigging assembly manufactured by wire rope rigging suppliers facilitating the attachment of up to five independent loads to the hoist rigging of a crane.

- Opening — A gap or void 12 inches (30.5 cm) or more in its least dimension in a floor, roof or other walking/working surface. For the purposes of this policy, skylights and smoke domes not meeting the strength requirements of a floor or roof cover shall be regarded as openings.

- Permanent Floor — A structurally complete floor at any level or elevation.

- Personal Fall Arrest System — A system used to arrest a worker in a fall from a walking/working level. The system consists of an anchorage, connectors, and a body harness and may include a lanyard, deceleration device, lifeline, or suitable combination.

- Positioning Device — A body harness rigged to allow a worker to be supported on a elevated, vertical surface, such as a wall or column and work with both hands free while leaning.

- Post — A structural member with an essentially longitudinal axis, which weighs 300 pounds or less and is axially loaded, OR is not axially loaded, but is laterally restrained by the above member.

- Project Structural Engineer of Record — The registered, licensed professional responsible for the design of structural steel framing and whose seal appears on the structural contract documents.

- Purlin — A “Z” or “C” shaped member formed from sheet steel spanning between primary framing and supporting roof material.

- Qualified Person — One who by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject mater, the work, or the project.

- Safety Deck Attachment — An initial attachment used to secure an initially placed sheet of decking to keep proper alignment and bearing with structural support members.

- Shear Connector — Headed steel studs, steel bars, steel lugs, and similar devices, which are connected to a structural member for the purpose of achieving composite action with concrete.

- Steel Erection — The construction, alteration, or repair of steel buildings, bridges and other structures including the installation of metal decking and all planking used during the process. This includes layout, rigging, hoisting, placing, connecting, burning, welding, guying, bracing, bolting, plumbing of structural steel, steel joists, metal buildings, installing metal decking, curtain walls, window walls, siding, ornamental iron and similar materials, and moving point-to-point while performing these activities.

- Steel Joist — Open web, secondary load-carrying member of 144 ft (43.9 m) or less used for support of floors and roofs.

- Steel Joist Girder — Open web, primary load-carrying member used for the support of floors and roofs.

- Steel Truss — Open web member designed by the project engineer of record.

- Structural Steel — A steel member, or a member made of equivalent substitute material. These members include, but is not limited to, steel joists, joist girders, purlins, columns, beams, trusses, splices, seats, metal decking, girts, all bridging, and cold formed metal framing integrated with the structural steel framing of the building.

- Tank — A container for holding gases, liquids or solids.

- Unprotected Sides and Edges — Any side or edge, except at entrances to points of access, of a walking/working surface, for example a floor, roof, ramp or runway, where there is no wall at least 39 in. (1.0 m) high or guardrail system.

Site Layout, Site-specific Erection Plan and Construction Sequence

Prior to authorizing steel erection activities, the Steel Erection Subcontractor is provided with the following written notifications:

- A copy of the Steel Erection Procedures found in the Port of Lake Charles Safety & Health Manual.

- Verification of concrete strength for footer, piers and walls.

- Adequate access into and through the site for the safe delivery and movement of necessary equipment and materials to be erected shall be provided and maintained.

- Safe means and methods for pedestrian and vehicular control shall be determined.

- Provide a firm, properly graded, drained area, with adequate space for storage of materials and operations office.

- Approval to begin the steel erection process.

Prior to receiving authorization to begin steel erection, they shall provide the Engineer with the following:

- A signed copy of the Steel Erection Coordination Checklist.

- A Job Safety Analysis (JSA) for the steel erection activity.

- A Site-Specific Erection Plan as referenced in the Steel Erection Safety Standard developed by a qualified person. This plan shall be available at the work site for inspection. These requirements shall meet or exceed the guidelines of 29 CFR 1926 and shall include: pre-planning, hoisting, rigging, fall protection, and erection sequence.

- A written Fall Protection Work Plan as defined in the Fall Protection section of this manual.

- The names and designated responsibilities of the steel erector's competent person(s), qualified rigging personnel and crane operator.

- Verification of the make, model and year of the crane to be utilized for hoisting, a copy of the current annual certification of inspection, document proof of controlled lowering device, and manufactures recommendations concerning multiple lift rigging.

- Copies of training records in reference to Fall Protection, Multiple Lifts, and Connecting Procedures as found in part G of this section.

General Safety Requirements

- Face shields and eye protection shall be worn at all times during operations such as reaming, drilling, welding and cutting. Eye protection shall be worn for driving wedges, shims, or pins.

- Employees shall wear hard hats. Only "connectors" when actually connecting or "welders" when actually welding will be allowed to reverse their hard hats.

- Containers shall be provided for storing or carrying bolts, drift pins, and other loose objects. Containers shall be secured against accidental displacement when used aloft.

- Employees shall be provided with and required to use safety harnesses and lifelines when working from floats, needle beam scaffolds, and single- and two-point suspension scaffolds.

- When welding or burning is performed from floats or other suspended work platforms, wire rope or cable shall be used for suspension. Protect the suspension from possible arcing by covering with non-conductive material.

- Procedures for hot work, fire watch, cutting and welding as well as the storage and use of compressed gas cylinders shall be followed.

Fall Protection

- General Requirements - Each person engaged in a steel erection activity that is on a walking/working surface with an unprotected side or edge more than 4 feet above a lower level shall be protected from fall hazards by guardrail systems, safety net systems, personal fall arrest systems or fall restraint systems.

- Open web steel joists and girders - Shall not be used as an anchorage point for a fall arrest system without written approval obtained from a qualified person.

- Perimeter safety cables - On multi-story structures, perimeter safety cables shall be installed at the interior and exterior perimeters of the floors as soon as the metal decking has been installed.

Connectors

- Each connector shall have completed connector training in accordance with OSHA 1926 Subpart R and at heights over 6 feet above a lower level, shall be protected with a personal fall arrest system or fall restraint system.

Decking Operations

- The use of a Warning Line System as prescribed in 29 CFR 1926 Subpart M; and supplemented by the use of a Safety Monitor System as prescribed in Subpart M to protect workers engaged in duties between the forward edge of the warning line and the unprotected sides and edges, including the leading edge, of a low pitched roof or walking/working surface is prohibited! In order for the Warning Line and Safety Monitor System to be used, the Contractor must first demonstrate, in writing, to the Engineer, that the use of a fall arrest or restraint system is not feasible.

- Warning Line and Safety Monitor Systems as described above are prohibited on surfaces exceeding a 4 in 12 pitch, and on any surface whose dimensions are less than 45 inches in all directions

- 100% Fall Protection Policy of 6 (six) feet or greater.

Controlled Access Zone

- When leading edge work such as decking is being performed, a Controlled Access Zone shall be established to safe guard other employees working in the area. Any individuals entering into this Controlled Access Zone must comply with the 100% Fall Protection Policy!

Custody of Fall Protection

Fall protection provided by the steel erector shall remain in the area where steel erection activity has been completed, to be used by other trades.

The controlling Contractor shall:

- Direct the steel erector to leave the fall protection in place.
- Inspect and accept control and responsibility of the fall protection prior to authorizing persons other than steel erectors to work in the area.
- Provide written documentation regarding this issue.

Training

Training required by this section shall only be provided by a qualified person(s).

Fall Protection Training

A training program shall be provided for all personnel exposed to fall hazards.

The program shall include training and instruction in the following areas:

- The recognition and identification of fall hazards in the work area.
- The use and operation of guardrail systems (including perimeter safety cable systems), personal fall arrest systems, positioning device systems, fall restraint systems, safety net systems, and other protection to be used.
- The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used.
- The procedures to be followed to prevent falls to lower levels and through or into holes and openings in walking/working surfaces and walls.

- ❖ The procedures for the prompt, safe removal of injured workers or those suspended as a result of a fall.

- ❖ The fall protection requirements of this manual.

Special Training Programs – the Safety Officer or Contractor shall ensure workers have been provided training in:

- ❖ Multiple Lifts - The nature of the hazards associated with and the proper procedures for multiple lifts, and the equipment to perform the work.

- ❖ Connector Procedures - The hazards associated with connector procedures; the establishment, access, proper connecting techniques, and work practices.

Falling Object Protection

- ❖ Secure all materials, equipment and tools against accidental displacement while not in use.

- ❖ Personnel shall not work, walk or pass below steel erection unless overhead protection is provided.

Footings and Anchors

- ❖ The concrete in the footing, piers and walls, and the mortar in the masonry piers and walls will have attained either 75 percent of the intended minimum compressive design strength or sufficient strength to support the intended loads.

- ❖ Anchor bolts will not be repaired, replaced or “field” modified without the written notification/consent of the Engineer.

- ❖ Any repairs, replacements and modifications to the anchor bolts were conducted in accordance with the proper standards.

Column Anchorage

- ❖ Columns shall be anchored by a minimum of 4 anchor rods/bolts.

- ❖ Anchor rod/bolt assemblies shall resist a minimum eccentric gravity load of 300 lbs. (136.2 kg) located 18 in. (.46 cm) from the extreme outer edge of the column in each direction at the top of the column shaft.

- Columns shall be set on level finished floors, pre-grouted leveling plate, leveling nuts, or shim packs, which are adequate to transfer the construction loads.

- A competent person shall evaluate each column to determine if guying or bracing is needed.

Bolting, Fitting-Up, Drilling and Reaming

Air Tools

- Pneumatic hand tools shall be disconnected from the power source and pressure in hose lines released before any adjustments or repairs to the tools are made.

- Air hose sections shall be tied together with “whip checks” except when quick disconnect couplers are used to join sections.

- Chicago-type connections or couplers shall be pinned.

- Air hoses located on roadways shall be protected to prevent vehicular damage.

Bolting

- When bolts or drift pins are being knocked out, a means shall be provided to keep the bolts or drift pins from falling.

- Bolts, nuts, washers, and pins shall not be thrown. They shall be placed in bolt baskets or other approved containers and raised or lowered by a line. Bolt baskets, buckets or other approved containers will be secured to the steel or lanyards while on “open” steel.

- Impact wrenches shall be provided with a locking device for retaining the socket.

Drilling and Reaming

- Two employees shall operate drilling and reaming machines, unless the handle is firmly secured to resist the torque reaction upon the machine in the event that the drilling or reaming bit should foul.

Hoisting and Rigging

Pre-Shift Visual Inspection of Cranes

- The crane operator shall be responsible for the performance of any activity during crane use. The operator will have the authority to stop work or refuse to handle loads until applicable safety measures have been taken in regard to the safety concern.

- A competent person shall visually inspect cranes prior to each shift.

- In addition to crane systems and equipment, the inspection shall include ground conditions around the hoisting equipment for proper support, including ground settling under and around outriggers, ground water accumulation, or similar conditions.

- The inspection shall be documented, maintained on site, and shall include observation for deficiencies during operation.

- Any deficiencies noted for safety devices, or any deficiency determined to be a hazard, the equipment shall be removed from service until the deficiencies are corrected.

Rigging Inspection

- A qualified rigger shall inspect the rigging prior to each shift and during use. Damaged or defective rigging shall be immediately removed from the project.

Riding the Hook

- The headache ball, hook or load shall not be used to transport personnel.

- The use of a crane or derrick to hoist employees on a suspended work platform is prohibited under normal circumstances. Only when the erection, use, dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevated work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

If determined that the use of a suspended work platform is necessary, a meeting shall be held between the Project Manager, the Safety Representative, the Engineer and a member of the Port of Lake Charles Safety Group. A written plan meeting the crane manufacturer's specifications will be submitted for review. The plan shall at a minimum include the compelling reasons why conventional means and methods are not feasible or create a greater hazard, how the cranes instruments and components function, which

type of positive acting device will prevent contact between the load block or ball and the boom tip and written procedures for suspended work platform use.

For requirements, refer to the Suspended Work Platforms section of this manual.

- Material being hoisted shall be rigged to prevent unintentional displacement.

- Safety latches on hooks shall not be deactivated or made inoperable.

Multiple Lift Rigging (Christmas Treeing).

- A multiple lift shall only be performed when the following are met:

  - The crane manufacturer's specifications and imitations permits the use of the crane for a multiple lift.

  - A multiple lift rigging assembly is used.

  - A maximum of five members hoisted per lift.

  - Only beams and similar structural members are lifted.

  - All personnel engaged in the multiple lifts are trained in accordance with applicable standards.

- The load capacities for the total multiple lift rigging assembly and for each individual attachment, point shall not be exceeded. The capacity shall be based upon the manufacturer's specifications with a 5:1 safety factor for all components.

- The total load shall not exceed the hoisting equipment capacity specified in the equipment load charts or the rigging capacity specified in the rigging-rating chart.

- The multiple lift assembly shall be rigged with members attached at their center of gravity, rigged from the top down and rigged at least 7ft. apart.

- The members of the lift shall be set from the bottom up.

- Controlled load lowering shall be used whenever the load is over the connectors.

Working Under Loads

- Only those personnel directly involved with the initial connection, or the hooking/unhooking of suspended loads will be permitted under the loads.

Critical Lift Plan

- Proof of compliance with the Suspended Work Platform Procedures, Cranes & Rigging section) will be required when the load is 75% or greater of the cranes capacity, or multiple cranes are used.

Structural Steel Assembly

- Structural stability shall be maintained at all times.

- Permanent floors shall be installed as the erection of steel progresses. There shall be no more than eight (8) stories between the erection floor and the uppermost permanent floor.

- There shall be no more than four (4) floors or 48ft (14.6m), whichever is less, of unfinished bolting or welding above the foundation or uppermost permanent floor.

Walking Working Surfaces

- Shear connectors, reinforcing bars, deformed anchors or threaded studs shall not project vertically from or horizontally across the top flange of a steel member until after the metal decking, or other walking/working surface has been installed.

- Shear connectors used in the construction of composite floors, roofs and bridge decks shall be laid out and installed after the metal decking has been installed and while using the metal decking as a working platform.

Slip Resistance of Metal Decking

- After July 18, 2006, personnel shall not be permitted to walk the surface of any structural steel member coated with paint or similar material unless minimum slip resistance is determined in accordance with 20 CFR 1926 Subpart M.

Plumbing-Up Equipment.

- All plumbing-up equipment, when used, shall be installed in conjunction with steel erection, in place and properly installed before the structure is loaded with construction material, and removed only with the approval of a competent person.

- Connections for the rigging equipment used for plumbing-up shall be safely secured.

- A restraint device shall be used when the turnbuckle is under load stress during plumbing.

- Guys for plumbing-up and related equipment shall be placed so that employees can reach the connection points.

- Guys shall be removed only under the supervision of a competent person.

Metal Decking

- Bundle packaging or strapping shall not be used for hoisting, landing and placing of metal decks unless specifically designed for that purpose.

- Secure loose items placed on top of metal deck bundles to be hoisted to prevent dislodging.

Roof and Floor Holes and Openings

- Structural members shall be turned down to allow continuous deck installation.

- Metal deck openings and holes shall not be cut until immediately prior to installing the equipment or structure intended for each location. Openings and holes, which cannot be immediately filled, shall be covered in accordance with 29 CFR 1926 Subpart M.

- Roof and floor holes and openings shall be immediately decked over. Install standard guardrail systems and toe boards when size, configuration or structural design does not allow deck installation.

- Covers for openings and holes shall be capable of:

  - Withstanding two (2) times the weight of personnel, equipment and materials imposed upon the cover at any one time.

  - Be affixed to prevent displacement.

  - Labeled “Danger — Opening” or “Danger — Hole” with letters at least 4 inches high.

  - Smoke dome or skylight fixtures shall not be considered acceptable covers unless they meet the strength requirements of 29 CFR 1926 Subpart M.

- Decking gaps around columns shall be covered with wire mesh, exterior plywood, or equivalent, where planks or metal decking do not fit tightly.

- Metal decking shall be laid tightly and immediately secured upon placement. Initial placement of decking panels shall ensure full support by structural members.

- Derrick floors shall be fully decked and/or planked and the steel member connections completed. Distribute Temporary loads over the underlying support members to prevent overloading of the deck material.

Beams and Columns

- The load shall not be released from the hoist line during placement of solid web structural members until the members are secured with at least two (2) bolts per connection, of the same size and strength shown in the erection drawings, drawn-up wrench tight.

- To ensure the stability of cantilevered members, a competent person shall determine if more than two (2) bolts per connection are necessary.

- Diagonal bracing shall be secured by at least one (1) bolt per connection, drawn up wrench tight.

- Double connections on opposite sides of column webs, or a beam web over a column, shall have at least one bolt with its wrench-tight nut remain connected to the first member unless:

    - A shop-attached or field-attached seat or equivalent connection device is used.

- If a seat or equivalent device is used it shall:

    - Be designed to support the load during the double connecting process.

    - Be bolted or welded to both a supporting member and the first connecting member before the nuts on the shared bolts are removed.

Perimeter columns shall be erected so:

- The columns extend at least 48 inches (1.2 m) above the finished floor to permit perimeter safety cable installation.

- The columns have holes or other devices in or attached to the columns at 42 — 45 in. (107 — 114 cm) above the finished floor and at the midpoint between the floor and the top cable.

Open Web Steel Joists

Where steel joists are used and columns are not framed in at least two directions with structural members, a steel joist shall be field-bolted at the column to provide lateral stability during erection.

The contractor shall:

- Provide a vertical stabilizer plate, at least 6” x 6”, on each column for steel joists, extending at least 3” below the bottom cord of the joist for attachment of guying or plumbing cables.

- Stabilize the bottom cords of steel joists at each column to prevent rotation while erecting.

- Shall not release the hoisting cable until the seat at each end is field-bolted, and the stabilizer plate restrains each end of the bottom cord.

- When Constructability does not does not allow a steel joist to be installed at the column.

- Stability shall be provided, designed by a qualified person, be shop installed, and be included in erection drawings.

- Hoisting cables shall not be released until the seat at each end of the joist is field-bolted and the joist is stabilized.

- Design steel joists at or near columns spanning 60ft(18.3 m) or less with sufficient strength to allow one person to release the hoisting cable without the need for erection bridging.

- Steel joists spanning more than 60ft (18.3 m) shall be set in tandem with all bridging installed unless a qualified person determines an alternative method providing equivalent stability and the method is included in the site-specific erection plan.

- Do not place steel joists and girders on a support structure until it has been stabilized.

- Secure steel joists landed on a structure prior to installation, to prevent unintentional displacement.

- Make no modification to a steel joist or girder, which would affect its strength, without the approval of the project structural engineer of record.

- Connections of individual steel joists to structures in bays of 40 ft (12.2 m) or more shall be fabricated to allow for field bolting unless the joists have been pre-assembled into panels.

- Steel joists and girders shall not be used as an anchorage point for a fall arrest system without written approval obtained from a qualified person.

- A bridging terminus point shall be established before bridging is installed.

- Attachment of Steel Joists and Steel Joist Girders. Each end of “K” series steel joists shall be attached to the support structure with a minimum of two 1/8-inch (3mm) fillet welds 1 in. (25mm) long or with two 1/2 inch (13mm) bolts, or equivalent.

- Attach each end of “LH” and “DLH” series steel joists and girders to the support structure with a minimum of two 1/4 inch (6mm) fillet weld 2 in. (51mm) long, or with two 3/4 inch (19mm) bolts, or equivalent.

- Steel joists shall be attached to the support structure with at least one end on both sides of the seat, immediately upon placement and before additional joists are set.

- Pre-assembled steel joist panels with bridging shall be attached to the structure at each corner before releasing the hoisting cable.

- Steel Joist Erection. Joists over 60ft. shall be attached at both ends as specified in paragraph 13 and the provisions of paragraph 15 of this section shall be met before releasing the hoisting cables.

- Only one person shall be allowed on steel joists not requiring erection bridging under Tables A and B until all bridging is installed and anchored.

- Personnel shall not be allowed on steel joists where the span of the joist is greater than shown in Tables A and B.

- When permanent bridging terminus points cannot be used during erection, additional temporary bridging terminus points shall be required to provide stability.

Table A- Erection bridging for Short Span Joists

Joist	Span	Joist	Span	Joist	Span
8L1	NM	20K10	NM	30K7	44-0
10K1	NM	22K4	34-0	20K8	45-0
12K1	23-0	22K5	35-0	30K9	45-0
12K3	NM	22K6	36-0	30K10	50-0
12K5	NM	22K7	40-0	30K11	52-0
14K1	27-0	22K9	40-0	30K12	54-0
14K3	NM	22K10	40-0	10KCS1	NM
14K4	NM	22K11	40-0	10KCS2	NM
14K6	NM	24K4	36-0	10KCS3	NM
16K2	29-0	24K5	38-0	12KCS1	NM
16K3	30-0	24K6	39-0	12KCS2	NM
16K4	32-0	24K7	43-0	12KCS3	NM
16K5	32-0	24K8	43-0	14KCS1	NM
16K6	NM	24K9	44-0	14KCS2	NM
16K7	NM	24K10	NM	14KCS3	NM
16K9	NM	24K12	NM	16KCS2	NM
18K3	31-0	26K5	38-0	16KCS3	NM
18K4	32-0	26K6	39-0	16KCS4	NM
18K5	33-0	26K7	43-0	16KCS5	NM
18K6	35-0	26K8	44-0	18KCS2	35-0
18K7	NM	26K9	45-0	18KCS3	NM
18K9	NM	26K10	49-0	18KCS4	NM
18K10	NM	26K12	NM	18KCS5	NM
20K3	32-0	28K6	40-0	20KCS2	36-0
20K4	34-0	28K7	43-0	20KCS3	39-0
20K5	34-0	28K8	44-0	20KCS4	NM
20K6	36-0	28K9	45-0	20KCS5	NM
20K7	39-0	28K10	49-0	22KCS2	36-0
20K9	39-0	28K12	53-0	22KCS3	40-0
22KCS4	NM	26KCS2	39-0	28KCS4	53-0
22KCS5	NM	26KCS3	44-0	28KCS5	53-0
24KCS2	39-0	26KCS4	NM	30KCS3	45-0
24KCS3	44-0	26KCS5	NM	30KCS4	54-0
24KCS4	NM	28KCS2	40-0	20KCS5	54-0
24KCS5	NM	28KCS3	45-0		

NOTE: NM diagonal bolted bridging not mandatory for joists less than 40 feet.

Table B – Erection bridging for Long Span Joists

Joist	Span	Joist	Span
18LH02	33-0	28LH06	46-0
18LH03	NM	28LH07	NM
18LH04	NM	28LH08	NM
18LH05	NM	28LH09	NM
18LH06	NM	32LH09	NM – 60-0
18LH07	NM	32LH10	NM – 60-0
20LH07	NM	32LH11	NM – 60-0
20LH08	NM	32LH12	NM – 60-0
20LH09	NM	32LH13	NM – 60-0
20LH10	NM	32LH14	NM – 60-0
24LH03	35-0	32LH15	NM – 60-0
24LH04	39-0	36LH07	47-0 – 60-0
24LH05	40-0	36LH08	47-0 – 60-0
24LH06	45-0	36LH09	57-0 – 60-0
24LH07	NM	36LH10	NM – 60-0
24LH08	NM	36LH11	NM – 60-0
24LH09	NM	36LH12	NM – 60-0
24LH10	NM	36LH13	NM – 60-0
24LH11	NM	36LH14	NM – 60-0
28LH05	42-0		

NOTE: NM diagonal bridging not mandatory for joists less than 40 feet.

Erection Bridging

Where the span of the steel joist is equal to or greater than shown in Tables A and B.

- A row of bolted diagonal erection bridging shall be installed near the mid span of the steel joist.
- Hoisting cables shall not be released under the diagonal erection bridging is installed and anchored.
- Only one person shall be on the span until all other bridging is installed and anchored.

Steel joists spanning 60 ft. (18.3M) to 100ff. (30.5m) shall require:

- All bridging rows shall be bolted diagonal bridging.
- Two rows of bolted diagonal bridging be installed ate each of the one-third points of the span.
- Hoisting cables remain connected and be released only after this bridging is installed and anchored.
- Only two personnel shall be allowed on these spans until all other bridging is installed and anchored.
- Steel joints spanning more than 100 feet (30.5 m) through 144 ft. (43.9 m), the following shall apply.
- All rows of bridging shall be bolted diagonal bridging.
- Hoisting cables shall not be released until all bridging is installed and anchored.
- Only two personnel shall be allowed on these spans until all bridging is installed and anchored.
- Steel members spanning more than 144 ft. (43.9 m), shall be erected in accordance with OSHA 29 CFR 1926, Subpart R, and “Steel Erection.”
- Any steel joist, which is a bottom chord bearing joist, shall have bolted diagonal bridging installed and anchored near the support(s) before the hoist cable(s) is released.

When bolted diagonal bridging is required:

- The bridging shall be indicated on the erection drawing.
- The erection drawing shall be the exclusive indicator of the proper placement.
- Shop-installed bridging clips or equivalents shall be used where the bridging bolts to the steel joist.
- When attaching two or more pieces of bridging by a common bolt, the nut screwing the first piece of bridging shall not be removed from the bolt for the attachment of the second.
- Bridging attachments shall not protrude above the top chord of the steel joist.

Landing and Placing Loads

- Loads placed on steel joists shall be distributed so as not to exceed the carrying capacity of any steel joist.
- No loads are allowed on steel joists until all bridging is installed and anchored, and all joist-bearing ends are attached.
- A bundle of joist bridging shall not exceed 1,000 lbs. (454 kg) total weight. The bundle shall be placed on at lest three joists, each secured at one end, and positioned within 1 ft. (.30 m) of the secured end.
- Bundles of decking shall not be placed on steel joists until all bridging has been installed and all joist bearing ends attached, except where the decking bundle is placed on a minimum of three steel joists:
  - The joists supporting the decking bundle are attached at both ends.
  - At least one row of bridging is installed and anchored.
  - The total weight of the bundle shall not exceed 4,000 lbs. (1818 kg).
  - Placement of the bundle shall be within 1 ft. (.30 m) of the bearing surface of the joint end.
- The edge of the construction load shall be placed within 1 ft. (.30 m) of the bearing surface of the joint end.

Systems-Engineered Metal Buildings

- Each structural column shall be anchored by a minimum of four anchor rods (anchor bolts).

- Rigid frames shall have 50 percent of their bolts or the number of bolts specified by the manufacturer (whichever is greater) installed and tightened on both sides of the web adjacent to each flange before the hoisting equipment is released.

- Construction loads shall not be placed on any structural steel framework unless such framework is safely bolted, welded or otherwise adequately secured.

- In girt and eave strut-to-frame connections, when girts or eave struts share common connection holes, at least one bolt with its wrench-tight nut shall remain connected to the first member unless a manufacturer-supplied, field-attached seat or similar connection device is present to secure the first member so that the girt or eave strut is always secured against displacement.

- Both ends of all steel joists or cold-formed joists shall be fully bolted and/or welded to the support structure before:

  - Releasing the hoisting cables.
  - Allowing workers on the joists.
  - Allowing any construction loads on the joists.

- Purlins and girts shall not be used as an anchorage point for a fall arrest system unless written approval is obtained from a qualified person.

- Purlins may only be used as a walking/working surface when installing safety systems, after all permanent bridging has been installed and fall protection is provided.

- Construction loads may only be placed in a zone located within 8 feet of the centerline of the primary support member.

STEEL ERECTION COORDINATION CHECKLIST

Project Name		Contract No.	
Date		Contractor	

GENERAL REQUIREMENTS		
1.	The steel erector has been provided a copy of the Job Safety Analysis requirements to the project.	☐ YES ☐ NO
2.	The steel erector has been provided a copy of the Fall Protection requirements for the project.	☐ YES ☐ NO
3.	The steel erector has been provided a copy of the Steel Erection Safety Procedures (Section 2.12) for the project.	☐ YES ☐ NO
4.	Concrete or mortar in footings piers and/or walls has obtained either. a. 75% of intended minimum compressive design strength. b. Sufficient strength to support loads imposed during steel erection activities.	☐ YES ☐ NO
5.	Test results (ASTM Standard) for Item 4 have been provided to the steel erector.	☐ YES ☐ NO
6.	Anchor bolt modification or field repairs. a. Field modifications or repairs to anchor bolts have not been preformed. b. Anchor bolts modifications have been performed. c. All modifications to anchor bolts have been made with the acceptance of the Engineer.	☐ YES ☐ NO
7.	Access to the site for all applicable equipment, and supplies have been established and will be maintained.	☐ YES ☐ NO
8.	Vehicle and pedestrian traffic through the steel erection activity will be restricted erection activities.	☐ YES ☐ NO
9.	Firm, graded, drained, area (s) have been provided for steel.	☐ YES ☐ NO
10.	Site access below the steel erection activities will be limited to those of the steel erectors personnel only.	☐ YES ☐ NO
11.	Through a documented process, the Contractor will accept responsibility of the perimeter safety cable system installed by the steel erector after the steel erector has finished their work.	☐ YES ☐ NO
12.	The steel erector has been provided with written authorization to begin the steel erection process.	☐ YES ☐ NO

STEEL ERECTOR REQUIREMENTS

1.	The erector has submitted a copy of their Job Safety Analysis.	☐ YES ☐ NO
2.	The erector has submitted a written Fall Protection Work Plan.	☐ YES ☐ NO
3.	The erector has submitted a copy their Site-Specific Erection Plan.	☐ YES ☐ NO
4.	The erector has submitted the names and designated responsibilities of their competent persons(s), qualified rigging personnel, and crane operator.	☐ YES ☐ NO
5.	Annual safety certification of their hoisting equipment, proof of controlled lowering device and manufactures recommendations concerning multiple lift rigging	☐ YES ☐ NO
6.	Copies of training records in reference to Fall Protection, Connecting Procedures, and Multiple Lifts as found in this section.	☐ YES ☐ NO

General Contractors Project Manager	
Steel Erector's Project Manager	

2.13 CRANES AND RIGGING

Scope

This section defines the minimum safety procedures for tower and mobile cranes, as well as boom trucks or any hoisting devices working on Port of Lake Charles projects.

Purpose

To prevent injury or property damage to facilities or equipment from unsafe or unqualified operation of lifting equipment.

Reference

ANSI A10.28 — 1983, ANSI B30.5 — 1984, OSHA 29 CFR 1926, Subpart N.

Definitions

- Competent Person - A person who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, who has the authorization to take prompt corrective measures to eliminate them, and is knowledgeable of OSHA industry requirements for cranes and rigging.

- Critical Pick — Any lift exceeding 75% of the cranes rated capacity (depending on manufacturer's specifications), any lift involving more than one crane, or any lift involving unusual or severe circumstances.

- Hoist (or hoisting) - All crane or derrick functions, such as lowering, lifting, swinging, booming in and out or up and down, or suspending personnel platform.

- Rated Capacity — The maximum live load that an object has been designated to carry.

General Requirements

- All cranes working on Port of Lake Charles projects shall have a copy of the yearly certification report provided to the Engineer prior to work beginning.

- The operator is responsible for items being hoisted and shall consider factors such as; excessive weight, shape or size, rigging, and weather or ground conditions, before hoisting.

- Comply with all manufacturers' specifications and limitations applicable to the operation of any crane or derrick.

- A capacity chart shall be posted in the operators cab or remote control stand.

- Designate a Competent Person who shall perform a daily inspection of the crane. Any deficiencies shall be corrected before use continues.

- Daily inspections shall be documented in writing and kept in the cab of the crane.

- No crane or other equipment shall be operated within 10 ft of energized electrical transmission, distribution or power lines. A person shall be designated to observe clearance and provide warnings when working in such situations.

- All cab glass shall be safety glass and distortion free.

- A "Critical Pick" is defined as any lift exceeding 75% of the crane's rated capacity (this may vary depending on the manufacturer's specifications), any lift involving more than one crane, or any lift involving unusual or severe circumstances. The Safety Manager and/or Project Manager shall submit a written plan to the Engineer for review, prior to such work beginning.

- The use of a crane or derrick to hoist employees on a suspended work platform is prohibited under normal circumstances. Only when the erection, use, dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevated work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

- If it determined that the use of a suspended work platform is necessary, a meeting shall be held between the Project Manager, the Safety Representative, the Engineer and a member of the Port of Lake Charles Safety Group. A written plan meeting the crane manufacturer's specifications will be submitted for review. The plan shall include the compelling reasons why conventional means and methods are not feasible or create a greater hazard, and how the cranes instruments and components function, and which type of positive acting device will prevent contact between the load block or ball and the boom tip. For requirements, refer to Suspended Work Platforms section of this manual.

- Accessible areas within the swing radius of all cranes shall be barricaded to prevent employees from being struck by the counter weight.

- A fire extinguisher rated at least 5 BC shall be located in the cab of the crane.
- Loads shall not be hoisted or suspended over personnel or live traffic areas.
- Loads shall not be suspended from an unattended crane.
- Workers shall not be allowed to ride on loads.
- Any cranes left on docks or near the water, at night shall have their boom lowered or be equipped with warning systems.
- Cranes will not be manned nor operated when wind speeds are at or above 35 miles per hour or when lightning is observed within ten miles.

Rigging

- A Competent Person shall perform all rigging.
- An illustration of hand signals shall be posted on site.
- An illustration of hand signals shall be posted on site.
- Rigging shall be inspected prior to each use for wear or damage. Worn or damaged rigging shall be removed from service immediately.
- Safety latches on all crane hooks and rigging, shall be in good working order.
- When chain rigging is used for hoisting, the manufacturer's data tag must be attached.
- Loads must be guided and prevented from swinging by the use of a tagline for control.

Floating Cranes and Derricks

Mobile cranes mounted on barges

- When a mobile crane is mounted on a barge, the rated load of the crane shall not exceed the original capacity specified by the manufacturer.
- A load rating chart, with clearly legible letters and figures, shall be provided with each crane, and securely fixed at a location easily visible to the operator.

- When load ratings are reduced to stay within the limits for list of the barge with a crane mounted on it, a new load rating chart shall be provided.

- Mobile cranes on barges shall be positively secured.

Permanently Mounted Floating Cranes and Derricks

- When cranes and derricks are permanently installed on a barge, the capacity and limitations of use shall be based on competent design criteria.

- A load rating chart with clearly legible letters and figures shall be provided and securely fixed at a location easily visible to the operator.

- Floating cranes and floating derricks in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, and operation as prescribed by the manufacturer.

Protection of employees working on barges. Work shall comply with the applicable requirements for protection of employees as specified in OSHA 29 CFR 1926.

2.14 SUSPENDED WORK PLATFORMS

Scope

This section defines the minimum safety requirements for the use of Suspended Work Platforms used to lift personnel in combination with tower and mobile cranes on Port of Lake Charles projects.

Purpose

To prevent injury to personnel and ensure that the proper procedures are being followed while this work is performed.

Reference

ANSI 30.5, 29 CFR Subpart N, OSHA 29 CFR 1926, and the Cranes & Rigging section of this manual.

Definitions

- Controlled Load Lowering - A system or device on the power train, other than the load hoist brake, which regulates the rate of speed of the hoist mechanism during lowering.

- Live Boom - A boom in which lowering is controlled by brake without aid from other lowering retarding devices.

- Qualified Engineer - One who has a current engineering registration certificate and has successfully demonstrated the ability to design mechanical or structural objects.

- Competent/Qualified Person - One who, by possession of a recognized degree, certificate, or professional standing, or by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or project.

- Failure - Load refusal, breakage, or separation of components.

- Hoist (or hoisting) - All crane or derrick functions, such as lowering, lifting, swinging, booming in and out or up and down, or suspending personnel platform.

- Load Refusal - The point where the ultimate strength is exceeded. Maximum Intended.

- Load - The total load of all employees, tools, materials, and other loads reasonably anticipated to be applied to a personnel platform or personnel platform component at any one time.

- Rated Capacity — The maximum live load that an object has been designated to carry.

- Rotation Resistant Wire Rope - Wire rope consisting of a left lay inner rope covered by regular lay strands laid in the direction opposite to the inner rope.

- Two-Blocking - The condition in which the load block or hook assembly is drawn tight to the boom point.

General

Suspended Work Platform Procedures

The use of a crane or derrick to hoist employees on a personnel suspended work platform is prohibited under normal circumstances. Only when the erection, use, dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevated work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

- If it is determined that the use of a suspended work platform is necessary, a meeting shall be held between the Project Manager, the Safety Representative, the Engineer and a member of the Port Safety Group. A written plan meeting the crane manufacturer's specifications will be submitted for review. The plan shall include at a minimum the compelling reasons why conventional means and methods are not feasible or create a greater hazard, how the cranes instruments and components function, which type of positive acting device will prevent contact between the load block or ball and the boom tip and procedures for using a suspended work platform.

- Documentation such as lift capacity information shall be produced to verify that OSHA 29 CFR 1926.550(g) requirements have been met.

- Manufacturer recommends all lifts shall be made in accordance with the manufacturer's lifting recommendations.

- This operation/lift shall be documented.

Crane Requirements

- The load line on which the platform is suspended shall have controlled load lowering. The free fall option shall not be used with suspended work platforms.

- Load lines shall have a minimum intended load. A safety factor of ten is required when anti-rotation wire rope is used.

- The swing brake and/or locks shall be engaged when the suspended platform is in the working position.

- A positive acting device shall be used which prevents contact between the load or overhaul ball and the boom tip (anti-two-blocking device), or a system that deactivates the hoisting action before damage occurs in the event of a two-blocking situation (two block damage prevention feature).

- The total weight of the loaded suspended platform (with employees in the platform) and related rigging shall not exceed 50 percent of the rated capacity for the radius and configuration of the crane.

- The crane or derrick shall be inspected immediately prior to suspending a work platform. Inspection shall include wire rope, hook brakes, boom, and other mechanical and rigging equipment vital to the safety of the operation. The inspection shall be performed at least once daily when the machine is being used in suspended work platform service.

- Any structural or functional defect, which could adversely affect safe operation of the crane, shall be corrected before operation begins with a suspended work platform.

- Live boom equipment cannot be used to hoist personnel platforms.

- Cranes must be equipped with boom extension indicators and load radius indicators.

- All locking devices, including hoist drum brakes, swing brakes, pawls, and dogs must be engaged when an occupied personnel platform is in a stationary work position.

- All load line hoist drums shall have a system or device, in addition to the load hoist brake, that regulates the lowering rate of the hoist mechanism. Free fall is prohibited.

- Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator readily visible to the operator.

Suspended Work Platform Design and Specifications

Design

- All suspended platforms shall be in accordance with applicable OSHA standards and be designed by a qualified engineer competent in structural design.

- The weight of the empty platform and its rated capacity shall be permanently marked on the platform in a visible location.

- An access gate should be provided. When provided, the access gate shall swing inward and be equipped with a positive latch.

- The platform and rigging shall be inspected daily prior to being used. The rigging for the man-basket will be designated solely for the man-basket.

Crane Specifications

- Each personnel platform shall be provided with perimeter protection from the floor to 42 inches plus or minus 3 inches above the floor, which shall consist of either solid construction or expanded metal having openings no greater than ½ inch.

- A grab-rail shall be provided inside the personnel platform.

- Overhead protection shall be provided on the personnel platform when employees are exposed to falling objects.

- All rough edges exposed to contact by employees occupying the platform shall be ground smooth.

- All welding shall be performed by a welder who is qualified for weld types and material specified in the design.

- Personnel platforms shall be easily identified by color or markings.

Loading and Rigging

Suspended platforms shall be used only for employees, tools, and sufficient materials to do the job. Suspended work platforms shall not be used for transporting bulk materials.

- Materials or equipment on an occupied suspended platform shall be suitably secured and evenly distributed while the platform is being removed.

- The number of employees to be hoisted shall be kept to a minimum. In no case shall the number exceed four.

- Employees using the platform shall be considered as weighing 250 pounds each.

- The platform shall not be used during high winds, electrical storms, snow, or other adverse weather conditions that could endanger employees on the platform.

- An accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel with cranes with telescoping booms.

- The crane shall be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers shall have them all fully deployed following manufacturer's specifications, insofar as applicable, when hoisting employees.

Rigging

- When a wire rope bridle is used to connect the personnel platform to the load line, each bridle leg shall be connected to a master link or shackle in such a manner to ensure that the load is evenly divided among the bridle legs.

- Hooks on overhaul ball assembly, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor-type shackle with a bolt, nut, and retaining pin may be used.

- Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings shall be capable of supporting without failure at least ten times the maximum intended load.

- All eyes in wire rope slings shall be fabricated with thimbles.

- Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for the platform and the necessary employees, their tools and the materials necessary to do their work, and shall not be used for any other purposes when not hoisting personnel.

Personal Protective Equipment

- In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when exposed to falling objects.

- Except over water, employees occupying the personnel platform shall use a body harness system with lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage.

Work Practices

- Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person.

- Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.

- Tag lines shall be used unless their use creates an unsafe condition.

- The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.

- Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions or other impending danger.

- Employees being hoisted shall remain in continuous sight of and in direct communication with the operator or signal person. In those situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for that person, direct communication alone, such as by radio, may be used.

- All crane operators must be qualified and certified.

Trial Lift, Inspection, and Testing

Trial Lift

- A trial lift with unoccupied personnel platform loaded at least to the anticipated lift weight shall be made from ground level, or any other location where employees enter the platform, to each location at which the personnel platform is to be hoisted and positioned. This trial lift shall be performed immediately prior to

placing personnel on the platform. The operator shall determine that all systems, controls, and safety devices are activated and functioning properly; that no interference's exist; and that all configurations necessary to reach those work locations will allow the operator to remain under fifty percent limit of the hoist's rated capacity. Materials and tools to be used during the actual lift may be loaded in the platform. A single trial lift may be performed at one time for all locations that are to be reached from a single set-up position.

- The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift shall be repeated when the lift route is changed unless it is determined that the route change is not significant (i.e., the route change would not affect the safety of hoisted employees).

- After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to ensure that it is secure and properly balanced.

Employees shall not be hoisted unless the following conditions are determined to exist:

- Hoist ropes shall be free of kinks.

- Multiple part lines shall not be twisted around each other.

- The primary attachment shall be centered over the platform.

- The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly stated on drums and in sheaves.

Inspection

- A visual inspection of the crane or derrick, rigging, personnel platform, the crane or derrick base support, or ground shall be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect, or produced any adverse effect upon any component or structure.

- Any defects found that create a safety hazard shall be corrected before hoisting personnel.

Testing

- Prior to hoisting employees on the personnel platform and after repair or modification, the platform and rigging shall be proof tested to 150 percent of the platforms rated capacity. To accomplish this, hold in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done

concurrently with the trial lift). After proof testing, a competent person shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

Pre-Lift Meeting

- A meeting attended by the crane or derrick operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed shall be held to review appropriate lifting procedures.

- This meeting shall be held prior to the trial lift at each new work location and be repeated for any employees newly assigned to the operation.

2.15 PERSONNEL AND MATERIAL HOISTS

Scope

This section applies to operations that employ personnel and material hoists.

Purpose

To establish minimum safety standards for the safe operation and maintenance of hoists.

Reference

29 CFR 1926.552

Definitions

- Qualified Person - One who, by possession of a recognized degree, certificate, or professional standing, or by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or project.
- Failure - Load refusal, breakage, or separation of components.
- Load Refusal - The point where the ultimate strength is exceeded.
- Maximum Intended Load - The total load of all employees, tools, materials, and other loads reasonably anticipated to be applied to a personnel platform or personnel platform component at any one time.
- Rated Capacity - The maximum live load that an object has been designated to carry.

Personnel Hoists

- Personnel hoists shall be provided for access on all structures where vertical travel exceeds sixty feet from a ground level access point.
- Hoist towers outside the structure shall be enclosed for the full height on the side(s) used for entrance and exit to the structure. At the lowest landing, the enclosure on the side(s) not used for exit or entrance shall be enclosed to a

height of at least 10 feet. Other sides of the tower adjacent to floors or scaffold platforms shall be enclosed to a height of 10 feet above the level of such scaffolds.

- Towers inside the structure shall be enclosed on all four sides throughout the full height.

- Towers shall be anchored to the structure at intervals not exceeding 25 feet. In addition to tie-ins, a series of guys shall be installed. Where tie-ins are not practical, the tower shall be anchored by means of guys made of wire rope at least ½ inch in diameter, securely fastened to anchorage to ensure stability.

- Hoist-way doors or gates shall be not less than 6' 6" high and will be provided with mechanical locks that cannot be operated from the landing side and shall be accessible only to persons on the car.

- An emergency stop switch marked "Stop" shall be provided in the car.

- A personnel hoist operator shall be employed who is instructed in safe operating procedures.

- A Qualified Person shall inspect and maintained the hoist.

- A call box or other means to summon the hoist operator shall be installed at each location where work is performed.

- Overhead protective covering of 2-inch planking, 3/4 inch plywood, or other solid material of equivalent strength shall be provided at the top of every personnel hoist.

- Periodically verify that safe conditions, procedures, and inspections are being maintained. Rated load capacities and special hazard warnings or instructions shall be posted on cars and platforms.

- Smoking is prohibited while personnel and equipment are being transported inside personnel hoist.

- A 10-pound ABC-rated fire extinguisher shall be secured inside personnel hoist for use in the event of an emergency.

Inspections

- The certifying authority shall perform safety inspections and maintenance at regular intervals recommended by the manufacturer.

Inspections shall specifically include:

- Condition of wire ropes or tieback.
- Operations of car-arresting device in case of rope failure.
- Operations of emergency STOP switch.
- Operations of all safety controls.
- Copies of all inspections, tests, and maintenance documents shall be kept on file for Port Safety review.

Material Hoists

- Operating rules such as signal system and line speed for various loads shall be posted at the operator station and on the car. A “No Riders Allowed” sign shall be posted on the car and visible at every point of access.

- No persons shall be allowed to ride on material hoists except for the purposes of inspection and maintenance.

- All entrances of the hoist-ways shall be protected by substantial gates or bars that guard the full width of the landing entrance. All hoist-way entrance bars and gates shall be painted with diagonal contrasting colors such as black and yellow stripes. Bars/gates shall be 2 x 4 wood or equivalent located at least two feet from the hoist-way with top between 36 and 42 inches above the floor, and feature a latching device.

- Hoist cage or platform shall have overhead protective covering of 2-inch planking or 3/4 inch plywood.

- All material hoists shall conform to the requirements of ANSI A. 10-5-1969.

- Operator’s station shall have overhead covering of tight planking at least 2 inches thick.

Use of Hoist by Workers

- Workers on the job shall be instructed not to ride the material hoist. No person will be allowed to ride on material hoist except for the purpose of maintenance and inspection.

Inspections

- Safety inspections and maintenance shall be performed by an authorized manufacturer's representative prior to first placing the equipment in service, and at regular intervals recommended by the manufacturer.

- Written inspections shall specifically include the condition of wire ropes.

  - Hoisting ropes that have six randomly broken wires in one rope lay or three broken wires in one strand in rope lay must be removed from use.

  - Operation of car arresting device in case of rope failure.

  - Qualified person shall be designated to make weekly inspections of entrances, enclosures, signage, etc. for compliance.

2.16 AERIAL LIFTS

Scope

This section defines minimal safety requirements to follow while utilizing aerial lifts.

Purpose

This section is intended to point out some of the basic safety situations that may be encountered during the operation and maintenance of aerial lifts.

Reference

29 CFR 1926 Subparts L & V.

Definitions

- Aerial Lift — Any vehicle-mounted device, telescoping or articulating or both, that is used to position workers and/or materials.
- Aerial Ladder — An aerial device consisting of a single- or multiple-section extensible ladder.
- Articulating Boom Platform — An aerial device (except ladders) with a telescopic or extensible boom. Telescopic derricks with personnel platform attachments shall be considered to be extensible boom platforms when used with a personnel platform.
- Electric Line Truck — A truck used to transport people, tools, and material, and to serve as a traveling workshop for electric power line construction and maintenance work. It is sometimes equipped with boom and auxiliary equipment for setting poles, digging holes, and elevating material and/or people.
- Platform — Any personnel-carrying device (basket or bucket) that is a component of an aerial device.
- Scissor Lift — An aerial device designed to elevate a platform in a substantially vertical position.

General

Aerial devices include the following types of vehicle-mounted aerial devices used to elevate personnel and/or material to jobsites above ground:

- Extensible boom platforms;
- Aerial ladders;
- Articulating boom platforms;
- Scissor Lift

- Only trained individuals may operate such equipment and shall maintain all documentation of training.

- Aerial equipment may be made of metal, wood, fiberglass reinforced plastic (FRP), or other material; may be powered or manually operated; and are deemed to be aerial lifts whether or not they are capable of rotating about a substantially vertical axis.

- For operations near overhead electrical lines, aerial equipment shall not get closer than ten feet from energized electrical lines and a lookout shall be posted to ensure the distance is kept.

- The base of lifts shall be delineated to protect those working in the area.

- Aerial lifts used in areas subject to vehicle traffic shall be demarcated around the base.

Ladder and Tower Trucks

- Before a truck is moved for highway travel, aerial ladders shall be secured in the lower traveling position by the locking device above the truck cab, and the manually-operated device at the base of the ladder, or by other equally effective means (i.e., cradles that prevent rotation of the ladder in combination with positive acting linear actuators).

Extensible and Articulating Boom Platforms

- Lift controls shall be tested each day prior to use to determine that such controls are in safe working condition.

- Only trained persons shall operate an aerial lift.

- Belting off to an adjacent pole, structure, or equipment while working from an aerial lift shall not be permitted.

- Employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.

- A Full Body Harness shall be worn and a lanyard attached to the point specified by the lift manufacturer when working from an aerial lift.

- Boom and basket load limits specified by the manufacturer shall not be exceeded.

- The brakes shall be set and outriggers, when used, shall be positioned on pads or a solid surface. Wheel chocks shall be installed before using an aerial lift on an incline.

- An aerial lift truck may not be moved when the boom is elevated in a working position with workers in the basket.

- Articulating boom and extensible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

- Before moving an aerial lift for travel, the boom(s) shall be inspected to see that it is properly cradled and outriggers are in stowed position, except as provided in subdivision .

Scissor Lift

- Lift Controls shall be tested each day prior to use to determine that such controls are in safe working condition.

- Only trained personnel shall operate.

- Employees shall always stand firmly on the floor and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.

- All handrail sections shall be securely bolted to the machine.

- The entrance rail or chain must be put in place once the employee has entered the lift.

- Do not operate machines when winds exceed 25 mph.

- Do not operate within 10 ft. of high voltage wires.

2.17 FORKLIFT PROCEDURES

Scope

This section outlines minimal safety requirements to be followed by all personnel operating and maintaining powered industrial trucks (forklifts).

Purpose

This intent of this program is to eliminate or minimize the potential for injury or property damage to personnel, equipment, and facilities.

Reference

29 CFR 1910.178, ANSI B56.1-1975, ASME B56.1-1993

Definitions

- Powered Industrial Truck — Any fork truck, industrial tractor, platform lift truck, motorized hand truck, or other specialized industrial trucks powered by electric motors or internal combustion engines. This definition does not include vehicles designed primarily for earthmoving or over the road hauling that have bucket-mounted forks.

- Critical Pick — Any lift exceeding 75% of the machines rated capacity, any lift involving more than one machine, or any lift involving unusual or severe circumstances.

General

- All powered industrial trucks in used at Port facilities must meet the applicable requirements of design, construction, and stability as defined by the American National Standards Institute B56.1-1969, Safety Standards for Powered Industrial Trucks, except for vehicles intended primarily for earth moving or over-the-road hauling. All new powered industrial trucks acquired and used by a contractor, must meet the applicable requirements of design, construction, and stability as defined in ASME B56.1-1993. All powered industrial trucks must be inspected, maintained, and operated in accordance with this section and the manufacturer's recommendations and specifications.

- Approved trucks must have a label indicating approval by the testing laboratory as meeting the specifications and requirements of ANSI B56.1- 1969.

- Modifications or additions must only be performed with the manufacturer's prior written approval. When modifications or additions are made, capacity, operation, and maintenance instruction plates, tags, or decals must be changed accordingly.

- If the truck is equipped with front-end attachments other than factory-installed attachments, it must be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with the load centered from side to side.

- The user must ensure that all nameplates and markings are in place and legible.

- A "Critical Pick" is defined as any lift exceeding 75% of the rated capacity (this may vary depending on the manufacturer's specifications), any lift involving more than one machine, or any lift involving unusual or severe circumstances. The Safety Manager and/or Project Manager shall submit a written plan to the Engineer for review, prior to such work beginning.

Lighting for Operations

- All lift trucks shall be equipped with functioning headlights, tailgates and rotating of flashing amber becons compliant with SAE Class II.

- Lift trucks shall operate with headlights, taillights and becons operating at all times.

Operator Requirements for Powered Industrial Trucks

Safe Operation

- Each powered industrial truck operator must be trained in the safe operation of a powered industrial truck, and is competent to operate a powered industrial truck safely.

- Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the Supervisor must ensure that each operator has successfully completed the training required by this section.

Training Program Implementation

- Trainees may operate a powered industrial truck only under the direct supervision of persons who have the knowledge, training, and experience to train operators and where such operation does not endanger the trainee of other employees.

NOTE: *Any other qualified person of the employer's choosing, may give required training and evaluation.*

- Training must consist of formal instruction and/or practical training, conveyed in a manner that the trainee understands.

NOTE:*: Formal instruction may include lecture, discussion, interactive computer learning, videotape and/or written material. Practical training may include demonstrations performed by the trainer and practical exercises performed by the trainee.*

Training Program Content

Powered industrial truck operators must receive initial training in the truck related topics that follow.

- Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate.
- Differences between the track and the automobile.
- Truck controls and instrumentation: where they are located, what they do, and how they work.
- Engine or motor operation.
- Steering and maneuvering.
- Visibility (including restrictions due to loading).
- Fork and attachment adaptation, operation, and use limitations.
- Vehicle capacity.
- Vehicle stability.
- Any vehicle inspection and maintenance that the operator will be required to perform.

- Operating Limitations - Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.

Powered industrial truck operators must receive initial training in the workplace related topics that follow:

- Surface conditions where the vehicle will be operated.
- Composition of loads to be carried and load stability.
- Load manipulation, stacking, and unstacking.
- Pedestrian traffic in areas where the vehicle will be operated.
- Hazardous (classified) locations where the vehicle will be operated.
- Ramps and other sloped surfaces that could affect the vehicle's stability.
- Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust.
- Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

Retraining

Retraining in relevant topics must be provided to the operator when:

- The operator has been observed to operate the vehicle in an unsafe manner.
- The operator has been involved in an accident or near-miss incident.
- The operator has received an evaluation that reveals they are not operating the truck safely.
- The operator is assigned to drive a different type of truck.
- The condition of the workplace change in a manner that could affect the safe operation of the truck.

Retraining must be provided to an operator if three years has elapsed since they last received training.

Avoidance and Duplicative Training

- If an operator has previously received training in a topic specified in paragraph 3, Training Program Content, above, and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator can provide proof of such training within three years.

Recordkeeping

- Records must be kept showing that each operator has been trained or received retraining as required by this section. These records must include the name of the operator, the date of training or retraining, and the name of the person(s) giving the training or retraining.

Operator Identification

- Operators who have successfully completed training shall be identified with a hardhat sticker or a certification card that includes the date of course completion.

Operating Powered Industrial Trucks

- No operator may drive a truck up to anyone standing in front of a fixed object.

- No one may stand or pass under the elevated portion of any truck, whether loaded or empty.

- People may not ride on powered industrial trucks unless a safe place to ride is provided.

- **Employees must not place any body parts between the uprights of the mast or outside the running lines of the truck.**

- When an operator leaves a powered industrial truck unattended:

  - The load must be fully lowered.
  - The controls must be neutralized.
  - The power must be shut off.
  - The brakes must be set.
  - If the truck is parked on an incline, the wheels must be blocked.

- A powered industrial truck is “unattended” when the operator is 25 feet or more away from the vehicle, which remains in view, or whenever the operator leaves the vehicle and it is not in view.

- When a truck operator is dismounted, within 25 feet of the truck, and still in view, the load must be fully lowered, the controls must be neutralized, and the brakes must be set to prevent movement.

- The operator must maintain a safe distance from the edge of ramps or platforms while operating on any elevated dock, or platform or freight car.

- There must be enough headroom for trucks to operate under overhead installations, lights, pipes, sprinkler systems, or other overhead projections.

- An active operator protection restraint device (such as a seatbelt or lap-bar) or other such approved system must be provided and used.

- Access to fire aisles, stairways, and fire equipment must be kept clear.

Lifting Employees on the Forks of Trucks

- Due to the advances in technology and the availability of aerial lifts, forklifts shall not be used to lift personnel under any conditions!

Traveling in a Powered Industrial Truck

- The operator must remain at a safe distance of approximately three truck lengths from the truck ahead. The truck must be kept under control at all times.

- The operator must yield the right-of-way to ambulances, fire trucks, or other vehicles in emergency situations.

- Passing other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations is prohibited.

- Railroad tracks must be crossed diagonally wherever possible. The operator must not park closer than 8 feet from the center of railroad tracks.

- The operator must look in the direction of, and keep a clear view of the path of travel.

- Stunt driving and horseplay are prohibited.

- ❖ The operator must approach elevators slowly, and then enter squarely after the elevator car is properly leveled. Once on the elevator, the operator must neutralize controls, shut off power, and set the brakes.

- ❖ Motorized hand trucks must enter elevator or other confined areas with load end forward.

- ❖ The operator must avoid running over loose objects on the roadway surface.

- ❖ Access to fire aisles, stairways, and fire equipment must be kept clear.

Traveling Speeds of Powered Industrial Trucks

- ❖ The operator must observe all traffic regulations, including authorized plant speed limits.

- ❖ The operator must slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load obstructs a forward view, the driver must travel with the load trailing.

  Exception: *If traveling with the load trailing creates new hazards, it is not required.*

- ❖ The operator must ascend and descend grades slowly.

  - ➢ At grades over 10 percent, loaded trucks must be driven with the load upgrade.

  - ➢ Unloaded trucks should be operated on all grades with the load carrier downgrade.

  - ➢ On all grades, the load and load carrier must be tilted back if applicable, and raised only as far as necessary to clear the road surface.

- ❖ Under all travel conditions, the truck must be operated at a speed that will permit it to be stopped safely.

- ❖ The driver must slow down for wet and slippery floors.

- ❖ While negotiating turns, the operator must slow to a safe speed and turn the wheel in a smooth, sweeping motion.

Loading Powered Industrial Trucks

- All loads must be stable or safely arranged. Exercise caution when handling off-center loads that cannot be centered.

- All loads must be within the rated capacity of the truck.

- Take care securing, manipulating, positioning, and transporting loads when attachments are used. Trucks with attachments must be operated as partially loaded trucks when not handling a load.

- Place the load carrier under the load as far as possible. Tilt the mast backward to stabilize the load.

- Use extreme caution when tilting the load forward or backward, particularly when high tiering. Avoid tilting the load forward with the load carrier elevated except to pick up a load, or when the load is in a deposit position over a rack or stack. When stacking or tiering, use only enough backward tilt to stabilize the load.

Maintaining Powered Industrial Trucks

- Powered industrial trucks must be removed from service when not in safe operating condition. An authorized employee must make all repairs.

- When repairs to fuel and ignition systems of industrial trucks involve fire hazards, the repairs must be conducted only in designated locations.

- Trucks in need of repairs to the electrical system must have the battery disconnected prior to repair.

- Industrial truck parts must be replaced only by parts of equivalent safety.

- Industrial trucks must not be altered so that the relative positions of parts are different from when they were manufactured. Industrial trucks must not have parts added or eliminated, except as provided in 29 CFR 1910.178. Fork trucks must not have additional counterweight added unless approved by the truck manufacturer.

- Industrial trucks must be examined at least daily before being placed in service. Industrial trucks must not be placed in service if the examination shows any unsafe condition. Where industrial trucks are used on a round-the-clock basis, they shall be examined after each shift. Defects must be immediately reported and corrected.

- Water mufflers must be filled daily or as frequently as necessary to prevent the water supply from dropping below 75 percent. Vehicles must not be operated if muffler screens or other parts are clogged. Any vehicle that emits hazardous sparks or flames from the exhaust system must immediately be removed from service until the emission of such sparks and flames has been eliminated.

- When the temperature of any part of any truck exceeds its normal operating temperature, the vehicle must be removed from service until the cause for overheating has been eliminated.

- Industrial trucks must be kept clean and free of excess accumulations of combustible materials, oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100° F) solvents must not be used. High flash point (at or above 100° F) solvents may be used. Take precautions regarding toxicity, ventilation, and fire hazard according to the agent or solvent used.

2.18 MECHANIZED EQUIPMENT/MOTORIZED VEHICLES

Scope

This section defines minimum safety requirements for earth moving operations, maintenance and fueling, site conditions and the safety of the general public. Equipment is defined to include motor vehicle, earthmoving equipment and over the road and onsite haul trucks.

Purpose

To safeguard employees and members of the general public, to prevent equipment and property damage. The Federal Motor Carriers Safety Administration in 1999 estimated that truck crashes cost liable parties an average of $3.5 million for fatal accidents and $217 thousand for injury accidents.

According to a 1991 NIOSH report, there were 841 road construction fatalities between 1992-1998. Of those 493 occurred *"inside"* work zones with the leading cause of death to construction workers on foot being trucks (61%), followed by construction equipment (30%).

Reference

29 CFR 1926, Subparts 0, P & W, and the Excavation & Trenching section of this manual.

General Requirements

Only experienced, trained and qualified personnel are allowed to operate equipment.

- Proper licensing requirements such as Commercial Drivers License (CDL) shall be met.
- The operator must know and understand the working limits of the equipment.
- Must be physically, emotionally, and mentally fit.
- Must know and comply with the safety rules and attend at a minimum at least one toolbox safety meeting per week.
- Must have read and understood the manufacturers operating instructions for the equipment they are operating.

- Must be qualified and checked out on the specific equipment they will be operating.

- The operator is personally responsible for the safe operation/movement of the equipment.

- Rest periods for operators as prescribed by State & Federal law shall be complied with.

- All personnel on the project shall utilize proper Personal Protective Equipment (PPE) as referenced in this manual.

- All equipment shall be inspected and serviced by a qualified mechanic on a pre-determined schedule. Such inspections shall be documented. A sample “Daily Checklist” is included in this section.

- In the course of the work shift, it shall be operator’s responsibility to report unsafe conditions that arise with the equipment or on the site.

- Any equipment unsafe to operate shall be taken out of service and repaired.

- All cab glass shall be safety glass, or the equivalent, that introduces no distortion.

- All equipment including smaller vehicles such as pick-ups, maintenance trucks , golf carts, etc. shall be equipped with strobe/beacon lights meeting SAE Class II requirements to enhance visibility around equipment.

- The use of seat belts is mandatory while operating equipment or riding in vehicles.

- Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried. Personnel may not ride in pick-up beds or other areas not equipped with proper seats and seat belts.

- All equipment and heavy-duty vehicles shall be equipped with a reverse signal alarm distinguishable from the surrounding noise level.

- For Safety purposes, all vehicles must use emergency brake when parking on an incline/decline. In addition, all vehicles being serviced shall have mandatory drive wheel chocks in place.

- Operators shall climb up and down from the equipment using the proper steps/handholds. Do not jump — it is a cause of serious injury!

- No person other than the operator shall ride on equipment or in a vehicle that is not specifically designed to carry passengers.

- No employee shall be allowed to ride in or work from an end-loader bucket.

- Equipment shall not be moved until the operator is sure that all individuals are clear of the equipment.

- No equipment shall operate within 10 feet of any energized power line except in conformity to OSHA standards.

- All vehicles shall have a service brake system capable of stopping and holding the equipment fully loaded, an emergency brake system, and a parking brake system.

- Equipment shall not be loaded beyond their rated capacities and all loads shall be secured to prevent shifting or loss.

- No persons shall be permitted to remain in equipment that is being loaded by excavating equipment unless the cab is adequately protected against heavy impact.

- Headlights and warning beacons on equipment shall be on at all times while they are engaged in a work operation.

Maintenance, Repair, & Fueling

- All equipment and vehicles in use shall be inspected at the beginning of each shift to assure that equipment and accessories are in safe operating condition and free of apparent damage that could cause failure. Items to be checked shall include:

    - Operating Controls
    - Brakes
    - Seat and Seat Belt
    - Windshields and Wipers
    - Tires
    - Reverse Alarm
    - Horn
    - Steering Mechanism
    - Lights – Headlights, Taillights, Warning Beacons
    - Steps and Handholds
    - Hydraulic Hoses
    - Fire Extinguisher

- Heavy equipment or vehicles which are suspended or held aloft by the use of slings, hoists, or jacks shall be substantially blocked or cribbed to prevent falling

or shifting before employees are permitted to work under or between them. Likewise, bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment shall be either fully lowered or blocked when being repaired or not in use. All controls shall be in a neutral position, with the engine stopped and brakes set, unless the work being performed requires otherwise.

- Equipment being repaired or adjusted shall have the key removed and a tag-out device placed on the control panel.

- Only maintenance persons trained in the operation of equipment shall be allowed to move such equipment.

- Equipment with obvious hydraulic, coolant, or oil leaks shall be promptly repaired.

- Fuel storage and maintenance areas shall be kept clean and free of debris and spilled material. Oily and greasy rags shall be properly stored.

- Proper fire protection, flammable liquid storage, and cutting and welding procedures shall be followed.

- Gasoline powered engines shall be shut off to refuel!

- No smoking or ignition sources shall be allowed within 35 feet of a fueling operation.

Site Control

- Yield the right-of-way to all equipment!

- All visitors to the Port or construction sites shall check in with the Port Engineer or Contractor's supervision or grading supervisor.

- No vehicle will be allowed onsite without a SAE Class II strobe/beacon light for high visibility.

- When equipment or vehicles operate under dusty conditions, good visibility shall be maintained by the suppression of dust.

- Haul routes shall be built in accordance with OSHA Standards. Turnouts, emergency ramps, and berms shall be provided where needed.

- Haul routes shall be properly maintained to prevent injury to employees and damage to equipment.

- Berms or barricades shall be provided and maintained on roadways where drop-offs of sufficient grade or depth exist. They shall be at least mid-axle height of the largest equipment that travels the roadway.

- Equipment speeds shall be appropriate to site and weather conditions if speed limits are not posted.

- All equipment left unattended at night adjacent to a roadway in normal use, or adjacent to construction areas where work is in progress, shall be barricaded in conformance with the Uniform Traffic Code.

- Everyone on the ground working around moving equipment shall wear high visibility vests or garments.

- Before driving through or within an equipment operation, stop and observe long enough to become familiar with what equipment is working, how much equipment is working.

- When stopped to observe, be aware that material can come off of the top of the haul units, especially when they are in a turn.

- Observe what traffic pattern is being followed. There may be one-way traffic, and in rare cases, there may be the need for a left-hand traffic pattern.

Compaction Testing in Active Earthwork Fills

- Technicians working among active earthmoving equipment shall utilize proper PPE including hard hats, high-visibility vest, and appropriate footwear.

- Vehicles shall be equipped with tall signal flags and strobe/beacon lights to enhance visibility around equipment.

- Technicians will be required to communicate with the grading supervisor to determine when fill areas are ready for testing, and the best routes for entering and leaving the fill area.

- In large fills, if at all possible, tests should be performed at a safe distance from equipment traffic. Technicians shall enter the fill areas by traveling with the flow of the equipment traffic, and take all prudent steps to avoid unsafe situations.

- Yield the right of way to all equipment!

- Technicians shall make contact with equipment operators and shall not proceed into the paths of equipment unless the operator has given them a positive hand signal to do so.

- Technicians and grading supervision shall communicate to ensure test pits are located and quantified in accordance with project requirements for testing.

- Technicians should place their vehicles at the open end of the test pit, place a signal flag in the spoil pile at the closed end while keeping their strobe/beacon light “on” at all times while in the fill.

- When leaving the test pit, technicians should check the immediate surroundings to ensure no obstacles are in the way of making a safe vehicle exit. If such obstacles are present, they shall promptly inform the grading supervisor of the situation and remain at the test pit until it is safe to exit.

- Technicians shall leave the fill by traveling with the flow of the equipment traffic.

- Any “Near Miss” situations or problems shall be reported to the appropriate supervisor.

Public Safety

- No employer shall move or cause to be moved construction equipment or vehicles upon any access roadway or grade unless the access roadway or grade is constructed and maintained to accommodate safely, the movement of the equipment or vehicles involved.

- Where trucks enter public highways, or cross-established routes, warning signs or certified flaggers shall be posted to alert the traveling public.

- Before vehicles exit the project, they shall have had all loose or excess material removed.

- All roadways used by the traveling public shall be kept clear of spilled material.

- Drivers shall obey all posted speed limits and operate their vehicles in accordance with road/weather conditions.

- Alleged incidents such as reckless driving or speeding reported to the Port by the general public shall be investigated as a “Near Miss” situation.

Daily Equipment Safety Inspection

	OK	N/A	REPAIR
Operating Controls			
Brakes			
Seat/Seatbelts			
Tires/Wheels			
Windshield / Wipers			
Lights			
Head Tail Beacon			
Reverse Alarm			
Horn			
ROPS Canopy			
Fenders/ Flaps			
Steering Mechanism			
Fire Extinguisher			
Hydraulic Hoses			
Steps/Handholds			
Equipment#			
Operator:			
Date/Shift			

2.19 EXCAVATION AND TRENCHING

Scope

This section defines minimum safety requirements for all open excavations made in the earth's surface. Excavations are defined to include trenches.

Purpose

To ensure that methods of protecting employees against cave-ins and safe work practices for employees during excavation and trenching operations are in place prior to work.

Reference

OSHA 29 CFR 1926 Subparts P & S, and the Mechanized Equipment/Motorized and Excavation & Trenching sections of this manual.

Definitions

- Accepted Engineering Practices — Requirements that are compatible with standards of practice required by a registered Professional Engineer.
- Aluminum Hydraulic Shoring — Pre-engineered shoring system comprised of aluminum hydraulic cylinders (cross-braces) used in conjunction with vertical rails (uprights) or horizontal rails (walers), designed specifically to support the side-walls of an excavation and prevent cave-ins.
- Bell Bottom Pier Hole — Type of shaft or footing excavation, the bottom of which is made larger than the cross-section above to form a bell shape.
- Benching (Benching System) — Method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near vertical surfaces between levels.
- Cave-in — Separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.
- Competent Person - A person who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, who has the authorization to take prompt corrective measures to eliminate them and is knowledgeable of OSHA 29 CFR 1926, Subpart P.

- Cross Braces — Horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

- Excavation — Any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal.

- Faces or Sides — The vertical or inclined earth surfaces formed as a result of excavation work.

- Failure — Breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and support capabilities.

- Hazardous Atmosphere — Atmosphere which, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic or otherwise harmful, may cause death, illness, or injury.

- Kick-Out — The accidental release or failure of a cross-brace.

- Protective System — A method of protecting employees from cave-ins, from material that could fail or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support or shield systems that provide necessary protection.

- Qualified Person - One who, by possession of a recognized degree, certificate, or professional standing, or by extensive knowledge, training and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, work or project.

- Ramp — Inclined walking or working surface that is used to gain access to one point from another, constructed from earth or structural materials such as steel or wood.

- Sheeting — Large surface area members used to retain soil supported by structural members of a shoring system.

- Shield (Shield System) — A structure that is able to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or be designed to be portable and moved along as work progresses. Additionally, they can be either premanufactured or job built in accordance with 29 CFR Part 1926.652. Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

- Shoring (Shoring System) — A structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and is designed to prevent cave-ins.

- Sloping (Sloping System) — A method of protecting employees from cave-ins by excavating to form sides that are inclined away from the excavation. The angle of incline required to prevent a cave-in varies depending on the differences in such factors as soil type, environment conditions and application of surcharge loads.

- Stable Rock — Natural, solid, mineral material that can be excavated with vertical sides and remains intact while exposed. Unstable rock is considered to be stable when the rock minerals on the side(s) of the excavation is secured against caving in or movement by rock bolts, or by a protective system that was designed by a Registered Professional Engineer.

- Structural Ramp — A ramp built of steel or wood, usually for vehicle access. Ramps made of soil or rock are not considered structural ramps.

- Support System — A structure such as underpinning, bracing, or shoring that provides support to an adjacent structure, underground installation, or the sides of an excavation.

- Tabulated Data — Tables and charts approved by a registered professional engineer and used to design and construct a protective system.

- Trench — A narrow excavation in relation to its length made below the surface of the ground. In general, the depth is greater than the width, but the width (measured at the bottom) is not greater than 15 feet (4.6m) (measured at the bottom of the excavation).

- Uprights — The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed in such a way that individual members are closely spaced; in contact with, or inter-connected to each other are often called “sheeting”.

- Wales — Horizontal members of a shoring system placed parallel to the excavation face and whose side bears against the vertical members of the shoring system or earth.

General Requirements

- Surface encumbrances that are located so as to create a hazard to employees shall be removed or supported.

- Underground installations such as sewer, telephone, fuel, electric, water lines or any other installations that reasonably may be expected to be encountered during excavation shall have their location determined prior to opening an excavation trench.

- When underground utility lines are being located, “hand digging” in these locations shall be required. While the excavation/trench is open, underground lines shall be protected, supported, or removed as necessary to safeguard employees and the utilities.

- Means of egress from excavation/trenches such as a stairway, ladder, ramp or other safe means shall be located in excavations/trenches 4 feet or more in depth so as to require no more than 25 feet of lateral travel for employees.

- Employees exposed to vehicular traffic shall wear warning vests or other suitable garments marked with or made of highly-visible, reflective material.

- No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials as prescribed by ANSI.

- Where the stability of adjoining buildings, walls, or other structures may be endangered by excavation/trench operations, an engineer engineered support system such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

- Adequate protection shall be provided from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material and stockpiling excavated materials at least 2 ft back from the excavation.

- Warning systems shall be utilized around excavations such as barricades, hole covers, signals, or signs.

- If the excavation is exposed to vehicle or equipment traffic, berms or barricades shall be provided and maintained that will divert or stop vehicles or equipment from driving into the excavation. Berm or barricade height shall be at least mid-axle of the largest equipment.

- Structurally safe walkways shall be provided where employees are required to cross over excavations.

- Standard guardrails shall be provided on walkways where the depth is 4 feet or more to the next level.

- Employees shall utilize all appropriate PPE such as hardhats, hearing, eye and foot protection while working in and around excavations.

- Upon completion of exploration and similar operations, temporary excavations, and shafts shall be back-filled.

- Employees shall not work in excavations where there is accumulated water or in excavations where water is accumulating, unless adequate precautions have been taken to protect against hazards posed by water accumulations.

- Employees shall not enter bell-bottom pier holes, caissons, shafts or other similar deep and confined footing excavations unless a protective system/sleeve is in place. The entrant shall wear a harness with a lifeline securely attached and follow all procedures found in the Confined Space Entry Section of this manual.

- Employees in an excavation/trench shall be protected from cave-ins by proper sloping, benching or an adequate protective system designed in accordance with the subparagraph H of this Section - Protective System Requirements.

Competent Person

- The Competent Person shall be identified by name in the Safety Program.

- The Competent Person shall meet the definition set forth by OSHA.

- The Competent Person shall be located on the project and be capable of classifying soils.

- The Competent Person shall perform as a minimum, daily inspections of the excavation and additional inspections as required due to changing conditions.

- The Competent Person shall be present at the excavation during periods of accumulated water or when dewatering equipment is in use.

- The Competent Person shall take appropriate action as site conditions dictate.

Inspections

- Daily inspections of excavations, adjacent areas, and protective systems and surface encumbrances shall be performed by the Competent Person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions.

- Inspections shall be conducted prior to the start of work and as required throughout the shift.

- Inspections shall be performed after every rainstorm or as required by changing site conditions.

- If conditions that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions are

found, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

- ❖ All inspections shall be documented using the Trenching & Excavation Checklist found at the end of this section.

Emergency Rescue

- ❖ Emergency rescue equipment such as breathing apparatus, safety harness, lines, and basket stretcher shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation.

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

- ❖ If applicable, the Confined Space Entry Procedures in this manual shall be followed.

Protective Systems Requirements

All employees in an excavation shall be protected from cave-ins by proper sloping, benching or shoring or an adequate protective system designed in accordance with sloping and benching configurations.

Exceptions are:

- ➢ Excavations/trenches are made entirely in stable rock.

- ➢ Excavations/trenches are less than 4 feet in depth and examination of the ground by the Competent Person provides no indication of a potential cave-in.

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

    - Tabulated Data for such systems shall bear the stamp of a Professional Engineer and be located on the project.

    - A Professional Engineer shall design excavations or shoring systems that will be located at 20 feet or more below grade.

Materials and Equipment

- Materials and equipment used for protective systems shall be free from damage or defects that may impair proper function.

- Manufactured materials and equipment used for protective systems shall be used and maintained consistent with manufacturer recommendations and in a manner that will prevent employee exposure to hazards.

- When material or equipment that is used for protective systems is damaged, the Competent Person shall examine the material or equipment and evaluate its suitability for continued use.

Installation and Removal of Support

- Members of support systems shall be securely connected together to prevent sliding, failing, kick-outs, or other predictable failure.

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

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

- Back filling of the excavation shall progress together with the removal of support systems.

Additional Requirements for Support Systems

- Excavations of material to a level no greater than two feet below the bottom of the members of the support system shall be permitted, but only if the system is designed to resist forces calculated for the full depth of the trench and there is no indication while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

- Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees, except when employees at the lower levels are adequately protected from hazards of falling material.

- Shield systems shall not be subjected to loads exceeding those that the system was designed to withstand.

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

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

2.19.1 RULE "A" — SOIL CLASSIFICATION

Scope

This rule describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The rule contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soil.

Definitions

- Cemented Soil — A soil in which particles are held together by a chemical agent, such that a hand-size sample cannot be crushed into a powder or individual soil particles by finger pressure.

- Cohesive Soil — Clay (fine-grained) or soil with a high clay content and that has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical slide slopes, and has plasticity when moist.

- Confined Compressive Strength — The load per unit area at which a soil will fail in compression.

- Dry Soil — Soil that does not exhibit visible signs of moisture content.

- Fissured — Soil material that has a tendency to break along definite planes of fracture with little resistance.

- Granular Soil — Gravel, sand, or silt (coarse gravel soil) with little or no clay content, and no cohesive strength.

- Layered System — Two or more distinctly different soil or rock types arranged in layers.

- Moist Soil — A condition where a soil looks and feels damp.

- Plasticity — A property of a soil that allows the soil to be deformed or molded without cracking or experiencing appreciable volume change.

- Saturated Soil — A soil in which the voids are filled with water. Saturation does not require flow.

- Stable Rock — Natural solid mineral that can be excavated with vertical sides and remains intact while exposed.

- Submerged Soil — Soil that is underwater or is free seeping.

- Wet Soil — Soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when

vibrated granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

Soil Classification

- Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the standard.

- The classification of the deposits shall be made based on the results of at least on visual and at least one manual analysis.

Such analysis shall be conducted by the Competent Person using recognized forms of testing.

- Visual and manual analysis shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to properly identify the properties, factors, and conditions affecting the classification.

- In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

Acceptable Visual and Manual Tests

- Observe soils that are have been excavated. Fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

- Observe soil as it is being excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily moreover, does not stay in clumps is granular.

- Observe the side of the opened excavation. Crack like openings could indicate fissured material.

- Observe the side of the excavation to identify a layered system.

- Observe the area adjacent to the excavation for surface encumbrances to identify previously disturbed soil.

- Observe the area adjacent to the excavation and side of the excavation for evidence of surface water or seeping water and evidence of the water table level.

- Observe the adjacent area for any signs of vibration.

Manual Tests

- Plasticity - Mold a moist or wet sample of soil into a ball and attempt to roll it into threads. Cohesive material can be successfully rolled into threads without crumbling.

- Dry Strength - If the soil is dry and crumbles on its own or with moderate pressure into individual grains or powder, it is granular. If the soil is dry and falls into clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in combination with gravel, sand or silt.

- Thumb Test - Take a soil sample and press upon it with your thumb and note the following:

  - Type A: Cohesive soil with an unconfined compressive strength of 1 .5 ton per square foot or greater. The soil can be easily indented by the thumb; however, it can be penetrated by the thumb only with very great effort. Examples of cohesive soils are: clay, silty clay, sandy clay, and clay loam. Cemented soils such as caliche and hardpan are also considered Type A. No soil is Type A if:

    - It is fissured.
    - Subject to heavy vibration from heavy traffic, pile driving, or similar effects.
    - The material is subject to other factors that would require it to be classified as a less stable material.

  - Type B: Cohesive soil with an unconfined compressive strength greater than 0.5 ton per square foot but less than 1.5 ton per square foot. Type B soil would include previously disturbed soil or those subject to vibration.

  - Type C: Cohesive soil with an unconfined compressive strength of 0.5 ton per square foot or less. Type C soil can easily be penetrated several inches by the thumb. Examples of this soil would be granular such as a sand, gravel, submerged rock or soil from which water is freely seeping. All soil in SW Louisiana is considered to be Type C.

2.19.2 RULE "B" — SLOPING AND BENCHING

Scope

This rule contains specifications for sloping and benching when used as methods of protecting employees working on excavations from cave-ins.

Definitions

- Actual Slope - The slope to which an excavation face is excavated.
- Distress - The soil is in a condition where a cave-in is imminent or likely to occur.
- Maximum Allowable Slope - The steepest incline of an excavation face that is acceptable for the most favorable site conditions as protection against cave-ins and is expressed as the ratio of horizontal distance to vertical rise (H:V).
- Short Term Exposure - A period of time less than or equal to 24 hours that an excavation is open.

Requirements

- Stable Rock is the only allowable classification that allows for vertical walls.
- The maximum allowable slope for Type A soil in an excavation less than 20 ft is 3/4:I.
- The maximum allowable slope in Type B soil in an excavation that is less than 20 ft is 1:1.
- The maximum allowable slope in Type C soil in an excavation less than 20ft is 1/2:I.
- Type A and Type B soils can be benched with a maximum allowable bench dimension of 4 ft. Type C soil cannot be benched.

  NOTE: For other sloping and benching configurations, please consult the OSHA regulations.

Daily Excavation Checklist

Supervisor:					Project No.	
Yes	No	N/A	1.	Were utility companies or owners contacted, advised of proposed work, and asked to establish the location of underground utilities?		
Yes	No	N/A	2.	Has a safety meeting been held with all employees involved in the process with hazards, shoring, sloping, soil type and emergency procedures discussed?		
Yes	No	N/A	3.	Have soils been properly classified through at least one visual and one manual test?		
Yes	No	N/A	4.	When excavation approaches the estimated location of underground utilities, is the exact location determined by “hand-digging?”		
Yes	No	N/A	5.	While the excavation is opened, are underground utilities protected, supported or removed as necessary to safeguard employees?		
Yes	No	N/A	6.	Are structural ramps that are used by employees and equipment as a means of access or egress from excavations designated by a Competent Person?		
Yes	No	N/A	7.	In excavations four feet or more in depth, is a safe means of egress located so as to require no more than 25 feet of lateral travel?		
Yes	No	N/A	8.	Is each employee in an excavation protected from cave-ins by an adequate protective system designed in accordance with 1926.652(b) and (c)?		
Yes	No	N/A	9.	Where employees or equipment are require to crossover excavations at four feet or more above grade, are walkways with standard guardrails or barriers provided that will meet the intended load of the equipment?		
Yes	No	N/A	10.	Do protective systems such as trench boxes have the capacity to resist without failure all loads to be transmitted to them? Is the tabulated data on site?		
Yes	No	N/A	11.	Are all surface encumbrances removed or supported as necessary to safeguard employees?		
Yes	No	N/A	12.	Are employees who are exposed to vehicle/equipment traffic wearing warning vests or other suitable garments, marked with made of reflective or high-visibility material?		
Yes	No	N/A	13.	Are employees prohibited from working beneath loads handled by lifting or excavating equipment?		
Yes	No	N/A	14.	Is adequate protection provided to protect employees from loose rock or soil that could pos a hazard by falling or rolling from an excavation face?		
Yes	No	N/A	15.	If sidewalks, pavements, or structures are present, is a support system or another method provided to protect against possible collapse?		
Yes	No	N/A	16.	Is excavated or other materials kept at least 2 feet from the edge?		
Yes	No	N/A	17.	Are employees protected from the hazard of cave-ins when entering or exiting the area protected by shields?		
Yes	No	N/A	18.	Do you prohibit employees from being in shields when the shields are being installed, removed, or moved vertically?		
Yes	No	N/A	19.	Is a warning system such as stop blocks used when mobile equipment		

				is operated adjacent to an excavation or when the equipment is required to approach the edge of an excavation?
Yes	No	N/A	20.	Is an adequate barrier or physical protection warning system provided around the excavation?
Yes	No	N/A	21.	Are all wells, pits, and shafts properly barricaded or covered?
Yes	No	N/A	22.	Is the atmosphere tested in excavations greater than four feet in depth where an oxygen deficient or hazardous atmosphere exists or could reasonably be expected to exist before employees enter?
Yes	No	N/A	23.	If hazardous soil conditions or atmosphere exist, are Confined Space Entry Procedures being followed?
Yes	No	N/A	24.	Where water is controlled or prevented from accumulating by use of water removal equipment is the water removal equipment and operations monitored by the Competent Person to ensure proper operation?
Yes	No	N/A	25.	Where excavation work interrupts the natural drainage of surface water, are suitable means used to prevent surface water from entering the excavation and is adequate drainage of the area adjacent to the excavation provided?
Yes	No	N/A	26.	Are daily inspections of the excavation, the adjacent areas, and protective systems made by the Competent Person before the work shift?
Yes	No	N/A	27.	Is an inspection of the excavation the adjacent areas, and protective systems made after every rainstorm or as conditions necessitate?
Yes	No	N/A	28.	Are materials and equipment used for protective systems free from damage or defects that might impair their proper function?
Yes	No	N/A	29.	Does the Competent Person examine the material or equipment used for protective shoring for damage and evaluates its suitability for continued use?
Yes	No	N/A	30.	Is excavation of materials to a level no greater than two feet below the bottom of the shield prohibited if there are indications of a possible loss of soil from behind or below the bottom of the shield?
Yes	No	N/A	31.	Are members of support systems securely connected together to prevent sliding, falling or other predictable failure?
Yes	No	N/A	32.	Are support systems installed and removed in a manner that protects employees from cave-ins, structural collapse, or from being struck by?

Competent Person		Date	
Weather Conditions		Soil Type	

2.20 ELECTRICAL SAFETY PROGRAM

Scope

This section defines the minimum safety requirements for electrical work.

Purpose

The purpose of this program is to ensure the proper use, maintenance, and inspection of electrical equipment and cords to minimize potential injuries due to electrical shock.

Reference

29 CFR 1926 Subpart K, NEC, Lock-out/Tag-out and Energized Electrical sections of this manual.

Protection of Employees

- Employees shall not be permitted to work in such proximity to any part of an electric power circuit so that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.

- Access into electrical substations, rooms, cabinets, vaults, and manholes is restricted to Qualified Persons only, unless the equipment is deenergized or a Qualified Person is in supervision of the unqualified personnel making access.

- Only Qualified Persons shall work on electric circuit or parts of equipment that have not been deenergized under the procedures of OSHA 29 CFR1926 Subpart K. Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, Personal Protective Equipment, insulating and shielding materials, and insulated tools.

  NOTE: For work to be performed on energized systems, a “Compelling Reason” must be documented in writing.

- Employees shall not enter spaces containing exposed energized parts, unless illumination is provided that enables the employee to perform the work safely.

- Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) shall not be worn if they might contact exposed energized parts.

- Portable ladders shall have nonconductive side rails if they are used where the employee or the ladder could contact exposed energized parts.

- Only a Qualified Person may defeat an electrical safety interlock, and then only temporarily while they are working on the equipment. The interlock systems shall be returned to its operable condition when this work is completed.

Working Around Energized Electrical Lines

- Before work begins, the employee shall ascertain whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit.

- The employee shall post and maintain proper warning signs where such areas exist. The Supervisor shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.

- In work areas where the exact location of underground electric power lines are unknown, no activity that may bring employees into contact with those power lines shall begin until the location of the power lines has been positively identified.

- Personnel shall not perform any work in proximity to electrical conductors or engage in any excavation, construction, demolition, repair, or other operation, until danger from accidental contact with said electrical conductors have been effectively guarded by deenergizing the circuit and grounding it or by guarding it by effective insulation or other effective means.

- No work shall be performed; no material shall be piled, stored or otherwise handled; no scaffolding, commercial signs, or structures shall be erected or dismantled; nor any tools, machinery or equipment operated within the specified minimum distances from any energized high voltage electrical conductor capable of energizing the material or equipment; except where the electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the equipment have been erected.

To prevent physical contact with the lines, equipment shall be operated proximate to, under, over, by, or near energized conductors only in accordance with the following:

- For lines rated 50 kV or below: Minimum clearance between the lines and any part of the equipment or load shall be ten feet.

- For lines rated over 50 kV: Minimum clearance between the lines and any part of the equipment or load shall be ten feet plus 0.4 inch or each 1 kV over 50 kV, or twice the length of the line insulator, but never less than ten feet.

Ground Fault Circuit Interrupters

- Employees using existing electrical systems for powering temporary electrical cords, tools and equipment shall use Ground Fault Circuit Interrupters (GFCI). Supervisors shall ensure the use of GFCI's where work is performed outside existing buildings and where work is performed in damp or metal-enclosed situations

- The GFCI system shall be inspected and maintained as required by OSHA.

- Temporary power shall utilize GFCI.

- Work in wet or damp locations shall not be performed until all efforts to abate the hazard have been exhausted. Ground Fault Circuit Interrupters (GFCI) shall be used when any work must be performed in these locations.

Cords and Cables

- Employees shall conduct visual inspections of cord sets and equipment connected by cord and plug before each day's use for external defects, such as deformed or missing ground pins, or insulation damage, and for indication of possible internal damage.

- Equipment found to be damaged or defective shall not be used and must immediately be tagged and removed from service.

- Employee's hands shall not be wet when plugging and unplugging flexible cords and cord and plug connected equipment.

- Extension cords or temporary lighting shall not be fastened with staples, hung from nails, or suspended by wire.

- Power tools and portable equipment shall be handled in a manner that will not cause damage. Flexible electric cords connected to equipment shall not be used for raising or lowering the equipment.

Housekeeping

- Where live parts present an electrical contact hazard, employees shall not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

- Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) shall not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

Lighting and Illumination

- Adequate lighting shall be provided throughout the building and in all work areas, particularly passageways and stairways, and wherever necessary to avoid a hazard due to a lack of light.

- The minimum level of task lighting for all indoor activities shall be an average of 10 foot candles measured 30 inches above the floor or the task.

- The minimum level of task lighting for all outdoor activities shall be an average of five foot candles measured 30 inches above the floor or the task.

- Areas requiring the continuous use of temporary lighting shall be inspected regularly and defective lamps replaced.

- Temporary lighting shall be equipped with guards to prevent accidental contact with the bulbs.

- In addition to providing the required illumination intensities, consideration should be given to the selection and placement of lights so as to provide minimum glare, eliminate harsh shadows and provide adequate illumination to work effectively.

- Empty exposed light sockets and broken bulbs shall not be permitted.

- High intensity task lighting shall not be left on after the work shift has concluded.

2.21 TOOLS - HAND AND POWER

Scope

This section defines the minimum safety requirements for employees using hand, power and powder actuated tools.

Purpose

To minimize hazards to employees due to improper use, worn, or damaged tools.

Reference

29 CFR 1926 Subparts I & Q.

General

All hand and power tools and similar equipment shall be maintained in a safe condition.

- The use of unsafe tools shall not be permitted. They shall be removed from service, tagged and repaired.
- When power operated tools are designed to accommodate guards, they shall be equipped with such guards.
- Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains or other reciprocating, rotating or moving parts of equipment shall be guarded if such parts are exposed to contact by employees.
- The proper PPE shall be utilized while working with or around hand and power tools.

Hand Tools

- Impact tools shall be kept free of mushroomed heads.
- Wooden handles of tools shall be crack or splinter free and shall not be covered by tape.

Power-Operated Hand Tools

All hand-held power tools shall be equipped with the appropriate positive 'on-off', momentary contact, or constant pressure switch in good working order.

- Electric power-operated tools shall be double insulated or grounded.
- Electrical cords shall not be used to hoist or lower such equipment.
- Cords shall be kept free of nicks and cuts to the insulation.
- Guards shall never be removed or rendered inoperable.
- GFCI's shall be utilized.

Powder Actuated Tools

- Only persons trained and authorized by a qualified person shall operate the tool.
- Qualified operators shall have their operator's card in their possession while operating such equipment.
- A lockable container shall be provided for each tool.
- A sign shall be posted in plain sight where tools are used.
- Loaded tools shall not be left unattended.
- Proper hearing, eye, and face protection shall be utilized.
- Tools shall be inspected prior to use.
- Tools shall be used on only the recommended surfaces with the recommended loads per manufacturer's instructions.
- Unfired shot shall be collected and misfired shot shall be handled per the manufacturer's instructions.

Pneumatic Tools

- Safety clips or retainers shall be used to secure hose sections and to each other as well as the tool to prevent accidental disconnect.

- ❖ Compressed air shall not be used at the nozzle for cleaning purposes except where reduced to less than 30 psig.

Masonry Saws

- ❖ Saws shall be guarded by a semicircular enclosure over the blade.

- ❖ All table mounted saws shall be equipped with a mechanical means of exhausting dust into a covered receptacle or be provided with water on the saw blade to control dust.

- ❖ The motor frames of all stationary saws shall be grounded through conduit, water pipe, or a driven ground. Portable saws shall be guarded through a grounded electrical system and GFCI.

Come-A-Longs & Chain Falls

- ❖ Damaged equipment shall not be used.

- ❖ Safety latches shall be maintained in working order.

- ❖ A pick exceeding 75% of the rated capacity of the hoisting device is considered “Critical”. A written plan shall be submitted to the Engineer before the Work is performed.

2.22 BLOODBORNE PATHOGEN EXPOSURE CONTROL PLAN

Scope

This section defines minimum safety standards for personnel who are trained in first aid/cardiopulmonary resuscitation procedures as responders.

Purpose

First aid responders are deemed to have a reasonably anticipated exposure to blood, or other potentially infectious matter in the course of rendering first aid. It is the purpose of this section is to establish the means and methods to protect against such exposure.

Reference

29 CFR 1910.1030, Blood borne Pathogens

Definitions

- HBV—Hepatitis means “inflammation of the liver”. Hepatitis B virus is extremely contagious and is the major infectious blood borne hazard faced on the job. It infects approximately 8,700 health care workers a year, resulting in more than 400 hospitalizations and 200 deaths. The incubation period after exposure is from 1 to 6 weeks before onset of symptoms. At the onset, flu-like symptoms occur, becoming so severe hospitalization may be required; or there may be no symptoms at all. Yet blood, saliva and other body fluids may be infectious. Urine will become dark in color, followed by jaundice (yellow color to eyes and skin). The liver becomes enlarged and in very serious cases, it will become cancerous.

- HIV—The Human Immune Deficiency Virus (AIDS), attacks the body’s immune system. Currently there is no vaccine to prevent infection. A person may carry the virus without developing symptoms for several years. They may suffer flu like symptoms, fever, diarrhea and fatigue. They may develop AIDS-related illnesses including neurological problems, cancer and other opportunistic infections.

Modes of Transmission

- HBV and HIV are transmitted in the same ways in the work place, by body fluids such as saliva, semen, vaginal secretions and other fluids that contain blood. These fluids may enter your body through a variety of means including an accidental injury with a sharp object contaminated with infectious material. Open

cuts, nicks and skin abrasions, even a rash or acne as well as the mucous membranes of your mouth, nose or eyes can become a path of entry to your body. Indirect transmission can also occur from touching a contaminated object or surface and transferring the infectious material to your mouth, nose, skin, or eyes. HBV can survive on environmental surfaces dried at room temperatures for at least one week. Make sure after an accident that the area is thoroughly cleaned and disinfected.

Exposure Control Plan

- The risks of blood borne diseases in the work place are quite serious, yet there are effective ways of minimizing them. A good place to start is your employers written exposure control plan. This plan should identify the employees covered by the standard and the measures your company intends to take to minimize the risks. In the work setting, the persons with the highest risks are the medical personnel and safety personnel. Next in line would be first responders and anyone else who might be on the scene of an accident.

Methods of Control

- First, treat all situations where there is blood or body fluids containing visible blood as if it were contaminated with an infectious disease. This is known as Universal Control.

- Isolating or removing hazards through the use of technology and devices is known as Engineering Control. e.g., puncture proof containers for used needles or minimizing exposure to sharp or jagged objects, etc.

- Alterations in the manner in which tasks are performed in an effort to reduce exposure are known as Work Practice Controls. Wash your hands as soon after exposure with a non-abrasive soap and water. Remove all contaminated clothing as soon as possible. Any assistance that is given to the insured should be done to minimize splashing spattering or spraying.

Personal Protective Equipment (PPE)

First aid equipment shall include the following items of protective equipment:

- Gloves that will protect the skin from blood or other potentially infectious materials; Gloves shall be worn when the responder has the potential to have direct skin contact with blood or other potentially infectious body fluids or materials, or when handling items or surfaces soiled with blood or other potentially infectious body fluids or materials Gloves shall be changed when

visibly soiled, torn, punctured or when their ability to function as a barrier is compromised. Gloves shall not be re-used.

- ❖ Safety glasses equipped with side shields shall be worn if there is potential for splashing, spraying blood or other potentially infectious material.

- ❖ A face shield shall also be worn if there is a potential for splashing, spraying of blood or other potentially infectious material.

- ❖ Mouthpieces or resuscitation bags shall be used to avoid “mouth-to-mouth” contact.

- ❖ A disposable gown, apron or coverall will be utilized when there is the potential for splashing or spraying of blood or other potentially infectious materials on the work clothing.

- ❖ Antiseptic hand cleanser and clean paper towel or cloth. Hands and other skin surfaces shall be washed immediately and thoroughly if contaminated with blood, potentially infectious body fluids or materials, or after handling soiled or contaminated equipment. Hands shall be washed immediately after gloves are removed.

- ❖ Red biohazard bags shall be used for all blood soaked clothing, bandages or other infected items.

Hepatitis B Vaccination

Each responder shall be offered the opportunity to receive the Hepatitis B immunization vaccination. Information concerning the vaccination shall be covered in the training program. Responders shall be offered the vaccine within ten (10) days of the conclusion of their initial training. Those refusing the vaccine must sign a declination form.

- ❖ HBV vaccine now being used in the USA is made from yeast and cannot be infected with HIV or other blood borne pathogen. The vaccine is perfectly safe and is administered in a series of 3 injections. The vaccine is 85 to 97 percent effective at protecting you from getting HBV or becoming a carrier for nine years or longer.

Procedures After Possible Exposure

- ❖ If a worker suffers a needle stick, cut; mucous membrane (splash to eye, nasal mucous, or mouth); exposure; or has a skin exposure to blood when the workers skin is chapped, abraded, or otherwise non-intact, the employer shall be

informed of the incident. The worker shall be tested for HIV and HBV infections, after consent is obtained.

- If consent is refused or if the employee tests positive, the individual shall be evaluated clinically and by HIV antibody testing as soon as possible and advised to report and seek medical evaluation of any acute febrile illness that occurs within 12 weeks after exposure. HIV zero negative workers shall be re-tested 6 weeks post-exposure and on a periodic basis thereafter (12) weeks and 6 months after exposure.

- Follow-up procedures shall be taken for employees exposed or potentially exposed to HBV. The types of procedures depend on the immunization status of the individual (i.e., whether HBV vaccination has been received and antibody response is adequate) and the HBV serologic status of the worker.

- If an employee refuses to submit to the procedures in (2) or (3) above when such procedures are medically indicated, no adverse action can be taken on that ground alone since the procedures are designed for the benefit of the exposed employee.

Disposal of Wastes

- All blood soaked clothing, bandages or other materials shall be placed in red bags marked **BIOHAZARD**.

- If such bags are not available, tags shall be used as a means to identify potentially hazardous material. Tags shall be used until such time as the identified hazard is eliminated or the hazardous operation is completed. Tags shall contain a signal word and a major message. The signal word shall be **BIOHAZARD** or the biological hazard symbol. The major message shall indicate the specific hazardous condition to be communicated to the employee. The signal word shall be readable at a minimum of 5 feet or such greater distance as warranted by the hazard. They shall be attached by a positive means such as wire, string, or adhesive that prevents their loss.

- All material shall be properly disposed of.

2.23 HEARING CONSERVATION

Scope

This section defines the minimum safety requirements for personnel exposed to Time Weighted Average (TWA) noise levels of 85 dBA or greater, areas with noise levels over 90 dBA, or equipment that generates noise levels in excess of 90 dBA.

Purpose

The Hearing Conservation Program is designated to protect against potential hearing loss by reducing or isolating personnel from exposure to potentially hazardous noise levels during the performance of their job.

Reference

29 CFR 1926.101, and the PPE section of this manual.

Definitions

- Audiogram — The chart, graph, or table developed from hearing testing that documents a person's hearing threshold levels.
- Audiogram, Baseline — A baseline test generally performed at the time of hire and/or prior to work site noise exposure, and is the test result against which all future audiograms are compared. NOTE: Baselines are adjusted after a Standard Threshold Shift (STS) has been confirmed and reported to the employee. The latest hearing test becomes the new Baseline Audiogram.
- Audiogram, End-of-Exposure — The End-of-Exposure hearing test that is conducted after an individual leaves noise exposure due to change of jobs or termination of employment.
- Decibel (dBA) - Unit of measurement for sound level, or sound pressure.
- End-of-Exposure — End of noise exposure due to transfer, retirement, termination, or reduction in noise exposure due to implementation of noise controls.
- Impulsive or Impart Noise — Intermittent noise levels (e.g. riveting, blasting, firearm discharge) that involve impulses or impacts. If intervals are greater than one second, the noise levels are considered to be continuous.

- Noise Dose — An individual's accumulated noise exposure over a specified time period (usually an 8-hour work shift). It is a ratio relative to a reference noise level of 90 dBA for an 8-hour period, which is equivalent to 100% of the allowable noise exposure.

- Noise Dosimeter — An instrument that measures an individual's personal sound pressure exposure over a period of time. Such measurements of noise dose are expressed in percent.

- Representative Exposure — Measurement of a given personnel's noise dose averaged, usually, over a period of eight (8) hours, and believed to be representative of other personnel in the work site.

- Standard Threshold Shift (STS) — An average change in an individual's hearing acuity, relative to the baseline audiogram, of 10 dB or more at 2000, 3000, 4000 Hz in either ear.

- Sound Level Meter — An instrument that measures an individuals sound pressure exposure instantaneously.

- Time Weighted Average (TWA) — The time weighted means, or average, of sound levels. It is usually measured for an 8 hour period or work shift.

- 85 dBA — This noise level can be described as a noise level in which, if three feet apart, individuals must speak with raised voices. 85 dBA refers to 85 decibels measured on what is called an A-weighted sound level scale.

General Requirements

Employees and supervisors shall actively participate in the Hearing Conservation Program by:

- Identifying high noise areas and equipment, as well as possible noise control methods.

- Ensure personnel are properly wear hearing protection in designated high noise areas or when operating high noise equipment/tools.

- Ensure employees keep appointments for hearing tests, follow-up testing or medical referral.

The primary responsibilities are:

- Perform noise monitoring (initially and when conditions change), and provide this information to hearing test provider.
- Train affected personnel regarding the Hearing Conservation Program.
- Provide personnel the opportunity to observe noise monitoring and provide noise measurement information to them.
- Document high noise level areas and equipment at each site.
- Implement feasible noise controls with appropriate outside assistance.
- Install appropriate warning signs for high noise areas and equipment.
- Maintain an "approved list" of hearing protection suitable for use.
- Ensure that personnel receive hearing tests and any appropriate follow-up designated by the Hearing Conservation Program.
- Ensure that personnel that have experienced a Standard Threshold Shift (STS) on a hearing test are re-tested within 30 days of notification.
- Maintain hearing test records.

Program Elements

- OSHA has adopted an 8-hour Time Weighted Average (TWA) of less than 90 dBA. Supervisors shall identify personnel exposed to noise at or above this level and include them in the Hearing Conservation Program. Additionally, personnel exposed to noise levels at or above 90 dBA in specifically definable areas (boiler rooms, emergency generator rooms, metal fabrication shops) or operating specifically identifiable equipment (power tools, jack hammers/high volume air compressors), shall be mandated to wear acceptable hearing protection devices.

Identification of Exposed Personnel & High Noise Areas/Equipment:

- Personnel potentially exposed to high levels of noise on the job are initially identified through interviews with supervisors, employees, safety committee members, fellow personnel and through a survey of the work area.
- Representative noise monitoring of the individual, the work area or equipment shall be conducted with sound level meters or noise dosimeters.

- Monitoring should be coordinated through the personnel's supervisor and the employee should be briefed on the monitoring process. Personnel should be given the opportunity to observe noise monitoring and will be informed of the monitoring results.

- The job titles to which the Hearing Conservation Program currently apply shall be listed in the Job Title Matrix. This Matrix should be revised periodically to reflect current employee noise levels.

- The Safety Officer or Contractor shall maintain a list of the work areas or equipment that have the potential for noise levels of 90 dBA or greater.

Table 1
Noise Evaluation Criteria

Criteria	Description	Requirements
85dBA TWA_8	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must have a hearing loss prevention program	- Hearing protection - Training - Audiometric testing
90 dBA TWA_8	Full-day employee noise exposure dose. If you leave one or more employees whose exposure equals or exceeds this level, you must reduce employee noise exposures in the workplace	- Noise controls - Hearing protection - -Training - Audiometric testing - Caution signs posted
115 dBA measured using slow response	Extreme noise level (greater than one second in duration)	- Noise controls - Hearing protection - Training - Audiometric testing - Danger signs posted
140 dBA measured using fast response	Extreme impulse or impact noise (less than one second in duration)	Hearing protection

Noise Monitoring Methods

- Dosimeters or sound level meters used for noise monitoring shall meet the requirements of the OSHA Hearing Conservation Standard.

- The equipment shall be factory-calibrated according to the manufacturer's instructions, and be field calibrated before and after each test.

- Monitoring results of all continuous, intermittent, and impulsive sound levels shall be integrated into the personnel's exposure records.

- Monitoring shall be repeated whenever changes in production, process, equipment, or controls significantly alter the employee noise exposure.

- Noise levels changing the hearing protection effectiveness shall also be re-evaluated.

  If these changes elevate the personnel's noise exposure to 90 dBA, Time Weighted Average (TWA) or greater, the feasibility of engineering noise controls must be re-evaluated.

Noise Controls

- Whenever an individual's noise exposure equals or exceeds an 8-hour Time Weighted Average of 90 dBA, the feasibility of administrative or engineering controls must be determined an documented.

- Feasible controls shall be implemented even though the control may not reduce the personnel's exposure to less than a 90-dBa Time Weighted Average.

Warning Signs

- Warning signs shall be posted to focus attention on areas and/or equipment that produce unusually high noise exposure levels. These signs shall warn personnel when hearing protection is required.

- Caution signs shall be posted at entrances to or on the periphery of all work areas with noise levels at or above 90 dBA (e.g. emergency generator rooms, crane cabs, etc.).

- Danger warning signs shall be posted at entrances to or on the periphery of all work areas with noise levels at or above 115-dBA.

  NOTE: Warning signs in areas where noise is intermittent must indicate that hearing protection is required when equipment is operating. They must also be

attached to or near tools, which operate above 90 dBA (e.g. table saws, routers, air compressors).

Hearing Protection

- Selection of Hearing Protection Devices - Personnel shall be given the opportunity to select their hearing protection from at least two different types (molded, self-molded, custom-molded, or ear-muffs).

Hearing protection shall be worn by personnel with the following exposures:

- An 8 hour Time Weighted Average of 85 dBA or greater.
- Noise exposures of 90 dBA or greater within well-defined areas or generated from equipment noise.
- Any duration of noise greater than 115 dBA.
- Any duration of impulsive or impact noise at or above 140 dBA.

Evaluation of Hearing Protection Effectiveness:

- Hearing protection devices shall be evaluated in accordance with the Hearing Conservation Standard OSHA 29 CFR 1926.101, and ordered from the "approved list".
- Specific considerations shall include the hearing protections noise attenuation, suitability in the work environmental, and interference with communication, durability, worker acceptance and sanitation.
- Hearing protection shall also be evaluated to determine it's effectiveness in reducing employee equal to 85 dBA.
- Each type of hearing protection carriers a Noise Reduction Rating (NRR). This rating will be used in combination with the highest noise exposure in an area to determine the effectiveness of the hearing protection being used.
- Each type of hearing protection carries a Noise Reduction Rating (NRR). This rating will be used in combination with the highest noise exposure in an area to determine the effectiveness of the hearing protection being used.

Use the procedure outlined in the following table to determine if a certain type of hearing protection is adequate for a given noise level:

Step	Action
1	Find the Noise Reduction Rating (NRR) of the hearing protection. (Listed on the container) .
2	Subtract 7 from this number.
3	Subtract the remainder from the measured noise level for the area or equipment.
4	If the result is less than 85 dBA, the hearing protection is adequate for this application.

Example:

An employee is exposed to noise levels reaching 97 dBA. This employee is utilizing hearing protection with an NRR of 28.

28-7= 21

97-21= 76 dBA

The hearing protection is adequate for this level of noise exposure.

If the number calculated using this method is greater than 85 dBA, the hearing protection is inadequate and better protection is required. In some cases, double protection (ear muffs over ear plugs) may be required in order to reduce the personnel's noise exposure level to 85 dBA or less.

Audiometric Testing

- Audiometric tests shall be performed by a licensed or certified audiologist, Otolaryngologist or other qualified physician, or by a technician who is certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC).

- A technician performing the tests must be responsible to an audiologist, Otolaryngologist or other qualified physician.

Baseline and Annual Audiograms

- Personnel shall be given an initial hearing test or Baseline Audiogram within thirty (30) days of their first exposure to noise at or above a TWA of 85 dBA. Personnel will thereafter be given audiograms on an annual basis.

- Annual audiograms shall be compared with their current baseline to determine if a hearing loss has occurred. The result of each audiogram will be discussed with the employee immediately after the test.

Baseline Audiogram testing shall be preceded by at least fourteen (14) hours of quiet time (no loud noise exposure). This may be accomplished by the use of hearing protection. Supervisors must notify personnel of the need to avoid exposure by using the Noise Avoidance Notification Form (Appendix A).

End-of-Exposure Audiograms

- Personnel who are no longer exposed to noise levels addressed by the Hearing Conservation Program (transfer, leave/retire, reduce noise levels through noise control) shall receive an End-of-Exposure Audiogram.

    - For personnel remaining within the company, this can be the next regularly scheduled annual audiogram.

    - Personnel transferring to another company will be given their End-of-Exposure Audiogram within 30 days of their transfer from a noise-exposed position.

- Testing for an End-of-Exposure Audiogram will also be preceded by at least fourteen (14) hours of quiet time (no loud noise exposure).

Audiometric Evaluation and Employee Notification

- The audiogram test provider will compare an individuals Baseline Audiograms to the most recent audiogram to determine if a Standard Threshold Shift (STS) has occurred. A certified audiometric technician may make this comparison. An audiologist, Otolaryngologist or other qualified physician shall confirm that an STS has occurred, and whether or not further evaluation of the employee is necessary.

The following information will be available to the individual evaluating the audiogram:

- A copy of the Hearing Conservation Standard.

- Baseline and most recent audiogram reports.

- Records of background sound pressure levels in the audiometric test rooms (as received from the test provider).

- Records of audiometer calibrations as received from the test provider.

- The audiogram provider will inform each employee verbally at the time of testing, of his/her results and whether or not there has been a hearing level decrease or improvement since the previous test. The employee shall be notified in writing of any Standard Threshold Shift within 21 days of notification by the hearing Test Provider.

- The audiometric test provider will provide an annual summary of the hearing test data to the Safety Officer.

Audiograms — Follow-up

The Test Provider will carry out the following:

- Send a summary of audiometric tests to the Safety Officer after each testing period.

- Send copies of letters describing test results for distribution to the employee and to required agencies such as Worker's Compensation. Letters will follow all baseline exams. Letters will follow annual exams only if an STS is detected or if a medical or audiologist referral is being made.

- Substitute the annual audiogram for the baseline audiogram, when, in the judgment of the audiologist, Otolaryngologist or other qualified physician who is evaluating the audiogram:

    - The Standard Threshold Shift revealed by the annual audiogram is persistent.

    - The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

- Fit, re-fit, and re-train personnel regarding hearing protection who have had an STS.

The Safety Officer shall:

- Forward provider letters to personnel.

- Shall review the report and take appropriate action.

- Obtain a re-test within 30 days of notification, if an STS has occurred. (The results of the re-test will be considered the annual audiogram.)

- Coordinate additional testing, either “diagnostic” (extensive hearing evaluation) or “medical” (less extensive check-up, e.g., for wax accumulation) if recommended by the provider.

- See that confirmed STS’s are reported on the OSHA 300 Log.

Recordkeeping

- All records of noise exposure monitoring shall be retained by the Safety Officer for a minimum of 2 years.

- All audiometric test records shall be retained for the duration of the affected personnel’s employment.

Audiometric test records will contain the following information:

- Audiograms with name, job classification, date, examiner’s name, date of the last acoustic or exhaustive calibration of the audiometer.

- Audiometric test room measurements.

Education and Training

- All personnel within the program must complete an annual education and training program in conjunction with their hearing testing.

- The program shall be updated annually to incorporate changes in hearing protection technology and work processes.

Employee education for the Hearing Conservation Program will address the following elements:

- The effects of noise on hearing.

- The purpose of hearing protection, the advantages, disadvantages, and attenuation of various types, instruction on selection, fitting, use, and care.

- The purpose of hearing testing and explanation of test procedures.
- Information regarding the right to access audiometric test records.

- A demonstration on the proper insertion/use of hearing protection devices.

- Information regarding the personnel’s right to access his/her records.

Appendix A
Hazard Avoidance Notification Form

To (Employee)	Social Security Number
From (Supervisor)	Department
Subject	Date
Noise Avoidance Notification	

Prior to Baseline and End-of-Exposure Hearing Tests in order to obtain an accurate measurement of hearing thresholds, OSHA regulations (29 CFR 1926.52) require that a baseline or End-of Exposure audiogram be preceded by at least fourteen (14) hours of quiet time. (No loud noise exposure such as loud music, driving in traffic with windows open, operating power tools, etc.)

Please wear hearing protection if necessary to meet this requirement.

Your exam is scheduled on:		Date	
Time		Place	

PERMIT REQUIRED PROCEDURES

This section contains types of work that require permits or approval by controlling authorities such as the Safety Department or the Engineer. It is the responsibility of the Supervisor to coordinate and obtain any required permits or approval prior to commencing work.

Confined Space Entry
Under Dock Work
Hot Work
Electrical Lockout / Tagout
Portable Heaters
Energized Electrical Work

3.0 CONFINED SPACE ENTRY

Scope

This section outlines the minimum safety requirements to be followed while conducting work in a confined space.

Purpose

The intent of this program is to reduce the potential for injury to personnel, fire, explosion and damage to property while engaged in confined space entry work.

Reference

OSHA 29 CFR 1910.146 and ANSI Z1 17.1-2003

Definition

A Confined Space is a space that:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit.
- Is not designed for continuous occupancy.
- Some typical examples of confined spaces are electrical vaults, excavations & trenches (where potential or known hazards exist), utility manholes, and sewers. The Qualified Person will be required to make a determination as to what is and what is not a confined space.

  NOTE: There are no minimum depth requirements for confined spaces!

- The hazards of confined space entry are not always seen, smelled, heard, or felt. What may appear to be a harmless situation may indeed be a potential threat.

A Permit Required Confined Space is a space that:

- Meets the criteria for a confined space listed above.

- Does contain or has the potential to contain hazardous atmospheric conditions, energized electrical gear, mechanical, engulfment, entrapment or may have hazards introduced through welding, cutting or painting operations.

  NOTE: Do not over look the obvious — animals, insects or reptiles can create hazards during a confined space entry.

- A Confined Space Survey is a survey initially conducted by the Qualified Person of the project or operations to identify confined spaces as defined by the standard.

- A Qualified Person is a person who by reason of training, education and experience is knowledgeable in the operation to be performed and is competent to judge the hazards involved and specify controls and/or protective measures.

Requirements

- Personnel entering into confined spaces must first complete the Confined Space Entry Program Certificate found in Section 3.0, page 198 of this manual and forward to the Engineer.

- A Job Safety Analysis (JSA) must also be completed for this operation.

Training

Training shall be given to all personnel who will or may perform such work prior to initial assignment in a confined space and at least annually thereafter. As a minimum, training shall cover the following procedures and related personnel:

  - Hazard recognition.
  - Emergency procedure.
  - Use of personal protective equipment.
  - Electrical/mechanical lockout and tagout procedures.
  - Proper use and limitations of atmospheric testing devices.
  - Proper use of special equipment and tools.
  - Refresher training of personnel shall occur when employees are noted to be in violation of the standard or the specific duties listed in the standard.

- Entry Supervisor is the individual (employer, foreman, superintendent) who is responsible for determining if acceptable entry conditions are present where entry is planned, verifies rescue services are available prior to entry, authorizes entry, oversees the entry operation and terminates the entry permit when required.

- Attendant is the individual stationed outside the confined space who monitors the authorized entrants and who performs all entrant duties assigned and have no other duties.

- Authorized Entrant is any employee who is trained and authorized to enter the confined space.

- Rescue Personnel are trained designated personnel who provide rescue and emergency services.

- Documentation – the names, dates, and type of training performed shall be documented and maintained in the file. These records must be available to the port Construction Safety Staff and Engineer to verify that the employees are trained.

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Personal Protective Equipment

- Suitable and necessary rescue equipment including retrieval gear shall be immediately available at all times. This equipment shall be selected with the potential hazards or possible contingencies anticipated during the work operations.

- Employees entering into both permitted and non-permitted confined spaces must be wearing a full body harness for retrieval purposes.

- If the confined space is designated a “permit entry” confined space, the entrant’s lifeline shall be fastened to both the full body harness and retrieval device.

- Employees exposed to physical hazards shall utilize appropriate Personal Protective Equipment (PPE) for the work to be performed.

- Protective clothing shall be worn where burning or irritating substances may be encountered. Where flammable vapors may be present, use only non-spark producing hand tools. Power tools must be grounded and have Ground Fault Circuit Interrupter (GFCI) protection.

- When welding, cutting, or burning takes place inside a confined space, the use of airline respirators or pressure demand self-contained breathing apparatus shall be required for all entrants if the space can not be properly ventilated.

Atmospheric Conditions

The most common atmospheric conditions that constitute hazards during confined space entry are oxygen deficiency, combustible and flammable gases and vapors, and toxic gases and vapors. In fact, some of the deadliest gases and vapors have no odor or other distinguishable characteristics at all.

Oxygen Deficiency

Normal air contains 20.9 percent oxygen. Oxygen-deficient atmospheres contain less than 19.5 percent oxygen. Never permit any employee to work in any atmosphere where the oxygen content is below 19.5 percent without providing ventilation or air supplying respirators. Oxygen deficiency occurs in confined spaces when the level of oxygen is reduced below the limit to support life. Some of the more common causes of this hazard are oxidation of metals, bacterial action, combustion, and displacement by other gases.

Examples of these atmospheric conditions are as follows:

- The slow oxidation of metals as rust can be prevalent in tanks made of iron or steel. This process depletes the confined space of oxygen.

- Work in or around sewer, lines and sanitary landfills may contain enormous amounts of bacteria. Certain bacteria consume oxygen and produce carbon dioxide.

- Combustion is the rapid oxidation of a substance. An ignited welding or cutting torch consumes oxygen rapidly and may leave an area dangerously low in oxygen if ventilation is not provided.

NOTE: By the same token, oxygen enriched atmospheres with levels above 23.5 also constitute a hazardous atmosphere.

Combustible/Flammable Gases and Vapor

- Combustible gas and vapor hazards include naturally occurring gases and vapors or a large group of liquids used as fuels and solvents. Some of these liquids vaporize quickly. Both gases and vapors when mixed with air will burn or explode when ignited. Besides having a fire potential, many combustible gases and vapors are also toxic.

- Some flammable gases and vapors are heavier than air. These gases and vapors are frequently found in sewers, pits, and other low-lying confined spaces.

- Some flammable substances may leak into ground water that seeps into excavations and vaporize, creating an explosive atmosphere. Some types of bacteria produce methane gas. Methane is the chief constituent of natural gas and is extremely explosive. Methane is often found in the vicinity of swamps, marshes, bogs, and sanitary landfills.

- Toxic Atmospheres – toxic substances are commonly found in industry, as well as being generated by natural processes. These substances include all gases and vapors that are known to produce disease, acute discomfort, bodily injury, or death. There are two major classes of toxic substances found in confined areas: asphyxiates and irritants.

- Asphyxiates – An

- Asphyxiates can be any gas that causes asphyxiation by displacing the oxygen in the atmosphere. Asphyxiates may also render the body incapable of utilizing an adequate oxygen supply. This is called chemical asphyxia. For example, carbon monoxide kills by chemically combining with hemoglobin in the blood. This combining process greatly reduces the ability of the blood to carry oxygen to the body tissue. Death occurs due to chemical asphyxiation. Never operate gasoline or diesel power equipment in or near a confined space.

- Irritants – some gases in low concentrations are mildly irritating to the respiratory and nervous systems. At high levels, they cause death. These gases work by paralyzing either the body sensory or pulmonary functions. Death results from asphyxiation. Common irritants found in industrial construction are hydrogen sulfide (H2S), sulfur dioxide (S02), and nitrogen dioxide (NO2).

  The following chart shows the irritants found in industrial construction.

Gas	Physical Characteristics	Flammability Lower Exposure	Toxicity Threshold Limit Value (TLV) PPM
Carbon Monoxide (CO)	Colorless Odorless	12.5%	35 PPM
Carbon Dioxide (C02)	Colorless Odorless	Nonflammable	5000 PPM
Methane (CH_4)	Colorless	5%	500 PPM
Hydrogen Sulfide (H_2S)	Colorless Suffocating Odor	Nonflammable	2 PPM
Nitrogen Dioxide (N02)	Brown Pungent Odor*	Nonflammable	3 PPM

* Cannot be smelled at lethal concentrations due to paralyzing action of the olfactory system.

NOTE: Other potentially hazardous gases, fumes, and vapors are used or created by construction operations such as welding, cutting, and painting. These substances include zinc, cadmium, chromium, magnesium, lead, and toluene. If these substances are allowed to accumulate, they can cause both acute and chronic injury and illness.

Isolation and Lockout

- All confined space areas that cannot be isolated from the possible release of hazardous substances must be treated as if the area actually contained the hazardous substance. All valves must be locked closed along with lines leading to the confined space. Whenever possible, the lines should be taken apart. Blinds must be inserted between flanged connections. Be sure that blinds are of sufficient strength to handle any pressure building if the pump were accidentally turned on.

- Electrical circuits and machinery that could cause injury shall be locked and tagged out before entry is permitted. The main switch to the electrical power supply for any pump, fan or motor must be locked in the “off’ position. Locks must have only one key, and it should be in the possession of the individual working in the confined space. If more than one person is working in the confined space, each should have his or her own lock and key. A tag shall be used in conjunction with the use of locks. See the Hot Work section of this manual.

- Entry into vaults containing energized systems requires notification 7 days in advance to the Engineer and the Port Electrical Shop. Work on systems that are not de-energized requires proper PPE as found in OSHA 29 CFR 1926 Subpart K – Electrical, and the Electrical Safety Program, Hot Work, and Energized Electrical Work sections of this manual.

Clean and Purge the Space

- Once the space has been isolated, cleaning and purging may be required. The extent of these procedures depends on the nature of the material in the space, decomposition or other chemical reactions that may affect the atmosphere, the level of residue and amount of scale buildup on the inside walls, the configuration of the space, and the size and location of manholes, hatches, and vents.

- A confined space that has been used to store liquids, chemicals, or food must be purged of all sediment, sludge, or residue. Even small amounts of material can create lethal quantities of hazardous gases or vapors.

These steps should be followed:

- Empty the vessel and drain or pump out remaining sludge and residue.

- Flush the vessel if possible. Flushing can range from simply hosing the walls and floor to completely filling and draining the container.

- It may be necessary to purge the vessel further with steam, nitrogen, or an inert gas after it has been flushed. The environment inside the vessel should be tested at this point to determine if further purging is necessary. If sediment adheres to the walls or floor, or if corrosion scale or rust is heavy, purging is almost always necessary.

Ventilate the Space

- All "permit required" confined spaces, regardless of their content, must be ventilated! The term "ventilation" refers to a continuous forced air system and not natural ventilation. If the space has been re-classified to a non-permit" required status, ventilation is not required but is recommended.

  NOTE: It is the responsibility of the Qualified Person to determine the dimensions of the confined space and the number of air changes required in that space before the space is entered.

- Ventilation is required to eliminate oxygen deficiency, accumulated combustibles or toxic substances. The space must be sufficiently ventilated so that levels of combustibles do not exceed ten percent of their lower explosive limit (LEL), and toxic substance levels do not exceed their respective Threshold Limit Values (TLV).

- The most efficient way to ventilate a space is to introduce fresh air near the bottom of the space and discharge it near the top. Any system of positive ventilation must maintain a constant flow of fresh air through all areas of the space.

- When combustibles are purged, any spark source outside the space such as an electric or combustion motor should be kept away from the discharge stream.

- Oxygen must never be used to purge or ventilate a confined space. Oxygen concentrations in excess of 21 percent may significantly increase the combustibility of other substances in the space.

Testing the Atmosphere

- After the space has been cleaned, purged, and ventilated, the atmosphere shall be tested for oxygen deficiency, combustibility, and toxicity.

- *All* confined spaces regardless of classification must have the atmosphere tested!

- At a minimum, atmospheric testing shall take place *prior* to the authorized entrant(s) entering the confined space or upon re-entry of the space after the entrant(s) have vacated the space for a minimum of (30) thirty minutes. Other circumstances may require more frequent monitoring or continuous monitoring of the space.

- As discussed earlier, gases and vapor possess different characteristics with some being heavier than air. When testing the atmosphere be sure to test not only the area at the top but also all areas down through the bottom of the confined space.

- Persons responsible for using atmospheric testing equipment shall be trained in their use as specified by the manufacturer. This equipment shall also be calibrated as specified by the manufacturer and documentation from such tests shall be retained.

- If the atmosphere still tests positive for any hazard, further cleaning and purging may be necessary.

Communication

Communication shall be maintained with all personnel in confined spaces. This shall be accomplished by utilizing one or more of the following methods:

- Visual
- Voice
- Telephone
- Two-way Radio

NOTE: Proper selection shall be dictated as to whether an explosive atmosphere exists in areas of intended use.

Entry Permit

- All work performed in confined spaces shall be completed under a Confined Space Entry Permit System. Permits shall be valid for one (1) shift only.

- The purpose of the entry permit is to ensure that all necessary precautions have been taken before any confined space entry is made. The type of operation to be

performed in a confined space will determine safety requirements necessary during the work. The confined space entry permit outlines such precautions.

- Use the Confined space entry Permit found on pages 189 – 190 of this manual.

- The confined space entry permit shall be posted at the entrance into the confined space. **NOTE**: Under OSHA 29 CFR 1910.146, each cancelled confined space entry permit must be retained for at least one year.

Attendant

- At least one attendant shall be stationed outside of a "permit required" confined space while that space is occupied. If the space has been reclassified to "non-permit", required status an attendant is not required but is recommended**.**

- The attendant shall remain at this station until the entry is terminated or another attendant relieves them of their duties.

- Shall terminate the entry if a hazardous condition is detected.

- Communication with the authorized entrants is a duty of the attendant.

- The attendant must also monitor the activities of the entrants in the space and order an evacuation of the space if required.

- The attendant shall summon rescue or emergency personnel to the space if required.

- The attendant must also be properly trained, equipped, and capable of removing the worker in an emergency.

  NOTE: Attendants are instructed not to *enter* the confined space to perform rescue unless another attendant is present and they have been thoroughly trained and equipped in confined space entry rescue.

Entry

- Under no circumstances shall anyone enter a confined space without first testing it for hazardous atmospheric conditions.

  NOTE: When accepted engineering control measures such as continuous forced air ventilation are employed and air sampling determines that flammable or toxic limits have been exceeded or an oxygen deficiency exists, or other existing

hazards can not be controlled, the space shall not be entered. The Supervisor shall notify the Engineer and the Port Safety Department.

- Access and egress shall be maintained at all times while work is being performed in a confined space.

- All personnel entering confined spaces shall wear a full body harness. If the space is deemed "permit required," a lifeline shall be employed and attached from the harness to the retrieval system.

- Before entry is made into any energized electrical cable vault or manhole, an infrared tester shall be used to scan the cables and connector components. If a temperature difference of 10 degrees Fahrenheit is detected between the cable and connector components, or any reading greater than 140 degrees Fahrenheit is detected from the cables or components the entry shall not be made!

The Authorized Entrant

- Shall be able to recognize potential hazards that may be encountered during the entry.

- Must be able to respond to emergencies, which includes methods for self-rescue.

- Must recognize symptoms and warning signs of exposure to potential hazards or prohibited conditions.

- Shall notify the attendant of emergencies or unacceptable conditions in the confined space.

- Exit the confined space immediately if symptoms, warning signs, or unacceptable conditions occur or if detected by the attendant or entry supervisor.

Non-Permit Required Confined Space

- Some permit-required confined spaces may be re-classified to non-permitted confined spaces once all safety and health hazards or potential hazards have been eliminated. To reclassify a permit-required confined space to a non-permitted, both the Entry Permit and the Re-classification Permit must be completed. Monitoring of atmospheric conditions is required.

- Employees entering the space must be wearing a full body harness and a retrieval device must be readily accessible.

- The use of an attendant and ventilation are not required but recommended.

Illumination

- Personnel shall not enter confined spaces without an approved portable light. The use of an open flame for lighting is prohibited.

- In confined spaces where a flammable atmosphere exists or may exist, only approved low-voltage, explosion-proof lights shall be permitted. Such lights shall be properly identified and in good condition.

- Approved battery-powered flashlights (three volts or less) properly marked for use only in a hazardous area shall be permitted when flammable atmospheres are present.

- All external-powered illumination devices shall be of the approved type and equipped with a ground fault circuit interrupter.

Temporary illumination used in areas other than where flammable atmospheres are present shall meet all National Electrical Codes and local requirements, and be of the grounded type.

Fire Protection

The following conditions shall be assured in confined spaces at all times. Refer to the Fire Prevention & Hot Work Sections in this manual for general information concerning overall work area fire prevention requirements.

- Flammable liquids (i.e., acetone, alcohol) must be stored in approved (UL or FM) flammable liquid containers or dispensers. The amount of such flammable liquids shall not be in excess of the amount necessary to perform the work each day.

- Properly rated fire extinguishers shall be immediately available.

- Cylinders containing oxygen, acetylene or other fuel gases shall not be taken into confined spaces.

- All used rags, brushes, wipes, and gloves shall be stored in metal containers with lids.

- A “fire watch” shall be posted during all welding, burning and heating operations to monitor for fires. This person shall ensure that there are no fire conditions present after the work has ceased or at the end of a work shift.

- All flammable gas equipment such as hoses and torches shall be free of defects and inspected by the user prior to confined space work.

- To eliminate the possibility of fire in confined spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be positively closed at the tanks whenever the torch is left unattended for a period of thirty (30) minutes or greater, such as during lunch breaks. At the end of a work shift, the torch and hoses shall be removed from the confined space. Fuel gas and oxygen hoses shall not be disconnected from the torch or other gas-consuming device while in the confined space.

SELECTION GUIDE FOR CONFINED SPACE ENTRY PROCEDURES

Types of Hazards	Procedure	Paperwork Required	Attendant Required	Air Testing	Ventilation	Rescue Equipment
❖ Electrical ❖ Entrapment ❖ Engulfment ❖ Contaminated Atmosphere ❖ Oxygen Deficient ❖ Other Recognized Hazards	Permit Required	Completed Entry Permit	Yes	Required	Required	Entrant(s)
❖ Poses No Actual or Potential Hazards	Reclassification to Non Permit	Entry Permit & Authorization for Entry	No	Required	Required	Entrant(s) in full body harness with retrieval gear readily available

PORT OF LAKE CHARLES
CONFINED SPACE ENTRY PERMIT

Contractor		Date		Time	
Name and Location of Confined Space					
Reason for Entry					
Name of Entry Supervisor					

	YES	NO	N/A
Is a HOT WORK Permit Required and Attached?			
Has pre-entry training been conducted?			
Is electrical equipment disconnected, locked and tagged out?			
Have all mechanical and physical hazards been isolated?			
Are the attendants trained on their duties?			
Have the applicable Port personnel been notified of the entry?			
Are entrants utilizing full body harnesses?			
Retrieval gear available?			
Has confined space been ventilated?			
Has infrared scan of cables/connectors been performed?			

List all people who will be authorized to enter the space and be a standby person(s)

Names of Authorized Entrants	Names of Designated Attendant(s)

Record of atmospheric testing – Make sure equipment is working and calibrated

Containment Tested For	Limits	Result	Time	Results	Time	Results	Time
Oxygen (19.5 – 23.5” only)							
Combustible Gas (LEL) 10% Max							
Carbon Monoxide 35 PPM Max							
Hydrogen Sulfide 10 ppm Max							
Other							

Name of person(s) conducting atmospheric testing						
Testing Equipment Used	Name		Type		ID#	
	Name		Type		ID#	

Type(s) of Personal Protective Equipment used available to entrant(s) and attendant(s)

Insulated Clothing/Barriers	Respirator	Eye Protection	Hard Hat	Hearing Protection
Other Safety Equipment	Lighting	Retrieval Gear	SCBA	Full Body Harness

Rescue/Emergency Numbers				
Communication System Between Entrants/Attendants				
Permit Cancelled	Date		Time	
SIGNED (Entry Supervisor/Competent Person)				

EMPLOYEES MAY NOT ENTER CONFINED SPACE UNDER ANY CONDITIONS UNTIL IT HAS BEEN PROPERLY EVALUATED – NO EXCEPTIONS

PERMIT MUST REMAIN ON JOB SITE UNTIL THE JOB IS COMPLETE
THIS PERMIT IS VALID FOR ONE (1) SHIFT ONLY

AUTHORIZED FOR ENTRY
INTO A PERMIT-REQUIRED CONFINED SPACE
RE-CLASSIFIED TO NON-PERMIT REQUIRED STATUS

Location & Description of Confined Space:	
Date of Entry	Time of Entry
Purpose of Entry:	
Name of Entrant(s):	

CERTIFICATION REQUIREMENTS FOR NON-PERMIT REQUIRED STATUS		
Note: All requirements must be marked YES and the Entry Supervisor must sign and date prior to entry.		
YES	NO	This confined space poses no actual or potential atmospheric hazards, and the work to be conducted during entry does NOT include welding, the use of chemicals, or other activity that could create an atmospheric hazard.
YES	NO	The lockout/tagout procedures necessary to eliminate all hazards from mechanical, electrical or other energy sources within the space have been completed.
YES	NO	All recognized serious safety hazards with the space have been eliminated.

Entry Supervisor Signature	Date

3.1 UNDER DOCK WORK

PROGRAM SUMMARY

To Whom Does this Apply?

- Employees who work under docks must receive education in potential hazards, reporting procedures and use of radios and life jackets. The procedures outlined in this summary apply to every one who must work under marine docks whether in work boats or on platforms.

Key Program Elements

- Use of Life Jacket and Radio — Employees must wear a life jacket and take a marine radio.

Departure, Check-In, and Return Reporting Responsibilities:

- Advise Safety Representative* when leaving the boat moorage of estimated time of arrival where dock work will be done.

- Contact Safety Representative* before going under dock. Give estimate of the time when you will be coming out from under the dock. Do not proceed without confirmation that message has been received by Dispatch.

- Contact Safety Representative* at scheduled lunch break even if work is not complete.

- Contact Safety Representative* when you are finished under dock.

Give the following information:

- Next location for under dock work or advise of intent to return to moorage.

- Estimate time of arrival at next location or moorage.

- Contact Safety Representative* to notify, when you have returned to moorage and are out of the water.

- Safety Representative* Responsibilities —Safety Representative will log all communications on the status board. The Safety Representative will ensure that

personnel check-in as required and will advise relief Safety Representative of status of under dock work. In case of lost communications, the Safety Representative will make appropriate contacts with 911, and the Resident Engineer. The Resident Engineer will contact facilities and Port Maintenance.

NOTE: *The Resident Engineer is responsible for monitoring under dock activity at the Port. It is the responsibility of the Safety Representative to manage the communications and monitoring for under-dock work and to keep the Resident continually aware of the under-dock work status. Any other projects requiring under-dock work must establish a similar contact for monitoring the progress and safety of employees doing this type of work.*

Education and Training

- Employees must be informed of safe practices for under dock work.

3.2 HOT WORK

Scope

This section outlines the minimum safety requirements for hot work operations.

Purpose

The intent of the "Hot Work" permit procedure is to implement fire protection precautions and minimize the potential for a fire and property damage, as well as possible interruption of Port of Lake Charles operations.

Reference

29 CFR 1926 Subparts F & J, and the Cutting & Welding, Flammable and Combustible Liquids and Fire Protection sections of this manual.

Definition

- Hot Work is considered to be open flame equipment, gas, or arc cutting and welding, brazing, cad welding, or spark-producing equipment.

General

All regulations must be followed as outlined in the Port's work program/procedures, as well as State and federal safety requirements, uniform fire codes, national fire codes, and NFPA standards.

The following general conditions shall apply to each hot work operation.

- A Hot Work Permit shall be required and issued by the designated site safety representative. The permit must be in the employee's possession before any work begins. Each crew involved in hot work operations is required to have a permit.

- Hot work operations will be limited to the area specified on the permit.

- Hot work cannot begin on or near any container or equipment that contains or had contained flammable liquids until the fire and/or explosive hazard has been eliminated.

- The designated site safety representative shall conduct an inspection of the area in which the hot work is to take place. The inspection shall take place prior to the

work to ensure flammables or combustibles are not present and no possibility of fire exists.

- When practical, objects to be welded, cut, or heated shall be moved to a designated location.

- If the object to be welded, cut, or heated cannot be moved and the fire hazards cannot be removed, positive means shall be taken to confine the heat, sparks, and slag and protect the immovable hazard or in place property from damage. This can be accomplished through the use of fire retardant plastic or blankets.

- Flammable/combustible materials subject to hot work operations shall not be stored closer than 35 feet from the hot work operations.

- In areas where welding and cutting operations have the possibility of impacting employees with falling molten slag, employees shall be protected by providing overhead protection, barricading, or other means.

- A fire watch shall be employed and assigned no other duties than those related to observation of the hot work area. This individual shall be familiar with the operation of fire fighting equipment, warning system, and facility layout.

- The fire watch must observe the area in question through lunch and/or coffee breaks and up to the prescribed time on the Hot Work permit after work has been completed.

- The employee shall supply, at least, a ten-pound ABC fire extinguisher.

- An additional fire watch may be required on the other side of any wall or partition if the hot work is performed adjacent to a wall or partition.

- Call 493-3551 or 911 in case of fire.

- Should the use of a fire extinguisher be necessary, a fully charged replacement is required before work can resume.

- Port Safety will review storage areas of compressed gas cylinders containing oxygen or fuel.

- When air monitoring is required, the lower Explosive Limit must be non-detectable prior to any type of burning, welding, or hot work being conducted. (Air monitoring shall be required around or near any areas, which may pose a potential fire or explosion threat from flammable or combustible vapors).

HOT WORK PERMIT

Before initiating Hot Work, can this job be avoided? Is there a safer way?

This Hot Work Permit is required for any temporary operation involving open flames or producing heat and/or sparks. This includes, but is not limited to: Brazing, Cutting, Grinding, Soldering, Thawing Pipe, Torch Applied Roofing & Welding.

Instructions: Fire Safety Supervisor

- Verify precautions listed or do not proceed with the work.
- Complete and retain Part 1.
- Issue Part 2 to person doing job.

Hot Work Being Done By		Date:		Job No	
Employee		Contractor			
Location/Building & Floor					
Nature of Job					
Name of Person Doing Hot Work					
I verify the above location has been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire and permission is authorized for this work.					
Signed: (Fire Safety Supervisor)					
Permit Expires	Date		Time		

NOTE: Emergency notification on back of form. Use as appropriate for your facility.

REQUIRED PRECAUTIONS CHECKLIST

- ☐ Available sprinklers, hose streams & extinguishers are in service/operable.
- ☐ Hot Work equipment in good repair.

Requirements Within 35 ft (11m) of Work

- ☐ Flammable liquids, dust, lint and oily deposits removed.
- ☐ Explosive atmosphere in area eliminated.
- ☐ Floors swept clean.
- ☐ Combustible floors wet down, covered with damp sand or fire-resistive sheets.
- ☐ Remove other combustibles where possible. Otherwise, protect with fire-resistive tarpaulins or metal sheets.
- ☐ All wall and floor openings covered.
- ☐ Fire resistive tarpaulins suspended beneath work.

Work on Walls or Ceilings

- ☐ Construction is noncombustible and without combustible covering or insulation.
- ☐ Containers purged or flammable liquids/vapors.

Work on Enclosed Equipment

- ☐ Enclosed equipment cleaned of all combustibles.
- ☐ Containers purged of flammable liquids/vapors.

Fire Watch/Hot Work Area Monitoring

- ☐ Fire watch will be provided during & for 60 minutes after work including any coffee or lunch breaks.
- ☐ Fire watch is supplied with suitable extinguishers, charged small hose.
- ☐ Fire watch is trained in use of this equipment and in sounding alarm.
- ☐ Fire watch may be required for adjoining areas, above and below.
- ☐ Monitor Hot Work area for 4 hours after job is completed.

Other Precautions Taken

WARNING!
HOT WORK IN PROGRESS
WATCH FOR FIRE!
Part 2

Instructions:

- Person doing Hot Work: Indicate time started & post permit at Hot Work Location. After Hot Work, indicate time completed and leave Permit posted for Fire Watch.
- Fire Watch: Prior to leaving the area, do final inspection, sign, leave permit posted and notify Fire Safety Supervisor.
- Monitor: After 4 hours do final inspection, sign and return to Fire Safety Supervisor.

Hot Work Being Done By		Date		Job No	
Employee		Contractor			
Location/Building & Floor:					
Nature of Job:					
Name of Person Doing Hot **Work**					
I verify the above location has been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire and permission is authorized for this work.					
Signed: (Fire Safety Supervisor)					
Permit Expires	Date		Time		

Fire Watch Sign Off: Work area and all adjacent areas to which sparks & heat might have spread were inspected during the Fire Watch period & were found fire safe.

SIGNED:

Final Check-Up: Work area was monitored for 4 hours following Hot Work and found fire safe.

SIGNED:

REQUIRED PRECAUTIONS CHECKLIST

- ☐ Available sprinklers, hose streams & extinguishers are in service/operable.
- ☐ Hot Work equipment in good repair.

Requirements Within 35 ft (11m) of Work

- ☐ Flammable liquids, dust, lint and oily deposits removed.
- ☐ Explosive atmosphere in area eliminated.
- ☐ Floors swept clean.
- ☐ Combustible floors wet down, covered with damp sand or fire-resistive sheets.
- ☐ Remove other combustibles where possible. Otherwise, protect with fire-resistive tarpaulins or metal sheets.
- ☐ All wall and floor openings covered.
- ☐ Fire resistive tarpaulins suspended beneath work.

Work on Walls or Ceilings

- ☐ Construction is noncombustible and without combustible covering or insulation.
- ☐ Containers purged or flammable liquids/vapors.

Work on Enclosed **Equipmen**t

- ☐ Enclosed equipment cleaned of all combustibles.
- ☐ Containers purged of flammable liquids/vapors.

Fire Watch/Hot Work Area Monitoring

- ☐ Fire watch will be provided during & for 60 minutes after work including any coffee or lunch breaks.
- ☐ Fire watch is supplied with suitable extinguishers, charged small hose.
- ☐ Fire watch is trained in use of this equipment and in sounding alarm.
- ☐ Fire watch may be required for adjoining areas, above and below.
- ☐ Monitor Hot Work area for 4 hours after job is completed.

3.3 ELECTRICAL LOCKOUT/TAGOUT

Scope

This section defines the minimum safety requirements for lockout tag-out to assure the safety of personnel and equipment when performing work on or around equipment capable of having an energy source applied.

Purpose

This procedure is intended to protect personnel from injury caused by accidental activation of equipment and to prevent damage to equipment and/or processes that could occur from the same cause.

Reference

29 CFR19IO Subpart S, 29 CFR 1926 Subpart G, and the Electrical Safety and Energized Electrical sections of this manual.

Definitions

- Tag-out Device — A tag used in the Lockout/tagout Procedure. Examples: Danger, Do Not Operate, Do Not Start.

- Competent/Qualified Person — A person familiar with the construction, operation, and hazards of the specific equipment involved and has training in avoiding hazards.

Responsibility

- Supervisors are responsible for seeing that equipment or circuits that are de-energized are properly tagged, locked out and rendered inoperative. Supervisors must brief all employees who will be performing work on the de-energized equipment or circuits to familiarize them with the lockout/tag-out procedure before any work is started. Only the person signing and placing a tag/lock may remove it when work is complete. All electrical lockout/tagouts, power outages, power disruptions, and re-energizations shall be coordinated through the Engineer.

- Zero energy storage must be assured by bleeding, blocking, or blinding control circuits or systems to assure deactivation. Trying to activate it to ensure positive lockout will then test the system. This procedure applies to energy sources that are mechanical, air, hydraulic, thermal, chemical or spring loaded.

- A lock and tagout device and attachment apparatus and shall be used to secure main power sources. This includes electrical panels and switches, which service equipment and/or processes that upon activation could cause unexpected movement or release of energy. This procedure applies to inspection, cleaning, alteration, installation, and repair activities.

Specific Requirements

- The Competent/Qualified Person is responsible for ensuring adequate protection is provided through these lockout/tagout procedures for all equipment and personnel under their control. Do not assume that protection is provided due to tags placed by another employee! Do not clear tags placed by others.

- The following procedures shall be read and discussed with all craftsmen and staff to ensure complete understanding of the procedures before energizing the system;

Prior to Energizing New Equipment

- All electrical gear shall be locked and tagged out by the designated representative.

- All electrical gear shall have devices installed or be capable of installation of multiple locks.

- In the event a positive lockout cannot be made (such as a toggle switch), the individual switch shall be de-energized and a tag-out device installed by the person working on it.

- All tagout devices shall be signed and dated by the employee with instruction as to why the tag was placed.

- It is the Competent/Qualified Person designated responsibility to ensure that no work is performed beyond the protection of the lock and tags installed.

Energizing New Equipment for the First Time

- Prior to energizing, the Competent/Qualified Person and the Port's electrical representative shall inspect all electrical gear to ensure compliance with Part I of this procedure.

- Furnish and install a "DANGER — HIGH VOLTAGE" sign on all switchgear and Motor Control Centers (MCC), as well as on all distribution panels and disconnect switches prior to energizing. Signs shall be of adequate size and be installed so as to be visible from any approach. A sticker of a bright fluorescent color, reading "HOT" or "ENERGIZED" shall identify all energized

circuits in the distribution panels and switchgear. These stickers shall be of the peel-off type.

- Once energized, the Competent/Qualified Person has the responsibility to see that these stickers are used in each area as the sections are energized.

- Any questions as to the adequacy of the protective measures installed shall be forwarded to the Competent/Qualified Person or the Engineer.

Crafts Working on Energized Electrical Gear or Equipment

- Prior to working on any electrical gear or electrically driven or powered equipment, every craft or persons associated with that activity shall obtain a lock and two (2) tags from the designated representative. These locks and tags shall be installed on the associated switchgear along with a "Warning" tag — one for the switchgear and one for the local equipment control switch.

- The individual installing the lock shall retain the key.

- A "Warning" tag that identifies the person by name, badge number, or company shall accompany each lock.

- Only the individual who placed the lock and tag shall remove it from the equipment. It shall then be returned to the Competent /Qualified Person.

Lockout/Tagout General Guidelines

- Identify all sources of energy, movement or hazardous substances. Also, locate all isolation points and disconnects that deactivate the equipment or system.

- Physically isolate, disconnect, or eliminate all hazards by tagging/locking of circuit breakers, motor control switches and removal of fuses, installing blinds, closing and locking of valves, etc.

- Immobilize and lockout all isolation points and disconnects.

- Tag all isolation points and identify persons installing the tag.

- There must be separate, identifiable locks and tags for each employee working on the circuit.

- When work is complete and locks and tags are removed, the system must continue to be identified by a tag as being a live system.

- Reactivate the system only through a set published procedure, which prevents injury or equipment damage when performed properly. This includes removal of all personnel and equipment from the danger zone, the assurance that the

equipment is in operating condition, and the removal of all locks and tags only by those who placed them.

Lockout Procedure

- Employees who are to perform the work on the equipment shall place their own locks and tags to deactivate the equipment.
- Padlocks are the preferred lockout devices.
- Locks shall not be a common key type.
- Where the main electrical switches and circuit breakers must be used to de-energize a system, Port Maintenance shall be contacted to identify the proper controls to be locked and tagged out.
- When more than one employee or trade is working on a single system or piece of equipment, each shall apply it own lock and tag to the lockout device.
- Standard circuit switches, push buttons, or toggle switches are not to be used for lockout/tagout purposes where employees may be injured by accidental operation.
- After the equipment has been locked out, attempt to start it with the start button in the control circuit to test the effectiveness of the lockout.
- Always check all locks and tags at the start of each shift. Never assume the equipment or system is locked out before starting work. If any locks or tags have been removed, contact your supervisor immediately!
- Where the work requires entrance into a confined space, the provisions for Confined Space Entry as found in this manual shall be followed.
- Only those who install the tags and locks may remove them.
- A written procedure must be in place in order to remove any lock and tag when the tag signer is absent from the job site. In addition, the procedure shall only be performed after a check is made to assure that all persons are out of danger and that the equipment is in working order.
- Any violation of these rules shall result in the employee being disciplined in reference to the Disciplinary Action Matrix found in Safety Document 00860!

Tagging Procedures

- The tag is to be clearly signed in ink by the employee and their Supervisor. This includes their full name, badge number, and the date.

- A signed tag shall always accompany a lock.

- Tags shall be placed directly on the lock and in a place as visible as possible.

Procedures for Entry into High Voltage Areas

- For procedures for entry and work in High Voltage areas, refer to the Energized Electrical Work section of this manual.

3.4 PORTABLE HEATERS

Scope

This section outlines the minimum safety requirements for the use of portable heaters and salamanders.

Purpose

To minimize the potential for fire, smoke damage and impacts to the public.

Reference

NFPA

Definitions

- Below Grade — Any underground level.
- Listed — for the purpose of this section, means equipment that has been approved by a nationally recognized testing laboratory such as Factory Mutual Engineering or Underwriters Laboratory.
- LP Gas — Liquid Propane.

Requirements for Portable Heaters

- The use of open flame heating devices or salamanders requires a Port Hot Work Permit.
- Open flame heating devices shall not be left unattended.
- Portable heaters shall be listed, installed, used, and maintained in accordance with the manufacturer's recommendations.
- Portable heaters, while in operation and unattended shall be bracket mounted and elevated above the floor surface.
- Portable heaters shall be switched "off' at the end of each shift unless a following work shift will occupy the area.

- Proper housekeeping shall be maintained in areas of portable heaters.

- Portable heaters shall be installed with proper clearance in regard to combustible material, equipment, and construction.

- Portable heaters shall be monitored for safe operation and maintained by properly trained personnel.

- When operated in enclosed structures, proper ventilation shall be maintained.

- Building materials shall be fastened securely or guarded so as not to contact portable heaters.

- Employees or Contractors violating these procedures shall remove the portable heaters from service.

Requirements for Liquid Propane Heaters/Devices

- A Hot Work Permit is required for LP heaters and salamanders.

- Adequate ventilation shall be provided and heaters and salamanders shall be equipped with an approved automatic device to shut off the flow of gas to the main burner in the event of a flame failure.

- Monitoring for carbon monoxide (CO) shall be required when used in confined or enclosed spaces.

- LP Gas cylinders shall be secured in an upright position.

- Valves, connectors, regulators, manifolds, piping and tubing shall not be used as structural support for heaters.

- For temporary heating, heaters shall be located at least six (6) feet away from the LP Gas container.

- Heating devices shall be installed as to prevent direct or radiant heat to the LP Gas containers.

- If two or more heating devices of either the integral or non-integral type are located in a non-partitioned area on the same floor, the LP Gas containers shall be separated from each other by at least 20 feet.

Requirements for Liquid Propane Storage

- Storage of LP Gas below grade is prohibited.
- Storage of LP Gas within buildings or enclosed spaces such as a conex box is prohibited.
- Cylinders shall be stored in a suitable ventilated area.
- Cylinders shall be secured against displacement.
- Cylinders shall be stored away from fire, flame, or heat.
- Warning signs prohibiting smoking or open flames shall be posted, maintained, and enforced 25 feet around storage areas for flammable and combustible material.
- Fire protection shall be provided with at least one approved portable fire extinguisher with a rating of not less that 20 B:C.

3.5 ENERGIZED ELECTRICAL WORK

Scope

This section defines the minimum safety requirements for all personnel to ensure compliance with regulatory requirements applicable to electrical systems.

Purpose

To minimize hazardous electrical exposures to all personnel who perform work in any electrical substations, rooms, cabinets, vaults and manholes within reach of live parts (electrical wires, cables and equipment) of 50V to ground or higher, on Port property.

Reference

29 CFR Part 1926-Subpart K, 1910 Subpart S, The National Electrical Code (NEC), ANSI Z89.1 & Z87.1, and NFPA Article 70 & 79, and the Electrical Safety and Lockout/Tagout sections of this manual.

Definitions

- Attendant System - A safety system that employs one person functioning as a dedicated Qualified EEW Attendant while another is performing Energized Electrical Work. A single person may function as an EEW Attendant for two persons if they are working on the same system and are both in a single line of sight from a single observation point.

- Blast Suit - Properly rated hood, face shield, gloves, hardhat, and Nomex or equivalent outer clothing combination.

- Classified Location Rating — Ratings applied to Hazardous Locations based upon the presence of flammable gases or vapors; the handling, use or processing of flammable vapors; the presence of combustible dust or easily ignitable fibers or filings.

- Compelling Reason - A situation where greater operational health, safety or environmental hazard exists if equipment is de-energized or if an essential continuity of service is halted.

  Examples of Compelling Reasons include:
  - Impact to Emergency Alarms
  - Impact to Illumination

- Electrical Hazard - An electrical condition where the possibility of injury or Incident is present due to an exposed energized circuit.

- Energized Electrical Work (EEW) - Any work requiring performance of duties on or near an exposed energized circuit with magnitude greater than 50 volts to ground or 240 volt-amps.

- EEW Permit - Document authorizing Qualified Persons to perform installations or repairs on energized electrical equipment and/or systems.

- Hazardous Locations - Class I, Division 1 and 2 Locations as specified in the NEC and NFPA.

- Infeasible Shutdown — A situation, determined by a senior level manager where EEW must be performed in lieu of de-energizing the system to complete the work.

- Meter/Metering — The task of electrical testing with an approved device.

- One-Hand Rule — The EEW Attendant/Standby Person physically reaching the person performing EEW with one hand in the event of an accident. The one hand rule shall not be used when a single EEW attendant is functioning for two persons.

- Properly Rated and Tested — Any PPE or tool that has a specific purpose and a specific rating that will determine if it will protect the worker. Rubber insulated gloves; sleeves, mats and tools require a certification. The term applies to specific tools or equipment and cannot be universally applied to all tools or equipment.

- Qualified EEW Attendant - A person assigned to monitor the individual performing Type 4 EEW.

- Qualified Person - A person who is familiar with the construction, operation, and hazards of the specific equipment involved and has had training in avoiding the electrical hazards of working on or near exposed energized parts. This person shall meet the requirements of this document.

- Qualified Person as an EEW Attendant - A person assigned to monitor the individual performing Type 5 EEW.

- Qualified Supervisor — The individual responsible for all aspects of the work, issuing EEW permits, and maintaining safe working conditions in relation to this Section.

- ❖ Safe Work Distances — The minimum distance personnel may approach exposed energized parts without protective insulation or PPE.

- ❖ Testing & Metering — Diagnosis and analysis of electrical systems to trace or determine voltage and/or current on circuits.

- ❖ Troubleshooting— Investigation techniques employed to locate the source of an equipment malfunction.

- ❖ Volt-amps — Circuit voltage (volts) multiplied by current (amperes).

General

- ❖ All personnel who perform work on electrical systems shall be qualified.

- ❖ Whenever possible, electrical equipment should be worked on in an electrically de-energized state in accordance with the Port of Lake Charles Lock-out/Tag-out Procedures found in this manual.

- ❖ Work on energized electrical equipment will be permitted only when it can be demonstrated that the use of de-energized work practices introduces additional or increased hazards or is not feasible; documented Compelling Reasons must be provided.

- ❖ Only Qualified Persons shall work on electric circuits/systems that have not been de-energized.

    - ➢ Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

- ❖ Access into electrical substations, rooms, cabinets, vaults and manholes is restricted to Qualified Persons only, **unless the equipment is de-energized or a Qualified Person is in supervision** of the unqualified personnel making access:

    - ➢ Before entry and upon exit, notify the Engineer and the Port Safety Officer and if a Shutdown Notice is required, it shall be filed.

    - ➢ Before entry is made into energized electrical cable vaults or manholes, an infrared tester shall be used to scan the cables and connector components. If a temperature difference of 10 degrees Fahrenheit is detected between the cable and connector components, or any reading greater than 140 degrees Fahrenheit is detected from the cables or

components the entry shall not be made! Personnel shall notify the Engineer and the Port Maintenance Electrical Shop.

Protection of Employees

- Identify any medium or high voltage areas that may be involved in the project and immediately notify the Engineer if they have not been properly identified.

- A Task Specific Job Hazard Analysis (JHA) shall be conducted and documented prior to beginning any Energized Electrical Work.

- The scope of work must be communicated and understood by all parties involved.

- Personnel shall not wear conductive items when working on or within the defined Safe Working Distance of energized electrical equipment. These items include, but are not limited to watches, bracelets, rings, conductive-framed glasses, earrings, badge clips, and clothing with metal snaps and buttons. If conductive items cannot be removed, they must be covered with a non-conductive material.

- EEW in Hazardous Locations should be avoided. This work should only be performed after a thorough analysis has been made to verify the work can be performed safely. Compelling Reasons shall be documented on the EEW Permit.

- Clearances around electrical cabinets, transformers, switchgears, etc. shall be maintained in accordance with OSHA 29 CFR 1926 Subpart K, and Port requirements.

- The use of temporary coverings (blankets), insulated tools, mats, and PPE reduces the risk to the employee conducting the work however; it does not reduce the Energized Electrical Work to a lower type.

- No EEW may be performed without approved insulated tools. The hand tools must be specified in the JHA and be manufactured to meet the requirements of the work.

- Areas around exposed/energized equipment must be properly barricaded and/or secured to prevent accidental contact and maintain a safe work environment.

- Personnel should not employ practices, which provide a current path through any part of their body. Every effort should be made to practice the “one-hand rule” when the task allows.

- Work in wet or damp locations shall not be performed until all efforts to abate the hazard have been exhausted. Ground Fault Circuit Interrupters (GFCI) shall be used when any work must be performed in these locations.

Safe Working Distances

- Ensure that no person approaches or takes any conductive object closer to exposed energized parts than set forth below unless:

  - Personnel are insulated from the energized part.

  - The energized part is insulated from personnel.

Voltage Range (phase to phase)	Minimum Approach Distance
<300 V	Avoid Contact
>300V and<750V	1 ft 0 in. (30.5 cm)
>750V and< 2kV	1 ft. 6 in. (46 cm)
>2kV and< 15kV	2 ft 0 in. (61 cm)
>15kV and< 37kV	3 ft 0 in. (91 cm)
>37kV and< 87.5kV	3 ft 6 in. (107 cm)
>85.5kVand<121 kV	4 ft 0 in. (122 cm)
>121kV and < 140 kV	4 ft 6 in. (137 cm)

Electrical Work in Hazardous Locations

- Work on equipment that is rated for use in Hazardous Locations that will violate the Classified Location Rating is not permitted. For example, work, which requires the opening of explosion proof enclosures in a classified location, must be performed in a de-energized, locked and tagged out state.

- If there is a potential for combustible vapors in a work area a test of the area shall be made with a combustible gas meter prior to and during the duration of any EEW. Work must be halted immediately if any combustible gas or vapor is detected.

Appropriate Safe Work Practices Matrix

The appropriate safe work practices to be used for a project or task are based upon the highest Electrical Work Type and Energy Magnitude until proven to be a lesser type.

Energy MagnitudeWork SpecificsTesting Metering OperationsTypical Minimum Safety Equipment Required **Attendant RequiredEEW Permit RequirementZero Volt Amps					
Covered energized circuits less than 600 volts	Permanent covers in place, equipment designed for metering & testing that will prevent any accidental bodily contact with electrical or RF energies.	Meter & test only by means of designed testing points with all covers in place.	Safety glasses & hardhat or as defined by a Job Hazard Analysis.	No	No*
Less than 240 volt amps & less than 50 volts, visual inspections less than 600 volts.	Obtain approval to perform work, verify test equipment functionality, determine location of shutdown points & voltage and ensure proper tools are available.	Meter, test or troubleshoot within voltage & volt amp ranges.	Safety glasses w/non-conductive frames or as defined by a Job Hazard Analysis	No	No*
Energized electrical work on exposed circuits 50 to 600 volts	Determine "Compelling Reason", verify test equipment, and determine shutdown locations & voltage, tag breakers, ensure area is properly barricaded.	Metering & testing with any covers removed allowing for direct contact within this voltage range.	Reference Part ___ of this Section.	Qualified EEW Attendant	Yes
Energized electrical work on circuits greater than 600 volts	Work involving potential direct physical contact with energized exposed circuits greater than 600 volts. Ensure the area is properly barricaded with non-conductive material.	Metering & testing with covers removed exposing over 600 volts.	Reference Part ___ of this Section.	Qualified person as an EEW Attendant	Yes

* Any energized work (Types 2-5) performed in a hazardous location requires an EEW Permit.
** Individual tasks must be reviewed for PPE requirements.

*** Work should be classified at the highest level until testing is complete

Energized Electrical Work Types/Procedures

NOTE: The following procedures should be common to all electrical work for the respective types. Additional task specific procedures and equipment should be included when developing the work plan. In all cases the work should be classified at the higher rated level until it bas been determined to be a lower one.

Type 1 - De-energized, Locked & Tagged out

- File Shutdown Notice for the equipment/systems.
- De-energize all power sources including backup power, lock and tag-out and verify all electrical sources are at zero voltage. Ensure that Port Lock-out/Tag-out procedures are followed.
- Verify functionality of test equipment and ensure it is properly rated for maximum potential voltage to be tested, including valid calibration date.
- No Attendant System or EEW Permit/Checklist is required.
- PPE to consist at a minimum of hardhat and safety glasses.

Type 2 - Covered, Energized Circuits Less Than 600 volts

- Verify that all covers are in place.
- Verify functionality of test equipment and ensure it is properly rated for work to be performed, including valid calibration date.
- No Attendant System or EEW Permit/Checklist is required.

PPE to consist at a minimum of hardhat and safety glasses

Type 3 — Energized Work On Exposed Electrical Systems (50 Volts or less)

- Obtain approval from owner to do work.
- Verify functionality of test equipment and ensure it is properly rated for work to be performed and calibrated.
- Determine the voltage, location of shutdown points, and any other associated hazards.
- Ensure proper tools and test equipment are available for the work to be done and in proper working conditions.
- No Attendant System is required.

- EEW Permit is required if the work to be performed is in a Hazardous Location.

- PPE shall consist of, at a minimum, non-conductive hardhat and safety glasses.

Type 4 - Energized Work on Exposed Electrical Systems Greater Than 50 Volts and Less Than 600 Volts

- A Compelling Reason for performing EEW must be provided by the Supervisor, Project Manager, or Contractor on the EEW Permit.

- Verify functionality of test equipment and ensure it is properly rated for work to be performed and calibrated.

- Determine voltage, location of shutdown points, and other potential hazards.

- Apply warning tags that inform others that work is being completed on interrupting breakers/switches. The tag should be placed at the nearest level up-stream power source to prevent re-closure and reenergizing of equipment/systems. (Power distribution systems only!)

- The specific safety equipment will vary based on the potential hazard. The correct PPE, insulated tools, and procedures for safe practices should be documented in the job hazard analysis.

The safety equipment may include but is not limited to the following:

- ANSI approved hard hat
- ANSI approved safety glasses with non-conductive frames
- Rubber insulated mats or boots
- Properly rated and tested rubber gloves
- Properly rated and tested rubber sleeves
- Body hook
- Approved insulated tools
- Face shield
- Fire extinguisher
- Nomex or equivalent outer clothing
- Properly rated and tested Blast Suit
- Cotton clothing

- Insulated mats and/or boots shall be used when working on conductive surfaces for Type 4 and 5 work
- Barricade and/or secure the area.

Upon completion of job or shift:

- (Power distribution systems only) Retrieve all upstream warning tags.
- Return upstream warning tags to the Qualified Supervisor (power distribution systems only).

Type 5 - Greater than 600 volts

- In addition to Type 4 requirements, above all Type 5 Energized Electrical Work must be planned with documentation of sequenced steps, safety precautions, and equipment needed to perform the job safely. An electrical engineer will approve the documentation,. If this work is routine, procedures should be outlined in PM procedures and on line checklists.

Permit System

- Project Manager shall complete the Compelling Reason portion of the EEW Permit and sign.

- Qualified Supervisor shall complete the EEW Permit and Checklist, ensure all other appropriate signatures on EEW permit, and post the permit at the work area.

- Qualified Person (s) shall sign permit.

- EEW Attendant shall sign permit.

See Appendix A for a copy of the EEW Permit.

NOTE: Closed permits shall be archived for one year by the Safety Officer.

Responsibilities

Equipment Owner/Operator and Maintainer of Equipment.

- Have proper procedures to safely perform the work.

- Assist in scheduling to minimize system downtime.

Project Manager

- Reads, understands and conveyed the application and importance of this EEW Program to their Qualified Supervisor.

- Evaluate tasks performed at Types 4 & 5 for engineering controls that would reduce the work to Type 3 or below.

- Understands the scope & hazards associated with the work they are approving.

- Establish a means to enforce compliance with the requirements of this program.

- Ensure that there are a sufficient number of personnel trained and available to perform the work.

Qualified Supervisor

- Has read and understands this EEW Program.
- Understands the scope & hazards associated with the work they are performing.
- Ensure that permits are completed, understood, and signed for all EEW.
- Verifies that all employees performing electrical work have current training certifications and skills necessary to perform the work.
- Ensure that the Attendant System is used.
- Completes and explains the JSA to all employees involved.
- Predetermines emergency procedures.
- Ensure the maintenance and calibration of testing equipment.
- Ensures the availability and use of PPE.

Qualified Person

- Has read and understands this EEW Program.
- Understands the scope of work.
- Understands and complies with all electrical safe work procedures and requirements as described in the EEW Program.
- Has the experience required to perform work on the respective equipment and understand the hazards associated with the work.

Completed the following training requirements:

- CPR/First Aid - Every two years.
- Hazardous Energies – annual.

Qualified EEW Attendant:

- Has read and understands this EEW Program.
- Understands the scope of work.

- Understands and complies with all electrical safe work procedures and requirements as described in the EEW Program.

- Knows location of disconnects and how to de-energize.

- Has no other duty than to observe the work without interfering with worker and without participating in the work.

Has completed the following training requirements:

- CPR/First Aid - Every two years.

- Basic Electrical Safety.

Qualified Person as an EEW Attendant - In addition to the responsibilities listed for an EEW Attendant, the Qualified Person as an EEW Attendant must also have:

- Equivalent knowledge of the Qualified Person and of the equipment.

- Understand the scope of work.

Complete the following training requirements:

- CPR/First Aid -Every two years.

- Basic Electrical Safety.

- Intermediate Electrical Safety.

- Advanced Electrical Safety – Annually.

Health & Safety Manager:

- Has read and understands this EEW Program.

- Ensure quality training is provided.

- Ensure documentation of training and procedures.

- Audits the work process to assure that safe electrical work practices are being implemented.

- Coordinates the completion of the Job Hazard Analysis with the Qualified Supervisor.

- Communicate requirements to and concerns of Senior Management.

ENERGIZED ELECTRICAL WORK PERMIT

Supervisor	Project No.

Equipment to be worked on

Equipment/Pane	Voltages

EEW Type

Work to be performed

Has the EEW Permit Checklist been completed?

The compelling reason a shutdown is infeasible	Emergency Alarm	Illumination

Detailed explanation of compelling reason

I authorize the Energized Electrical Work due to the above reason(s)

Project Manager:	Date:

Individuals assigned to the work crew:
I certify that I am qualified to carry out the work described above, and that I understand and will follow the EEQ Program and all safety procedures necessary to complete the job safety.
Qualified Person
(Print Name) (Signature) (Date)
Qualified Person
(Print Name) (Signature) (Date)
Attendant
(Print Name) (Signature) (Date)
Qualified Supervisor
(Print Name) (Signature) (Date)

ENERGIZED ELECTRICAL WORK PERMIT CHECKLIST

Please check each of the following as they are completed:

□	A	Emergency telephone number: (Verified)
□	B	Location of nearest telephone:
□	C	Emergency equipment is located at the work area.
□	D	Up-line breaker has been tagged for panel distribution systems. □ Yes □ No Location of up-line source of power: (1) Building _____ (2) Area _____ (3) Panel_____ (4) Circuit
□	E	Location of Emergency Power Off (EPO) or Emergency Machine Off (EMO) buttons confirmed (if applicable).
□	F	Test meter available, calibrated and tested for reliability and accuracy.
□	G	The attendant is to perform no other duties than observe and ensure that safety procedures are followed/
□	H	Cable temperature readings taken prior to entry into manhole or vault and are acceptable.
□	I	A current copy of the panel schedule verified breaker positions are attached to this permit.
□	J	Task specific JSA completed and reviewed with the workers.
□	K	All work other procedures reviewed. (If possible, open equipment in de-energized state and review work to be done.)
□	L	Barriers placed to keep unauthorized personnel clear of work area.
□	M	Other forms of Hazardous Energy not required for work are properly locked/tagged out.
□	N	Confirmed adequate illumination (Flashlights are not acceptable.)
□	O	All conductive personal articles removed or covered .
□	P	Metal fasteners on clothing (zippers, snaps, buttons & pins) are not exposed.
□	Q	Clear evacuation path identified.
□	R	Tools in good condition. (Check insulation on handles.)
□	S	Appropriate personal protective equipment in place (includes properly rated and tested gloves, sleeves, face shields and blankets).

Closing Checklist – Post Service

□	1	Visual inspection/test performed to verify all tools, jumpers, grounds, etc. removed.
□	2	Employees exposed to hazards associated with re-energizing are notified of systems impending status change.
□	3	Visually confirm all employees are clear of circuits and equipment.
□	4	Equipment re-energized.
□	5	Barriers removed.
□	6	Upstream warning tags removed (if applicable)
□	7	EEW permit filed.