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J.M. WILKERSON CONSTRUCTION

Corporate Environmental Health and Safety Manual

J.M. Wilkerson Construction Co., Inc. Environmental, Health & Safety Manual

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Section 1 - Introduction

1.1 Mission Statement

Safety in all J.M. Wilkerson Construction Co., Inc.'s (JMW) operations are not only a company goal, but also a requirement! It is the belief of JMW that accidents can be prevented through planning, training, and a cooperative effort in all areas of our operations. Our goal is to eliminate injury or loss of life resulting from job site accidents by developing awareness of safe working practices on all our construction projects. To this end, management has formulated this written policy to govern all work operations on this project.

It is a condition of employment with JMW that all employees perform work in such a manner as to provide our employees and the public with a 100% safe work environment in which to work. Failure to do so will result in disciplinary action that could lead to termination of employment as outlined in the attached policy. It is a condition of all subcontracts and purchase orders issued by JMW that this policy and the safety rules, instructions and procedures issued in conjunction with it, as well as all applicable state, federal and local codes and regulations be adhered to. Failure to do this is a breach of contract terms and shall be dealt with accordingly.

To fulfill the requirements of this policy, an organized and effective safety program must be carried out at each location where work is performed. JMW will try to ensure that the operations of other contractors not under our control do not endanger the safety of our employees. To this end, all employees will participate in the **JMW Project Safety Program** and follow its rules.

Our commitment at JMW is to provide a safe and prosperous working environment for every employee. The following principles must be followed:

- Safety will be the responsibility of every employee! Safety cannot be delegated. You the employee are responsible for yourself and those around you.
- All filed operations shall comply with OSHA Standards 29 CFR 1926, 29 CFR 1910 and 46 CFR.
- All employees shall support and participate in the J.M. Wilkerson light/duty return to work policy.

The Project Managers, Superintendents, Foremen, and Safety Coordinators have the full support of management in enforcing the provisions of this policy as it relates to the responsibilities assigned to them. It is our objective to keep all the projects accident free. Safety is a leading indicator of how a project is being managed. Take pride in your work and stay safe!

1.2 Safety Goals

The following are the goals of the J.M. Wilkerson Construction Co., Inc. Safety Program in order to achieve our policy of safety excellence.

1. Provide all employees with the training and education necessary to achieve excellent safety performance.
2. Zero injuries.
3. Zero lost time accidents.
4. Zero O.S.H.A. or other regulatory deficiencies / violations.

J.M. Wilkerson Construction Co., Inc. will review and update the Site Safety Program and/or the Safety Manual as necessary and/or at least annually.

Section 2 - Safety Administration Organization

2.1 Safety Director Responsibilities

The Safety Director is responsible for ensuring company compliance with Local, State, Federal, Owner and OSHA requirements. It is the Safety Director's responsibility to initiate any action required to achieve the above objectives and ensure all project activities are consistent with JMW, Owner, and OSHA safety policies and procedures. The Safety Director has the full authority to stop unsafe conditions, correct hazards, and discipline any employee as required. Listed below are the minimum actions required by the Safety Director for the safe operation of all JMW projects.

The JMW Safety Director is **Ruthie Smith.**

The Safety Director ensures company compliance with Owner and OSHA requirements by:

a. Implementing safety program and making it known to all employees the established rules.
b. Developing, coordinating, and providing safety training sessions for employees, as necessary.
c. Maintaining accident, inspection, and training documentation.
d. Continually monitoring the safety program effectiveness.
e. Ordering and delivering Personal Protective Equipment for job sites.

The Safety Director ensures that job sites are safe by:

a. Conducting monthly site safety inspections of the project site documenting safety violations.
b. Pre-planning work with Project Managers and Superintendents.
c. Identifying job site hazards and alerting supervisors and employees.
d. Ensuring that accidents, incidents, and near misses are reported and investigated in accordance with company policy.
e. Explaining company safety polices to Subcontractors.

The Safety Director knows, practices and enforces the JMW, Owner and the OSHA safety programs, policies and procedures by:

a. Always following project-site safety requirements in the field.
b. Leading by example by always wearing appropriate Personal Protective Equipment on site.
c. Impressing upon all the responsibility and accountability of everyone to maintain a safe workplace.
d. Taking appropriate action (including disciplinary action) when adequate safety measures have not been established and enforcing in accordance with company procedure.
e. Personally, accompanying OSHA and other regulatory agency representatives during their site visits.

The Safety Director knows, practices, and enforces the JMW and Owner mandated substance abuse policies and programs by:

a. Following through on reasonable suspicion and the enforcement of the substance abuse policy.

2.2 Project Manager Responsibilities

The Project Manager is the JMW "management representative" responsible for the safe planning and completion of the project, ensuring it is on schedule and to JMW's Safety standards and satisfaction. It is the Project Managers responsibility to initiate any action required to achieve the above objectives and ensure all project activities are consistent with JMW, Owner and OSHA safety policies and procedures. Listed below are the minimum actions required by the Project Manager for the safe completion of a JMW project.

The Project Manager(s) ensures the project site is safe by:

a. Establishing clear safety expectations for all employees on the project site, including subcontractors and visitors.
b. Implementing special requirements for project specific health, safety and environmental concerns.
c. Monitoring the project site for compliance with safety policies and procedures and correcting any safety violations.
d. Conducting Site Safety Inspections of the project site, documenting corrective actions.

The Project Manager(s) knows, practices and enforces the JMW, Owner and the OSHA safety programs, policies and procedures by:

a. Modeling and reinforces safety as the top priority on the project site.
b. Always following project-site safety requirements in the field.
c. Leading by example by always wearing appropriate Personal Protective Equipment on site.
d. Ensuring that accidents, incidents, and near misses are reported and investigated in accordance with company policy.
e. Taking appropriate action (including disciplinary action) when adequate safety measures have not been established and enforcing in accordance with company procedure.

The Project Manager(s) proactively motivates project staff to advocate project safety by:

a. Working to visibly create safe operations as a top priority on the project site.
b. Being visible as a safety leader in the field.

The Project Manager(s) knows, practices, and enforces JMW and Owner mandated substance abuse policies and programs by:

a. Following through on reasonable suspicion and the enforcement of the substance abuse policies.

2.3 Superintendent Responsibilities

The Superintendent is the JMW onsite "Management Representative" assigned the responsibility and authority for daily coordination of the project so it is operated safe and to JMW and Owner satisfaction. It is the Superintendents responsibility to initiate any action required to achieve the above objectives and insure all project activities are consistent with JMW, Owner and OSHA policies and procedures. Listed below are the minimum actions required by the Superintendent for the safe completion of a JMW Project.

The Superintendent ensures the project site is safe by:

a. Establishing clear expectations for employees regarding safety and monitors worker performance to ensure compliance.

b. Planning production so that all work will be done in compliance with established safety regulations.
c. Making sure proper safety materials and protective devices are available and used.
d. Ensuring all equipment is in safe working order.
e. Instructing employees and visitors on safety hazards, policies, and procedures.
f. Monitoring the project site for unsafe conditions or work practices.
g. Correcting and documents safety violations.
h. Conducting site safety inspections, documenting corrective actions.
i. Assisting in the investigation of accidents, incidents and near misses.
j. Conducting onsite safety training meetings (ex. Toolbox Talks) and providing employees with proper instruction on safety requirements.
k. Coordinating new employee orientations as required.

The Superintendent knows, practices and enforces the JMW, Owner and OSHA safety programs, policies and procedures. Proactively motivates trade involvement in project safety by:

a. Modeling and reinforcing safety as the top priority on the project site.
b. Always following project-site safety requirements in the field.
c. Leading by example by always wearing appropriate Personal Protective Equipment on site.
d. Ensuring that accidents, incidents, and near misses are reported and investigated in accordance with company policy.
e. Taking appropriate action (including disciplinary action) when adequate safety measures have not been established and enforcing in accordance with company procedure.
f. Personally, accompanying OSHA and other regulatory agency representatives during their site visits.

The Superintendent knows, practices, and enforces the JMW and Owner mandated substance abuse policies and programs by:

a. Following through on reasonable suspicion and the enforcement of the substance abuse policy.

2.4 Alternate Safety Representative Responsibilities

The Safety Coordinator is the JMW "Safety Representative" responsible for the inspection of the project, monitoring its compliance with the safety regulations of JMW, Owner and OSHA. It is the Safety Coordinator's responsibility to initiate any action required to achieve the above objectives and ensure all project activities are consistent with JMW's safety policies and procedures. Listed below are the minimum actions required by the Safety Coordinator for the safe completion of a JMW Project.

The Alternate Safety Representative ensures the project site is safe by:

a. Advising field personnel on potential risks and hazards of work activities.
b. Monitoring the project site for compliance with safety policies and procedures, correcting any safety violations.
c. Ensuring the required safety equipment is used to conduct all work activities safely.
d. Conducting site safety observations of the project site documenting safety violations.
e. Instructing new employees and existing employees performing new tasks on safe work practices.
f. Conducting onsite safety training meetings (ex. Toolbox Talks) and providing employees with proper instruction on safety requirements.

g. Investigating and documenting accidents, incidents, and near misses in accordance with company policy.

The Alternate Safety Representative knows, practices and enforces the JMW, Owner and the OSHA safety programs, policies and procedures by:

a. Modeling and reinforces safety as the top priority on the project site.
b. Always following project-site safety requirements in the field.
c. Leading by example by always wearing appropriate Personal Protective Equipment on site.
d. Requiring conformance to safety standards from Subcontractors.
e. Providing for the protection of the public from company operations.
f. Ensuring that accidents, incidents, and near misses are reported and investigated in accordance with company policy.
g. Taking appropriate action (including disciplinary action) when adequate safety measures have not been established and enforcing in accordance with company procedure.
h. Personally, accompanying OSHA and other regulatory agency representatives during their site visits.

The Alternate Safety Representative knows, practices, and enforces the JMW and Owner mandated substance abuse policies and programs by:

a. Following through on reasonable suspicion and the enforcement of the substance abuse policy.

2.5 Foreman Responsibilities

The Foremen are JMW's "field representatives" responsible for carrying out the directions of the Superintendent of the project, ensuring the directions and work performed follow the safety regulations of JMW, Owner and OSHA. Listed below are the minimum actions required by the Foremen for the safe completion of the project.

The Foremen ensure the project site is safe by:

a. Carrying out safety programs at the work level.
b. Planning all work activities to comply with safe work practices.
c. Instructing new employees and existing employees performing new tasks on safe work practices.
d. Installing and maintaining safety to devices to protect employees from hazards.
e. Ensuring safety equipment is available and used to conduct all work activities safely.
f. Ensuring work is performed in a safe manner and no unsafe conditions or equipment are present.
g. Conducting onsite safety training meetings (ex. Toolbox Talks) and provide employees with proper instruction on safety requirements.

The Foremen know, practice and enforce the JMW, Owner and the OSHA safety programs, policies and procedures by:

a. Modeling and reinforcing safety as the top priority on the project site.
b. Always following project-site safety requirements in the field.
c. Leading by example by always wearing appropriate Personal Protective Equipment on site.
d. Reporting all accidents, incidents, and near misses in accordance with company policy.
e. Taking appropriate action (including disciplinary action) when adequate safety measures have not been established and enforcing in accordance with company procedure.

The Foremen know, practice, and enforce the JMW and Owner mandated substance abuse policies and programs by:

a. Following through on reasonable suspicion and the enforcement of the substance abuse policy.

2.6 Laborer Responsibilities

The Laborers are the JMW employee's responsible for carrying out the directions of the Foremen of the project, performing the work assigned to them in compliance with the safety regulations of JMW, Owner and OSHA. Listed below are the minimum actions required by the Laborer for the safe completion of their work assignment.

The Laborers know and practice JMW, Owner and the OSHA safety programs, policies and procedures by:

a. Always follows project-site safety requirements in the field.
b. Always wearing appropriate Personal Protective Equipment on site.
c. Work safely in such a manner as to ensure your safety as well as that of coworkers and others.
d. Request help when unsure about how to perform any task safely.
e. Corrects unsafe acts or conditions within the scope of the immediate work area.
f. Reports all accidents, incidents, hazards, and near misses in accordance with company policy.

2.7 Required Materials.

It shall be the responsibility of the Site Superintendent to ensure the following items are available and/or posted on JMW projects at all times:

a. JMW Environmental Health & Safety Manual
b. JMW Employees Manual
c. JMW Site Specific Safety Plan
d. Safety Data Sheets (SDS).
e. OSHA Form No. 300, Log and Summary of Occupational Injuries and Illnesses
f. Workers' Compensation Physician Panel and Bill of Rights for the Injured Worker (English & Spanish).
g. Employer's First Report of Injury or Occupational Disease (Form No. WC-1). This form must be completed for any work-related injuries or illnesses and sent to the office as soon as possible.
h. Posting on Job Safety & Health Protection
i. Posting on Your Rights Under the Fair Labor Standards Act.
j. Posting on Your Rights Under the Family and Medical Leave Act of 1993.
k. Notice on Employee Polygraph Protection Act.
l. Posting on Equal Employment Opportunity is The Law.

Please contact the main office immediately to obtain a copy of any items listed above you do not have readily accessible on site. It is **mandatory** that all projects have required documents posted, and all other items must be always obtainable.

Remember, it is always better, and less expensive, to have something and not need it than to need it and not have it!

Section 3 - Accident Management Procedures

3.1 General

It is the policy of J.M. Wilkerson (JMW) that all accidents and near misses are to be reported immediately to supervisors for management and documentation. The JMW shall insure that all injuries requiring medical treatment beyond first aid are handled appropriately.

3.2 Accident and Incident Notification

In the event of an accident or incident employees shall notify their Supervisor or Safety Coordinator immediately. **REPORT ALL INJURIES OR NEAR MISSES!**

- The work area shall be cleared, and work stopped until determined safe by the Site Superintendent or Safety Coordinator.
- The Site Superintendent or Safety Coordinator shall examine the injured employee and see to first aid treatment. For serious injuries, the employee shall be transported to an outside medical service.
- The Site Superintendent or Safety Coordinator shall inform the **JMW Safety Director** of the accident to discuss case management options.
- The Site Superintendent or Safety Coordinator shall fill out the First Report of Injury form, fax it to the JMW main office Safety and Risk Management Department, who shall fax it to the workers compensation carrier. Original paperwork shall be kept on-site.
- The injured employee must be treated and cleared by qualified medical personnel to return to work. Work authorization must be given to the Safety Director before the employee may return to work.
- Worker fatality will be verbally reported to OSHA within 8 hours and any amputation, loss of eye, or hospitalization of a worker within 24 hours.

3.3 Accident Investigation Procedures

- Do not assume that a minor accident is not important. **REPORT ALL ACCIDENTS!**
- Accident notification and investigation procedures are covered during on-board training.
- As soon as practical, the Site Superintendent or Safety Coordinator at the scene of the accident shall commence an investigation identifying:

    a. Time and location of the accident.
    b. All parties involved. Recording their name, title, and employer.
    c. All possible witnesses. Recording their name, title, and employer.
    d. Description of accident and surrounding area.

- The accident scene shall be secured so that only authorized personnel will be admitted.
- Photographs of the accident, surrounding area, and the conditions in the immediate vicinity of the accident shall be taken if possible. A list shall be prepared detailing who took the photo, date/time taken, and what the photo represents.
- Accident findings shall be recorded on the Site Incident Form.

- The Site Superintendent or Safety Coordinator shall fill out the Site Incident Form, fax it to the JMW main office Safety and Risk Management Department. Original paperwork shall be kept on-site.
- By maintaining sufficient documentation, JMW is best able to take away lessons learned from past experiences and better prepared for the future.
- Proper equipment, such as pens, paper, tape measures and phones with cameras, are on-site and should be utilized during an investigation.

3.4 Collection, Preservation, and Security of Investigation Evidence

Step 1: JMW will first assess the significance of the accident/incident:

The following questions will be asked to help JMW assess the significance of the problem:

1. Safety: Were fatalities, injuries or property damage involved?
2. Environmental Impact: Was there an environmental release?
3. Frequency: Has this type of accident/incident happened before?

These should be identified and considered. The purpose of an incident investigation is to identify what happened in order to prevent recurrence through a root cause analysis and corrective action implemented. JMW's legal and Risk Management departments will be involved to ensure the evidence preservation steps align with their responsibility to protect JMW and their client.

Step 2: Secure the scene:

JMW will secure the scene of the incident working in conjunction with client requirements. The purpose is to give the investigation team the opportunity to document evidence and gather information before it is disturbed. This can be crucial to an accurate root cause analysis later. Depending on the incident, JMW may grant access to additional parties – such as OSHA, Police, Fire, EMT etc., in conjunction with client site procedures.

JMW will have their Risk Management and legal representation involved right away to determine those authorized to access the area. JMW will tape the area off (Do Not Enter/Danger Tape) and allow access only to authorized personnel. JMW will immediately assign an area "security personnel" responsible for keeping a log of those who enter the controlled area. This log will include the name, company, time in and out, and purpose for entry. JMW's security personnel will not allow anyone in the area without confirming with the client and JMW management that they are authorized to enter the scene. This will be done via two-way radio and/or phone. Proper ID must be furnished by authorized personnel to enter the scene.

Evidence removed may not be physical – it may be pictures or notes only as permitted by JMW and/or client procedures. If necessary, JMW will identify a secure room to store the evidence. All authorized personnel will be advised of the following:

- No photographs (unless permission is provided by JMW and client)
- Do not disturb any part of the scene (unless permission is provided by JMW and client)
- Do not touch or remove any evidence at the scene (unless permission is provided by JMW and client)
- Governmental personal will be directed to the client representative for entrance.

Step 3: Document and secure the evidence:

Evidence will come in many forms. JMW always maintains confidentiality of evidence. JMW ensures that evidence is released only to authorized individuals per JMW's policies and their client's policies. No evidence will be released to any personnel, private firms, governmental entities (OSHA, EPA, City or Local Government personnel, etc.) without approval by JMW and client.

JMW will use a log sheet that includes the following information for evidence removed:

- Evidence ID Number: This is a unique identification number that will be associated with this piece of evidence from this point forward.
- Date: What time and date was the evidence collected?
- Location/Source: Where was the evidence collected?

Physical evidence:

If dealing with a piece of physical evidence, JMW will document as accurately as possible where the evidence was found. Depending on the significance of the event, creating a map of the affected area may be useful. Evidence location can then be documented relative to the incident location. This will be coordinated with our client permission and direction.

Witness statements/interviews:

Witness statements/interviews will be taken as soon as possible after the incident/accident. JMW will ensure to document each person's name and contact information, as well as their location relative to the incident. This is an initial interview; additional information may be collected once the formal root cause analysis is under way. JMW will only interview their own employees and subcontractors. Other witness statements may be taken by JMW if directed by client representative or JMW legal representation.

A follow-up interview, if needed, will be conducted by someone with JMW familiar with the root cause analysis process. This will help ensure that questions elicit causes as much as possible and minimize story saying that is jaded by opinion, loyalties, etc. All statements will be available to our client representative and will be confidential to all other parties.

Witness statements/interviews: will include/be conducted as follows:

- Interview witnesses separately so they do not influence each other's memories. Interview them in a place away from the workplace or other distractions.
- Put the witness at ease. A simple inquiry about the person's condition should be sufficient.
- Get the individual's version of what he or she remembers. The investigator should never challenge the story.
- Ask necessary questions at the right time only to prompt more detail.
- Give the witness constant feedback by putting key points into your own words.
- Record critical information by quickly making notes of key points. Avoid using recorders except in special circumstances. They make people uncomfortable.
- Use visual aids -- sketches, photographs, blueprints, models -- when appropriate.
- Ask where was your witness standing?
- Ask how long had they been on the scene?
- When did the witness notice the accident – before, during, or after?

- Did the witness have a clear view throughout the accident, or was it obstructed at any point? If it was, what did they see immediately before and after their view was obstructed?
- How far away from key events related to the accident was the witness?
- Interview witnesses separately so they do not influence each other's memories.
- End on a positive note to keep communication open. Ask for ideas on how to prevent similar incidents.

Photos and video:

Photos and video are extremely useful forms of evidence. Automatic photos or video, such as from a security camera, need to be documented and secured. JMW will take photos to document the incident scene.

Samples:

JMW will take product samples as soon as possible if required. This may be helpful later in determining the exact state of the product at the time of the incident. Samples will be secure and preserved in a secure location. The following will be collected:

- Authorized person who checked out the evidence. Include contact information. Ensure that only authorized individuals can check out evidence. - Date/Time Checked In: List the date and time the item was checked back in.

Step 4: Destruction of evidence:

Sometimes it is appropriate to destroy evidence after an investigation is completed. No evidence will be destroyed without written permission from our client. While some investigations will require the evidence to be held into perpetuity, most will not. Storing electronic files is easy and does not take up much space. However, storing physical parts and equipment may not be necessary. JMW legal representative will advise regarding evidence maintenance. Again, no evidence will be destroyed without client permission.

Step 5: Refine the evidence policy:

JMW will conduct a post-investigation review to determine opportunities for improvement. JMW continues to refine our policy based upon lessons learned and distribute to the organization.

Evidence preservation is crucial to any incident investigation. JMW approaches evidence preservation according to the actual and potential significance of the problem and client requests.

Developing and having with a formal evidence preservation policy will ensure that JMW has the data required to complete an accurate analysis – the only path to identifying true root causes and pinpointing solutions that effectively reduce risk and prevent recurrence.

3.5 First Aid Facilities

- First aid facilities will be provided and coordinated by JMW and will be used by all JMW employees and subcontractors for any injury or illness requiring medical attention. In the event of a serious injury and the employee is unable to be moved, immediately contact the JMW Superintendent or Safety Coordinator, at which time an ambulance shall be contacted.

3.6 Designated Injury Medical Facilities

- First aid facilities will be provided and coordinated by JMW and will be used by all JMW employees and subcontractors for any injury or illness requiring medical attention. In the event of a serious injury and the employee is unable to be moved, immediately contact the JMW Superintendent or Safety Coordinator, at which time an ambulance shall be contacted.
- The primary off site medical facility shall be determined by the JMW Safety Director.
- It is the responsibility of all employees and subcontractors to know the location of the first aid facility **(JMW main trailer)** and inform all employees of the location during new-hire orientations.
- The designated medical responder on site is the JMW Site Superintendent or Safety Coordinator.
  Caution: If you provide first-aid to someone you may be exposed to Blood borne pathogens. You are doing so at your own risk. Latex gloves and eye/face protection should be used to prevent exposure.
- Each JMW site shall develop an emergency action plan addressing medical emergency, emergency phone locations and phone numbers, cave ins, fire procedures, gas leak procedures, severe weather procedures, evacuation procedures, egress routes and muster point locations.

3.7 Injury Case Management/Return to Work Program

- Injured employees placed on “Restricted or Light Duty” status by the treating doctor shall be offered a “modified Duty” position while they are under the doctor’s care.
- Injured employees must present medical papers to superintendent for review.

3.8 Bloodborne Pathogens

General

Universal Precautions shall be observed to prevent contact with blood or other potentially infectious materials. For the purpose of this procedure, all body fluids are to be considered “Other potentially Infectious Material”.

First-Aid Treatment:

a. No employee covered by this procedure shall provide first-aid treatment where there is the potential for exposure to blood or other potentially infectious materials, unless the proper protective equipment is worn.
b. Immediately, or as soon as possible, after first-aid treatment is rendered, the first-aid provider shall thoroughly wash his/her hands and any other skin exposed with soap and running water. In the absence of soap and running water, the employee shall use an antiseptic soap hand cleaner in conjunction with paper towels or antiseptic towelettes to clean hands and other exposed areas of the body. Washing with soap and water shall be done as soon as possible.
c. Immediately, or as soon as possible after use. Contaminated gloves, gauze, sponges, etc. shall be placed in the biohazard disposal bags that have been placed in each first-aid kit.
d. Immediately, or as soon as possible after the treatment of any injury that involved blood or other potentially infectious material, the provider of first aid shall notify JMW management. It is mandatory that this notification be made within the same work shift as the occurrence.

First-Aid Kit:

a. All first-aid kits shall be equipped with the appropriate personal protective equipment (latex gloves, goggles, masks, etc.) to protect employees from the hazards associated with Blood-borne pathogens. Additionally, a copy of this procedure and the forms it establishes shall be maintained each first-aid kit.
b. All materials used for the treatment of injuries shall be replaced in the first-aid kits immediately, or as soon as possible.
c. It shall be the responsibility of the person who routinely provides first-aid to ensure, through regular inventory inspection, that the first-aid kit is adequately stocked.
d. In addition to first-aid supplies, personal protective equipment and Bio-Medical disposal bags, each first-aid kit shall contain a bottle of undiluted bleach. This bleach shall be diluted to a 1:10 solution with water, and used for decontamination.

Housekeeping:

a. All materials used in the treatment of an injury, that are contaminated with blood or other potentially infectious material, shall not be disposed of in trash receptacles. This material (latex gloves, contaminated sponges, etc.) shall be placed in the Bio-Medical disposal bags that are kept in the first-aid kit. These bags shall be transported to a nearby hospital for disposal.
b. Tools, clothing, counter tops or any area contaminated by blood or other potentially infectious material shall be thoroughly cleaned with a 1:10 solution, then washed with soap and water. Materials contaminated by this clean-up process shall be placed in Bio-Medical bags for disposal.
c. Any employees involved in the clean-up following an incident involving blood or other potentially infectious material shall wear, at a minimum, latex gloves as a protection for Blood-borne pathogens.

Exposure Follow Ups:

a. Upon receipt of notification that, through the treatment of an injured employee, a possible exposure to blood or other potentially infectious material has occurred, the management of JMW shall:

    - Determine if an exposure to blood or other potentially infectious material has occurred.
    - Offer the exposed employee, if unvaccinated, a hepatitis B inoculation within 24 hours of the exposure.
    - Obtain a copy of the exposure notification form and maintain it on file.
    - If the exposed employee chooses not to avail him/herself of this inoculation, he/she shall be required to sign a form waiving this treatment. The signed declaration form shall be maintained on file with the exposure notification card.

Training:

a. All employees who routinely provide first-aid treatment to injured co-workers shall receive in Universal Precautions, the guidelines contained in this procedure, and the guideline established by OSHA's Bloodborne Pathogens standard.
b. The employee shall be given a copy of this procedure, and make aware of their right to receive, at no cost, post-exposure inoculations of the Hepatitis B vaccine. They shall also be made aware that, should they decline this inoculation.
c. All training shall be documented and maintained on file at the JMW main office.

3.9 Emergency Action Plan

Purpose

During construction projects, J.M. Wilkerson Construction Co., Inc. (JMW) strives to provide the safest and most secure workplace possible. However, despite all efforts situations can occur which may result in serious personal injury or even death, and in extensive damage to property, equipment and materials.

The purpose of this Emergency Action Plan (EAP) is to:

- Assure the maximum safety and security possible for our employees, other people on site and the effected property on the project.
- Maximize the distribution of information needed by employees, owners, emergency services, the public and news media, regulatory agencies and others with legitimate needs for information.
- Minimize confusion, incorrect information and further loss through effective management of the situation.
- This Site EAP may be used to assist the development (not replacement) of other required regulatory emergency protocols used at the Site (i.e., compliance with 40 CFR Part 68, etc.).

Introduction

Examples of situations (pending on severity) requiring the implementation of the EMP include, but are not limited to:

- Employee injuries and/or fatality.
- Severe weather condition (Thunderstorm, lightning storm, blizzard, hurricane, tornado).
- Any direction given from recognized outside authority (police, fire, regulatory agency, etc.).
- Any direction given from JMW Site or Safety Management.
- Fire, explosion, hazardous material release or reaction.
- Catastrophic accident.

Alarm / Alert System

In the event of an emergency on site, all personnel will be notified via the following method:

- Verbal or Air Horn will alert personnel about the emergency.

It will then be the crew foreman's responsibility to evacuate his/her crew to a safe area.
Rescue / Medical Duties

All rescue operations will be performed by professionally trained personnel. These personnel will be provided by the city/county EMS unless otherwise stated. No worker on site is to attempt a rescue with exception of removing someone from an immediately life-threatening situation. Otherwise, make the affected persons as comfortable as possible, comfort and reassure them that and call for proper assistance.

There may be certain instances where emergency first aid or CPR must be started before others can be reached. Those trained to render first aid or CPR services on this site are:

Site Superintendent

First aid supplies are located at: Superintendent Truck.
Fire Extinguishers are located at: Work Site, CONNEX, Fuel truck

Emergency Operations

Should any critical equipment or utility operations be required during an emergency they will be handled as follows:

In the event a minor employee injury on the jobsite the employee shall be transferred to the nearest medical facility for examination and treatment.

Training

All site personnel will be trained in all aspects of this plan by the Superintendent at the following times:

- Upon initial completion of the site-specific orientation when first coming onsite
- Whenever the plan specifics are changed
- When they are assigned specific emergency duties such as equipment shut down
- Training information is administered both orally as well as written.

ALL TRAINING MUST BE DOCUMENTED!!!

This plan will be maintained onsite by the Superintendent and may be reviewed by any involved party at any time.

Emergency Evacuation Plan

All JMW Site Management are to review this plan and conduct a meeting with its respective employees and lower tier subcontractors to ensure everyone understands the policy, knows the steps to follow in the event of an evacuation, and to ensure proper accounting of all personnel.

Due to construction conditions, the excavation route(s) may be changed. In event of changes to the excavation routes, timely notice will be given to all personnel on site.

In the unlikely event that an evacuation of the job site is warranted, the outlined steps will be taken to ensure everyone evacuates the affected area and all employees are safe and accounted for. JMW will determine what areas need to be evacuated and will sound the alarm.

If there are any questions or an employee needs additional information regarding the EAP, they can reach out to JMW Safety Director, Ruthie Smith.

Section 4 - Safety Violation Procedures

J.M. Wilkerson Construction (JMW) is committed to providing a safe and healthy work environment for all employees working on our projects. The achievement of this goal depends upon the positive actions and attitudes of all employees and their willingness to contribute to an overall team effort. The ultimate responsibility for providing a safe work environment rests with each individual trade contractor. Therefore, in order to ensure a compliance with this safety program and current OSHA regulations, JMW has established this procedure for non-compliance with our safety rules, either in general or following an incident investigation. Employees who refuse or fail to follow the standards set forth herein will subject themselves to disciplinary action up to, and including, termination.

For the protection of all JMW employees and subcontract employees, everyone has an obligation to work by and obey all rules, programs, and policies established by JMW, COA and OSHA. Accordingly, violations of such rules, programs or policies will be dealt with as follows:

4.1 Progressive Disciplinary Policy

a. **First Offense:** Shall result in a minimum of a citation and/or removal from the project. A copy of the citation shall be given to the employee, a copy shall be given to the employee's company and a copy shall be kept on file with the JMW Site Superintendent.

b. **Second Offense:** Shall result in a minimum suspension for the remainder of that scheduled workday and/or removal from the project. A copy of the citation shall be given to the employee, a copy shall be given to the employee's company and a copy shall be kept on file with the JMW Site Superintendent.

- If the violation occurs within the last three hours of the individuals scheduled workday, the employee shall be suspended for the last two hours of the day, as well as the entire next consecutive scheduled workday.
- In order to return to work, the employee shall appear before the Risk Manager to discuss the employees understanding of the projects safety and health program and obtain the contractors approval for returning to work.

c. **Third Offense:** Shall result in permanent removal from the project. A copy of the citation shall be given to the employee, a copy shall be given to the employee's company and a copy shall be kept on file with the JMW Site Superintendent.

Safety Violation Notices shall be fully documented by the Superintendent, Project Manager or Risk Manager stating the disciplinary actions administered to an employee as required under this program. The required disciplinary actions for an employee not in compliance with the safety and health policies and procedures are stated on the back of the Safety Violation Notice form.

All Safety Violation Notices and contractor documentation shall be maintained, and original copies submitted to the JMW Safety and Risk Management Department immediately upon administering disciplinary actions.

4.2 Imminent Danger Safety Violations

Imminent Danger Safety Violations are incidents where the employee could have severely injured themselves and/or another employee or resulted in a fatality. These incidents shall be handled in a different manner than standard violations.

a. **First Offense**: Shall result in a minimum suspension for 3 workdays and/or removal from the project. A copy of the citation shall be given to the employee, a copy shall be given to the employee's company and a copy shall be kept on file with the JMW Site Superintendent.

    - The Subcontractor shall provide a written Corrective Action Statement for the preventing the safety violation from occurring again.

a. **Second Offense**: Shall result in permanent removal from the project. A copy of the warning shall be given to the employee, a copy shall be given to the employee's company and a copy shall be kept on file with the JMW Site Superintendent.

    - If repeat safety violations are found with one Subcontractor Supervisor, that individual may be removed from the project by JMW at any time.

Examples of an Imminent Danger Safety Violation include:

- Failure to comply with Fall Protection Guidelines
- Failure to comply with Excavation Procedures.
- Failure to comply with Lock Out / Tag Out Guidelines
- Failure to comply with Confined Space Entry Procedures
- Failure to comply with Hot Work Permitting Procedures

4.3 Investigation Incident Corrective Actions

JMW Accident/Incident Analysis & Correction

After evidence is collected, the next task is to analyze it to determine causes, identify corrective actions and develop a report for JMW management. The goal is to prevent recurrence of an incident.

Fundamental to this process is the identification of basic, as well as immediate, causes. To facilitate this, the five components of this Loss Causation Model can be very helpful:

- **Losses:** In this column, the JMW investigator lists all losses.
- **Incidents:** Here the JMW investigator specifies the physical events, e.g., "Lisa was struck by a load from a moving forklift."
- **Immediate Causes:** Based on the collected evidence, the JMW supervisor/investigator lists the substandard acts and substandard conditions that preceded Lisa being struck. Example: Failure to warn: The forklift shift driver and the mechanic failed to warn about the faulty brakes.

Although there is substantial debate on the definition of root cause, JMW uses the following:

1. Root causes are specific underlying causes.
2. Root causes are those that can reasonably be identified.

3. Root causes are those management has control to fix.
4. Root causes are those for which effective recommendations for preventing recurrences can be generated. Root causes are underlying causes.

JMW's investigator's goal is to identify specific underlying causes. The more specific JMW can be about why an event occurred, the easier it will be to arrive at recommendations that will prevent recurrence.

Root analysts should avoid using general cause classifications such as operator error, equipment failure or external factor. Such causes are not specific enough to allow JMW management to make effective changes. JMW management needs to know exactly why a failure occurred before action can be taken to prevent recurrence.

JMW must also identify a root cause that management can influence. Identifying "severe weather" as the root cause of parts not being delivered on time to customers is not appropriate. Severe weather is not controlled by management. Root causes are those for which effective recommendations can be generated.

Recommendations will directly address the root causes identified during the investigation. If the analysts arrive at vague recommendations such as, "Improve adherence to written policies and procedures," then they probably have not found a basic and specific enough cause and need to expend more effort in the analysis process.

Basic or Root Causes: These are the underlying reasons why the immediate causes existed.
Here are the root causes for the failure to warn:

- Mental stress: Working double shifts, the mechanic had more work than he could handle.
- Lack of skill: The forklift driver did not have adequate training.
- Inadequate motivation: The priority of things to be done was confusing to the mechanic because he had so much to do.
- Inadequate leadership: Unclear relationships in reporting and conflict in work planning about the mechanic.
- Inadequate work standards: The forklift should have been tagged as out of service for repair, but it was not.

Lack of Control:
These basic causes will be taken a step further to analyze JMW's organization's overall loss control program, program standards and level of compliance with those standards to determine the underlying reasons why those basic causes exist.

This level of analysis is a JMW management function. There are many elements in a loss control system that JMW implements. These include such factors as JMW leadership and administration, planned inspections & maintenance, and critical task analysis and procedures.

After the analysis is completed, the next task JMW performs is to develop remedial actions. These are either temporary, permanent or both:

- **Temporary:** These actions address immediate causes, e.g., take the forklift out of service and repair it.
- **Permanent:** These address permanent causes, e.g., develop a system to purchase better seals, revise procedures, revise the training program for future quarterly sessions.

- **Both:** Conduct audits to make sure training is effective.

After the causal analysis and development of remedial actions, the JMW investigator puts the investigation together in a brief summary for the next higher level of management.

By following the three-phase process described here, JMW can reduce losses to people, property, process and the environment.

Section 5 - Safety Process

Each JMW project site shall establish and administer an active Environmental Health & Safety training program that will comply with the Occupational Safety and Health Act. It is the responsibility of the JMW Superintendent to train their employees in Hazard Recognition, Safe Work methods, and Hazardous Material Communication. Documentation of this training shall be maintained onsite.

5.1 Employee Safety Orientation

All JMW employees and subcontractors on this project site shall undergo an orientation process. This orientation shall train them in specific hazard recognition and avoidance, the safety and health requirements established under this Environmental Health & Safety program and promote communication between all employees and supervision. JMW places the highest priority on the safety of all employees and strives to provide a safe workplace where workers can perform their jobs without injury to themselves or others.

5.2 Safety Training

JMW believes a key element in reducing jobsite hazards and preventing injuries is to develop and maintain a well trained work force that understands basic safety and health principles.

Each JMW Site shall be staffed with employees and subcontractors possessing the appropriate Competent Person(s) per OSHA requirements (ex. 29 CFR 1926 and CFR 1910). The OSHA specific training requirements are as follows:

- General Safety “OSHA 10 Hour”: 29 CFR 1926
- First Aid/CPR: 29 CFR 1910.266
- Hazard Communication Training: 29 CFR 1926.59
- Personal Protective Equipment: 29 CFR 1926.95
- Respiratory Protection: CFR 1926.103
- Rigging for Material Handling: 29 CGR 1926.251
- Scaffold Training: 29 CFR 451
- Fall Protection Training: CFR 1926.503
- Excavation and Trenching: CFR 1926.650

5.3 Job Hazard Analysis / Pre-Task Planning

Each subcontractor shall create a Job Hazard Analysis (JHA) for each scope of work. This training shall be conducted by the Site Superintendent and/or Safety Coordinator. The JHA shall cover the site conditions and work practices of JMW and Subcontract employees. The training shall be documented on a Pre-Task Plan (PTP) Form.

For each major task of work, a JHA will be completed to identify the following:

- Description of steps to be performed,
- Hazards associated with each step (ranked by severity),
- Required action to eliminate or control the hazards identified,
- Safety & Health considerations

Each day a crew will complete a PTP form.

Copies of this documentation shall be maintained on site and forwarded to JMW's Safety Management Department weekly.

Weekly Safety Meetings (Toolbox Talks)

- The Site Superintendent or Safety Coordinator shall conduct weekly Jobsite Safety Meetings, i.e., "Toolbox Talks". These meetings shall be documented by use of the appropriate form. Documentation shall include contractor name, date, time, attendance, a detailed safety talk (including any accidents, incidents or near misses and a review of the last safety training session) and who conducted the meeting.
- Copies of the meeting minutes shall be kept in your jobsite safety files. These should be faxed into the main office with your time sheets every Monday morning.
- Request by facsimile to the Safety and Risk Management Department which safety meeting outlines you would like to use for each month. No more than one month's safety meeting minutes should be ordered at a time.
- Be sure that each employee on the jobsite is present at the meeting and signs the attendance sheet.

5.4 Safety Inspections

- A weekly site safety inspection shall be conducted and documented by JMW personnel. This documentation shall include company name, date, time, the individual conducting the inspection, specific areas inspected, results of the inspection and corrective actions taken. Original copies of this documentation shall be maintained and furnished to the JMW Safety and Risk Department upon request.
- All site safety inspections shall be documented on the appropriate form. The forms shall be submitted to the JMW Safety and Risk Management Department.
- Failure to submit original documents specified in this program shall be considered an infraction of the Construction Site Safety Policy and will result in a safety violation notice or a stop work order. In the event of a stop work order is issued, the contractor in violation may not commence with work until all requirements have been fulfilled and a review of safety protocol has been conducted.

5.5 Training / Competent Persons

JMW believes a key element in reducing jobsite hazards and preventing injuries is to develop and maintain a well trained work force that understands basic safety and health principles.

Each JMW Site shall be staffed with employees and subcontractors possessing the appropriate Competent Person(s) per OSHA requirements (ex. 29 CFR 1926 and CFR 1910). The OSHA specific training requirements are as follows:

- General Safety "OSHA 10 Hour": 29 CFR 1926
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- Scaffold Training: 29 CFR 451
- Fall Protection Training: CFR 1926.503

- Excavation and Trenching: CFR 1926.650

5.6 Skill Specific Craft Safety Training

JMW shall arrange for and coordinate a craft training program for individual craft workers on site. The Craft Training program will be conducted primarily by the following organizations:

- Contractor Supervisory Personnel
- Contractor Safety Supervisors
- Subcontractor Supervisory Personnel
- Union Craft Training Programs
- Third Party Insurance Company Training Representatives
- Associated General Contractors Training Outreach
- Community Outreach training programs
- OSHA Partnership Outreach

The training program will focus on providing the minimum skills necessary for the craft workers to conduct their work safely and with quality. Such training will be geared to meet regulatory and standard training baselines for each worker.

Examples of the kind and types of training courses are as follows:

- Specific craft training classes by work area: (i.e. concrete, carpentry, MEP, etc.)
- Safety training specific to the phase of the project: (i.e. trenching and confined space during earthwork and underground activities, fall protection during elevated structure work, electrical hazards during the electrical energizing phase, etc.)
- First Aid/CPR
- OSHA 10- Hour Class
- Proper Lifting Techniques
- Hazard Communication
- Crisis Management/Site Safety/Evacuations

Tracking Mechanisms

Contractor and each Subcontractor will track each craft worker's training hours. Contractor will require Subcontractors to submit a monthly report of craft training courses and hours.

5.7 Subcontractor Pre-Qualification

Scope and Application
The goal of this process is to evaluate a contractor's historical statistical safety data and current written safety programs in order to indicate to J.M. Wilkerson Construction the level of safety that can be expected from a contractor if hired. Safety qualification applies to all contractors and subcontractors being considered to perform construction activities on this project.

The JMW management team shall evaluate the information submitted by the contractors. All prime contractors are responsible for collecting and evaluating the safety information of subcontractors and must submit it to

management at least two weeks prior to the start of work. A copy of the required evaluation paperwork will be forwarded to the insurance carrier(s).

The following terms are utilized in the qualification process:

a. Experience Modification Rate (EMR) -This Rating is issued by the contractors. worker compensation carrier: it is determined or influenced by the number, costs, and severity of incidents.

b. Lost Time incident Rate - The number of incidents that involve a contactor. employee receiving a work-related injury that does not allow the employee to return. to work (based on the restriction of work by the attending physician) on their next regularly scheduled work shifts per 200,000 work hours.

c. OSHA Recordable Incident Rate - The number of incidents that involve a contractor employee receiving a work-related injury that results in loss of consciousness, restriction of work or motion, transfer to another job, or requiring. medical treatment considered beyond that of first aid per 200,000 work hours.

Procedures

Before considering a contractor for work on this project, JMW shall request the prime contractor to complete the JMW Pre-qualification Form and submit it along with any other requested paperwork, and a copy of the contractor's written safety program. The site-specific safety program shall be submitted when the bid is awarded. JMW will evaluate the submitted information based upon criteria developed by the contractor. If the contractor's data is deemed acceptable, the contactor can be considered for work on this project. If the contractor's data is not acceptable, JMW may:

a. Use an alternative contractor.
b. Develop a plan of improvement to allow the contractor to achieve an acceptable rating.
c. Justify to top management (i.e., new technology, emergency, past onsite experience, positive trends in incident rates, etc.) that despite contractor's safety record, they must be utilized.
d. Allow to complete work. Only top management of JMW may allow one of these contractors to complete work with the approval of the site project safety coordinator.

5.8 Substance Abuse Prevention Program

General

In accordance with the Federal Drug-Free Act of 1988, any place or location that JMW conducts business is conducted is declared to be a drug-free workplace. The safety of all our employees working on this project is our primary concern.

Prohibited Conduct

All JMW employees and subcontractors are expected to report to work on time, free from the influences of unlawful drugs or other controlled substances, and alcohol.

The unlawful manufacture, distribution, dispersion, possession or use of a controlled or prohibited substance on company premises or while conducting company business is prohibited.

Employees may not use prescription drugs illegally, i.e., to use prescription drugs that have NOT been obtained in a legal manner or for a purpose other than as prescribed.

Violations of this policy will result in disciplinary action, up to and including termination of employment.

Subcontractor Requirements

In conjunction with its commitment to safety, JMW has instituted a comprehensive substance abuse, drug/alcohol testing policy and program. The Company is committed to providing a safe, healthy, and productive work environment for all associates, owners, subcontractors, and visitors to the site. The use of drugs and alcohol and their effects produce a serious threat and ARE NOT TOLERATED on JMW project sites.

Additionally, subcontractors are required by contract to develop a substance abuse program of their own or to formally adopt JMW's program.

A copy of JMW's Substance Abuse Policy, as well as JMW's Subcontractor's Substance Abuse and Drug/Alcohol Testing Policy follows.

Subcontractor agrees to be responsible for implementing and maintaining an effective Substance Abuse Program. Subcontractor shall submit this program for review within ten (10) days of the execution of this Subcontract or ten (10) days before mobilizing on the project, whichever occurs first.

Should Subcontractor not have a written Substance Abuse Program, it agrees to abide by the minimum standards stated in the Subcontractors' Substance Abuse and Drug/Alcohol Testing Policy, attached hereto as Exhibit F.

Any costs, including reasonable attorneys' fees and costs, incurred in the adoption, implementation or administration of Subcontractor's Substance Abuse Program shall be the responsibility of Subcontractor.

Section 6 – Basic Safety Rules & Regulations

It is the intention of JMW to comply with all State, Federal, Owner, and OSHA regulations, thereby achieving a safe working environment for you the employee. As an employee or subcontractor of JMW, and as your part of our Safety program, the following basic safety rules and regulations must be strictly adhered to maintain employment on all JMW Projects.

6.1 Site Access

Access to project sites are restricted to employees and admitted to those authorized by JMW. All employees must check in at the **JMW Trailer** before entering the site.

- Employees shall display **JMW Orientation Sticker** at all times when on the project for safety and security.
- There will be no parking available onsite for employee vehicles.
- Use and/or possession of intoxicants, alcohol, or drugs are strictly prohibited.
- Unprofessional behavior will not be tolerated. No fighting, horseplay, or gambling is allowed on site. All violators will be removed from the project site.

6.2 Accident Reporting

Report all accidents, unsafe conditions and/or NEAR MISS EVENTS to your supervisor or J.M. Wilkerson Construction Co., Inc. immediately.

6.3 Site Emergency Management Plan (EMP)

The **Site Emergency Management Plan (EMP)** is available for review at each project. The EMP list medical facility locations for employees to use in case of emergency.

- A complete first aid kit is available in the JMW Field Office.
- All Subcontractors must provide their own first aid kit.

6.4 Safety Meetings

JMW Superintendents shall hold safety meetings on a weekly basis. Documentation of topic and attendees shall be maintained, with a copy given to the JMW Superintendent. JMW shall hold a job wide safety meeting on the first Monday of each month. Subcontractors that do not attend the JMW Safety meeting shall hold safety meetings on a weekly basis and provide JMW with a copy of the sign in sheet/.

6.5 HAZCOM

HAZCOM: “Right to Know Policy”

- The JMW HAZCOM Program & SDS Book is available in the JMW Field Office for review by any employees.
- Each Subcontractor must have copies of their SDS onsite.
- Each Subcontractor shall submit a Site-Specific Chemical Inventory List to JMW.
- Report any chemical or hazardous material spills immediately.

6.6 Personal Protective Equipment (PPE)

Personal Protective Equipment: PPE shall be used when required by the hazards of the job. If there is any doubt as to whether the equipment is necessary, the equipment shall be always used when working. Failure to do so shall result in disciplinary action.

Head Protection:
All construction areas shall be considered "safety hard hat" areas. All employees and visitors shall be required to wear hard hats in all construction areas. Safety Hard Hats shall be provided to all visitors and kept in a clean condition at the jobsite in or convenient to the job site office or Superintendent's vehicle.

Eye Protection:
ANSI approved safety glasses or prescription glasses with side shields shall be always worn in the construction work areas when working at the jobsite. Other forms of eye protection such as goggles, face shields and welding hoods shall be worn where there is a danger of flying debris from chipping, grinding, concrete breaking, etc.

Respiratory Protection:
NIOSH approved respirators will be used when excessive dust, mist, fumes, gases or other atmospheric impurities are determined to be harmful to health. As necessary atmospheric testing, equipment selection/maintenance training, and fit tests must be conducted to determine if each employee is physically fit to wear a respirator and if the respirator is properly fitted. Training documentation for all employees shall be maintained and furnished to the JMW Safety and Risk Management Department upon request.

Fall Protection:
Fall protection will be required for all employees working at elevated work locations of six (6) feet or greater above grade level or within six (6) feet of a leading edge. Employee shall wear a full body harness and shock absorbing lanyard with double locking snap hook.

Dress Wear:
All employees shall wear:

a. Reflective safety wear (Shirt, Vest, or Jacket).
b. Shirts with at least a four (4) inch sleeve and trousers that are ankle length.
c. Heavy work boots that support the ankle with a sturdy sole.
d. Gloves must be worn when handling materials capable of burning, scraping, or cutting hands.

Occupational Noise / Hearing Protection:
Wherever excessive noise levels exist (above 90 decibels, refer to Table D-2 CFR-1926.529d0910) appropriate earplugs or earmuffs shall be worn by all employees and visitors entering or working within these areas. JMW shall utilize administrative controls where feasible. Where administrative controls fail to reduce the sound levels within the level of Table D-2, PPE shall be provided and used to reduce the sound levels within acceptable levels. Where the sound levels exceed the values shown herein, a continuing, effective hearing conservation program shall be administered.

Limiting exposure to excessive noise through engineering controls is JMW management's preferred method of control. (Engineering controls may be as simple as removing a generator from the work area and using a longer power cord). Where engineering controls are not feasible, supervisors shall provide and ensure that their employees wear hearing protection. When hearing protection is necessary, the use of protective

equipment is required. The objective of this policy is to prevent the unnecessary loss of hearing due to excessive noise levels.
Supervisors will be aware of and will notify their Contractors who may be exposed to sound levels equivalent to an average of 85 decibels (dB) over an eight-hour period that hearing protection is available and shall be utilized. As a rule of thumb, 85 dB may be defined as any level at which one has to shout in order to communicate at three feet. Contractors exposed to noise levels of 90 decibels or more shall be provided with and required to wear hearing protection, such as earmuffs or ear inserts. Contractors are solely responsible for any required noise testing for their employee(s) in their work areas.

When protective equipment is necessary; employees shall be given the opportunity to select their hearing protection from two different types of hearing protection. Usually these will be earplugs or earmuffs or a combination of the two. Contractor employees who are issued hearing protective equipment shall receive training which includes informing employees of the effects of noise on hearing and the purpose, use and care of hearing protection. This training is the responsibility of the Contractor.

Warning signs stating "High Noise Area - Hearing Protection required" will be posted by the Contractor on the periphery of all work areas where Contractor employees may be exposed to excessive noise levels.

6.7 Lunch/Break Areas

Designated eating areas away from hazards and contaminants may be established by the JMW Site Superintendent.

- Adequate trash receptacles shall be provided and emptied daily.
- There will be no eating or drinking in the building.
- No Smoking Permitted. All JMW jobsites, offices, and other locations are. designated SMOKE FREE.
- No glass containers, radios, tape decks, mp3/ipod or earphones allowed onsite.

6.8 Housekeeping

Each employee plays a vital role in the cleanliness of the project site.

- Disposal of Hazardous Materials (Ex. Paint Cans / when in doubt contact Safety).
- Keep scrap, trash, and debris localized to minimize tripping hazards and allow for easy pickup.
- Nails should be bent over or removed from lumber.
- Dispose of hazardous materials properly (ex. empty paint cans).

6.9 Sanitation

- An adequate supply of potable water shall be provided in all places of employment.
- Outlets for “Non-Potable” water shall be identified by signing to indicate that the water is unsafe and should not be used for drinking, hand washing or cooking purposes.
- An adequate number of hands washing facilities shall be set up in all break areas.
- No employee shall be allowed to consume food or beverages in a toilet area.
- An adequate number of temporary toilets shall be provided in all places of employment.

6.10 Hot Work

Prior to performing any hot work, you must contact the JMW Field Office to obtain a burn permit.

- Do not start work until meeting with the LM Fire Protection Representative at the site.
- POST the Hot Work Permit while working.
- Have a 10lb. ABC Fire Extinguisher at the site.
- Properly shield work from other employees.
- You must observe a 30-minute burn watch after the shift and call off the permit.

6.11 Compressed Gas Cylinders

- Always keep valve protection cap in place when a cylinder is not in use.
- Use care in handling and storage of cylinders, safety valves, relief valves, etc., to prevent damage.
- When cylinders are hoisted, secure them on a cradle, slingboard, or pallet.
- Move cylinders by tilting and rolling them on their bottom edges. Care in handling is required.
- Secure cylinders in an upright position always, especially when moving them by machine.
- Use carriers or carts provided for the purpose when cylinders are in use.
- When in use, isolate cylinders from welding or cutting or suitably shield them.
- Care will be taken to prevent them from becoming part of an electrical circuit.
- Maintain a distance of at least 20 feet or provide a non-combustible barrier at least five feet high in separating fuel gas cylinders from oxygen cylinders. This applies to indoor and outdoor storage.

Prohibited practices include:

- Use of valve protection caps for lifting cylinders.
- Use of damaged or defective cylinders. The Superintendent will provide appropriate tags and designate an appropriate storage area for these cylinders.
- Use of a wrench or hammer to open cylinder valves.
- Attempting to repair a cylinder valve. The supplier should be contacted.
- No Mixing of gases.
- Use of a magnet or choker sling when hoisting cylinders.
- Use of a bar to pry cylinders from frozen ground. Warm, not boiling, water is used to thaw cylinders.
- Taking oxygen, acetylene, or other fuel gas or manifolds with these gases into confined spaces.
- Storing cylinders near elevators, stairs, or gangways.
- Using cylinders as rollers or supports.

6.12 Torch Cutting

Safe practices in using compressed gases and torches include:

- Cracking cylinders and attaching regulators according to industry practice.
- Putting caps on header hose connections and manifolds when not in use.
- Keeping all hoses, regulators, cylinders, valve protection caps, couplings, apparatus, and torch connections free of grease and oil, especially those involving oxygen.
- Using fuel gas hose and oxygen hose of different colors.
- Inspections:
    - All hoses before every shift.
    - All torches. Only devices designed for the purpose will be used to clean torch tips.
- Use only friction lighters to ignite torches.
- Removal of torches and hoses and positive shut-off of gas sources from confined spaces when leaving a confined space project for any substantial period.

Prohibited practices include:

- Interchange of hoses, including use of adapters, between fuel gas and oxygen sources.
- Placement of anything on or near a manifold or cylinder top that may interfere with the prompt shut-off in case of an emergency.
- Taping more than four inches out of every 12 inches in joining fuel gas and oxygen hoses.
- Using defective hose or torches.
- Use of oxygen for personal cooling, cleaning off surfaces, ventilation or blowing dust from clothing.

Section 7 - STOP WORK AUTHORITY PROGRAM

7.1 PURPOSE/SCOPE

Construction and industrial sites present many hazards to employees when they are performing work-related activities. The purpose of J. M. Wilkerson Construction Co. (JMW) Stop Work Authority (abbreviated as SWA) Program is to provide employees and contract workers with the responsibility and obligation to stop work when a perceived unsafe condition or behavior may result in an unwanted event. JMW considers no activity to be so urgent or important that its standards for environmental protection, safety, or health may be compromised. Employees have the right and responsibility not to perform tasks or activities they feel pose undue risk to themselves, co-workers, or the environment. Stop work actions take precedence over all other priorities and procedures.

It is JMW policy that:

1. Employees have the authority and obligation to stop any task or operation where concerns or questions regarding the control of health and safety risk exist.

2. No work will resume until all Stop Work issues and concerns have been adequately addressed.

3. Any form of retribution or intimidation directed at any employee for exercising their authority to stop work will not be tolerated.

7.2 SITUATIONS THAT MAY REQUIRE A STOP WORK ACTION

SWA should be initiated for conditions or behaviors that threaten danger or imminent danger to person(s), equipment or the environment. Situations that warrant a SWA may include, but are not limited to the following:

1. **Change-** A modification or alteration that deviates from the way the job task is normally performed may cause unsafe work actions or conditions. For example, using a different tool, altering a standard procedure to meet new job task requirements, making a change to the work plan, or observing parameters that are outside the standard procedures.

2. **Unscheduled event-** An unplanned event that distracts employees from the job task being performed may cause unsafe work actions or conditions. For example, inclement weather, simultaneous work occurring nearby, or a community or property owner activity following an accident or spill.

3. **Observation with safety impact-** Whenever an employee observes a condition or situation that has an impact on safety. For example, a hose lying across a walkway, a spill that has not been cleaned up, a loose handrail or a damaged tool.

4. **Incomplete understanding-** Whenever an employee or coworker does not completely understand instructions, procedures or ongoing activities. For example, making assumptions about job task steps, uncertainty over the order that job steps are performed, or differing opinions about how a job task is performed.

5. **Relay information-** Whenever a situation requires critical information to be relayed, an unsafe work action or condition may occur. For example, shift change or employee reassignment.

6. **Observing new hazards-** Whenever an employee encounters risks that have not been addressed during previous job safety analysis or risk assessments. For example, new PPE requirements based on job task demands previously unidentified.

7. **Need to ask for help-** Whenever a job requires additional people, or the experience level of the person performing the job task requires support, an unsafe work action or condition may occur. For example, working to meet production demands and performing a two-person procedure alone, an inexperienced employee who does not ask for help, not asking for help with a heavy lift, or needing help with reading a drawing or sketch.

If an imminent danger stop work is necessary, worker(s) must safely stop their work and notify their supervisor(s). For non-imminent danger stop work, normal supervisory procedures, staff communication, as appropriate, should be used. The condition that caused a stop work to be initiated must be evaluated to determine if the controls that are in place will adequately protect people and the environment. If it is unclear as to whether the controls are adequate or if the scope changes, workers must contact their supervisor to discuss the situation and have their work re-authorized as appropriate. It may also be necessary to secure another release.

7.3 STOP WORK AUTHORITY ROLES AND RESPONSIBILITIES

1. **Senior Management-** Creates a culture that promotes SWA, allows it to be exercised freely, establishes clear expectations and responsibilities, resolves SWA conflicts when they arise and hold accountable anyone who chooses not to comply with established SWA policies. Demonstrates support for using SWA without the potential for retribution. Holds employees and contractors accountable for full compliance with the SWA program. All Stop Work reports will be reviewed by Senior Management.

2. **Supervisors and Managers**- Promotes a culture where SWA is freely exercised, SWA requests are honored and resolved before resuming operations, works to resolve issues before operations resume, and recognizes proactive participation. Ensures necessary stop work follow-up is completed. All Stop Work reports will be reviewed by a supervisor/manager.

3. **Safety Director**- Provides training and training materials, support, maintain associated documentation and monitors compliance of the SWA program. All SWA's will be documented by the Safety Director to assess trends and to share lessons learned.

4. **Company employees and contractors**- Initiate stop work (in good faith) and support stop work initiated by others. All employees have the authority to stop work when the control of the HSE risk is not clearly established or understood. Employees will not be reprimanded for issuing a SWA. Employees must support the intervention of others and properly report all SWA.

7.4 STOP WORK AUTHORITY PROCEDURE

Stop Work Authority is a several step process - **STOP, NOTIFY, CORRECT and RESUME**.

1. **Stop-** When a person identifies a perceived unsafe condition, act, error, omission, or lack of understanding, a SWA shall be immediately initiated with the person(s) observing and/or those who are potentially at risk. If the supervisor is readily available and the affected person(s), equipment or environment is not in imminent danger, coordinate the stop work action through the supervisor. The stop work action should be clearly identify as a stop work action and initiated in a non-combative manner directly with those at risk. Stop Work interventions should be initiated in a positive manner by briefly introducing yourself and starting a conversation with the phrase "I am using my Stop Work authority because." Using this phrase will clarify the user's intent and set expectations as detailed in this procedure.

2. **Notify-** Notify affected personnel and supervision of the stop work action. If necessary, stop work activities that are associated with the work area in question. Make the area(s) as safe as possible by removing personnel and stabilizing the situation. Affected personnel will discuss the situation and come to an agreement on the stop work action. If all parties come to an agreement the condition or behavior is safe to proceed without modifications, the affected persons should show appreciation to the SWA initiator for their concern and then resume work. The SWA is complete at this point and no further steps are needed.

3. **Correct-** The affected area(s) will be inspected to verify completeness of the modifications and to verify all safety issues have been properly resolved. Proceed with the job task safely and implement any recommendations in the JSEA, RAT or MOC, as necessary. Develop temporary procedures or revise existing procedures to accurately, safely perform the job task. Confirm that everyone understands the job task as it is about to be performed. Confirm that proper tools, materials, spill prevention/remediation equipment or personnel, etc. are available. Confirm that the appropriate and trained workforce is available. Determine if there is enough time to perform the job task safely. Confirm that the communication is appropriate (spotters, hand signals, signage, language barriers, etc. If the Stop Work issue cannot be resolved immediately, work shall be suspended until proper resolution is achieved. When opinions differ regarding the validity of the Stop Work issue or adequacy of the

resolution actions, the Person in Charge shall make the final determination. Details regarding differences of opinion and resolution actions should be included in the documented report.

4. **Resume-** The affected area(s) will be reopened for work by personnel with restart authority. All affected employees and contractors will be notified of what corrective actions were implemented and that work will recommence. No work will resume until all issues and concerns have been addressed. In the event an employee still believes it is unsafe, they will be assigned to another job with absolutely no retribution. All Stop Work interventions and associated detail shall be documented and reported to the Safety Director as detailed in this program.

Supervisors/ Managers will provide the root cause analysis to the stop work action and identify any potential opportunities for improvement. The Safety Director will publish the incident details regarding the stop work action to all Supervisors/ Managers and employees outlining the issue, corrective action and lessons learned. Although most issues can be adequately resolved in a timely fashion at the job site, occasionally additional investigation and corrective actions may be required to identify and address root causes. Stop Work interventions that required additional investigation or follow-up will be handled utilizing existing protocols and procedures for incident investigation and follow-up. If anyone in the process believes that the restart authorization or release is not justified, or that modifications imposed as a precondition to the operation's restart are inadequate, appeal the resume decision to the Safety Director.

7.5 TRAINING

Training regarding this SWA Program shall be conducted as part of all new employee and contractor orientations. At a minimum, employees will be trained in:

1. The importance of Stop Work Authority.
2. The benefits of Stop Work Authority.
3. The contents of this program and are expected to adhere to the provisions contained within

Section 8 – Globally Harmonized System (GHS)

8.1 General

It shall be the policy of JMW to comply with OSHA's Globally Harmonized System (GHS) by:

- Labeling containers which have hazardous materials properly per the GHS.
- Compiling a database of hazardous chemicals used and store on the job site.
- Collecting copies of Safety Data Sheets from subcontractors.
- Providing employee training on the hazardous materials used and stored on the job site.

8.2 Definitions

Safety Data Sheets (SDS) provide specific information on the chemicals employees use at a work site. The Superintendent will maintain a notebook in his office with an SDS on every chemical that is on the list of hazardous chemicals.

8.3 Program Requirements

The Hazard Communication Compliance Program is established to provide for the safety of all site employees, while also meeting all government requirements, which will include safety data sheets, employee training, container labeling and other forms of warning.

The JMW Site Superintendent shall:

- Assure compliance with this manual.
- Identify all hazardous chemicals found on the job site.
- Compile a Chemical Inventor List of all known hazardous materials being used by JMW
- Obtain a Chemical Inventor List for all subcontractors on the project site.
- Make copies of this list available to all employees.
- Train all employees in the requirements of the GHS.
- Follow all labeling requirements and directions.
- Assure proper use of personnel protection equipment.

Container Labeling:

All original and secondary chemical product containers, portable fuel cans, etc. will:

- Be clearly marked as to the chemical contents of the container.
- Provide the appropriate hazard warning.
- The name and address of the manufacturer.
- If the contents are known to be carcinogenic, that must be indicated on the container label.
- All chemicals should be stored in their original or approved containers that are properly labeled.

How to Read a SDS:

SDS have been standardized, and are divided into the following section:

- Material Identification
- OSHA Hazard Determination
- HMIS codes
- Physical Data
- Reactivity Data
- Fire and Explosion Data
- Transportation and Storage
- Health Hazard Information
- Emergency and First Aid Procedures
- Spill, Leak and Disposal Information
- Health Precautions

8.4 Training

Prior to commencing work at the site each employee shall be provided with training consisting of a health and safety orientation that will include information and training on the following:

- A summary of the JMW GHS.
- A review of the hazardous chemicals presents on site.
- The physical and health hazards of the hazardous chemicals on site.
- How to avoid, lesson or prevent exposure to hazardous chemicals by using good safe practices, person personal protective equipment, etc.
- Measures JMW has taken to lessen the opportunity of exposure to hazardous chemicals, including ventilation, respirators, presence of other employers' hazardous chemicals, and emergency procedures for exposure.
- The location, availability and contents of the JMW (or subcontractor) written GHS program and SDS book.
- How to read and interpret information on both labels and SDS sheets, and how employees can obtain additional information.
- How to detect the release or presence of hazardous chemicals in the work area.
- Health hazards, including signs and symptoms of exposure, associated with exposure to chemicals and any medical condition known to be aggravated by exposure to the chemical.
- Location of emergency and first aid equipment.
- How to report an occupational accident or illness.

8.5 Hazardous Non-Routine Tasks

Prior to commencing work at the work site, each employee will be given information by their employer about hazardous chemicals which they may be exposed on site. This information shall include:

- Specific chemical hazards
- Protective and safety measures the employee should take.
- Measures the contactor has taken to lessen the exposure to hazards, including ventilation, respirators, presence of other employees, and other emergency procedures.

8.6 Communication with Subcontractors On-Site

All Subcontractors on-site are to be provided with the following information:

- Identification and location of hazardous chemicals to which they may exposed while on-site.
- The protective measures to be taken which may lessen the possibility of exposure by the use of appropriate personal protective equipment.
- The subcontractors will be responsible for training their own employees.

8.7 Obtaining Information from Subcontractors On-Site

JMW and subcontractors working at the site are to exchange the following information:

- Identification and location of hazardous chemicals to which they may exposed while on-site.
- The protective measures to be taken which may lessen the possibility of exposure by the use of appropriate personal protective equipment.
- JMW submit a letter to other contractors stating their hazardous materials use on-site.
- All subcontractors on the project should also provide JMW with the same information regarding their particular scope of work.

8.8 SDS Database Management

SDS are to be obtained and organized on-site, and available for review by all employees.

Incoming SDS are to be reviewed for new and significant health and safety information. New information shall be passed on to the employees.

JMW shall maintain a central database of all hazardous chemical SDS used on-site. The database shall include at a minimum:

- SDS hardcopy.
- Common chemical name.
- CAS Number or similar references; and
- Manufacturer name and contact information.

The SDS database will be updated as necessary, maintained as part of the project records and will be available to all employees for review. JMW safety personnel shall have the responsibility to assure communication between subcontractors on-site, verify labeling and conduct training on the GHS.

Section 9 - Hazardous Materials Management

9.1 General

This guideline provides guidelines to all JMW employees and subcontractors to assure regulatory compliance, reduce hazard exposure to employees, and minimize costs associated with the purchase, transportation, storage, use, and disposal of hazardous materials.

9.2 Introduction

For purposes of this manual, a hazardous chemical is any chemical for which a SDS has been received. A material should be considered hazardous if it:

- Exhibits certain properties (i.e., toxicity, easily flammable, explosive, reactive and corrosive).
- Can cause or significantly contribute to an increased mortality or increase in serious irreversible or incapacitating illness.
- Presents a substantial or potential hazard to human health or environment when improperly treated, transported, stored or disposed of or otherwise managed.

JMW and all subcontractors shall receive and keep on file an SDS from the manufacturer of each hazardous material they order and is delivered to the site. A SDS Catalog of all hazardous materials used on site shall be kept in the main JMW trailer. This book shall be available for employees to look at or reference in case of an emergency.

9.3 Responsibilities

Subcontractor Emergency Contact

- This person must be familiar with all the Hazardous Substances and Extremely Hazardous Substances under his or her company's control and the location of each on-site.
- This person will act as a referral for the subcontractor if the emergency responders need assistance in responding to a chemical accident at the Site.

JMW Safety Coordinator

- This person shall assist the JMW Site Superintendent or Contractor Supervisors in the education of necessary Community Right to Know requirements.
- Conduct appropriate training seminars for Site managers, supervisors and other essential personnel in the requirements of the Community Right to know regulations and requirements and the forms and information which must be accumulated and sent to the appropriate authorities.
- Establish appropriate record keeping procedures for maintaining copies of all information transmitted to State Commissions, Local Communities and Fire Departments.

9.4 Hazardous Material Plan Requirements

JMW and each subcontractor shall develop a hazardous materials plan, to conform to the following sections of this document. This plan is to be included in their Safety program. The plan should be developed prior to mobilization and delivery of supplies, and include the following:

- A list of all hazardous materials to be used on the site with approximate quantities.
- Purchasing, where each hazardous material will be purchased, the manufacturer, and supplier.
- Transportation, who is the shipper, how will the hazardous material arrive, by rail, truck, co-vehicle, etc.
- Storage, where and how the hazardous materials be stored, special arrangements which must be made prior to arrival.
- Use, compliance with regulatory hazard communication standards for training, product labeling, SDS, a written HazCom program, notification of subcontractors and other contractors on site.
- Disposal, each hazardous material must have a disposal procedure in place prior to use.
- All incidents of overexposure, spills or leaks of any hazardous material will be reported immediately to a foreman, superintendent, or safety representative. Proper spill containment and emergency care for those exposed must be provided immediately.

9.5 Purchasing of Hazardous Material

The original specification and initial purchases of hazardous materials can have a significant impact on site hazardous materials management and presents an opportunity to simplify, or avoid entirely, the complex compliance requirements of handling hazardous materials.

When ordering or specifying hazardous materials, always consider:

- Alternative materials or methods – consider a less hazardous material or alternative method that would eliminate the need for the hazardous material.
- Quantity management – often, by purchasing smaller quantities instead of a large, single order, complex reporting and waste management disposal requirements may be avoided. (Example: order a 30-gallon barrel and 5-gallon pails of material instead of a 55-gallon drum)
- Hazard – when ordering any hazardous material, know what you are ordering. Have an SDS faxed to the site and review the concerns of planning with site management.
- Disposal – disposal of hazardous waste can be expensive. If hazardous material must be ordered, know the costs and methods of disposal.

9.6 Transportation

The transportation of hazardous materials is highly regulated by the US Department of Transportation (USDOT) and the individual states. In general, products are shipped to site by shippers who retain the legal responsibility for the hazardous material, until the purchaser signs the manifest.

Once the material is on site, transportation of hazardous material is regulated by Federal and State Occupational Safety and Health Standards and should be consistent with hazard information supplied with the SDS.

9.7 Storage of Hazardous Materials

Storage of hazardous materials must follow local, state, and federal regulations. As hazardous materials are brought onto the site, they shall be moved to a designated and secure location for storage.

When storing hazardous materials, the following concerns must be considered:

Security and Accessibility

Hazardous material products shall be located to guard against theft, vandalism, and the attraction to children in the area. Labels and signs indicating the material and hazard must be prominently displayed.

Spill Containment

Spills of hazardous materials may occur through normal transfer of material, material handling accidents, corrosion of containers, or vandalism. Transfer systems, i.e., pumps, barrel bungs, containers, etc., shall be specifically designed for the type of material being transferred. Storage areas are to be diked by a spill containment area. The surface on which hazardous material is stored shall be impermeable to the stored material, such as a concrete floor or visqueen barrier.

Flammability

When hazardous materials represent a significant fire hazard, storage should be outside, away from buildings and combustible materials. Signs should be prominently displayed indicating flammable material, fire hazard, and the specific material, fire hazard, and the specific material stored, i.e., gasoline, naphtha, toluene, etc. Fire extinguishers appropriate to the material and size consistent with the amount of material stored shall be placed in a readily accessible location within 25'-50' of the hazardous material.

Corrosiveness

When hazardous materials are indicated to be corrosive, labels and signs shall be prominently displayed indicating corrosive material, and the specific material stored, i.e., acetic acid, hydrochloric acid, etc.

Reactivity

When hazardous materials are indicated to be reactive, labels and signs shall be prominently displayed indicating reactive material, and the specific material stored. Also, signs should indicate how to avoid a dangerous reaction, i.e., do not mix with water, shock sensitive, do not mix with acid, etc.

Compatibility

Some materials should not be stored together with other materials, as mixing can create a hazardous result. For instance, gasoline and acid may cause self-ignition and explosion. Before storing one hazardous material with another, refer to the SDS.

Storage

An acceptable method for storage of paint, fuels, solvents, etc. routinely found on jobsites involves the designation of an area away from general workflow. A bermed dike of earth shall be created around the containment area to prevent escape of spilled material. The entire area and dike shall be covered in visqueen, or another high-density synthetic impermeable barrier.

Signs indicating the types of materials stored in the area and their hazards should be prominently displayed. Two 20-lb. ABC fire extinguishers are to be placed in proximity to the fuel storage with adequate signage indicating their presence.

9.8 Use of Hazardous Materials

Use of hazardous materials on site shall follow local, state, federal, and client requirements. In particular, the use will comply with the Federal OSHA Hazard Communication Act.

- JMW is responsible for providing SDS to each subcontractor. All subcontractors are responsible for providing SDS to JMW. JMW shall provide information as to the total amount of material arriving and the location of the hazardous materials to all subcontractors.
- Each JMW-controlled and subcontractor-controlled area will provide the appropriate protection for all materials considered being hazardous (i.e., fire protection, barricades, proper storage racks, visual warning signs and implementation of all additional safety precautions for the proper storage of hazardous materials).
- JMW and each subcontractor shall make readily available to all employees working in with the hazardous materials the appropriate personal protective equipment required by all federal, state and local governing agencies.
- JMW and each subcontractor shall educate each of their employees as to the proper safe work procedures to be utilized during the handling of the hazardous material. The employee education program shall include:

    a) An explanation of the potential health and environmental hazards involved when working with the hazardous material.
    b) Explanation of the correct usage of additional personal protective equipment (i.e., respirators, protective clothing) if required.
    c) An explanation of the purpose of the SDS and a description of where they are kept on site.
    d) Documentation of employee education programs, dealing with the proper handling of hazardous materials, shall be maintained by JMW and subcontractor (i.e., safety meetings and special training sessions). The signature list of employees shall be kept on file.

9.9 Transport and Disposal

This section on hazardous waste disposal will provide guidance and suggestions for subcontractors on techniques and services to recycle or dispose of hazardous wastes.

- Federal regulations strictly limit the disposal of hazardous wastes. JMW shall designate a Site Disposal area. All JMW subcontractors shall comply with the storage, use, and disposal of waste streams generated at the site and use the Site Disposal Area. Coordination of these activities shall be performed with the JMW Safety Coordinator.
- Never pour or dump any products or wastes directly onto the ground, into sumps, pits, holes or any water body.
- Never place any liquids, paints, sludge or other wastes that would not pass through a paint filter into a dumpster, landfill or refuse pile.
- Report all spills and releases, regardless of amounts, to the JMW Safety Coordinator.
- Keep all products or waste barrels off the ground on pallets so the barrels can be inspected for leaks.

- Practice good housekeeping (clean area, legible labels, etc.) to minimize unnecessary generation of waste.
- Maintain records of types of waste generated companies who take waste from site and all shipping documents used for wastes.
- The best hazardous waste management method is to avoid generating the waste in the first place. Minimization of the hazardous waste can occur by eliminating waste, reducing the toxicity of waste generated or lessening the quantity of waste generated.
- Waste minimization can occur in many ways. The major categories of waste management techniques are:

    a) Process Modifications – This includes any change in equipment that will operate more efficiently or use a product that does not generate waste.
    b) Material Substitution – This includes use of materials that do not generate hazardous waste or generate a less hazardous waste, such as latex paints and citrus-type solvents.
    c) Housekeeping Materials – This means working cleaner and eliminating practices that unnecessarily result in wastes being generated.
    d) Onsite Recycling – This can include virtually any legitimate reuse of waste materials, so long as the reuse does not involve putting the materials on the ground.

9.10 Record Keeping and Compliance Reporting

Record Keeping

- Purchasing: Record keeping is required at each step of hazardous material and hazardous waste management for the purchaser and user of hazardous material.
- Transportation**:** All hazardous material must be manifested and accompanied by a bill of lading. These documents must be kept for three years after the final disposal of the product waste.
- Use**:** All documents pertaining to employee training and hazard communication, including SDS and lists of chemicals used on site must be kept for three years after the project is completed.
- Disposal**:** After a product is used, the remaining or contaminated used product becomes classified as hazardous waste. Hazardous waste shipping manifests must be kept for at least three years. All records pertaining to personnel, including training, job titles, job descriptions, and names of employees involved with managing hazardous waste, must be kept for three years.

Hazardous Material Reporting: Community Right-to-Know.

By limiting the storage of hazardous materials on site to fewer than 10,000 ponds, or of hazardous wastes to fewer than 220 pounds per month, the site will normally have no reporting requirements.

The USEPA has established Community Right-to-Know reporting regulations relating to hazardous chemicals and extremely hazardous substances, which may be present in specified quantities. These regulations require the submission of forms and information regarding those chemicals and substances to the appropriate State Emergency Response Commission (State Commission), Local Emergency Planning Committee (Local Committee) in the locale of the site and the Fire Department with jurisdiction over the site.

The purpose of the reporting regulations is to provide to these three entities information, which will allow then to make plans to deal with the presence of these chemicals and substances in the event of a disaster at the site.

Section 10 - Tools

10.1 Statement of Purpose

The purpose of this document is to establish guidelines to protect the employees of J.M. Wilkerson Construction Co., Inc. (JMW) and its subcontractors form the hazards of using power and powder tools.

10.2 Machine Tools

- Machine tools shall be operated only by qualified operators.
- Guards shall not be removed or made inoperative.
- In cutting, drilling, shaping, etc., the work shall be properly secured and the correct tool used.
- Machines shall not be cleaned or oiled while in motion. All cutting edges shall be kept sharpened or replaced as needed.
- Machines shall not be stopped by placing hands on the belt or other moving parts.
- Machining operations shall not continue if the work or cutting tool becomes loose.
- All power tools shall be periodically inspected to see that they are in good condition.
- Workers should wear proper fitting clothes.
- Rings, loose jewelry, dangling sleeves, neck ties, and excessively long hair are dangerous and should not be worn.
- Approved eye protection shall be worn when working with or near machines or power tools.
- Extreme care shall be used to protect the hands when working on or around moving machinery.

10.3 Power Tools

- When pneumatic tools are used, all couplings shall be secured by retainage clips. Hoses shall not be used for hoisting or lowering tools.
- When using powder actuated tools, the operator shall be properly trained in accordance with the manufacturer's specifications. An operator license for the tool being used must be on the operator at all times.
- Check for hidden cables, conduit, etc., before drilling through floors, walls, or pavement.
- Power supply cords shall not be used for hoisting or lowering the tools to which they are attached.
- Never leave a loaded powder actuated tool unattended.
- Do not leave live powder loads discarded on the project site.

10.4 Powder Actuated Tools

- Only property trained and qualified operators should ever use powder-actuated tools. Users should possess 'Qualified Operations Cards' which, after thorough training, are issued by a particular manufacturer's authorized dealer or distributor or other competent source.

- When using the tool, it must be held firmly against and perpendicular to the surface into which the fastening device is being driven. Never shoot into a blind surface. Take the necessary time to check the other side. Many innocent construction workers have been injured, and some even killed, from being struck by a wayward fastening device which ricocheted off or went completely through the target.

- Personal protective equipment must be worn by the operator, and the face should be protected if there is any danger of spilling materials. Check with your supervisor on the type of safety goggles required. [See 1926.102 Table E-1]

- All powder-actuated tools must be tested daily - before use - and all defects discovered before or during use must be corrected. Tools must not be loaded until immediately before use. Loaded tools must not be left unattended. Keep hands clear of the muzzle end. Powder-actuated tools should never be stored or used in explosive atmospheres.

- When you are through using a powder-actuated tool, unload it and dispose of firing rounds property; never leave them laying around. For proper training check with your powder-actuated vendor, who will often come to the work site and conduct a safety class. Finally, if you are not qualified to use the tool, do not!

Section 11 - Electrical

11.1 General

All electrical work, either temporary, permanent installation or testing maintenance shall conform to the requirements of the Occupational Safety and Health Act. OSHA Standards 1926.400 through 1926.449 applies to the use of electricity on construction sites.

A basic element of controlling electrical hazards is that only trained and experienced electricians will perform electrical work on JMW project sites. All electrical installations will comply with the National Electrical Code regardless of where the installation is located.

This program establishes minimum standards to prevent hazardous electrical exposures to personnel and ensure compliance with regulatory requirements applicable to electrical systems. Working on equipment in a de-energized state is required unless de-energizing introduces an increased hazard or is infeasible. This program is designed to help ensure that energized electrical work at all HCC projects is performed safely by qualified electrical workers, who are trained and provided with the appropriate safe work procedures, protective equipment and other controls. The program is intended to protect employees against electrical shock, burns and other potential electrical safety hazards as well as comply with regulatory requirements.

11.2 Purpose

This program has been established in order to:

- Ensure the safety of employees who may work on or near electrical equipment.
- Ensure that employees understand and comply with safety standards related to electrical work.
- Ensure that campuses, agencies and employees follow uniform practices during the progress of electrical work.
- Comply with OSHA Standards

The following topics are covered as part of the Electrical Safety Program:

1. Standard Job Safety Requirements for Electrical
2. Assured Grounding Program
3. Ground Fault Protection (GFCI)
4. Electrical Power Cords
5. Electricity for Non-Electricians
6. Lockout/Tagout Safety Program
7. Arc Flash Safety Policy

11.3 Standard Job Safety Requirements

Standard Job Safety Requirements for Electrical Temporary and Permanent Power:

1. Total compliance with OSHA Title 29, Part 1926 and the National Electrical Code Article

305. Where conditions or requirements are addressed in both these sources the more stringent requirement shall be observed.

2. All branch circuits shall be protected by ground fault circuit interrupters (GFCI) and Assured Grounding Equipment Program.
3. The Assured Equipment Grounding Program will be site specific and comply with all the conditions of the subcontractors Exhibit D of the subcontract.
4. All power cords will be 3 wires, a minimum of #12 conductors, and designed for hard or extra hard usage. Flexible cords for portable lights will be designed for hard or extra hard usage.
5. At no time will any construction power hand tool be used without ground fault protection. When temporary power is removed and permanent power is available subcontractors shall provide ground fault protection for their own cords, lights and tools.
6. The Electrical subcontractor is responsible for compliance with all provisions of this HCC policy and will provide HCC with a written, site specific Electrical Safety Program.
7. Throughout construction and including punch list and warranty work Lock and Tag procedures as described in OSHA 1926.417 and as specified in the written site specific Electrical Safety Program will be followed.
8. All construction circuits for power hand tools, temporary lighting, elevators, welders, pumps, etc., will be identified at each end and at all junction points by a numerical and or alphabetical system. Circuits to lights and tools will be dedicated and not shared one with the other.
9. All temporary power equipment and devices exposed to the weather will be made rain-tight.
10. Temporary lighting levels will be maintained at a minimum of 5 ft. per sq. ft. throughout rough construction and at a minimum of 50 ft. per sq. ft. (or permanent lighting) for finish applications.
11. Employee parking lot lighting and access/ egress lighting to the building or work site will be maintained at a minimum of 2 ft. per sq. ft.
12. At least one full time electrician per building will be assigned to the upkeep and record keeping of the temporary power system.

11.4 Electrical Power Cords

Perhaps the most abused tool on the construction job site is the electrical power cord. They are kinked, twisted, cut, pulled and crushed almost constantly. Unfortunately, these damaged cords also take their toll in injuries and even fatalities.

Don't take electrical cords for granted. They can be a big help to us, but they can also hurt. Keep these pointers in mind:

- Visually inspect the cord for damaged and exposed conductors. If the cord is in damaged condition, don't use it.
- Inspect to make sure the ground prong is in good condition and the cord provides a satisfactory ground for the electrical tools being used.

- Don't drag cords over rough surfaces and don't use them to lift or pull materials. Electrical cords were not designed to function as ropes.
- Don't disconnect cords by jerking them out. They should be disconnected at the receptacle.
- Don't string electrical cords through water or oil and grease. Also, don't hammer nails or staples into cords.
- When not in use, the cords should be neatly coiled and stored.
- Only round cords that are rated for heavy duty use are allowed. Never use flat power cords.

11.5 Assured Grounding Program

Scope

This testing program shall cover all receptacles that are not part of the permanent wiring and all cord sets and equipment connected by cord and plug, which are available for use or used by employees.

Requirements

Equipment grounding conductors shall be installed in accordance with the applicable requirements of the National Electrical Code (NEC) (1971).

- All 120-volt, single-phase, 15- or 20-amp receptacles shall be of the grounding type and their contacts shall be grounded by connection to the equipment grounding conductor of the circuit supplying the receptacles.

- All 120-volt cord sets (extension cords) shall be of the three-wire type with a grounding conductor which shall be connected to the contacts of the plugs on each end of the cords.

- The exposed non-current carrying metal parts of cord and plug-connected tools and equipment shall be grounded by the use of a grounding conductor in the supply cord and shall be connected to the grounding contact in the attachment plug.

- All other receptacles of higher voltage shall be grounded in accordance with NEC (1971).

Testing and Inspection

- All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.

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

- The required tests for the above shall be performed and recorded:
    - Before first use

- Before equipment is returned to service following any repairs
- Before equipment is used after any incident, which can be reasonably suspected to have caused damage (for example, when a cord set is run over)
- At intervals not to exceed three months except those cord sets and receptacles that are fixed and not exposed to damage shall be tested at intervals not exceeding six months

- Visual Inspection: Employees shall be instructed to visually inspect receptacles, flexible cord sets (except those that are fixed and not exposed to damage,) and equipment connected by cord and plug before each day's use. Check for external defects such as deformed or missing ground prongs or insulation damage and for indication of possible internal damage. Where there is evidence of damage, the damaged item shall be taken out of service and tagged until tested and any required repairs have been made.

- Test Record: Test verification shall be by means of numeric or color-coded marking tape on the receptacle, cord set or equipment. Numeric or color codes will identify that it has passed the test and will indicate the date (month or quarter) in accordance with the color-coding scheme.

11.6 Ground Fault Protection

GFCI's are intended to prevent electrocution by quickly interrupting the circuit in the event of a ground fault. They operate independently of the equipment grounding circuit. The Assured Equipment Grounding Conductor Program requires periodic inspection and testing of the ground circuit. Regardless of which choice is made, all the grounding requirements of the National Electrical Code still apply. The regulations pertain only to the use of temporary wiring on construction sites. They do not apply to the permanent wiring of the building or structure.

11.7 Electricity for Non-Electricians

The average construction worker typically does not know how to safely deal with electricity and they are not expected to handle electrical work or repairs. However, there are some facts about electricity that non-electricians should know about in order to guard themselves against electrical shock.

The following are tips to keep you safe from electrical hazards:

- If any electrical device near your work area sparks, overheats or smokes, don't try to repair it yourself. Shut it off and report it.

- Stay away from all electrical switches, fuse boxes, or other devices unless you have been authorized to handle them and instructed in their use. Even if you think you understand them completely, it's better to remember the old saying, "a little knowledge is a dangerous thing."

- If you are authorized to replace a fuse, follow the operating instructions you've been given faithfully. An apparently harmless variation may be deadly. Also, never bridge a fuse with a nail or other metal – the fuse is your best safety device on any electrical circuit.

- When you must use any electrical equipment (including portable electrical tools or extension lights) in a situation where there is a lot of moisture around or where you have to contact grounded metal (particularly water or heating pipes,) GET CLEARANCE FROM YOUR SUPERVISOR FIRST.

Remember these rules – don't tackle any electrical job you haven't been assigned to and don't do any electrical job you have been assigned to in any other way than the way you've been trained.

11.8 Lockout / Tagout Safety Program

General

Lockout is the preferred method of isolating machines or equipment from energy sources. To assist employers in developing a procedure which meets the requirements of the standard, however, the following simple procedure is provided for use in both lockout and tagout programs. This procedure may be used when there are limited numbers or types of machines or equipment or there is a single power source. For more complex systems, a more comprehensive procedure will need to be developed, documented, and utilized.

Purpose

This procedure establishes the minimum requirements for the lockout or tagout of energy isolating devices. It shall be used to ensure that the machine or equipment is isolated from all potentially hazardous energy and locked out or tagged out before employees perform any servicing or maintenance activities where they are unexpectedly energized. The start-up or release of stored energy could cause injury.

Responsibility

Appropriate employees shall be instructed in the safety significance of the lockout or tagout procedure. Each new or transferred employee who is affected and other employees whose work operations are or may be in the area shall be instructed in the purpose and use of the lockout or tagout procedure.

Preparation for Lockout or Tagout

Make a survey to locate and identify all isolating devices to be certain which switch(es), valve(s), or other energy isolating devices apply to the equipment to be locked or tagged out. More than one energy source (electrical, mechanical, or others) may be involved.

Sequence of Lockout/Tagout System Procedure

1. Notify all affected employees that a lockout or tagout system is going to be utilized and the reason therefore. The authorized employee shall know the type and magnitude of energy that the machine or equipment utilizes and shall understand the hazards thereof.
2. If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.).
3. Operate the switch, valve, or other energy isolating device(s) so that the equipment is isolated from its energy source(s). Stored energy, such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure,

etc., must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, etc.

4. Lockout and/or tagout the energy isolating devices with assigned individual lock(s) or tag(s).
5. After ensuring that no personnel are exposed and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate.

CAUTION: Return operating control(s) to neutral or off position after the test.

6. The equipment is now locked out or tagged out.

Restoring Machines or Equipment to Normal Production Operations

1. After the servicing and/or maintenance is complete and equipment is ready for normal production operations, check the area around the machines or equipment to ensure that no one is exposed.

2. After all tools have been removed from the machine or equipment, guards have been reinstalled, and employees are in the clear, remove all lockout or tagout devices to restore energy to the machine or equipment.

Procedure Involving More Than One Person

In the preceding steps, if more than one individual is required to lockout or tagout equipment, each shall place his/her own personal lockout device or tagout device on the energy isolating devices(s). When an energy isolating device cannot accept multiple locks or tags, a multiple lockout or tagout device (hasp) may be used. If lockout is used, a single lock may be used to lockout the machine or equipment with the key being placed in a lockout box or cabinet which allows the use of multiple locks to secure it. Each employee will then use his/her own lock to secure the box or cabinet. As each person no longer needs to maintain his or her lockout protection, that person will remove his/her lock from the box or cabinet.

Basic Rules for Using Lockout or Tagout System Procedures

All equipment shall be locked out or tagged out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy isolating device where it is locked or tagged out.

11.9 NFPA 70-E Arc Flash Safety Policy

The Arc Flash Safety Program is written to define the responsibilities of subcontractors, vendors and HCC staff. This program shall be followed during construction, and throughout all commissioning activities. The intent of the Arc Flash Safety Program is to insure all HCC staff, Subcontractors, Suppliers, Owners, Architects, Engineers, Commissioning Agents, etc. are aware of the risks associated with Arc Flash as well as the necessary safety procedure, and NFPA 70E guidelines.

MEP and Safety Coordinator Responsibilities

All MEP and Safety Coordinators shall have arc flash awareness training and be familiar with the regulations relating to working on energized electrical equipment, be familiar with "Energized Electrical Work Permits" and be able to define the term, "Qualified Personnel." A copy of the NFPA 70 E handbook shall be made available in the on-site library. All electrical cubicles or equipment shall have arc flash labels applied which list the Risk Hazard level (PPE Level) relative to that piece of equipment or system, prior to being energized for the first time. Existing installations will be dealt with on a case by case analysis. It is the responsibility of the HCC staff to ensure that the electrical safety procedures are followed by all on site personnel that may be working on energized electrical systems.

Electrical Contractor Responsibilities

All Electrical Contractors shall have a section within their safety plan which addresses arc flash compliance during construction and commissioning. This section shall be based upon NFPA 70E Guidelines. The Electrical Contractor shall also provide an Electrical Safety Coordinator. The primary role of the ESC is to effectively manage job wide electrical safety and to monitor the activities of unqualified workers.

At least one safety meeting shall be scheduled to review the NFPA 70 E policies related to arc flash compliance, PPE, and Energized Electrical Work Permits prior to the energizing any of the electrical systems. The Electrical Contractor shall provide site specific Arc Flash Awareness Training for all personnel that may be involved with testing of energized electrical parts. This may include, but not be limited to vendors, controls systems technicians, commissioning agents, and owner representatives. Attendance is required to participate in any electrical commissioning activities or to be present during electrical commissioning.

Personal Protective Equipment (PPE)

NFPA 70 E shall be used as the baseline reference for all risk hazard assessments. The employee is responsible for providing cotton clothing, leather boots, and cotton layers as necessary for warmth. Metal items and jewelry are not to be worn including metal belt buckles. While the specific type of PPE will be determined by the application and risk hazard level, there are other types of clothing that should be in compliance with NFPA 70E such as:

- ✓ Safety vest rated for arc flash exposure
- ✓ Hard hat with FR (flame retardant) liner
- ✓ Hearing protection
- ✓ Safety glasses

For further information regarding the proper PPE levels or help in determining the appropriate type of PPE for the specific levels of protection, please reference the NECA PPE Selector and Arc Flash Guide. There is no guarantee that the above listed arc flash protection equipment will protect an employee from all possible arc flash energy releases. It is incumbent upon the individual to exercise extreme caution when dealing with electrical energy at all voltage levels. Those individuals should also endeavor to remain outside the arc flash boundary, avoid working on energized equipment and avoid entering energized

electrical rooms unless absolutely necessary. In general, HCC employees should not be involved with any electrical work which requires exposure to live parts.

Witness Testing of Energized Systems

Witness testing of energized equipment is defined as:

1. Performing tests on wiring or equipment that is either energized or in an enclosure that is energized.
2. Performing tests on wiring or equipment that passes through an enclosure that contains energized wiring.

If exposure to energized parts is a requirement of witness testing, the hazard risk category of any piece of vendor equipment should be identified by the vendor and the hazard risk assessment should be reviewed by the team prior to the commencement of testing. In the case that the vendor does not supply this information, the PPE selector shall be used to assist in determining the appropriate level of PPE.

11.10 Overhead Powerlines

- Keep a safe distance between yourself and power lines. Ten feet is generally considered the minimum safe distance.
- Before you begin working, check carefully for overhead power lines in the area you will be working. Do not assume that wires are telephone or cable lines: check with your electric utility for advice.
- If you need to cut a tree branch, be sure that it will not fall into power lines. Should a branch fall into our lines, call us at (602) 236-8888 to remove it.
- Even if a power line appears to be broken or grounded, keep your distance. The line could still be energized. Contact with an energized line can injure or kill.
- When working with ladders, make sure they cannot meet power lines in case they fall over.
- Work only in good weather. Thunderstorms, rain, winds and damp or icy ground can cause you to lose control and meet power lines.
- Although overhead power lines may appear to be insulated, often these coverings are intended only to protect metal wires from weather conditions and may not protect you from electric shock.

Section 12 - Fall Prevention

12.1 General

All work performed at elevation shall conform to the requirements of OSHA Standard CFR 29 1926.500 through 1926.503. A basic element of controlling fall hazards is that only trained and experienced workers will perform elevated work on J.M. Wilkerson Construction Co., Inc. (JMW) project sites.

Fall protection shall be required for all employees who are exposed to a fall of six (6) feet or more. Fall protection can be in the form of barriers, personal fall arrest systems, controlled access zones or a combination there of.

12.2 Types of Fall Protection

There are several forms of fall protection available. JMW shall use four basic types of fall protection: guardrails, controlled access zones, covers, and personal fall arrest systems. Each of these systems has specific requirements. How these three systems are used can mean the difference between life and death for workers. Be sure you are familiar with the specific requirements of each.

a) Covers: A physical barrier placed to protect employees from falling through an opening to a lower height from elevated height. Covers are made from any material able to support twice the intended load and be clearly labeled.

b) Guardrail System: A physical structure erected to prevent employees from falling to lower. levels from elevated heights. A guardrail system consists of a lower, mid, and top rail. Each piece shall be installed to OSHA requirements.

c) Controlled Access Zones: An area in which certain work may take place without the use of a guardrail systems, personal fall arrest systems, or other means of fall protection and access to the zone is limited to trained and authorized personnel only.

d) Personal Fall Arrest Systems: A system used to arrest (stop) an employee in a fall from work at an elevation. It consists of a body harness, a deceleration device, a lanyard, and an anchorage point, or suitable combination of these. If any employee ever has any doubts, which fall arrest system to use, choose the following basic system.

12.3 Fall Protection Requirements

Unprotected Edges or Sides

Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet or more above a lower level will be protected from falling by the use of guardrail systems or personal fall arrest systems.

Leading Edge Work

Leading edges are defined as the edge of a floor or roof that changes location as additional floor or roof sections are placed or constructed. If work stops on a leading edge it will be considered to be an "unprotected side or edge" and will be covered by the section of this plan on unprotected sides and edges.

JMW personnel who are involved in leading edge work will be protected from a fall by use of a personnel fall arrest system. Employees who are not constructing the leading edge, but who are on walking/working surfaces where leading edges are under construction, are also protected from a fall by guardrails or a personal fall arrest system.
Hoist Areas

In all situations where equipment and material hoisting operations take place, JMW protects employees from fall hazards. When JMW is involved in hoisting operations a guardrail or personal fall arrest system will be used to protect workers.

When guardrails (or chains or gates) are removed to facilitate hoisting operations and one of our employees must lean through the access opening or out over the edge to receive or guide materials they will be protected by a personal fall arrest system.

Holes

At JMW worksites, areas that employees can trip or step into or through a hole or an object could fall through a hole and strike a worker, JMW will ensure that guardrails or covers are used to prevent these types of incidents.

We understand that OSHA does not intend that a guardrail be erected around holes while personnel are working at the hole, passing materials, and so on. Therefore, if the cover is removed while work is in progress, guardrails are not required because they would interfere with the performance of work. Our personnel will use personnel fall arrest systems in these situations. When the work has been completed, we will be required to either replace the cover or erect guardrails around the hole.

Cover shall meet the following requirements:

- All other covers shall be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.
- All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.
- All covers shall be color coded or they shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard.

Ramps, Runways, and Other Walkways

JMW will equip all ramps, runways, and other walkways with guardrails when employees and are subject to falling 6 feet or more to lower levels.

Dangerous Equipment

JMW is committed to protecting our employees from falling onto dangerous equipment. JMW will use conventional fall protection or, if possible, eliminate the physical hazard below.

Wall Openings

Employees who are exposed to the hazard of falling out or through wall openings where the outside bottom edge of the wall opening is 6 feet or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches above the walking/working surface must be protected from falling. JMW protects employees from falls out or through wall openings by use of a guardrail system or personal fall arrest system.

Protection from Falling Objects

When employees are exposed to falling objects, JMW ensures employees wear hard hats and also implement one of the following measures:

- Erect toeboards, screens, or guardrail systems to prevent objects from falling from higher levels.
- Erect a canopy structure and keep potential fall objects far enough from the edge of the higher level so that those objects would not go over the edge if they were incidentally moved.
- Barricade the area to which objects could fall, prohibit employees from entering the barricaded area, and keep objects that may fall far enough away from the edge of a higher level so that those objects would not go over the edge if they were incidentally moved.
- Cover or guard holes 6 feet or more above a lower level.

12.3 Training Requirements

Superintendents shall assure that a competent person qualified in the following area of fall protection has trained their employees, as necessary. Training must be completed before the employee is assigned to work that requires fall protection. Training subjects include:

a) The nature of the fall hazards in the work area.

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

c) The use and operation of guardrail systems, controlled access zones, and fall arrest systems.

d) The nature of fall arresting equipment such as full body harnesses and connective devices that attach to the worker's protective gear such as lanyards, rope grabs, retractable lifelines.

12.4 Certification Requirements

Written certification records identifying the employee trained, dates of training, and person who conducted the training shall be completed. Training records shall be maintained and furnished to the JMW Safety and Risk Management Department upon completion.

If JMW has reason to believe that an employee who has already been trained does not have the understanding and skill required, JMW shall require the retraining of the employee.

Section 13 – Fire Prevention Program

13.1 General

It is the responsibility of the superintendent to maintain temporary fire protection by use of portable fire extinguishers and temporary standpipes with weekly inspections. All workers of all employers will be trained in the use of portable fire extinguishers and emergency plans and evacuations.

The local fire department, ambulance services, and emergency medical personnel shall be contacted prior to each project beginning to advise them of the project location, key contact personnel and to be advised of the project emergency plans for fire, injured man and confined space areas if applicable.

At all entrances/exits there shall be a covered and protected walkway that shall extend 8 feet beyond the farthermost most point of the building. This walkway shall be marked "Entrance" and "Exit" for emergency egress.

The covered walkway shall be constructed so that the roof sheeting is a full 1-½ inches thick with joist supports 16 inches on center and the walkway shall be a minimum of 4 feet wide.

13.2 Temporary Fire Extinguishers

- A 10-pound ABC fire extinguisher shall be kept adjacent to each stairway and ladder access on all floors of the building.
- All workers shall be trained in the proper use of fire extinguishers with documentation.
- A 20-pound BC fire extinguisher shall be kept no less than 25 feet and no greater than 75 feet from all fuel storage areas which include gasoline, diesel, propane, oxygen and acetylene.

13.3 Fuel Storage Areas

- All fuel storage tanks used for gasoline and diesel fuel shall have a berm installed around the tank at least 1 foot in height and adequate enough in size to contain the contents of the fuel tanks.
- All fuel storage areas shall be at least 25'-0" from all building and temporary structures or separated by a 1 hour rated firewall that extends 4 feet above the storage containers.
- All cylinders shall be kept upright and secured at all times
- All fuel tanks shall be marked as to their type of fuel and "Flammable – No Smoking" in 4" letters on all sides of the tanks.

13.4 Temporary Heating

- All temporary heaters shall be kept at least 10 feet from all flammable materials such as wood, paper, plastic, tarps, etc.
- A fire watch shall be maintained at all times when portable heaters are being used with adequate portable fire extinguishers in place.

- Salamander type heaters shall not be used.
- Fuel for temporary heaters shall not be stored in 55 gallon drums within the building or temporary buildings unless these areas are specifically designed and ventilated for fuel storage.
- All-purpose portable heaters shall be kept at least 10’-0” from the propane storage cylinders
- Propane heaters shall not be used to heat the propane storage cylinders.
- All propane storage cylinders shall be kept upright and secured at all times.
- Propane cylinders may not be stored inside of buildings.
- Areas shall be properly ventilated.

Section 14 - Confined Space

14.1 General

All work in confined spaces shall conform to the requirements of the Occupational Safety and Health Act. OSHA Standard 29 CFR 1926.1203 applies to the methods by which confined space work shall be completed on construction sites.

The basic elements of controlling the hazards of confined space work are testing every space before an entrant may enter it, only trained and experienced entrants will perform work, a rescue team is on standby for a rescue operation if need be.

14.2 Definitions

The following terms are defined for the purposes of this subpart only:

Acceptable entry conditions mean the conditions that must exist in a permit space, before an employee may enter that space, to ensure that employees can safely enter, and safely work within, the space.

Attendant means an individual stationed outside one or more permit spaces who assesses the status of authorized entrants and who must perform the duties specified in §1926.1209.

Authorized entrant means an employee who is authorized by the entry supervisor to enter a permit space.

Barrier means a physical obstruction that blocks or limits access.

Blanking or blinding means the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that can withstand the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

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

Confined space means a space that:

(1) Is large enough and so configured that an employee can bodily enter it.

(2) Has limited or restricted means for entry and exit; and

(3) Is not designed for continuous employee occupancy.

Control means the action taken to reduce the level of any hazard inside a confined space using engineering methods (for example, by ventilation), and then using these methods to maintain the reduced hazard level. Control also refers to the engineering methods used for this purpose. Personal protective equipment is not a control.

Controlling Contractor is the employer that has overall responsibility for construction at the worksite.

Note. If the controlling contractor owns or manages the property, then it is both a controlling employer and a host employer.

Double block and bleed mean the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Early-warning system means the method used to alert authorized entrants and attendants that an engulfment hazard may be developing. Examples of early-warning systems include but are not limited to: alarms activated by remote sensors; and lookouts with equipment for immediately communicating with the authorized entrants and attendants.

Emergency means any occurrence (including any failure of power, hazard control or monitoring equipment) or event, internal or external, to the permit space that could endanger entrants.

Engulfment means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, crushing, or suffocation.

Entry means the action by which any part of a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space, whether such action is intentional, or any work activities are performed in the space.

Entry Employer means any employer who decides that an employee it directs will enter a permit space.

Note. An employer cannot avoid the duties of the standard merely by refusing to decide whether its employees will enter a permit space, and OSHA will consider the failure to so decide to be an implicit decision to allow employees to enter those spaces if they are working in the proximity of the space.

Entry permit (permit) means the written or printed document that is provided by the employer who designated the space a permit space to allow and control entry into a permit space and that contains the information specified in §1926.1206 of this standard.

Entry rescue occurs when a rescue service enters a permit space to rescue one or more employees.

Entry supervisor means the qualified person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this standard.

Note. An entry supervisor also may serve as an attendant or as an authorized entrant if that person is trained and equipped as required by this standard for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during an entry operation.

Hazard means a physical hazard or hazardous atmosphere. See definitions below.

Hazardous atmosphere means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

(1) Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL).

(2) Airborne combustible dust at a concentration that meets or exceeds its LFL.
Note: This concentration may be approximated as a condition in which the combustible dust obscures vision at 5 feet (1.52 meters) or less.

(3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.

(4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart D—Occupational Health and Environmental Control, or in Subpart Z—Toxic and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or permissible exposure limit.

Note. An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this definition.

(5) Any other atmospheric condition that is immediately dangerous to life or health.

Note. For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Safety Data Sheets that comply with the Hazard Communication Standard, §1926.59 of this part, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Host employer means the employer that owns or manages the property where the construction work is taking place.

Note. If the owner of the property on which the construction activity occurs has contracted with an entity for the general management of that property and has transferred to that entity the information specified in §1203(h)(1), OSHA will treat the contracted management entity as the host employer for as long as that entity manages the property. Otherwise, OSHA will treat the owner of the property as the host employer. In no case will there be more than one host employer.

Hot work means operations capable of providing a source of ignition (for example, riveting, welding, cutting, burning, and heating).

Immediately dangerous to life or health (IDLH) means any condition that would interfere with an individual's ability to escape unaided from a permit space and that poses a threat to life or that would cause irreversible adverse health effects.

Note. Some materials—hydrogen fluoride gas and cadmium vapor, for example—may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12-72 hours after exposure. The victim "feels normal" after recovery from transient effects until collapse. Such materials in hazardous quantities are "immediately" dangerous to life or health.

Inerting means displacing the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

Note. This procedure produces an IDLH oxygen-deficient atmosphere.

Isolate or isolation means the process by which employees in a confined space are completely protected

against the release of energy and material into the space, and contact with a physical hazard, by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; blocking or disconnecting all mechanical linkages; or placement of barriers to eliminate the potential for employee contact with a physical hazard.

Limited or restricted means for entry or exit means a condition that has a potential to impede an employee's movement into or out of a confined space. Such conditions include, but are not limited to, trip hazards, poor illumination, slippery floors, inclining surfaces and ladders.

Line breaking means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Lockout means the placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lower flammable limit or lower explosive limit means the minimum concentration of a substance in air needed for an ignition source to cause a flame or explosion.

Monitor or monitoring means the process used to identify and evaluate the hazards after an authorized entrant enters the space. This is a process of checking for changes that is performed in a periodic or continuous manner after the completion of the initial testing or evaluation of that space.

Non-entry rescue occurs when a rescue service, usually the attendant, retrieves employees in a permit space without entering the permit space.

Non-permit confined space means a confined space that meets the definition of a confined space but does not meet the requirements for a permit-required confined space,
as defined in this subpart.

Oxygen deficient atmosphere means an atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen enriched atmosphere means an atmosphere containing more than 23.5 percent oxygen by volume.

Permit-required confined space (permit space) means a confined space that has one or more of the following characteristics: (1) Contains or has a potential to contain a hazardous atmosphere; (2) Contains a material that has the potential for engulfing an entrant; (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or (4) Contains any other recognized serious safety or health hazard.

Permit-required confined space program (permit space program) means the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

Physical hazard means an existing or potential hazard that can cause death or serious physical damage. Examples include but are not limited to explosives (as defined by paragraph (n) of §1926.914, definition of "explosive"); mechanical, electrical, hydraulic and pneumatic energy; radiation; temperature extremes; engulfment; noise; and inwardly converging surfaces. Physical hazard also includes chemicals that can cause death or serious physical damage through skin or eye contact (rather than through inhalation).

Prohibited condition means any condition in a permit space that is not allowed by the permit during the period when entry is authorized. A hazardous atmosphere is a prohibited condition unless the employer can demonstrate that personal protective equipment (PPE) will provide effective protection for each employee in the permit space and provides the appropriate PPE to each employee.

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 his ability to solve or resolve problems relating to the subject matter, the work, or the project.

Representative permit space means a mock-up of a confined space that has entrance openings that are like, and is of similar size, configuration, and accessibility to, the permit space that authorized entrants enter.

Rescue means retrieving, and providing medical assistance to, one or more employees who are in a permit space.

Rescue service means the personnel designated to rescue employees from permit spaces.

Retrieval system means the equipment (including a retrieval line, chest or full body harness, wristlets or anklets, if appropriate, and a lifting device or anchor) used for non- entry rescue of persons from permit spaces.

Serious physical damage means an impairment or illness in which a body part is made functionally useless or is substantially reduced in efficiency. Such impairment or illness may be permanent or temporary and includes, but is not limited to, loss of consciousness, disorientation, or other immediate and substantial reduction in mental efficiency. Injuries involving such impairment would usually require treatment by a physician or other licensed health-care professional.

Tagout means:(1) Placement of a tagout device on a circuit or equipment that has been deenergized, in accordance with an established procedure, to indicate that the circuit or equipment being controlled may not be operated until the tagout device is removed; and (2) The employer ensures that (i) tagout provides equivalent protection to lockout, or (ii) that lockout is infeasible, and the employer has relieved, disconnected, restrained and otherwise rendered safe stored (residual) energy.

Test or testing means the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

Note. Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during, entry.

Ventilate or ventilation means controlling a hazardous atmosphere using continuous forced-air mechanical systems that meet the requirements of §1926.57—Ventilation.

14.3 Scope.

(a) This standard sets forth requirements for practices and procedures to protect employees engaged in construction activities at a worksite with one or more confined spaces, subject to the exceptions in paragraph (b) of this section.

Note to paragraph 13.7(a). Examples of locations where confined spaces may occur include, but are not limited to, the following: Bins; boilers; pits (such as elevator, escalator, pump, valve or other equipment); manholes (such as sewer, storm drain, electrical, communication, or other utility); tanks (such as fuel, chemical, water, or other liquid, solid or gas); concrete pier columns; sewers; transformer vaults; heating, ventilation, and air-conditioning (HVAC) ducts; storm drains; water mains; precast concrete and other pre-formed manhole units; drilled shafts; enclosed beams; vessels; digesters; lift stations; cesspools; silos; step up transformers; turbines; chillers;; and/or mixers/reactors.

(b) Exceptions. This standard does not apply to: (1) Construction work regulated by §1926 subpart P—Excavations. (2) Construction work regulated by §1926 subpart S—Underground Construction, Caissons, Cofferdams and Compressed Air. (3) Construction work regulated by §1926 subpart Y—Diving.

(c) Where this standard applies and there is a provision that addresses a confined space hazard in another applicable OSHA standard, the employer must comply with both that requirement and the applicable provisions of this standard.

14.4 General requirements

(a) Before it begins work at a worksite, JMW must ensure that a competent person identifies all confined spaces in which one or more of the employees it directs may work, and identifies each space that is a permit space, through consideration and evaluation of the elements of that space, including testing, as necessary.

(b) If the workplace contains one or more permit spaces, the employer who identifies, or who receives notice of, a permit space must:

(1) Inform exposed employees by posting danger signs or by any other equally effective means, of the existence and location of, and the danger posed by, each permit space; and

A sign reading “DANGER -- PERMIT- REQUIRED CONFINED SPACE, DO NOT ENTER” or using other similar language would satisfy the requirement for a sign.

(2) Inform, in a timely manner and in a manner other than posting, its employees’ authorized representatives and the controlling contractor of the existence and location of, and the danger posed by, each permit space.

(c) Each employer who identifies, or receives notice of, a permit space and has not authorized employees it directs to work in that space must take effective measures to prevent those employees from entering that permit space, in addition to complying with all other applicable requirements of this standard.

(d) If JMW decides that employees it directs will enter a permit space, JMW will have a written permit space program that complies with §1926.1204 implemented at the construction site. The written program must be made available prior to and during entry operations for inspection by employees and their authorized representatives.

(e) JMW may use the alternate procedures specified in paragraph §1926.1203(e)(2) for entering a permit space only under the conditions set forth in paragraph §1926.1203(e)(1).

(1) JMW employees enter a permit space need not comply with §§1926.1204 through 1206 and §§1926.1208 through 1211, if all the following conditions are met:

(i) JMW can demonstrate that all physical hazards in the space are eliminated or isolated through engineering controls so that the only hazard posed by the permit space is an actual or potential hazardous atmosphere.

(ii) JMW can demonstrate that continuous forced air ventilation alone is sufficient to maintain that permit space safe for entry, and that, in the event the ventilation system stops working, entrants can exit the space safely.

(iii) JMW develops monitoring and inspection data that supports the demonstrations required by paragraphs §1926.1203(e)(1)(i) and §1926.1203(e)(1)(ii).

(iv) If an initial entry of the permit space is necessary to obtain the data required by paragraph §1926.1203(e)(1)(iii), the entry is performed in compliance with §§1926.1204 through 1211 of this standard.

(v) The determinations and supporting data required by paragraphs §1926.1203(e)(1)(i), (e)(1)(ii), and (e)(1)(iii) are documented by JMW and are made available to each employee who enters the permit space under the terms of paragraph §1926.1203(e) or to that employee's authorized representative; and

(vi) Entry into the permit space under the terms of paragraph §1926.1203(e)(1) is performed in accordance with the requirements of paragraph §1926.1203(e)(2).

Note to paragraph §1926.1203(e)(1). See paragraph §1926.1203(g) for reclassification of a permit space after all hazards within the space have been eliminated.

(2) The following requirements apply to entry into permit spaces that meet the conditions set forth in paragraph §1926.1203(e)(1):

(i) Any conditions making it unsafe to remove an entrance cover must be eliminated before the cover is removed.

(ii) When entrance covers are removed, the opening must be immediately guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space.

(iii) Before an employee enters the space, the internal atmosphere must be tested, with a calibrated direct reading instrument, for oxygen content, for flammable gases and vapors, and for potential toxic air contaminants, in that order. Any employee who enters the space, or that employee's authorized representative, must be provided an opportunity to observe the pre-entry testing required by this paragraph.

(iv) No hazardous atmosphere is permitted within the space whenever any employee is inside the space.

(v) Continuous forced air ventilation must be used, as follows:

(A) An employee must not enter the space until the forced air ventilation has eliminated any hazardous atmosphere.

(B) The forced air ventilation must be so directed as to ventilate the immediate areas where an employee is or will be present within the space and must continue until all employees have left the

space.

(C) The air supply for the forced air ventilation must be from a clean source and must not increase the hazards in the space.

(vi) The atmosphere within the space must be continuously monitored unless the entry employer can demonstrate that equipment for continuous monitoring is not commercially available or periodic monitoring is sufficient. If continuous monitoring is used, the employer must ensure that the monitoring equipment has an alarm that will notify all entrants if a specified atmospheric threshold is achieved, or that an employee will check the monitor with sufficient frequency to ensure that entrants have adequate time to escape. If continuous monitoring is not used, periodic monitoring is required. All monitoring must ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere. Any employee who enters the space, or that employee's authorized representative, must be provided with an opportunity to observe the testing required by this paragraph.

(vii) If a hazard is detected during entry:

(A) Each employee must leave the space immediately.

(B) The space must be evaluated to determine how the hazard developed; and

(C) The employer must implement measures to protect employees from the hazard before any subsequent entry takes place.

(viii) JMW must ensure a safe method of entering and exiting the space. If a hoisting system is used, it must be designed and manufactured for personnel hoisting; however, a job-made hoisting system is permissible if it is approved for personnel hoisting by a registered professional engineer, in writing, prior to use.

(ix) JMW must verify that the space is safe for entry and that the pre- entry measures required by paragraph §1926.1203(e)(2) have been taken, through a written certification that contains the date, the location of the space, and the signature of the person providing the certification. The certification must be made before entry and must be made available to each employee entering the space or to that employee's authorized representative.

(f) When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants, or some indication that the initial evaluation of the space may not have been adequate, each entry employer must have a competent person reevaluate that space and, if necessary, reclassify it as a permit- required confined space.

(g) A space classified by an employer as a permit-required confined space may only be reclassified as a non-permit confined space when a competent person determines that all the applicable requirements in paragraphs §1926.1203(g)(1) through (g)(4) have been met:

(1) If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated or isolated without entry into the space (unless the employer can demonstrate that doing so without entry is infeasible), the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated or isolated.

(2) The entry employer must eliminate or isolate the hazards without entering the space, unless it can

demonstrate that this is infeasible. If it is necessary to enter the permit space to eliminate or isolate hazards, such entry must be performed under §§1926.1204 through 1211 of this standard. If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated or isolated, the permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated or isolated.

Note to paragraph §1926.1203(g)(2). Control of atmospheric hazards through forced air ventilation does not constitute elimination or isolation of the hazards. Paragraph §1926.1203(e) covers permit space entry where the employer can demonstrate that forced air ventilation alone will control all hazards in the space.

(3) The entry employer must document the basis for determining that all hazards in a permit space have been eliminated or isolated, through a certification that contains the date, the location of the space, and the signature of the person making the determination. The certification must be made available to each employee entering the space or to that employee's authorized representative.
and

(4) If hazards arise within a permit space that has been reclassified as a non-permit space under paragraph §1926.1203(g), each employee in the space must exit the space. The entry employer must then reevaluate the space and reclassify it as a permit space as appropriate in accordance with all other applicable provisions of
this standard.

(h) Permit Space Entry Communication and Coordination:

(1) Before entry operations begin, the host employer must provide the following information, if it has it, to the controlling contractor:

(i) The location of each known permit space.

(ii) The hazards or potential hazards in each space or the reason it is a permit space; and

(iii) Any precautions that the host employer or any previous controlling contractor or entry employer implemented for the protection of employees in the permit space.

(2) Before entry operations begin, the controlling contractor must:

(i) Obtain the host employer's information about the permit space hazards and previous entry operations; and

(ii) Provide the following information to each entity entering a permit space and any other entity at the worksite whose activities could foreseeably result in a hazard in the permit space:

(A) The information received from the host employer.

(B) Any additional information the controlling contractor has about the subjects listed in paragraph (h)(1) of this section; and

(C) The precautions that the host employer, controlling contractor, or other entry employers implemented for the protection of employees in the permit spaces.

(3) Before entry operations begin, each entry employer must:

(i) Obtain all the controlling contractor's information regarding permit space hazards and entry operations; and

(ii) Inform the controlling contractor of the permit space program that the entry employer will follow, including any hazards likely to be confronted or created in each permit space.

(4) The controlling contractor and entry employer(s) must coordinate entry operations when:

(i) More than one entity performs permit space entry at the same time: or

(ii) Permit space entry is performed while any activities that could foreseeably result in a hazard in the permit space are performed.

(5) After entry operations:

(i) The controlling contractor must debrief each entity that entered a permit space regarding the permit space program followed and any hazards confronted or created in the permit space(s) during entry operations.

(ii) The entry employer must inform the controlling contractor in a timely manner of the permit space program followed and of any hazards confronted or created in the permit space(s) during entry operations; and

(iii) The controlling contractor must apprise the host employer of the information exchanged with the entry entities pursuant to this subparagraph.

Note to paragraph §1926.1203(h). Unless a host employer or controlling contractor has or will have employees in a confined space, it is not required to enter any confined space to collect the information specified in
this paragraph (h).

(iv) If there is no controlling contractor present at the worksite, the requirements for, and role of, controlling contactors in §1926.1203 must be fulfilled by the host employer or other employer who arranges to have
employees of another employer perform work that involves permit space entry.

14.5 Permit-Required Confined Space Program

Each entry employer must:

(a) Implement the measures necessary to prevent unauthorized entry.

(b) Identify and evaluate the hazards of permit spaces before employees enter them.

(c) Develop and implement the means, procedures, and practices necessary for safe permit space entry operations, including, but not limited to, the following:

(1) Specifying acceptable entry conditions.

(2) Providing each authorized entrant or that employee's authorized representative with the opportunity to observe any monitoring or testing of permit spaces.

(3) Isolating the permit space and physical hazard(s) within the space.

(4) Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards.

Note to paragraph §1204(c)(4). When an employer is unable to reduce the atmosphere below 10 percent LFL, the employer may only enter if the employer inerts the space to render the entire atmosphere in the space non- combustible, and the employees use PPE to address any other atmospheric hazards (such as oxygen deficiency), and the employer eliminates or isolates all physical hazards in the space.

(5) Determining that, in the event the ventilation system stops working, the monitoring procedures will detect an increase in atmospheric hazard levels in sufficient time for the entrants to safely exit the permit space.

(6) Providing pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards.

(7) Verifying that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry, and ensuring that employees are not allowed to enter, or remain in, a permit space with a hazardous atmosphere unless the employer can demonstrate that personal protective equipment (PPE) will
provide effective protection for each employee in the permit space and provides the appropriate PPE to each employee; and

(8) Eliminating any conditions (for example, high pressure) that could make it unsafe to remove an entrance cover.

(d) Provide the following equipment (specified in paragraphs §1926.1204(d)(1) through (d)(9)) at no cost to each employee, maintain that equipment properly, and ensure that each employee uses that equipment properly:

(1) Testing and monitoring equipment needed to comply with paragraph §1926.1204(e).

(2) Ventilating equipment needed to obtain acceptable entry conditions.

(3) Communications equipment necessary for compliance with paragraphs §1926.1208(c) and §1926.1209(e), including any necessary electronic communication equipment for attendants assessing entrants' status in multiple spaces.

(4) Personal protective equipment insofar as feasible engineering and work-practice controls do not adequately protect employees.

Note to paragraph §1926.1204(d)(4). The requirements of subpart E of this part and other PPE requirements continue to apply to the use of PPE in a permit space. For example, if employees use

respirators, then the respirator requirements in §1926.103 (Respiratory protection) must be met.

(5) Lighting equipment that meets the minimum illumination requirements in §1926.56, that is approved for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present, and that is sufficient to enable employees to see well enough to work safely and to exit the space quickly in an emergency.

(6) Barriers and shields as required by paragraph §1926.1204(c)(4).
(7) Equipment, such as ladders, needed for safe ingress and egress by authorized entrants.

(8) Rescue and emergency equipment needed to comply with paragraph §1926.1204(i), except to the extent that the equipment is provided by rescue services; and

(9) Any other equipment necessary for safe entry into, safe exit from, and rescue from, permit spaces.

(e) Evaluate permit space conditions in accordance with the following paragraphs (e)(1) through (6) of this section when entry operations are conducted:

(1) Test conditions in the permit space to determine if acceptable entry conditions exist before changes to the space's natural ventilation are made, and before entry is authorized to begin, except that, if an employer demonstrates that isolation of the space is infeasible because the space is large or is part of a continuous system (such as a sewer), the employer must:

(i) Perform pre-entry testing to the extent feasible before entry is authorized; and,

(ii) If entry is authorized, continuously monitor entry conditions in the areas where authorized entrants are working, except that employers may use periodic monitoring in accordance with paragraph §1926.1204(e)(2) for monitoring an atmospheric hazard if they can demonstrate that equipment for continuously monitoring that hazard is not commercially available.

(iii) Provide an early-warning system that continuously monitors for non- isolated engulfment hazards. The system must alert authorized entrants and attendants in sufficient time for the authorized entrants to safely exit.
the space.

(2) Continuously monitor atmospheric hazards unless the employer can demonstrate that the equipment for continuously monitoring a hazard is not commercially available or that periodic monitoring is of sufficient frequency to ensure that the atmospheric hazard is being controlled at safe levels. If continuous monitoring is not used, periodic monitoring is required with sufficient frequency to ensure that acceptable entry conditions are being maintained during entry operations.

(3) When testing for atmospheric hazards, test first for oxygen, then for combustible gases and vapors, and then for toxic gases and vapors.

(4) Provide each authorized entrant or that employee's authorized representative an opportunity to observe the pre-entry and any subsequent testing or monitoring of permit spaces.

(5) Reevaluate the permit space in the presence of any authorized entrant or that employee's authorized representative who requests that the employer conduct such reevaluation because there is some indication that the evaluation of that space may not have been adequate; and

(6) Immediately provide each authorized entrant or that employee's authorized representative with the results of any testing conducted in accordance with §1926.1204 of this standard.

(f) Provide at least one attendant outside the permit space into which entry is authorized for the duration of entry operations.

(1) Attendants may be assigned to more than one permit space provided the duties described in §1926.1209 of this standard can be effectively performed for each permit space.
(2) Attendants may be stationed at any location outside the permit space if the duties described in §1926.1209 of this standard can be effectively performed for each permit space to which the attendant is assigned.

(g) If multiple spaces are to be assigned to a single attendant, include in the permit program the means and procedures to enable the attendant to respond to an emergency affecting one or more of those permit spaces without distraction from the attendant's responsibilities under §1926.1209 of this standard.

(h) Designate each person who is to have an active role (as, for example, authorized entrants, attendants, entry supervisors, or persons who test or monitor the atmosphere in a permit space) in entry operations, identify the duties of each such employee, and provide each such employee with the training required by §1926.1207 of this standard.

(i) Develop and implement procedures for summoning rescue and emergency services (including procedures for summoning emergency assistance in the event of a failed non-entry rescue), for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, and for preventing unauthorized personnel from attempting a rescue.

(j) Develop and implement a system for the preparation, issuance, use, and cancellation of entry permits as required by this standard, including the safe termination of entry operations under both planned and emergency conditions.

(k) Develop and implement procedures to coordinate entry operations, in consultation with the controlling contractor, when employees of more than one employer are working simultaneously in a permit space or elsewhere on the worksite where their activities could, either alone or in conjunction with the activities within a permit space, foreseeably result in a hazard within the confined space, so that employees of one employer do not endanger the employees of any other employer.

(l) Develop and implement procedures (such as closing off a permit space and canceling the permit) necessary for concluding the entry after entry operations have been completed.

(m) Review entry operations when the measures taken under the permit space program may not protect employees and revise the program to correct deficiencies found to exist before subsequent entries are authorized; and

Note to paragraph §1926.1204(m). Examples of circumstances requiring the review of the permit space program include but are not limited to any unauthorized entry of a permit space, the detection of a permit space hazard not covered by the permit, the detection of a condition prohibited by the permit, the occurrence of an injury or near-miss during entry, a change in the use or configuration of a permit space, and employee complaints about the effectiveness of the program.

(n) Review the permit space program, using the canceled permits retained under paragraph §1926.1205(f), within 1 year after each entry and revise the program as necessary to ensure that employees participating in entry operations are protected from permit space hazards.

Note to paragraph §1926.1204(n). Employers may perform a single annual review covering all entries performed during a 12-month period. If no entry is performed during a 12-month period, no review is necessary.

14.6 Permitting Process.

(a) Before entry is authorized, each entry employer must document the completion of measures required by paragraph §1926.1204(c) of this standard by preparing an entry permit.

(b) Before entry begins, the entry supervisor identified on the permit must sign the entry permit to authorize entry.

(c) The completed permit must be made available at the time of entry to all authorized entrants or their authorized representatives, by posting it at the entry portal or by any other equally effective means, so that the entrants can confirm that pre-entry preparations have been completed.

(d) The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit in accordance with paragraph §1926.1206(b) of this standard.

(e) The entry supervisor must terminate entry and take the following action when any of the following apply:

(1) Cancel the entry permit when the entry operations covered by the entry permit have been completed; or

(2) Suspend or cancel the entry permit and fully reassess the space before allowing reentry when a condition that is not allowed under the entry permit arises in or near the permit space and that condition is temporary in nature and does not change the configuration of the space or create any new hazards within it; and

(3) Cancel the entry permit when a condition that is not allowed under the entry permit arises in or near the permit space and that condition is not covered by subparagraph (e)(2) of this section.

(f) The entry employer must retain each canceled entry permit for at least 1 year to facilitate the review of the permit-required confined space program required by paragraph §1926.1204(n) of this standard. Any problems encountered during an entry operation must be noted on the pertinent permit so that appropriate revisions to the permit space program can be made.

14.7 Training

(a) The employer must provide training to each employee whose work is regulated by this standard, at no cost to the employee, and ensure that the employee possesses the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this standard. This training must result in an understanding of the hazards in the permit space and the methods used to isolate, control or in other ways protect employees from these hazards, and for those employees not authorized to perform entry rescues, in the dangers of attempting such rescues.

(b) Training required by this section must be provided to each affected employee:

(1) In both a language and vocabulary that the employee can understand.
(2)

(2) Before the employee is first assigned duties under this standard.

(3) Before there is a change in assigned
B.

(4) Whenever there is a change in permit space entry operations that presents a hazard about which an employee has not previously been trained; and

(5) Whenever there is any evidence of a deviation from the permit space entry procedures required by paragraph §1926.1204(c) of this standard or there are inadequacies in the employee's knowledge or use of these procedures.

(c) The training must establish employee proficiency in the duties required by this standard and must introduce new or revised procedures, as necessary, for compliance with this standard.

(d) The employer must maintain training records to show that the training required by paragraphs §1926.1207(a) through (c) of this standard has been accomplished. The training records must contain each employee's name, the name of the trainers, and the dates of training. The documentation must be available for inspection by employees and their authorized representatives, for the period the employee is employed by that employer.

14.8 Duties of authorized entrants.

The entry employer must ensure that all authorized entrants:

(a) Are familiar with and understand the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.

(b) Properly use equipment as required by paragraph §1926.1204(d) of this standard.

(c) Communicate with the attendant as necessary to enable the attendant to assess entrant status and to enable the attendant to alert entrants of the need to evacuate the space as required by paragraph §1926.1209(f) of this standard.

(d) Alert the attendant whenever:

(1) There is any warning sign or symptom of exposure to a dangerous situation; or

(2) The entrant detects a prohibited condition; and

(e) Exit from the permit space as quickly as possible whenever:

(1) An order to evacuate is given by the attendant or the entry supervisor.

(2) There is any warning sign or symptom of exposure to a dangerous situation.

(3) The entrant detects a prohibited condition; or

(4) An evacuation alarm is activated.

14.9 Duties of attendants.

The entry employer must ensure that each attendant:

(a) Is familiar with and understands the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.

(b) Is aware of possible behavioral effects of hazard exposure in authorized entrants.

(c) Continuously maintains an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants under paragraph 1926.1206(d) of this standard accurately identifies who is in the permit space.

(d) Remains outside the permit space during entry operations until relieved by another attendant.

Note to paragraph §1926.1209(d). Once an attendant has been relieved by another attendant, the relieved attendant may enter a permit space to attempt a rescue when the employer's permit space program allows attendant entry for rescue and the attendant has been trained and equipped for rescue operations as required by paragraph §1926.1211(a).

(e) Communicates with authorized entrants as necessary to assess entrant status and to alert entrants of the need to evacuate the space under paragraph §1926.1208(e).

(f) Assesses activities and conditions inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:

(1) If there is a prohibited condition.

(2) If the behavioral effects of hazard exposure are apparent in an authorized entrant.

(3) If there is a situation outside the space that could endanger the authorized entrants; or

(4) If the attendant cannot effectively and safely perform all the duties required under §1926.1209 of this standard.

(g) Summons rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.

(h) Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:

(1) Warns the unauthorized persons that they must stay away from the permit space.

(2) Advises the unauthorized persons that they must exit immediately if they have entered the permit space; and

(3) Informs the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.

(i) Performs non-entry rescues as specified by JMW's rescue procedure; and

(j) Performs no duties that might interfere with the attendant's primary duty to assess and protect the authorized entrants.

14.10 Duties of entry supervisors.

The entry employer must ensure that each entry supervisor:

(a) Is familiar with and understands the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.

(b) Verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.

(c) Terminates the entry and cancels or suspends the permit as required by paragraph 1926.1205(e) of this standard.

(d) Verifies that rescue services are available and that the means for summoning them are operable, and that JMW will be notified as soon as the services become unavailable.

(e) Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations; and

(f) Determines, whenever responsibility for a permit space entry operation is transferred, and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

14.11 Rescue and emergency services.

(a) An employer who designates rescue and emergency services, pursuant to paragraph §1926.1204(i) of this standard, must:

(1) Evaluate a prospective rescuer's ability to respond to a rescue summons in a timely manner, considering the hazard(s) identified.

Note to paragraph 13.17 (a)(1). What will be considered timely will vary according to the specific hazards involved in each entry. For example, §1926.103—Respiratory Protection requires that employers provide a standby person or persons capable of immediate action to rescue employee(s) wearing respiratory protection while in work areas defined as IDLH atmospheres.

(2) Evaluate a prospective rescue service's ability, in terms of proficiency with rescue-related tasks and

equipment, to function appropriately while rescuing entrants from the permit space or types of permit spaces identified.

(3) Select a rescue team or service from those evaluated that:

(i) Has the capability to reach the victim(s) within a time frame that is appropriate for the permit space hazard(s) identified.

(ii) Is equipped for, and proficient in, performing the needed rescue services.

(iii) Agrees to notify JMW immediately if the rescue service becomes unavailable.

(4) Inform each rescue team or service of the hazards they may confront when called on to perform rescue at the site; and

(5) Provide the rescue team or service selected with access to all permit spaces from which rescue may be necessary so that the rescue team or service can develop appropriate rescue plans and practice rescue operations.

(b) An employer whose employees have been designated to provide permit space rescue and/or emergency services must take the following measures and provide all equipment and training at no cost to those employees:

(1) Provide each affected employee with the personal protective equipment (PPE) needed to conduct permit space rescues safely and train each affected employee so the employee is proficient in the use of that PPE.

(2) Train each affected employee to perform assigned rescue duties. JMW will ensure that such employees successfully complete the training required and establish proficiency as authorized entrants, as provided by §§1926.1207 and 1926.1208 of this standard.

(3) Train each affected employee in basic first aid and cardiopulmonary resuscitation (CPR). JMW will ensure that at least one member of the rescue team or service holding a current certification in basic first aid and CPR is available: and

(4) Ensure that affected employees practice making permit space rescues before attempting an actual rescue, and at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces, except practice rescue is not required where the affected employees properly performed a rescue operation during the last 12 months in the same permit space the authorized entrant will enter, or in a similar permit space. Representative permit spaces must, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be. performed.

(c) Non-entry rescue is required unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. JMW will designate an entry rescue service whenever non-entry rescue is not selected. Whenever non-entry rescue is selected, the entry employer must ensure that. retrieval systems or methods are used whenever an authorized entrant enters a permit space, and must confirm, prior to entry, that emergency assistance would be available if non-entry rescue fails. Retrieval systems must meet the following requirements:

(1) Each authorized entrant must use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, above the entrant's head, or at another point which JMW can establish presents a profile small enough for the successful removal of the entrant. Wristlets or anklets may be used in lieu of the chest or full body harness if we can demonstrate that the use of a chest or full body harness is infeasible or creates a greater hazard and that the use of wristlets or anklets is the safest and most effective alternative.

(2) The other end of the retrieval line must be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device must be available to retrieve personnel from vertical type permit spaces more than 5 feet (1.52 meters) deep.

(3) Equipment that is unsuitable for retrieval must not be used, including, but not limited to, retrieval lines that have a reasonable probability of becoming entangled with the retrieval lines used by other authorized entrants, or retrieval lines that will not work due to the internal configuration of the permit space.

(d) If an injured entrant is exposed to a substance for which a Safety Data Sheet (SDS) or other similar written information is required to be kept at the worksite, that SDS or written information must be made available to the medical facility treating the exposed entrant.

14.12 Employee participation

(a) Employers must consult with affected employees and their authorized representatives on the development and implementation of all aspects of the permit space program required by §1926.1203 of this standard.

(b) Employers must make available to each affected employee and his/her authorized representatives all information required to be developed by this standard.

Section 15 - Cranes

15.1 CRANE OPERATIONS – 1926.1400

Preface

This Crane and Derrick Operations Plan (1926.1400) has been written as a general guide for JMW employees. JMW requires all subcontractors to meet these requirements and all OSHA regulations**.**

15.2 Purpose

The written Crane & Derrick Operation Procedures establish guidelines to be followed whenever any of our employees work with and around cranes or derricks at this company. The rules are established to:

- Provide a safe working environment,
- Govern operator use of cranes and derricks, and
- Ensure proper care and maintenance of cranes and derricks.

These procedures establish uniform requirements designed to ensure that crane and derrick safety training, operation, and maintenance practices are communicated to and understood by the affected employees. These requirements are also designed to ensure that procedures are in place to protect the health and safety of all employees.

It is our intent to comply with the requirements of 29 CFR 1926.550 for construction activities. This regulation has requirements for crane and derrick operations.

15.3 Administrative Duties

The Safety Officer is responsible for developing and maintaining all JMW safety programs. A copy of this plan may be reviewed by employees at anytime. It is located at JMW corporate office and at each construction site field office. In addition, The Safety Officer is responsible for maintaining any records related to all safety programs for JMW.

We encourage all suggestions because we are committed to the success of our safety program. We strive for clear understanding, safe behavior, and involvement from every level of our company. Please direct all comments concerning this plan to The Safety Officer.

15.4Training

It is the policy of JMW to permit only trained and authorized personnel to operate cranes on our project jobsites. Subcontractors who wish to operate cranes and derricks on a JMW project will be responsible for providing certificates of training to JMW prior to operating any crane or derrick onsite.

15.5 Training Certification

JMC will ensure that all crane operators are certified crane operator by and accredited institution for the type of equipment being used on site. Certifications will be documented and filed with JMC.

15.6 Inspections

JMW performs inspections on cranes as required by OSHA. This includes daily, monthly, annual and post assembly. JMW requires each crane subcontractor to perform all crane inspections (Daily, Monthly, Annual & Post Assembly) and document the inspections as required by OSHA.

15.7 Ground Conditions

(a) *Definitions.*

(1) "Ground conditions" means the ability of the ground to support the equipment (including slope, compaction, and firmness).

(2) "Supporting materials" means blocking, mats, cribbing, marsh buggies (in marshes/wetlands), or similar supporting materials or devices.

(b) The equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met. The requirement for the ground to be drained does not apply to marshes/wetlands.

(c) The controlling entity must:

(1) Ensure that ground preparations necessary to meet the requirements in paragraph (b) of this section are provided.

(2) Inform the user of the equipment and the operator of the location of hazards beneath the equipment set-up area (such as voids, tanks, utilities) if those hazards are identified documents (such as site drawings, as-built drawings, and soil analyses) that are in the possession of the controlling entity (whether at the site or off-site) or the hazards are otherwise known to that controlling entity.

15.8 Assembly/Disassembly

When assembling or disassembling equipment (or attachments), the employer assembling the crane must comply with all applicable manufacturer prohibitions and must comply with either:

(a) Manufacturer procedures applicable to assembly and disassembly, or
(b) Employer procedures for assembly and disassembly. Employer procedures may be used only where the employer can demonstrate that the procedures used meet the requirements in § 1926.1406.
NOTE: The employer must follow manufacturer procedures when an employer uses synthetic slings during assembly or disassembly rigging. (See § 1926.1404(r).)

NOTE: JMW does not assemble / disassemble cranes. All cranes used by JMW are subcontractors.

(a) *Supervision – competent-qualified person for JMW Subcontractors:*

(1) Assembly/disassembly must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons ("A/D director").

(3) Where the assembly/disassembly is being performed by only one person, that person must meet the criteria for both a competent person and a qualified person. For purposes of this standard, that person is considered the A/D director.

(b) *Knowledge of procedures*. The A/D director must understand the applicable assembly/disassembly

procedures.

(c) *Review of procedures*. The A/D director must review the applicable assembly/disassembly procedures immediately prior to the commencement of assembly/disassembly unless the A/D director understands the procedures and has applied them to the same type and configuration of equipment (including accessories, if any).

(d) *Crew instructions*.

(1) Before commencing assembly/disassembly operations, the A/D director must ensure that the crew members understand all the following:

(i) Their tasks.
(ii) The hazards associated with their tasks.
(iii) The hazardous positions/locations that they need to avoid.

(2) During assembly/disassembly operations, before a crew member takes on a different task, or when adding new personnel during the operations, the requirements in paragraphs (d)(1)(i) through (d)(1)(iii) of this section must be met.

(e) *Protecting assembly/disassembly crew members out of operator view*.

(1) Before a crew member goes to a location that is out of view of the operator and is either in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member must inform the operator that he/she is going to that location.

(2) Where the operator knows that a crew member went to a location covered by paragraph (e)(1) of this section, the operator must not move any part of the equipment (or load) until the operator is informed in accordance with a pre- arranged system of communication that the crew member is in a safe position.

(f) *Working under the boom, jib or other components*.

(1) When pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components, except where the requirements of paragraph (f)(2) of this section are met.

(2) *Exception*. Where the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed, the A/D director must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom.

(g) *Capacity limits*. During all phases of assembly/disassembly, rated capacity limits for loads imposed on the equipment, equipment components (including rigging), lifting lugs and equipment accessories, must not be exceeded for the equipment being assembled/disassembled.

(h) *Addressing specific hazards*. The A/D director supervising the assembly/disassembly operation must address the hazards associated with the operation, which include:

(1) *Site and ground bearing conditions*. Site and ground conditions must be adequate for safe assembly/disassembly operations and to support the equipment during assembly/disassembly (see 1926.1402 for ground condition requirements).

(2) *Blocking material*. The size, amount, condition and method of stacking the blocking must be sufficient to sustain the loads and maintain stability.

(3) *Proper location of blocking*. When used to support lattice booms or components, blocking must be appropriately placed to:

(i) Protect the structural integrity of the equipment, and
(ii) Prevent dangerous movement and collapse.

(4) *Verifying assist crane loads*. When using an assist crane, the loads that will be imposed on the assist crane at each phase of assembly/disassembly must be verified in accordance with 1926.1417(o)(3) before assembly/disassembly begins.

(5) *Boom and jib pick points*. The point(s) of attachment of rigging to a boom (or boom sections or jib or jib sections) must be suitable for preventing structural damage and facilitating safe handling of these components.

(6) *Center of gravity*.

(i) The center of gravity of the load must be identified if that is necessary for the method used for maintaining stability.

(ii) Where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity must be used.

(7) *Stability upon pin removal*. The boom sections, boom suspension systems (such as gantry A-frames and jib struts), and components must be rigged or supported to maintain stability upon the removal of the pins.

(8) *Snagging*. Suspension ropes and pendants must not be allowed to catch on the boom or jib connection pins or cotter pins (including keepers and locking pins).

(9) *Struck by counterweights*. The potential for unintended movement from inadequately supported counterweights and from hoisting counterweights.

(10) *Boom hoist brake failure*. Each time reliance is to be placed on the boom hoist brake to prevent boom movement during assembly/disassembly, the brake must be tested prior to such reliance to determine if it is sufficient to prevent boom movement. If it is not sufficient, a boom hoist pawl, other locking device/back-up braking device, or another method of preventing dangerous movement of the boom (such as blocking or using an assist crane) from a boom hoist brake failure must be used.

(11) *Loss of backward stability*. Backward stability before swinging the upperworks, travel, and when attaching or removing equipment components.

(12) *Wind speed and weather*. The effect of wind speed and weather on the equipment.

(i) [*Reserved*.]

(j) *Cantilevered boom sections*. Manufacturer limitations on the maximum amount of boom supported only by cantilevering must not be exceeded. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must determine in writing this limitation, which must not be exceeded.

(k) *Weight of components*. The weight of each of the components must be readily available.

(l) [*Reserved*.]

(m) *Components and configuration*.

(1) The selection of components, and configuration of the equipment, that affect the capacity or safe operation of the equipment must be in accordance with:

(i) Manufacturer instructions, prohibitions, limitations, and specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or

(ii) Approved modifications that meet the requirements of § 1926.1434 (Equipment modifications).

(2) *Post-assembly inspection*. Upon completion of assembly, the equipment must be inspected to ensure compliance with paragraph (m)(1) of this section.

(n) [*Reserved*.]

(o) *Shipping pins*. Reusable shipping pins, straps, links, and similar equipment must be removed. Once they are removed, they must either be stowed or otherwise stored so that they do not present a falling object hazard.

(p) *Pile driving*. Equipment used for pile driving must not have a jib attached during pile driving operations.

(q) *Outriggers and Stabilizers*. When the load to be handled and the operating radius require the use of outriggers or stabilizers, or at any time when outriggers or stabilizers are used, all the following requirements must be met (except as otherwise indicated):

(1) The outriggers or stabilizers must be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart.

(2) The outriggers must be set to remove the equipment weight from the wheels, except for locomotive cranes. This provision does not apply to stabilizers.

(3) When outrigger floats are used, they must be attached to the outriggers. When stabilizer floats are used, they must be attached to the stabilizers.

(4) Each outrigger or stabilizer must be visible to the operator or to a signal person during extension and setting.

(5) Outrigger and stabilizer blocking must:

(i) Meet the requirements in paragraphs (h)(2) and (h)(3) of this section.
(ii) Be placed only under the outrigger or stabilizer float/pad of the jack or, where the outrigger or

stabilizer is designed without a jack, under the outer bearing surface of the extended outrigger or stabilizer beam.

(6) When lifting loads without using outriggers or stabilizers, the manufacturer's procedures must be met regarding truck wedges or screws.

(r) *Rigging*. In addition to following the requirements in 29 CFR 1926.251 and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the employer must ensure that:

(1) The rigging work is done by a qualified rigger.

(2) Synthetic slings are protected from: abrasive, sharp or acute edges, and configurations that could cause a reduction of the sling's rated capacity, such as distortion or localized compression. NOTE: Requirements for the protection of wire rope slings are contained in 29 CFR 1926.251(c)(9).

(3) When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations must be followed.

15.9 Weather Procedures

Wind Speed

- Crane manufacturers have some recommendations concerning the maximum permissible wind speed/gust, or how to derate the crane under windy conditions. Crane Operator will use best judgement and lifts will be postponed if the wind speed/gust is in the range of 15-20 mph (7-9 m/s). Above 20 mph (11 m/s), the lift must be canceled. When the craning operations have been postponed due to high wind/gust conditions loads must be landed and secured, the boom must be stowed, and the following will be met prior to resuming.

Lighting

- At the first sign of a thunderstorm (or at least of lightning), lifting activities should be brought to an orderly close. The boom should be lowered and/or retracted as much as possible, and personnel should leave the area. If the crane is struck by lightning, it should be thoroughly inspected before being put back into service. The path of the electricity is difficult to predict and there may be hidden damage (pitting) where arcs have occurred (often in bearings).

Hurricanes Procedures

- The competent person must determine whether it is necessary to implement manufacturer recommendations for securing the equipment. Once determined cranes will land the load and lay down the boom (if possible). Cranes will be moved to, high-ground (if possible) and secured. JMW will inspected cranes for damages prior to crane being put back in service.

15.10 Power line Safety

(a) *Hazard assessments and precautions inside the work zone*. Before beginning equipment operations, the employer must:

(1) *Identify the work zone by either*:

(i) Demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting the operator from operating the equipment past those boundaries, or

(ii) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.

(2) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 feet to a power line. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows:

(i) *Option (1) – Deenergize and ground*. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite.

(ii) *Option (2) – 20-foot clearance*. Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in paragraph (b) of this section.

(iii) *Option (3) – Table A clearance*.

(A) Determine the line's voltage and the minimum approach distance permitted under Table A below.

(B) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), while operating up to the equipment's maximum working radius in the work zone, could get closer than the minimum approach distance of the power line permitted under Table A. If so, then the employer must follow the requirements in paragraph (b) of this section to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.

(b) *Preventing encroachment/electrocution*. Where encroachment precautions are required under Option (2) or Option (3) of this section, all the following requirements must be met:

(1) Conduct a planning meeting with the operator and the other workers who will be in the area of the equipment or load to review the location of the power line(s), and the steps that will be implemented to prevent encroachment/electrocution.

(2) If tag lines are used, they must be non-conductive.

(3) Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings, at 20 feet from the power line (if using Option (2) of this section) or at the minimum approach distance under Table A (if using Option (3) of this section). If the operator is unable to see the elevated warning line, a dedicated spotter must be used as described in § 1926.1408(b)(4)(ii) in addition to implementing one of the measures described in §§ 1926.1408(b)(4)(i), (iii), (iv) and (v).

(4) Implement at least one of the following measures:

(i) A proximity alarm set to give the operator sufficient warning to prevent encroachment.

(ii) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter must:

(A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include but are not limited to a clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of- sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter).

(B) Be positioned to effectively gauge the clearance distance.

(C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.

(D) Give timely information to the operator so that the required clearance distance can be maintained.

(iii) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment.

(iv) A device that automatically limits range of movement, set to prevent encroachment.

(v) An insulating link/device, as defined in § 1926.1401, installed at a point between the end of the load line (or below) and the load.

(5) The requirements of paragraph (b)(4) of this section do not apply to work covered by subpart V of this part.

(c) *Voltage information*. Where Option (3) of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer's request.

(d) *Operations below power lines*.

(1) No part of the equipment, load line, or load (including rigging and lifting accessories) is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line, except where one of the exceptions in paragraph (d)(2) of this section applies.

(2) *Exceptions*. Paragraph (d)(1) of this section is inapplicable where the employer demonstrates that one of the following applies:

(i) The work is covered by subpart V of this part.

(ii) For equipment with non-extensible booms: The uppermost part of the equipment, with the boom at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line.

(iii) For equipment with articulating or extensible booms: The uppermost part of the equipment,

with the boom in the fully extended position, at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line.

(iv) The employer demonstrates that compliance with paragraph (d)(1) of this section is infeasible and meets the requirements of § 1926.1410.

(e) *Power lines presumed energized*. The employer must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.

(f) When working near transmitter/communication towers where the equipment is close enough for an electrical charge to be induced in the equipment or materials being handled, the transmitter must be deenergized or the following precautions must be taken:

(1) The equipment must be provided with an electrical ground.
(2) If tag lines are used, they must be non-conductive.

Table A – Minimum Clearance Distances

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	(as established by the utility owner/

15.11 Inspection Items

Frequent Inspections (Daily, Monthly)

The company requires a competent person to perform pre-operational crane and derrick checks prior to beginning each shift. This person walks around the crane or derrick looking for defects or problem areas. Components that have a direct bearing on the safety of the crane or derrick and whose status can change from day to day with use, must be inspected daily, and when possible, observed during operation for any defects that could affect safe operation. There are four frequent inspections: Pre-Operational Site Activity and Inspection, Pre-Operational (Daily) Walk Around Inspection, Pre-Start-Up (In Cab) Inspection and Documented Monthly.

Pre-Operational (Daily) Walk Around Inspection

Inspection of all cranes, derricks, and equipment will be made at the start of each shift and during usage to make sure they are in a safe operating condition. This inspection is the responsibility of the JMW competent person(s), typically this is the operator. Any deficiencies must be repaired, or defective parts replaced, before the equipment can be used.

Before the actual inspection, some general information about the crane operator's qualifications and the crane's certifications should be gathered, such as:

- Operator Qualifications Observe the operator in action and when the opportunity permits ask a few questions concerning the cranes capacity and restrictions imposed, either due to activity involved in or functional limitations.
- Crane Records Ask for inspection records and verify that the appropriate operator's manual and load charts are available for that crane in use.

In your initial survey of crane operations, look for crane stability, physical obstructions to movement or operation, and proximity of electrical power lines, as well as the following:

- Leveling - Has the crane operator set the crane up level and in a position for safe rotation and operation?
- Outriggers - Are the outriggers, where applicable, extended and being used in accordance with manufacturer's recommendations?
- Stability - The relationship of the load weight, angle of boom, and its radius (the distance from the cranes center of rotation to the center of load) to the center of gravity of the load. Also, the condition of crane loading where the load moment acting to overturn the crane is less than the moment of the crane available to resist overturning.
- Structural Integrity - The crane's main frame, crawler, track and outrigger supports, boom sections, and attachments are all considered part of structural components of lifting. In addition, all wire ropes, including stationary supports, help determine lifting capacity and are part of the structural elements of crane operations.

Pre-Start-Up (In Cab) Inspection

Our pre-start-up (in cab) inspection, performed by a designated competent person, includes, but is not limited to, the following:

Load Charts are the principle set of instructions and requirements for boom configurations and parts of line which establish crane capacity for safe crane operations.

- Availability The crane operator must have in his/her possession the appropriate load charts related to the crane in use and for the loads being lifted.
- Correct Use The crane operator must show adequate understanding and proficient use of the load charts as related to the equipment in use and the loads being lifted.

15.12 Crane Operation Checklist

The crane operation checklist, performed by a designated competent person, should include the following:

- Manufacturer's operating and Maintenance Manuals: Manufacturer's operating and maintenance manuals shall accompany all mobile hoisting equipment. These manuals stet forth specific inspection, operation and maintenance criteria for each mobile crane and lifting capacity.
- Guarding: All exposed moving parts such as gears, chains; reciprocating or rotating parts are guarded or isolated.
- Swing Clearance Protection: Materials for guarding rear swing area.
- High-Voltage Warning Sign: High-voltage warning signs displaying restrictions and requirements should be installed at the operator's station and at strategic locations on the crane.

- Boom Stops: Shock absorbing, or hydraulic type boom stops are installed in a manner to resist boom overturning.
- Jib Boom Stops: Jib stops are restraints to resist overturning.
- Boom Angle Indicator: A boom angle indicator readable for the operator station is installed accurately to indicate boom angle.
- Boom Hoist Disconnect, Automatic Boom Hoist Shutoff: A boom hoist disconnect safety shutoff or hydraulic relief to automatically stops the boom hoist when the boom reaches a predetermined high angle.
- Two-Blocking Device: Cranes with telescoping booms should be equipped with a two-blocking damage prevention feature that has been tested on-site in accordance with manufacturer's requirements. All cranes hydraulic and fixed boom used to hoist personnel must be equipped with two-blocking devices on all hoist lines intended to be used in the operation. The anti-two blocking device has automatic capabilities for controlling functions that may cause a two-blocking condition.
- Power Controlled Lowering: Cranes for use to hoist personnel must be equipped for power controlled lowering operation on all hoist lines. Check clutch, chains, and sprockets for wear.
- Leveling Indicating Device: A device or procedure for leveling the crane must be provided.
- Sheaves: Sheave grooves shall be smooth and free from surface defects, cracks, or worn places that could cause rope damage. Flanges must not be broken, cracked, or chipped. The bottom of the sheave groove must form a close-fitting saddle for the rope being used. Lower load blocks must be equipped with close fitting guards. Almost every wire rope installation has one or more sheaves – ranging from traveling blocks with complicated reeving patterns to equalizing sheaves where only minimum rope movement is noticed.
- Main Hoist and Auxiliary Drums System: Drum crushing is a rope condition sometimes observed which indicates deterioration of the rope. Spooling is that characteristic of a rope which affects how it wraps onto and off a drum. Spoiling is affected by the care and skill with which the first larger of wraps is applied on the drum. Manufacturer's criteria during inspection usually specify:
    - Minimum number of wraps to remain on the drum.
    - Condition of drum grooves
    - Condition of flanges at the end of drum.
    - Rope end attachment.
    - Spooling characteristics of rope.
    - Rope condition.
- Main Boom, Jib Boom, Boom Extension: Boom jibs, or extensions, must not be cracked or corroded. Bolts and rivets must be tight. Certification that repaired boom members meet manufacturers original design standard shall be documented. Non-certified repaired members shall not be used until recertified.
- Load Hooks and Hook Blocks: Hooks and blocks must be permanently labeled with rated capacity. Hooks and blocks are counterweighted to the weight of the overhaul line from highest hook position. Hooks must not have cracks or throat openings more than 15% of normal or twisted off center more than 10^{o} Hooks and blocks must be permanently labeled with rated capacity. Hooks and blocks are counterweighted to the weight of the overhaul line from highest hook position. Hooks must not have cracks or throat openings more than 15% of normal or twisted off center more than 10^{o} from the

longitudinal axis. All hooks used to hoist personnel must be equipped with effective positive safety catches especially on hydraulic cranes.

- Hydraulic Hoses Fittings and Tubing: Flexible hoses must be sound and show no signs of leaking at the surface or its junction with the metal and couplings. Hoses must not show blistering or abnormal deformation to the outer covering and no leaks at threaded or clamped joints that cannot be eliminated by normal tightening or recommended procedures. There should be no evidence of excessive abrasion or scrubbing on the outer surfaces of hoses, rigid tubing, or hydraulic fittings.
- Outriggers: Outrigger number, locations, types and type of control are in accordance with manufacturer's specifications. Outriggers are designed and operated to relieve all weight from wheels or tracks within the boundaries of the outriggers. If not, the manufacturer's specifications and operating procedures must be clearly defined. Outriggers must be visible to the operator or a signal person during extension or setting.
- Load Rating Chart: A durable rating chart(s) with legible letters and figures must be attached to the crane in a location accessible to the operator while at the controls. The rating charts shall contain the following:
    - A full and complete range of manufacturer's crane loading ratings at all stated operating radii.
    - Optional equipment on the crane such as outriggers and extra counterweight which effect ratings.
    - A work area chart for which capacities are listed in the load rating chart, i.e., over side, over rear, over front.
    - Weights of auxiliary equipment, i.e., load block, jibs, boom extensions.
    - A clearly distinguishable list of ratings based on structural, hydraulic or other factors rather than stability.
    - A list of no-load work areas.
    - A description of hoist line reeving requirements on the chart or in operator's manual.
- Wire Rope: Main hoist and auxiliary wire rope inspection should include examining for:
    - Broken wires
    - Excess wear
    - External damage from crushing, kinking, cutting or corrosion.
- Cab: Contains all crane function controls in additional to mechanical boom angle indicators, electric wipers, dash lights, warning lights and buzzers, fire extinguishers, seat belts, horn, and clear unbroken glass.
- Braking Systems: Truck cranes and self-propelled cranes mounted on rubber-tired chassis or frames must be equipped with a service brake system, secondary stopping emergency brake system and a parking brake system. Unless the owner/operator can show written evidence that such systems were not required by the standards or regulations in force at the date of manufacture and are not available from the manufacturer. The braking systems must have been inspected and tested and found to be in conformance with applicable requirements.
- Crawler cranes are provided with brakes or other locking devices that effectively hold the machine stationary on level grade during the working cycle. The braking system must be capable of stopping and holding the machine on the maximum grade recommended for travel. The brakes or locks are arranged to engage or remain engaged in the event of loss of operating pressure or power.

- Turntable/Crane Body: Make sure that the rotation point of a crane gears and rollers are free of damage, wear and properly adjusted and the components are securely locked and free of cracks or damage. The swing locking mechanism must be functional (pawl, pin) and operated in the cab.
- Counterweight: The counterweight must be approved and installed according to manufacturer's specifications with attachment points secured.

15.13 Periodic Inspections

Periodic Inspections (1-to-12-month intervals) – The periodic inspection procedure is intended to determine the need for repair or replacement of components to keep the machine in proper operating condition. It includes those items listed for daily inspections as well as, but not limited to, structural defects, excessive wear, and hydraulic or air leaks.

Frequent Inspection (daily to monthly intervals) – Frequent inspections are usually performed at the start of each shift by the operator who walks around the crane looking for defects or problem areas. Components that have a direct bearing on the safety of the crane and whose status can change from day to day with use must be inspected daily, and when possible, observed during operation for any defects that could affect safe operation. To help determine when the crane is safe to operate, daily inspections should be made at the start of each shift. Frequent inspections should include, but are not limited to the following:

- Check that all exposed moving parts are guarded. A removed guard may indicate that a mechanic is still working on part of the crane.
- Visually inspect each component of the crane used in lifting, swinging, or lowering the load or boom for any defects that might result in unsafe operation.
- Inspect all wire rope (including standing ropes), sheaves, drums rigging, hardware, and attachments. Remember, any hook that is deformed or cracked must be removed from service. Hooks with cracks, excessive throat openings of 15%, or hook twists of 10 degrees or more, must be removed from service.
- Check for freedom of rotation of all swivels.
- Visually inspect the boom and jib for straightness and any evidence of physical damage, such as cracking, bending, or any other deformation of the welds. Look for corrosion under any attachments that are connected to the chords and lacing. Watch carefully for cracking or flaking of paint. This may indicate fatigue of the metal which often precedes a failure. On lattice booms, look for bent lacing. If they are kinked or bent, the main chord can lose substantial support in that area. When lacing is bent, the ends also tend to draw together which pulls the main chords out of shape. This precaution is especially important on tubular booms where every component must be straight and free from any dents. Do not attempt to straighten these members by hammering or heating them and drawing them out. They must be cut out and replaced with lacing to the manufacturer's specifications, procedures, and approval.
- Inspect tires for cuts, tears, breaks, and proper inflation.
- Visually inspect the crane for fluid leaks, both air and hydraulic.
- Visually check that the crane is properly lubricated. The fuel, lubricating oil, coolant and hydraulic oil reservoirs should be filled to proper levels.
- Check that the crane is equipped with a fully charged fire extinguisher and that the operator knows how to use it.

- Check all functional operating mechanisms such as: sheaves, drums, brakes, locking mechanisms, hooks, the boom, jib, hook rollers brackets, outrigger components, limit switches, safety devices, hydraulic cylinders, instruments, and lights.
- Check the turntable connections for weld cracks and loose or missing bolts. If they are loose, there is a good chance that they have been stretched.
- When checking the outriggers be sure that neither the beams nor the cylinders are distorted. Check that the welds are not cracked and that both the beams and cylinders extend and retract smoothly and hold the load. Check the condition of the floats, and check that they are securely attached.
- Inspect and test all brakes and clutches for proper adjustment and operation.
- Always inspect boom hoist lockout and other operator aids, such as anti-two-block devices (ATB) and load moment indicators (LMI), for proper operation and calibration.
- While the engine is running, check all gauges and warning lights for proper readings and operate all controls to see that they are functioning properly.
- Check for any broken or cracked glass that may affect the view of the operator.

15.14 Operating Procedures

Cranes are carefully designed, tested, and manufactured for safe operation. When used properly they can provide safe reliable service to lift or move loads. Because cranes can lift heavy loads to great heights, they also have an increased potential for catastrophic incidents if safe operating practices are not followed.

Crane operators and personnel working with cranes need to be knowledgeable of basic crane capacities, limitations, and specific job site restrictions, such as location of overhead electric power lines, unstable soil, or high wind conditions. Personnel working around crane operations also need to be aware of hoisting activities or any job restrictions imposed by crane operations and ensure job site coordination of cranes. Crane inspectors therefore should become aware of these issues and, prior to starting an inspection, take time to observe the overall crane operations with respect to load capacity, site coordination, and any job site restrictions in effect.

15.15 Anti Two-Blocking Device

(i) Telescopic boom cranes manufactured after February 28, 1992, must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur.

(ii) *Temporary alternative measures*: Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking and use a spotter when extending the boom.

(iii) *Lattice boom cranes*.
(A) Lattice boom cranes manufactured after Feb 28, 1992, must be equipped with a device that either automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component), or warns the operator in time for the operator to prevent two-blocking. The device must prevent such damage/failure or provide adequate warning for all points where two-blocking could occur.

(B) Lattice boom cranes and derricks manufactured after 2011must be equipped with a device

which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage/failure at all points where two-blocking could occur.

(C) *Exception*. The requirements in paragraphs (d)(3)(ii)(A) and (B) of this section do not apply to such lattice boom equipment when used for dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, marine operations that do not involve hoisting personnel, and pile driving work.

(D) *Temporary alternative measures*. Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking or use a spotter.

15.16 Lifting Principles

There are four basic lifting principles that govern a crane's mobility and safety during lifting operations:

1. Center of Gravity The center of gravity of any object is the point in the object where its weight can be assumed to be concentrated or stated in another way, it is the point in the object around which its weight is evenly distributed. The location of the center of gravity of a mobile crane depends primarily on the weight and location of its heaviest components (boom, carrier, upperworks and counterweight).
2. Leverage Cranes use the principle of leverage to lift loads. Rotation of the upperworks (cab, boom, counterweight, load) changes the location of the crane's center of gravity, its leverage point or fulcrum.

As the upperworks rotates, the leverage of a mobile crane fluctuates. This rotation causes the crane's center of gravity to change and causes the distance between the crane's center of gravity and its tipping axis to also change. Stability can be affected by the fluctuating leverage the crane exerts on the load as it swings. The crane's rated capacity is therefore altered in the load chart to compensate for those changes in leverage.

Provided the ground can support the load, a crane can be made more stable by moving the tipping axis further away from its center of gravity. The extra stability gained by moving the tipping axis can then be used to carry larger/heavier loads.

3. Stability Is the relationship of the load weight, angle of the boom and its radius (distance from the cranes center of rotation to the center of load) to the center of gravity of the load. The stability of a crane could also be affected by the support on which the crane is resting. A crane's load rating is generally developed for operations under ideal conditions, i.e., a level firm surface. Unlevel surfaces or soft ground therefore must be avoided. In areas where soft ground poses a support problem for stability, mats and or blocking should be used to distribute a crane's load and maintain a level stable condition.

In addition to overturning (stability failure), cranes can fail structurally if overloaded enough. Structural failure may occur before a stability failure. In other words, a mobile crane's structure may fail long before its tips. As loads are added beyond its rated capacity, a crane may fail structurally before there is any sign of tipping. Structural failure is not limited to total fracture; it includes all permanent damage such as overstressing, bending and twisting of any of the components. When a crane is overstressed, the damage may not be apparent. Nevertheless, a structural failure has occurred, and overstressed components are then subject to catastrophic failure at some future time.

4. Structural Integrity The crane's main frame, crawler track and/or outrigger supports, boom sections, and attachments are all considered part of the structural integrity of lifting. in addition, all wire ropes, including stationary supports or attachment points, help determine lifting capacity and are part of the

overall structural integrity of a crane's lifting capacity. The following elements may also affect structural integrity:

- The load chart capacity in relationship to stability.
- The boom angle limitations which affect stability and capacity; and
- The knowledge of the length of boom and radius in determining capacity.

- Stability failures are foreseeable, but in structural failure it is almost impossible to predict what component will fail at any given time. No matter what the cause, if the crane is overloaded, structural failure can occur. JMW policy is that cranes will not exceed 80% of lifting capacity and use the computer operated weight indicators.

15.17 Crane Signals

(a) A signal person must be provided in each of the following situations:

(1) The point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator.
(2) When the equipment is traveling, the view in the direction of travel is obstructed.
(3) Due to site specific safety concerns, either the operator or the person handling the load determines that it is necessary.

(b) *Types of signals*. Signals to operators must be by hand, voice, audible, or new signals.

(c) *Hand signals*.

(1) When using hand signals, the Standard Method must be used (see Appendix A of this subpart). *Exception*: Where use of the Standard Method for hand signals is infeasible, or where an operation or use of an attachment is not covered in the Standard Method, nonstandard hand signals may be used in accordance with paragraph (c)(2) of this section.

(d) *New signals*. Signals other than hand, voice, or audible signals may be used where the employer demonstrates that:

(1) The new signals provide at least equally effective communication as voice, audible, or Standard Method hand signals, or
(2) The new signals comply with a national consensus standard that provides at least equally effective communication as voice, audible, or Standard Method hand signals.

(e) *Suitability*. The signals used (hand, voice, audible, or new), and means of transmitting the signals to the operator (such as direct line of sight, video, radio, etc.), must be appropriate for the site conditions.

(f) During operations requiring signals, the ability to transmit signals between the operator and signal person must be maintained. If that ability is interrupted at any time, the operator must safely stop operations requiring signals until it is reestablished, and a proper signal is given and understood.

(g) If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator must safely stop operations. Operations must not resume until the operator and signal person agree that the problem has been resolved.
(h) Only one person may give signals to a crane/derrick at a time, except in circumstances covered by paragraph (j) of this section.

(i) [*Reserved*.]

(j) Anyone who becomes aware of a safety problem must alert the operator or signal person by giving the stop or emergency stop signal.

(k) All directions given to the operator by the signal person must be given from the operator's direction perspective.

(l) [*Reserved*.]

(m) *Communication with multiple cranes/derricks*. Where a signal person(s) is in communication with more than one crane/derrick, a system must be used for identifying the crane/derrick each signal is for, as follows:

(1) for each signal, prior to giving the function/direction, the signal person must identify the crane/derrick the signal is for, or

(2) must use an equally effective method of identifying which crane/derrick the signal is for.

Radio / Telephone or other Electronic Transmission of Signals

(a) The device(s) used to transmit signals must be tested on site before beginning operations to ensure that the signal transmission is effective, clear, and reliable.

(b) Signal transmission must be through a dedicated channel, except:

(1) Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations.
(2) Where a crane is being operated on or adjacent to railroad tracks, and the actions of the crane operator need to be coordinated with the movement of other equipment or trains on the same or adjacent tracks.

(c) The operator's reception of signals must be by a hands-free system.

Voice Signals – Additional Requirements

(a) Prior to beginning operations, the operator, signal person and lift director (if there is one), must contact each other and agree on the voice signals that will be used. Once the voice signals are agreed upon, these workers need not meet again to discuss voice signals unless another worker is added or substituted, there is confusion about the voice signals, or a voice signal is to be changed.

(b) Each voice signal must contain the following three elements, given in the following order: function (such as hoist, boom, etc.), direction; distance and/or speed; function, stop command.

(c) The operator, signal person and lift director (if there is one), must be able to effectively communicate in the language used.

Hand Signal Chart

(a) Hand signal charts must be either posted on the equipment or conspicuously posted in the

vicinity of the hoisting operations.

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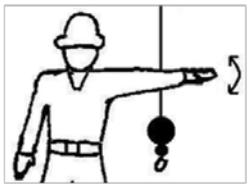
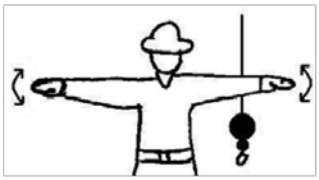
Appendix A to Subpart CC of Part 1926–Standard Hand Signals.



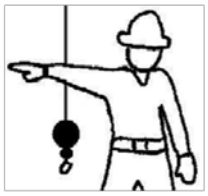
STOP – With arm extended horizontally to the side, palm down, arm is swung back and forth.



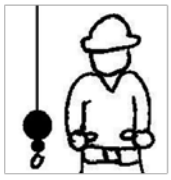
EMERGENCY STOP – With both arms extended horizontally to the side, palms down, arms are swung back and forth.

HOIST – With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles.

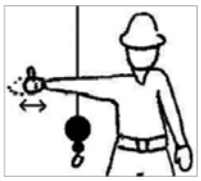
RAISE BOOM – With arm extended horizontally to the side, thumb points up with other fingers closed.



SWING – With arm extended horizontally, index finger points in direction that boom is to swing.



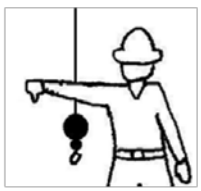
RETRACT TELESCOPING BOOM – With hands to the front at waist level, thumbs point at each other with other fingers closed.



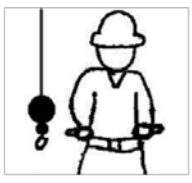
RAISE THE BOOM AND LOWER THE LOAD – With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired.

DOG EVERYTHING – Hands held together at waist level.

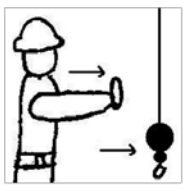
LOWER – With arm and index finger pointing down, hand and finger make small circles.



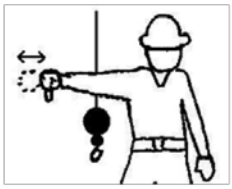
LOWER BOOM – With arm extended horizontally to the side, thumb points down with other fingers closed.



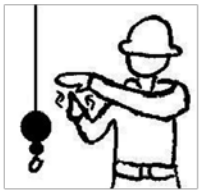
EXTEND TELESCOPING BOOM – With hands to the front at waist level, thumbs point outward with other fingers closed.



TRAVEL/TOWER TRAVEL – With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel.

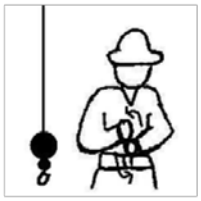


LOWER THE BOOM AND RAISE THE LOAD – With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired.



MOVE SLOWLY – A hand is placed in front of the hand that is giving the action signal.

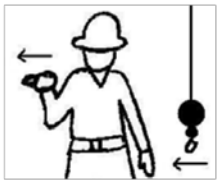
USE AUXILIARY HOIST (whipline) – With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action.



CRAWLER CRANE TRAVEL, BOTH TRACKS – Rotate fists around each other in front of body; direction of rotation away from body indicates travel forward; rotation towards body indicates travel backward.

USE MAIN HOIST – A hand taps on top of the head. Then regular signal is given to indicate desired action.

CRAWLER CRANE TRAVEL, ONE TRACK – Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel.



TROLLEY TRAVEL – With palm up, fingers closed and thumb pointing in direction of motion, hand is jerked horizontally in direction trolley is to travel.

15.18 Fall Protection - Cranes

(a) *Application*.

(1) Paragraphs (b), (c)(3), (e) and (f) of this section apply to all equipment covered by this subpart except tower cranes.

(2) Paragraphs (c)(1), (c)(2), (d), (g), (j) and (k) of this section apply to all equipment covered by this subpart.

(3) Paragraphs (c)(4) and (h) of this section apply only to tower cranes.

(b) *Boom walkways*.

(1) Equipment manufactured after2011 with lattice booms must be equipped with walkways on the boom(s) if the vertical profile of the boom (from cord centerline to cord centerline) is 6 or more feet.

(2) *Boom walkway criteria*.

(i) The walkways must be at least 12 inches wide.
(ii) Guardrails, railings and other permanent fall protection attachments along walkways are:
(A) Not required.
(B) Prohibited on booms supported by pendant ropes or bars if the guardrails/railings/attachments could be snagged by the ropes or bars.
(C) Prohibited if of the removable type (designed to be installed and removed each time the boom is assembled/disassembled).
(D) Where not prohibited, guardrails or railings may be of any height up to, but not more than, 45 inches.

(c) *Steps, handholds, ladders, grabrails, guardrails and railings*.

(1) Section 1926.502(b) does not apply to equipment covered by this subpart.

(2) The employer must maintain in good condition originally equipped steps, handholds, ladders and guardrails/railings/grabrails.

(3) Equipment manufactured after 2011must be equipped to provide safe access and egress between the ground and the operator workstation(s), including the forward and rear positions, by the provision of devices such as steps, handholds, ladders, and guardrails /railings/grabrails. These devices must meet the following criteria:

(i) Steps, handholds, ladders and guardrails/railings/grabrails must meet the criteria of SAE J185 (May 2003) (incorporated by reference, see § 1926.6) or ISO 11660-2:1994(E) (incorporated by reference, see § 1926.6) except where infeasible.
(ii) Walking/stepping surfaces, except for crawler treads, must have slip- resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).

(4) Tower cranes manufactured after 2011 must be equipped to provide safe access and egress between the ground and the cab, machinery platforms, and tower (mast), by the provision of

devices such as steps, handholds, ladders, and guardrails/railings/grabrails. These devices must meet the following criteria:

(i) Steps, handholds, ladders, and guardrails/railings/grabrails must meet the criteria of ISO 11660-1:2008(E) (incorporated by reference, see § 1926.6) and ISO 11660-3:2008(E) (incorporated by reference, see § 1926.6) or SAE J185 (May 2003) (incorporated by reference, see § 1926.6) except where infeasible.
(ii) Walking/stepping surfaces must have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).

(d) *Personal fall arrest and fall restraint systems*. Personal fall arrest system components must be used in personal fall arrest and fall restraint systems and must conform to the criteria in §1926.502(d) except that § 1926.502(d)(15) does not apply to components used in personal fall arrest and fall restraint systems. Either body belts or body harnesses must be used in personal fall arrest and fall restraint systems.

(e) For non-assembly/disassembly work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level as follows:

(1) When moving point-to-point:

(i) On non-lattice booms (whether horizontal or not horizontal).
(ii) On lattice booms that are not horizontal.
(iii) On horizontal lattice booms where the fall distance is 15 feet or more.

(2) While at a workstation on any part of the equipment (including the boom, of any type), except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.

(f) For assembly/disassembly work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.

(g) *Anchorage criteria*.

(1) Sections 1926.502(d)(15) and 1926.502(e)(2) apply to equipment covered by this subpart only to the extent delineated in paragraph (g)(2) of this section.
(2) *Anchorages for personal fall arrest and positioning device systems*.

(i) Personal fall arrest systems must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in § 1926.502(d)(15) would not be met.
(ii) Positioning device systems must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in § 1926.502(e)(2) would not be met.
(iii) Attachable anchor devices (portable anchor devices that are attached to the equipment) must meet the anchorage criteria in § 1926.502(d)(15) for personal fall arrest systems and § 1926.502(e)(2) for positioning device systems.

(3) *Anchorages for fall restraint systems*. Fall restraint systems must be anchored to any part of the

equipment that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.

15.19 Work Control Area

(a) *Swing radius hazards*.

(1) The requirements in paragraph (a)(2) of this section apply where there are accessible areas in which the equipment's rotating superstructure (whether permanently or temporarily mounted) poses a reasonably foreseeable risk of:

(i) Striking and injuring an employee; or
(ii) Pinching/crushing an employee against another part of the equipment or another object.

(2) To prevent employees from entering these hazard areas, the employer must:

(i) Train each employee assigned to work on or near the equipment ("authorized personnel") in how to recognize struck-by and pinch/crush hazard areas posed by the rotating superstructure.
(ii) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas. *Exception*: When the employer can demonstrate that it is neither feasible to erect such barriers on the ground nor on the equipment, the hazard areas must be clearly marked by a combination of warning signs (such as "Danger – Swing/Crush Zone") and high visibility markings on the equipment that identify the hazard areas. In addition, the employer must train each employee to understand what these markings signify.

(3) *Protecting employees in the hazard area*.

(i) Before an employee goes to a location in the hazard area that is out of view of the operator, the employee (or someone instructed by the employee) must ensure that the operator is informed that he/she is going to that location.
(ii) Where the operator knows that an employee went to a location covered by paragraph (a)(1) of this section, the operator must not rotate the superstructure until the operator is informed in accordance with a pre- arranged system of communication that the employee is in a safe position.

(b) Where any part of a crane/derrick is within the working radius of another crane/derrick, the controlling entity must institute a system to coordinate operations. If there is no controlling entity, the employer (if there is only one employer operating the multiple pieces of equipment), or employers, must institute such a system.

15.20 Keeping Clear of the Load

(a) Where available, hoisting routes that minimize the exposure of employees to hoisted loads must be used, to the extent consistent with public safety.
(b) While the operator is not moving a suspended load, no employee must be within the fall zone, except for employees:

(1) Engaged in hooking, unhooking or guiding a load.
(2) Engaged in the initial attachment of the load to a component or structure

(c) When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection

of a load to a component or structure and are within the fall zone, all the following criteria must be met:

(1) The materials being hoisted must be rigged to prevent unintentional displacement.
(2) The materials must be rigged by a qualified rigger.

(d) *Receiving a load*. Only employees needed to receive a load are permitted to be within the fall zone when a load is being landed.

15.21 Recordkeeping & Certification

- All records and certifications of a JMW crane and/or derrick will be kept by JMW. Crane subcontractor will keep records and certifications of the cranes they own and operate on a JMW worksite.

15.22 Tag-out

(1) *Tagging out of service equipment/functions*. Where the employer has taken the equipment out of service, a tag must be placed in the cab stating that the equipment is out of service and is not to be used. Where the employer has taken a function(s) out of service, a tag must be placed in a conspicuous position stating that the function is out of service and is not to be used.

(2) *Response to "do not operate"/ tag-out signs*.

(i) If there is a warning (tag-out or maintenance/do not operate) sign on the equipment or starting control, the operator must not activate the switch or start the equipment until the sign has been removed by a person authorized to remove it, or until the operator has verified that:

(A) No one is servicing, working on, or otherwise in a dangerous position on the machine.
(B) The equipment has been repaired and is working properly.

(ii) If there is a warning (tag-out or maintenance/do not operate) sign on any other switch or control, the operator must not activate that switch or control until the sign has been removed by a person authorized to remove it, or until the operator has verified that the requirements in paragraphs (f)(2)(i)(A) and (B) of this section have been met.

(g) Before starting the engine, the operator must verify that all controls are in the proper starting position and that all personnel are in the clear.

(h) *Storm warning*. When a local storm warning has been issued, the competent person must determine whether it is necessary to implement manufacturer recommendations for securing the equipment.

15.23 Maintenance records

- All records and certifications of a JMW crane and/or derrick will be kept by JMW. Crane subcontractor will keep records and certifications of the cranes they own and operate on a JMW worksite.

Section 16 - Rigging

16.1 General

OSHA standards 1926.251 and 1926.550 apply to the use of rigging and cranes on JMW job sites. The Standards contain much useful information and are the minimal standards for JMW construction work.

16.2 Rigging Requirements

- All Rigging equipment shall be inspected prior to each shift and as necessary during the shift to ensure safety. Damaged or defective slings shall be immediately removed from service.
- All rigging devices, including slings, shall have permanently affixed identification stating size, grade, rated capacity and manufacturer.
- Rigging not in use shall be removed from the immediate work area when not in use.
- Rigging, including slings, shall be hung on a rigging frame so that bends and kinks do not set in.
- Wire rope slings shall be lubricated as necessary during use. Slings shall be lubricated no less than every four months when in storage.
- “Shop-made” grabs, hooks, clamps or other lifting devices shall not be wasted unless proof tested to 125% of their rated load by an approved testing agency. Approved devices shall have the capacity permanently affixed.
- Slings shall not be left lying on the ground or otherwise exposed to dirt and elements.
- Eyes on wire-rope bridles, slings or bull wires shall not be formed by wire clips or knots.
- Protruding ends of strands in splices on slings or bridles shall be covered or blunted.
- All rigging equipment in use shall have a safety factor of 5 (five).

16.3 Slings

- Slings in use shall not be shortened by knots, bolts or other makeshift devices.
- Wire rope slings shall be padded, or softeners used to protect from damage resulting from sharp corners.
- Slings used in a basket hitch shall have the loads balanced to prevent slippage.
- Loads handled by the slings shall be landed on cribbing or dunnage so that slings need not be pulled from under or be crushed by the load.
- Slings subjected to shock loading shall be immediately removed from use and destroyed.
- U-bolts and/or wire rope clips are not permitted for use on slings. Only manufactured slings that are properly tagged are to be used.
- Only drop forged steel eyebolts shall be used for lifting. Field fabricated eyebolts are to be designed by a competent person.

16.4 Inspection and Record Keeping

- Thorough inspection of slings in use shall be made on regular basis, as determined by:

    a) Severity of service conditions
    b) Frequency of sling use
    c) Nature of lifts being made.
    d) Experience gained on the service life if slings similarly used.

- Inspection periods shall not exceed once in 12 months.

- A record of inspection shall maintain.

16.5 Chains

- Alloy steel chains shall be removed from service and repaired or replaced when:

    a) Master links, coupling links or other components are cracked or deformed.
    b) Sling hooks have opened more than 15% of the normal throat opening or twisted more than 10 degrees off center.
    c) Stretch exceeds 5% of the original reach.
    d) They have been exposed to temperatures in excess of 600 degrees.

- Only the manufactures or an equivalent entity shall repair or recondition slings covered in this section.

- Mechanical coupling links or “cold sheets”, bolts or clevis pins shall be used for chain repairs.

- Any chain used for hoisting must be grade 8 (eight) or higher.

- Wire ropes slings shall be removed from service when:

    a) There are 2 (two) randomly disturbed broken wires in one rope lay or 5 (five) broken wires in one strand on one rope lay.
    b) There is wear or scrapping of one-third the original diameter of outside individual wires.
    c) Kinking, crushing, bird capping, or similar damage results in distribution.
    d) End attachments are cracked, deformed, or worn.
    e) Exposed to temperatures exceeding 200 degrees Fahrenheit (fiber core) or 400 F.
    f) Corrosion of the rope or end attachments occurs.

Section 17 - Trench & Excavation

17.1 General

All trench & excavation work shall conform to the requirements of OSHA standard 29 CFR 1926.650 t652. A basic element of controlling excavation hazards is that only trained and experienced employees will perform work in excavations on JMW project sites.

17.2 Responsibilities

Competent Person:

Where trenching excavations exceed 4 feet in depth, JMW shall designate a Competent Person. This Competent Person shall be a has been trained in OSHA Trenching Requirements, including:

- Determination of soils,
- Documentation requirements,
- Monitoring for hazardous atmospheres,
- Means of access/egress.
- Sloping, benching, and shoring

Site Superintendent:

When excavation work is being performed that exceeds 4 feet in depth the Site Superintendent shall ensure that the following are done:

- Daily excavation inspections
- Protective systems ordered and in use.

17.3 Requirements

1. Trenches and excavations as described below in which employees are exposed to danger from moving ground or cave-ins shall be guarded by a shoring system, proper sloping, or other equivalent means.

    - Trenches in unstable material 5'-0" or more in depth
    - Trenches in stable material more than 5'-0" in depth and 8'-0" in length
    - Excavations for tower footings in unstable material in excess of 5'-0" in depth
    - Excavations for manholes, vaults, and other underground facilities in excess of 5'-0" in depth

2. Conditions immediately adjacent to a trench or excavation, such as trees, boulders, slides, banks, or building foundations, shall be examined and proper precautions taken.

3. Site conditions, such as surface water drainage and vibration from blasting, traffic, or machinery, shall be considered in planning the excavation.

4. Trenches and excavations in which associates are working shall be inspected by the competent person at least daily and more frequently as made necessary by rain storms, freezing and thawing conditions, and other hazard-increasing occurrences.

5. Excavated or other material shall be kept at least 2'-0" from the edge of any trench or excavation. Where this requirement cannot be met, effective barriers or retaining devices shall be used.

6. When associates are required to enter a trench or excavation 4'-0" deep or more, approved ladders of proper length and location shall be used and shall be within 25'-0" of travel distance at all times.

7. Heavy machinery or material should not be placed near the edge of excavations unless necessary precautions are taken to prevent a cave-in. A distance of at least 2'-0" must be maintained.

8. Where an explosive, toxic, or oxygen deficient atmosphere creates hazards to employees in a trench or excavation, proper tests shall be made. Work in such a trench or excavation may be performed only after the atmosphere is designated safe by the competent person.

9. Before and during an excavation, all underground facilities, such as pipelines, storage tanks, cables, etc. shall be located prior to excavating. Proper measures shall be taken to protect associates from hazards resulting from exposed facilities.

17.4 Protective Systems

Protection of Employees in Excavations

Each employee in an excavation shall be protected from cave-ins by an adequate protective system, unless:

- The excavations are made entirely in stable rock; or
- The excavations are less than 4 feet deep.

Protective systems shall have the capacity to resist all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

17.5 Caissons

When working around caissons greater than 24” in diameter and the height of the casing is less than 39”, guardrails must be in place at all times or the openings must be securely covered to support twice their intended load.

When caissons are being drilled, leading edge barricades shall be in place to designate the work area to keep other workers out. The fall protection policy of the caisson contractor shall be reviewed by the HCC superintendent to ensure that the policy meets the current OSHA standards for fall protection, excavation, tunneling, blasting, etc. and that the OSHA standards are enforced.

- The swing radius of the drill rigs must be protected at all times.

- All other equipment shall have operable back up alarms.

- When blasting must be performed, the HCC Blasting Policy must be reviewed and the Risk Management Department contacted.

- For caissons and auger cast piles less than 24" in diameter the following safety procedures shall apply:

    - Leading edge barricades in place for caisson work area.
    - Swing radius of drill rig protected
    - HCC layout engineers are to coordinate being inside these work areas with the caisson contractor and should use special precaution.
    - PVC pipe or some other rigid material shall be used to protect the caisson after the concrete is placed that extends at least 12" above the existing grade elevation. Aluminum flashing is not an acceptable caisson protection for hole coverings/protection. The removal of excavated spoils from the area shall not disturb nor remove the caisson protection. Only excavation of the caisson for the pile cap installation shall allow removal of the protection with guardrails and rebar protection in place.

17.6 Tunneling

Scope

This part applies to the construction, modification, and major repair of tunnels, shafts, caissons, chambers, passageways, cofferdams, any other aspect of tunnel construction, and the use and maintenance of equipment.

Advance Notice of Tunnel Excavation

Before the start of a tunnel, as defined in R 408.41456, which is 24 inches or more in diameter, height or width, and which will be occupied by an employee, a report prepared by the contractor performing the tunnel excavation shall be sent to the JMW Safety Director for review.

5. The report shall contain all the following information:
    - Name of contractor or contractors.
    - Starting date.
    - Length of tunnel
    - Diameter of cut.
    - Finished diameter.
    - Number of shafts.
    - Depth of shafts.
    - Location of shafts.
    - Method of tunneling.
    - Maximum working pressure in tunnel or shaft.
    - Type of primary liner.

- Number of shifts.
- Projected completion date.
- Projected maximum work force within tunnel.

6. The employer shall notify parties notified pursuant to subrule (1) of this rule when the work has been completed.
7. If after the start of any tunnel project, a tunnel or shaft that the employer has shown to be constructed, modified, or repaired under atmospheric conditions requires the tunnel to be pressurized, then the employer shall notify the Construction Safety and Health Division at the Michigan Department of Licensing and Regulatory Affairs, 7150 Harris Drive, P.O. Box 30645, Lansing, Michigan 48909-8145, 24 hours before allowing employees to enter the tunnel.

8. If the work operations of any occupied tunnel projects are discontinued for 30 consecutive days or longer, then the employer shall notify the construction safety and health division at the Michigan department of licensing and regulatory affairs, 24 hours before resuming work operations on the tunnel project.

General Safety

1. The employer shall inform oncoming shifts of any hazardous occurrences or conditions that have affected or might affect employee safety, including liberation of gas, equipment failures, earth or rockslides, cave-ins, flooding, fires, or explosions.

2. A safe means of egress and access to all work areas shall be provided and maintained free of hazards.

3. When work is not being performed, access to an underground opening shall be covered, bulk headed, fenced off or restricted by gates or doors and appropriately posted.

4. Any section of tunnel that is not in use shall be barricaded to prevent ingress by an unauthorized employee.

5. Construction of a trench, manhole, or other opening for use in a tunnel or shaft operation shall be as prescribed in construction safety standard Part 9. Excavation, Trenching, and Shoring and construction safety standard Part 45. Fall Protection, which is referenced in R 408.41410.

6. An area subject to subsidence that is ha7.ardous to an employee shall be fenced and appropriately posted.

7. Each operation shall have a check-in and check-out system that will provide positive identification of an employee by number or name and will identify the location of each employee who is underground. An accurate record shall be kept on the surface. However, a check-in and check-out system is not required when the construction of underground facilities that are designed for human occupancy has been completed so that the permanent environmental controls are effective, and the remaining construction activity will not cause any environmental hazard or structural failure within the facilities.

8. All employees shall be instructed in the recognition and avoidance of hazards that are associated with all the following underground construction activities:

(a) Air Monitoring.
(b) Ventilation.
(c) Illumination.
(d) Communications.
(e) Flood Control.
(f) Mechanical equipment.
(g) Personal protective equipment.
(h) Explosives.
(i) Fire prevention and protection.
(j) Emergency procedures, including evacuation plans and check-in and check-out systems.

9. The employer shall issue each employee a copy of the project's general safety rules before the employee commences work at the project.

10. Each employer shall designate a qualified person who is responsible for administering the safety program. A written record shall be maintained of the safety training program.

11. Before an employee enters a tunnel where the atmosphere may be hazardous due to a condition such as a deficiency of oxygen or may be toxic in excess of the maximum allowable limits, the tunnel shall be tested, and the results shall be recorded as prescribed in occupational health standard Part 665. Underground Construction, Caissons, Cofferdams, and Compressed Air, which is referenced in R408.41410. The records shall be maintained at the jobsite. If the atmosphere is hazardous, either sufficient ventilation to eliminate the hazard shall be provided or respiratory equipment as prescribed by the department of licensing and regulatory affairs shall be worn.

12. If an atmosphere is found to be explosive, then sparks, flame, and other sources of ignition shall be prohibited, and ventilation shall be provided until the hazard has been reduced and maintained at or below the maximum allowable limits as prescribed by the department of licensing and regulatory affairs.

Emergency Provisions; Plans; Equipment; Rescue Crews

1. The employer shall develop a plan to evacuate a tunnel in an emergency and the procedures to carry out the plan shall be made known to the employees and to the rescue team.

2. An employer shall ensure that rescue teams are familiar with conditions at the jobsite.

3. On jobsites where 25 or more employees work underground at 1 time, an employer shall provide, or decide in advance with locally available rescue services to provide, at least 2 5-person rescue teams. One of the teams shall be on the jobsite or within 1/2 hour of travel time from the entry point and the other team shall be within 2 hours of travel time from the entry point.

4. On jobsites where fewer 1han 25 employees work underground at 1 time, an employer shall provide, or decide in advance with locally available rescue services to provide, at least 1 5-person rescue team. The team shall either be on the jobsite or be within 1/2 hour of travel time from the entry point.

5. On jobsites where flammable or noxious gases are encountered or anticipated in hazardous quantities, rescue team members shall practice donning and using self-contained breathing apparatus monthly.

6. An emergency hoisting facility, such as a mud box or a crane, shall be readily available at a shaft that is used as a means of egress, unless a hoisting means is provided that is independent of an electrical power failure. The hoisting means shall be designed so that the load hoist drum is powered in both directions of rotation and so that the brake is automatically applied upon power release or failure.

7. An employer shall provide an escape-only respirator that is a self-contained breathing apparatus with a minimum of a 5-minute air supply. Respirators shall be approved by the national institute for occupational safety and health as prescribed in the provisions of 42 C.F.R. Public Health Service, Part 84 "Approval of Respiratory Protective Devices," as adopted in R 408.41410. Respirators shall be used in accordance with Occupational Health Standard Part 451 "Respiratory Protection," as referenced in R408.41410. Escape-only respirators shall be immediately available for each employee at workstations in underground areas where employees might be trapped by smoke or gas.

8. Escape-only respirator that is a self-contained breathing apparatus shall be maintained in good operating condition. Employees shall be trained in its use.

9. The employer shall maintain a rescue crew for each shift of all underground operations. The rescue crew shall be trained in rescue procedures, the use and limitations of a breathing apparatus, and the use of tire fighting equipment. The crews shall be retrained at least once each year. Local tire and police personnel may be used as rescue teams for tunnel operations. If local personnel are to be used, then the employer shall arrange for assistance before the start of the project.

10. The employer shall provide the following minimum rescue equipment at the top of the shaft:

    (a) Four units of 1/2-hour-rated, self-contained breathing apparatus.
    (b) Four additional units of 1/2-hour-rated air bottles.
    (c) Four bureau of mines flashlights or lanterns with additional batteries for each light. The flashlights shall be as prescribed in part 20 of subchapter B of the provisions of 30 C.F.R., Mineral Resources, Parts 1-199 "Mine Safety and Health Administration, Department of Labor," as adopted in R 408.41410.
    (d) Two 2A-10BC fire extinguishers.
    (e) One stretcher, wire basket type or equivalent with slings attached.
    (f) One fire blanket.
    (g) One 10-ton hand hydraulic rescue kit.
    (h) One first aid kit as prescribed in Construction Safety Standard Part 1 "General Rules," as referenced in R 408.41410.

11. At least 1 employee shall be on duty above ground when an employee is working underground. The primary duty of the employee who is above ground shall be to secure immediate aid for an employee who is underground in case of an emergency.

17.7 Cofferdams

A. The work shall include design and construction of cofferdam(s) as required for temporary excavation, groundwater control, dewatering. and construction of structures without in any way jeopardizing or compromising the integrity or safety of the existing lock, gate structure, hinged-crest gate, fixed crest dam, dam, and other project features, or new project structures. Such structures may include:

1. Location 1 - Proposed Intake Structure
2. Location 2 - Proposed Lock Repair - Upstream
3. Location 3 - Proposed Lock Extension - Downstream
4. Location 4 - Proposed Gate Structure - Phase 1
5. Location 5 - Proposed Gate Structure - Phase 2

B. Cofferdam shall be defined as a temporary structure, consisting of engineered components, designed to isolate the work area from water to enable construction under dry conditions based on location, height, and size limitations as shown on the contract plans and as specified below. Cofferdams may consist of but are not limited to concrete gravity structures; rock cofferdams; sheet pile cellular cofferdams; or sheet pile walls. Water shall be isolated from in-stream work area using a cofferdam constructed of non-erodible materials (steel sheets, aqua barriers, rip rap and geotextile fabric, etc.) Earthen cofferdams are not permissible. When cofferdams are not specified in the contract documents and conditions are encountered where the excavation for the structure cannot be kept free of water for prosecuting the work by pumping and/or diverting water, the Contractor, with the written permission of the Engineer, will be permitted to construct a cofferdam.

C. The Contractor shall submit a cofferdam work plan for each cofferdam to the Engineer for approval prior to the start of construction. Cofferdams shall not be installed or removed without the Engineer's approval. Work shall not be performed in flowing water except for the installation and removal of the cofferdam the cofferdam work plan shall address the following:

Cofferdam Work Plan

A. The Contractor shall submit a cofferdam work plan which describes the cofferdam system; safety requirements; addresses the proposed methods of construction and removal; construction sequencing, schedule and phasing; instrumentation and monitoring; temporary excavation and ground support; groundwater and surface water control; dewatering and re-watering methods; erosion and sediment control measures; disposal of excavated material; effluent water control measures; backfilling; the best management practices to prevent reintroduction of excavated material into the aquatic environment; and other relevant data needed to assess the completeness of the cofferdam work plan. The design and method of construction shall provide, within the measurement limits specified in Article 502.12, necessary clearance for forms, inspection of exterior of the forms, pumping, and protection of fresh concrete from water.

B. The cofferdam work plan shall describe the methods for temporary excavation, including temporary slopes, and any shoring and sheeting of-excavations. Drawings shall include, temporary slopes, shoring and sheeting material sizes and types, arrangement of members including any anchorage, location of shoring and sheeting and excavation of soils, and

Section 18 - Housekeeping & Cleanup

18.1 General

Overall Responsibility: Each contractor shall keep all walking, working, storage and break areas free from debris and rubbish. Combustible scrap and debris shall be removed from work areas daily and disposed of in a safe manner.

18.2 Basic Rules of Housekeeping

- Contractors shall provide appropriate containers, in adequate numbers, to handle flammables, metal, lumber, paper, and trash disposal. All containers shall be properly labeled, and disposal shall adhere to the Occupational Safety and Health Act.
- All materials, equipment and tools shall be stored on skids, pallets or cribbing. At no time are these items to be stored on the floor, leaning against a wall or structure or inside the web of a column.
- Contractor supervision shall maintain a constant check on housekeeping conditions.
- There shall be no accumulation of form and scrap lumber, building debris or other waste. Access to working areas, scaffolding, work platforms, in and around buildings and other structures must be maintained.
- Nails or other protruding metal from boards, form lumber or timbers shall be removed, hammered down or bent over.
- Final Clean Up: Upon the completion of work, each contractor shall remove all rubbish and debris resulting from their work activities, temporary buildings, construction equipment, tools and surplus that are their property.

18.3 Material Handling and Storage

- All materials and equipment shall be stored in a safe manner.
- All equipment, materials and tools shall be stored on skids, pallets or cribbing. At no time are these items to be stored on the floor, leaning against a wall or structure or inside the web of a column.
- Materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse.
- Loose and/or all light materials stored on roofs, in open areas or where there is the potential for them to fall, shall be properly secured.
- Compressed gas cylinders shall be always secured in an upright position. When not in use, compressed gas cylinders shall be stored in an upright position, secured and with protective valve caps in place. Storage of compressed gas cylinders shall be outside the plant at a minimum distance of fifty (50) feet from the building.
- Non-compatible compressed gasses (i.e., oxygen and acetylene) shall be segregated in storage by a non-combustible firewall or at a minimum distance of twenty (20) feet apart.
- Rigging equipment shall be inspected prior to each use. Rigging equipment not in use shall be properly stored to avoid damage and deterioration. All rigging equipment must have a legible label stating its safety factors.

18.4 Equipment and Vehicles

- Prior to arrival onsite, all heavy/mobile equipment shall be thoroughly inspected by a qualified person. A record of the dates and results of all inspections for each device shall be documented, maintained and furnished to the Construction Site Safety Department upon request.
- Prior to use of any equipment on the project, Daily Equipment Inspections shall be conducted to ensure the equipment meets the manufacturers and Occupational Safety and Health Act standards. These inspections shall be documented and kept on site for review.
- All Daily Equipment Inspections shall be documented on the appropriate form provided.
- A qualified person shall make an annual inspection of all heavy/mobile equipment. A record of the dates and results of all annual inspections shall be documented, maintained and furnished to the Construction Site Safety Department upon request.
- Failure to furnish original documents specified in this program shall be considered an infraction of the Construction Site Safety Policy and will result in a Safety Violation Notice or a Stop Work Order. In the event a Stop Work Order is issued, the contractor in violation may not commence with work until all requirements have been fulfilled and a review of safety protocol has been conducted.
- Traffic control personnel must always wear reflective safety vests while directing traffic.
- All self-propelled construction equipment, except for light service trucks, panels, pickups, station wagons, crawler-type cranes, power shovels, shall be equipped with an automatic back-up alarm.
- Seat belts shall be installed in all vehicles, as specified by the manufacturer. Seat belts must be utilized in all vehicles equipped with such safeguards.
- Rollover protection structures shall be installed on all equipment, as specified by the manufacturer.
- All equipment shall be supplied with an ABC type fire extinguisher, as specified by the manufacturer.
- Rigging equipment shall be inspected prior to each use. Rigging equipment not in use shall be properly stored to avoid damage and deterioration. All rigging equipment must have a legible label stating its safety factors.
- All equipment and vehicles shall adhere to the plant speed limits. All plant traffic regulations (i.e., speed limits, stop signs, etc.) shall be monitored. Noncompliance with plant traffic regulations shall result in disciplinary actions.

18.5 Signs and Barricades

Each crew is responsible for erecting signs and barricades sufficient to warn others of the hazards associated with construction work.

- **Yellow Caution** tape must be crossed once you check to insure the area is safe to enter.
- **Red Danger** tape must never be crossed or removed, unless you are part of the work crew in that area.
- Do not block an area off without permission from JMW.
- Remove the barricades and tape once the hazard is gone.

If hazards exist on site appropriate signs such as “NO SMOKING” shall be placed near the hazard to alert employees.
When warning signs are inadequate to protect employees from hazards physical barricades shall be placed to protect employees from hazards.

18.6 Health and Sanitation

This section contains specific safety and health policies and procedures. These procedures may be revised, updated and/or supplemented as the conditions on the project change or as required regulations dictate. Compliance with these policies and procedures is essential to ensure the safety of all persons working on this project, and to protect the equipment, materials and facilities on the project from damage. Any questions should be directed to the Construction Site Safety Department.

It shall be understood these safety procedures do not take the place of the mandatory Occupational Safety and Health Act requirements, but rather supplement them. In the unlikely event of a conflict, the more stringent standard shall govern.

Water:

a. Each Superintendent shall provide an adequate supply of potable water for his employees.
b. Portable water containers shall be kept tightly closed and maintained in a sanitary condition. When filled the container lid shall be taped to the base and dated.
c. Any container used for drinking water shall be clearly marked as water, labeled with the company name, and shall not be used for any other purpose.
d. The common drinking cup is prohibited. Waste receptacles will be provided for disposal of used cups.

Toilets:

a. Adequate toilet facilities shall be provided and maintained by JMW unless otherwise specified in the contract.
b. Sewage must be disposed of in accordance with the appropriate sanitary requirements under good public health practices and standards.

Section 19 – Steel Erection

19.1 Statement of Purpose

Each contractor working on a Turner project will comply with 29 CFR 1926, Construction Industry Regulations, and Subpart R - Steel Erection, in addition to the following.

19.2 Steel Erection Procedures

Steel Erection

Safety on all construction sites is a vital issue. With steel erection the potential for exposure of workers to equipment, falls, being struck or caught between material and equipment are ever present. It is the responsibility of the Site Superintendent to prepare for and execute a safe, productive steel erection process.

This preparation must include the general contractor and any other organizations involved in the process. It should also include all trades who will be working in the area during steel erection operations.

Project Planning

Safety begins with close coordination between JM Wilkerson and others involved in the process to determine the construction sequence, site layout, location of site storage, staging areas for equipment, and the selection of hoisting and lifting equipment and methods. This is the stage of project planning where space and schedule conflicts among subcontractors can be identified and a plan to avoid conflicts can be developed. Many incidents and injuries on construction sites occur during the moving of materials. If the need to move materials around the site is reduced through proper site layout, then the risk of injury is reduced. A side benefit of this layout strategy is reduction in time spent on moving materials and increase in worker productivity.

General Contractor

Before starting steel erection JM Wilkerson and the General Contractor must ensure that:

- The concrete in the footings, piers, and walls and the mortar in the masonry piers and walls has attained, based on an appropriate American Society for Testing and Materials (ASTM) standard test method of field-cured samples, either 75 percent of the intended minimum compressive design strength or sufficient strength to support the loads imposed during steel erection.
- Any repairs, replacements, and modifications to the anchor bolts were conducted in accordance with the OSHA regulations at 29 CFR 1926.755(b).
- There are adequate access roads into and through the site for the safe delivery and movement of derricks, cranes, trucks, other necessary equipment, and the material to be erected and means and methods for pedestrian and vehicular control. This requirement does not apply to roads outside of the construction site.
- There is a firm, properly graded, drained area, readily accessible to the work with adequate space for the safe storage of materials and the safe operation of the erector's equipment.
- Other construction processes going on below steel erection activities must be barred unless overhead protection for the employees below is provided.

19.3 Site Specific Plans

The site-specific plan serves as a guideline to assist JM Wilkerson to develop a site-specific erection plan in accordance with 29 CFR 1926.752(e) with alternate means and methods to provide employee protection in accordance with 29 CFR 1926.752(e), 29 CFR 1926.753(c)(5), 29 CFR 1926.757(a)(4) and 29 CFR 1926.757(e)(4).

Development of a Site-Specific Erection Plan.

Pre- construction conference(s) and site inspection(s) are held between the JM Wilkerson and the controlling contractor, and others such as the project engineer and fabricator before the start of steel erection. The purpose of such conference(s) is to develop and review the site-specific erection plan that will meet the requirements of this section.

Components of a Site-Specific Erection Plan

In developing a site-specific erection plan, a steel erector considers the following elements:

A. The sequence of erection activity, developed in coordination with the controlling contractor, that includes the following:

- Material deliveries.
- Material staging and storage; and
- Coordination with other trades and construction activities.

B. A description of the crane and derrick selection and placement procedures, including the following:

- Site preparation.
- Path for overhead loads; and
- Critical lifts, including rigging supplies and equipment.

C. A description of steel erection activities and procedures, including the following:

- Stability considerations requiring temporary bracing and guying.
- Erection bridging terminus point.
- Anchor rod (anchor bolt) notifications regarding repair, replacement and modifications.
- Columns and beams (including joists and purlins).
- Connections.
- Decking; and
- Ornamental and miscellaneous iron.

D. A description of the fall protection procedures that will be used to comply with 29 CFR 1926.760.

E. A description of the procedures that will be used to comply with 29 CFR 1926.759.

F. A description of the special procedures required for hazardous non-routine tasks.

G. A certification for each personnel who has received training for performing steel erection operations as required by 29 CFR 1926.761.

H. A list of the qualified and competent persons.

I. A description of the procedures that will be utilized in the event of rescue or emergency response.

19.4 Multi-Lifts

JM Wilkerson may perform multiple lifts only in accordance with the following procedures:

A. A multiple lift shall only be performed if the following criteria are met:

- A multiple lift rigging assembly is used.
- A maximum of five members are hoisted per lift.
- Only beams and similar structural members are lifted; and
- All personnel engaged in the multiple lift have been trained in these procedures in accordance with Section1926.761(c)(1).
- No crane is permitted to be used for a multiple lift where such use is contrary to the manufacturer's specifications and limitations.

B. Components of the multiple lift rigging assembly shall be specifically designed and assembled with a maximum capacity for total assembly and for each individual attachment point. This capacity, certified by the manufacturer or a qualified rigger, shall be based on the manufacturer's specifications with a 5 to 1 safety factor for all components.

C. The total load shall not exceed:

- The rated capacity of the hoisting equipment specified in the hoisting equipment load charts.
- The rigging capacity specified in the rigging rating chart.

D. The multiple lift rigging assembly shall be rigged with members:

- Attached at their center of gravity and maintained reasonably level.
- Rigged from top down; and
- Rigged at least 7 feet apart.

E. The members on the multiple lift rigging assembly shall be set from the bottom up.

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

19.5 Structural Steel Assembly

Structural stability will be always maintained during the steel erection process. When erecting multi-story structures, we will implement the following additional requirements:

- All involved in steel erection will use the requirements of this steel erection standard (Section 1926.753(c)(4)) when hoisting personnel on a personnel platform during steel erection operations.
- Permanent floors will be installed as the erection of structural members progresses.
- There will not be more than eight stories between the erection floor and the upper-most permanent floor, except where the structural integrity is maintained as a result of the design.
- At no time will there be more than four floors or 48 feet, whichever is less, of unfinished bolting or welding above the foundation or uppermost permanently secured floor, except where the structural integrity is maintained as a result of the design.
- A fully planked or decked floor or nets will be maintained within two stories or 30 feet, whichever is less, directly under any erection work being performed.

Walking/Working Surfaces

Because of the possibility of becoming a trip hazard, shear connectors (such as headed steel studs, steel bars, or steel lugs), reinforcing bars, deformed anchors, or threaded studs will not be attached to the top flanges of beams, joists or beam attachments so that they project vertically from or horizontally across the top flange of the member until after the metal decking, or other walking/working surface, has been installed.

When subcontractors use shear connectors in the construction of composite floors, roofs, and bridge decks, personnel will lay out and install them after the metal decking has been installed, using the metal decking as a working platform. Shear connectors will not be installed from within a controlled decking zone.

Plumbing-up

- When deemed necessary by a competent person, plumbing-up equipment shall be installed in conjunction with the steel erection process to ensure the stability of the structure.
- When used, plumbing-up equipment shall be in place and properly installed before the structure is loaded with construction material such as loads of joists, bundles of decking or bundles of bridging.
- Plumbing-up equipment shall be removed only with the approval of a competent person.

Metal Decking Operations

During metal decking operations, the subcontractor specific operational requirements to protect personnel during the installation of metal decking are: Hoisting, Landing and Placing of Metal Decking Bundles

- Bundle packaging and strapping will not be used for hoisting unless specifically designed for that purpose.
- If loose items such as dunnage, flashing, or other materials are placed on the top of metal decking bundles to be hoisted, those items will be secured to the bundles.
- Bundles of metal decking on joists will be landed in accordance with Section 1926.757(e)(4) of the OSHA regulations (see the requirements for Landing and Placing Loads in this written safety plan).
- Metal decking bundles will be landed on framing members so that enough support is provided to allow the bundles to be unbanded without dislodging the bundles from the supports.
- At the end of the shift or when environmental or jobsite conditions require, metal decking will be secured against displacement.

Roof and Floor Holes and Openings

Metal decking at roof and floor holes and openings will be installed as follows:

- Framed metal deck openings will have structural members turned down to allow continuous deck installation except where not allowed by structural design constraints or constructability.
- Roof and floor holes and openings will be decked over. Where large size, configuration, or other structural design does not allow openings to be decked over (such as elevator shafts, stair wells, etc.) employees will be protected in accordance with Section 1926.760(a)(1) of the OSHA regulations (see the Fall Protection requirements in this written safety plan).
- Metal decking holes and openings will not be cut until immediately prior to being permanently filled with the equipment, or structure needed or intended to fulfill its specific use, and which meets the strength requirements of the next section of this written safety plan (Covering Roof and Floor Openings) or will be immediately covered.

Covering Roof and Floor Openings

Covers for roof and floor openings will be capable of supporting, without failure, twice the weight of the employees , equipment, and materials that may be imposed on the cover at any one time.

All covers will be secured when installed to prevent incidental displacement by the wind, equipment, or personnel.

All covers will be painted with high-visibility paint or will be marked with the word HOLE or COVER to provide warning of the hazard.

Smoke dome or skylight fixtures that have been installed, are not considered covers unless they are capable of supporting, without failure, twice the weight of the employees, equipment, and materials that may be imposed on the cover at any one time.

Decking Gaps Around Columns

Wire mesh, exterior plywood, or equivalent, will be installed around columns where planks or metal decking do not fit tightly. The materials used will be of sufficient strength to provide fall protection for personnel and prevent objects from falling through.

Installation of Metal Decking

Except as provided in the controlled decking zone requirements of this plan, metal decking will be laid tightly and immediately secured upon placement to prevent incidental movement or displacement.

During initial placement, structural members will place metal-decking panels to ensure full support.

19.6 General Requirements for Erection Stability

All column anchorage operations will follow the following requirements to assure column stability:

- All columns will be anchored by a minimum of 4 anchor rods (anchor bolts).
- Each column anchor rod (anchor bolt) assembly, including the column-to-base plate weld and the column foundation, will be designed to resist a minimum eccentric gravity load of 300 pounds located 18 inches from the extreme outer face of the column in each direction at the top of the column shaft.

- Columns will be set on level finished floors, pre-grouted leveling plates, leveling nuts, or shim packs which are adequate to transfer the construction loads.
- A competent person to determine whether guying or bracing is needed; if guying or bracing is needed, it shall be installed will evaluate all columns.
- Repair, replacement, or field modification of anchor rods (anchor bolts)
- Anchor rods (anchor bolts) will not be repaired, replaced or field-modified without the approval of the project structural engineer of record.
- Prior to the erection of a column, the controlling contractor will provide written notification to the steel erector if there has been any repair, replacement or modification of the anchor rods (anchor bolts) of that column.

Beams and Columns.

To minimize the hazard of structural collapse during the early stages of steel erection, JMW will require subcontractor's procedures for connecting beams and columns to meet the following minimum requirements:

During the final placing of solid web structural members, the load must not be released from the hoisting line until the members are secured with at least two bolts per connection, of the same size and strength as shown in the erection drawings, drawn up wrench-tight or the equivalent as specified by the project structural engineer of record, except as specified in paragraph (b) (Diagonal Bracing) of this section.

A competent person will determine if more than two bolts are necessary to ensure the stability of cantilevered members; if additional bolts are needed, they must be installed.

Diagonal Bracing

Solid web structural members used, as diagonal bracing shall be secured by at least one bolt per connection drawn up wrench-tight or the equivalent as specified by the project structural engineer of record.

Double Connections at Columns and/or at Beam Webs Over a Column

When two structural members on opposite sides of a column web, or a beam web over a column, are connected sharing common connection holes, at least one bolt with its wrench-tight nut must remain connected to the first member unless a shop-attached or

field-attached seat or equivalent connection device is supplied with the member to secure the first member and prevent the column from being displaced. If a seat or equivalent device is used, the seat (or device) must be designed to support the load during the double connection process. It must be adequately bolted or welded to both a supporting member and the first member before the nuts on the shared bolts are removed to make the double connection.

Column Splices

Each column splice shall be designed to resist a minimum eccentric gravity load of 300 pounds located 18 inches from the extreme outer face of the column in each direction at the top of the column shaft.

Perimeter Columns

Perimeter columns shall not be erected unless:

- The perimeter columns extend a minimum of 48 inches above the finished floor to permit installation of perimeter safety cables prior to erection of the next tier, except where constructability does not allow.
- The perimeter columns have holes or other devices in or attached to perimeter columns at 42-45 inches above the finished floor and the midpoint between the finished floor and the top cable to permit installation of perimeter safety cables required by Section 1926.760(a)(2), except where constructability does not allow. (See Appendix F to the Steel Erection rule).

19.7 Open Web Joists

Some of the most serious risks facing ironworkers are encountered during the erection of open web steel joists. Except as provided previously, where steel joists are used and columns are not framed in at least two directions with solid web structural steel members, a steel joist shall be field bolted at the column to provide lateral stability to the column during erection. For the installation of this joist:

- A vertical stabilizer plate shall be provided on each column for steel joists. The plate shall be a minimum of 6 inch by 6 inches and shall extend at least 3 inches below the bottom chord of the joist with a 13/16-inch hole to provide an attachment point for guying or plumbing cables.
- The bottom chords of steel joists at columns shall be stabilized to prevent rotation during erection.
- Hoisting cables shall not be released until the seat at each end of the steel joist is field-bolted, and the column stabilizer plate restrains each end of the bottom chord.

Where constructability does not allow a steel joist to be installed at the column:
An alternate means of stabilizing joists shall be installed on both sides near the column and shall:

- Provide stability equivalent to paragraph (a)(1) of this section,
- Be designed by a qualified person,
- Be shop installed, and
- Be included in the erection drawings.
- Hoisting cables shall not be released until the seat at each end of the steel joist is field-bolted and the joist is stabilized.

Where steel joists at or near columns span 60 feet or less, the joist shall be designed with sufficient strength to allow one subcontractor personnel to release the hoisting cable without the need for erection bridging.

Where steel joists at or near columns span more than 60 feet, the joists shall be set in tandem with all bridging installed unless an alternative method of erection, which provides equivalent stability to the steel joist, is designed by a qualified person and is included in the site-specific erection plan.

A steel joist or steel joist girder shall not be placed on any support structure unless such structure is stabilized.

When steel joist(s) are landed on a structure, they shall be secured to prevent unintentional displacement prior to installation.

No modification that affects the strength of a steel joist or steel joist girder shall be made without the approval of the project structural engineer of record.

Field-Bolted Joists

Except for steel joists that have been pre-assembled into panels, connections of individual steel joists to steel structures in bays of 40 feet or more shall be fabricated to allow for field bolting during erection. These connections shall be field bolted unless constructability does not allow.

Steel joists and steel joist girders shall not be used as anchorage points for a fall arrest system unless written approval to do so is obtained from a qualified person.

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 fillet welds 1 inch long or with two 1/2-inch bolts, or the equivalent.

Each end of "LH" and "DLH" series steel joists and steel joist girders shall be attached to the support structure with a minimum of two 1/4-inch fillet welds 2 inches long, or with two 3/4-inch bolts, or the equivalent.

Except as provided in previous sections, each steel joist shall be attached to the support structure, at least at one end on both sides of the seat, immediately upon placement in the final erection position and before additional joists are placed.

Panels that have been pre-assembled from steel joists with bridging shall be attached to the structure at each corner before the hoisting cables are released.

Erection of Steel Joists

Both sides of the seat of one end of each steel joist that requires bridging under Tables A and B (29 CFR 1926.757) shall be attached to the support structure before hoisting cables are released.

For joists over 60 feet, both ends of the joist shall be attached as specified in previous paragraphs before the hoisting cables are released.

On steel joists that do not require erection bridging under Tables A and B, only one subcontract personnel shall be allowed on the joist until all bridging is installed and anchored.

Employees shall not be allowed on steel joists where the span of the steel joist is equal to or greater than the span shown in Tables A and B except in accordance with Section 1926.757(d).

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

19.8 Erection Bridging

Where the span of the steel joist is equal to or greater than the span shown in Tables A and B, the following shall apply:

- A row of bolted diagonal erection bridging shall be installed near the midspan of the steel joist.

- Hoisting cables shall not be released until this bolted diagonal erection bridging is installed and anchored.
- No more than one subcontractor personnel shall be allowed on these spans until all other bridging is installed and anchored.

Where the span of the steel joist is over 60 feet through 100 feet, the following shall apply:

- All rows of bridging shall be bolted diagonal bridging.
- Two rows of bolted diagonal erection bridging shall be installed near the third points of the steel joist.
- Hoisting cables shall not be released until this bolted diagonal erection bridging is installed and anchored.
- No more than two subcontractor personnel shall be allowed on these spans until all other bridging is installed and anchored.

Where the span of the steel joist is over 100 feet through 144 feet, 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.
- No more than two subcontractor personnel shall be allowed on these spans until all bridging is installed and anchored.

For steel members spanning over 144 feet, the erection methods used shall be in accordance with Section1926.756.

Where any steel joist specified in early paragraphs of this section is a bottom chord-bearing joist, a row of bolted diagonal bridging shall be provided near the support(s). This bridging shall be installed and anchored before the hoisting cable(s) is released.

When this section requires bolted diagonal erection bridging, the following shall apply:

- The bridging shall be indicated on the erection drawing.
- The erection drawing shall be the exclusive indicator of the proper placement of this bridging.
- Shop-installed bridging clips, or functional equivalents, shall be used where the bridging bolts to the steel joists.
- When two pieces of bridging are attached to the steel joist by a common bolt, the nut that secures 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

During the construction period, the JM Wilkerson placing a load on steel joists shall ensure that the load is distributed so as not to exceed the carrying capacity of any steel joist.

Except as stated earlier, no construction loads are allowed on the steel joists until all bridging is installed and anchored and all joist-bearing ends are attached.

The weight of a bundle of joist bridging shall not exceed a total of 1,000 pounds. A bundle of joist bridging shall be placed on a minimum of three steel joists that are secured at one end. The edge of the bridging

bundle shall be positioned within 1 foot of the secured end.

No bundle of decking may be placed on steel joists until all bridging's has been installed and anchored and all joist bearing ends attached, unless all the following conditions are met:

- The Supervisor has first determined from a qualified person and documented in a site-specific erection plan that the structure or portion of the structure can support the load.
- The bundle of decking is placed on a minimum of three steel joists.
- The joists supporting the bundle of decking are attached at both ends.
- At least one row of bridging is installed and anchored.
- The total weight of the bundle of decking does not exceed 4,000 pounds.
- Placement of the bundle of decking shall be in accordance with paragraph previously stated sections.
- The edge of the construction load shall be placed within 1 foot of the bearing surface of the joist end.

19.9 Protection from Falling Objects

JM Wilkerson has the responsibility of barring other construction processes below steel erection unless overhead protection for employees below is provided. All materials, equipment, and tools, which are not in use while aloft, will be secured against incidental displacement.

19.10 Training

JM Wilkerson follows both the training requirements of the Steel Erection rule and 29 CFR 1926.21, Safety Training and Education. We ensure that a qualified person(s) provides steel erection training.

JM Wilkerson shall provide a training program for all employees 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; and
- The fall protection requirements of the Steel Erection rule.

<u>Special Training Programs</u>

In addition to the training required as described above, JM Wilkerson will provide special training to employees:

- Multiple lift rigging procedures

JM Wilkerson will ensure that each employee who performs multiple lifts rigging has been provided training in the following areas:

- The nature of the hazards associated with multiple lifts; and
- The proper procedures and equipment to perform multiple lifts required by Section 1926.753(e).

Connector procedures

JM Wilkerson shall ensure that each connector has been provided training in the following areas:

- The nature of the hazards associated with connecting; and\
- The establishment, access, proper connecting techniques and work practices required by Section 1926.756(c) and Section 1926.760(b).

Section 20 - Lock-Out/Tag-Out

20.1 Scope

This procedure establishes the Lock-Out/Tag-Out (LOTO) procedure for securing machinery and equipment during periods of construction on JMW job sites. It is essential all employees are consistent with their lockout procedures to insure the safety of all other employees.

A LOTO procedure is designed to render inoperative electrical systems, pumps, pipelines, valves, tanks and all other such energy systems which may accidentally be energized or started up while employees are working on them on or before they are mechanically ready and released for service.

These LOTO procedures have been established to ensure energy sources to equipment or machinery are de-energized, isolated, blocked, locked, and/or tagged out to prevent accidental injury or property damage. (Lock-Out IS THE PREFERED METHOD OF ISOLATION). Energy sources are defined as steam, air, electrical, mechanical, hydraulic, thermal, spring/loaded devices, etc.

20.2 Responsibilities

The Subcontractor Superintendent must:

- Be knowledgeable of hazardous energy sources and their specific LOTO methods prior to removing, installing or servicing, machinery, and/or power distribution systems.
- Administer a lockout program which meets or exceeds the JMW and OSHA requirements.
- Ensure that all hazardous energy sources are locked out or tagged out.
- Ensure that LOTO procedure used provides effective safety protection for all employees.
- Ensure that all affected employees have received training and understand the lock-out/tag-out procedure, and maintain documentation relating to the training.
- Designate competent personnel to serve as LOTO Officer.
- Provide an adequate number of locks and associated equipment to be used for LOTO.
- Ensure that all keys shall be in the possession of the person utilizing the specific lock.
- NO EQUIPENT IS TO BE TAKEN OUT OF SERVICE OR PLACED INTO SERVICE WITHOUT THE KNOWLEDGE AND APPROVAL OF THE LOTO OFFICER.
- Keep a log of all lockouts stating, the date, individual utilizing the lock, lock number, the equipment/machinery to be locked out, the time the lockout began and the time the lockout was completed.

The JMW LOTO Officer must:

- Review and understand the LOTO procedure.
- Have knowledge of the energy source and the specific LOTO method prior to authorizing the removing, installing or servicing, machinery, and/or power distribution systems.
- Have knowledgeable of the magnitude of the energy source.
- Verify that LOTO procedures used provide effective safety protection for all employees.
- Ensure that all affected employees have received training and understand the LOTO procedure as follows:

a) Instruction in the use and purpose of the Lock-Out/Tag-Out procedure.
b) LOTO procedures taken to avoid equipment from being operated.
c) Instruction on the type and magnitude of equipment or energy source.
d) Instruction on the hazards of the work and area of safety concern.

- Maintain documentation relating to the training.
- Issue Energy Control Permit to JMW employees or subcontractors.

20.3 LOTO Procedures

- Prior to de-energizing any equipment or machinery, the Subcontractor LOTO Officer shall notify the JMW LOTO Officer of the job activity that requires LOTO. The JMW LOTO Officer will then meet with the person requesting a LOTO permit and discuss:

  a) The type of work.
  b) Method of energy control, LOTO.
  c) Review of LOTO procedure.
  d) Date and time work is to start, and approximate finish time.

- All affected employees shall be notified that a LOTO system is going to be utilized.
- The JMW Site Superintendent shall issue an Energy Control Permit, which shall be filled out by the contractor prior to commencing work.
- De-energize/Isolate electrical sources by LOTO procedures.
- Release all potential sources of stored energy.
- Verify that equipment cannot be started with the Lock-Out devices in place.
- All Locked-Out energy sources shall be Tagged-Out with a **"DANGER"** tag affixed to the equipment or system indicating who installed the lock, craft, contractors name, phone number and the reason the system was locked out. Examples of energy sources requiring to be locked out and tagged are:

  1. Electrical systems as they are energized will be locked out by the responsible electrical contractor until they are released to the JMW LOTO Officer. Anytime repairs or modifications are made to the electrical systems, either temporary or permanent, they shall be locked out. Locks shall be applied to the main disconnect switch whenever possible. All locks must be accompanied by a tag. To ensure zero energy, all sources of potential energy to the work area at hand must be locked out.
  2. Electrical systems providing electrical power to equipment such as pumps and electrical motors, shall be locked out by the appropriate contractor until such time the system is released.
  3. Pipelines, valves and other such sources, which could be inadvertently activated, causing a hazardous condition, shall be locked out, blanked off or otherwise secured to prevent accidental activation.
  4. Lines, valves and similar systems being tested pneumatically or with other gases, such as nitrogen, shall be tagged and/or locked out to prevent any accidental discharge of the pressure within the line. In addition, areas affected by the pneumatic test shall be barricaded against entry and inspected by the contractor prior to commencement of the test.

5. When preparing to work on presumably disconnected electrical equipment, the employee will test all incoming wires with an AC voltage detector. The detector will indicate electrical potential of any wire from 25 to 1500 AC volts.
6. Before using a tester, check to a known live circuit to make sure the tester is working properly.
7. When using a voltage detector, check each wire as close to the conduits as practical. This will ensure the coverage of all wires that enter the box or equipment. If you have conduits coming in, check each wire in all conduits.

20.4 Multiple Source Procedures

- When multi-worker or multi-craft situations exists, a multiple lockout device shall be used.
- When all work requiring lockouts has been completed, the JMW Site Superintendent shall be contacted. The JMW LOTO Officer shall remove their lock last before any device is re-energized.
- Upon completion of the Energy Control Permit, the Superintendent shall return the original copy of the Permit to the JMW Safety and Risk Management Department to ensure it is filled out completely. The LOTO Officer shall be responsible for posting the Energy Control Permit at the location of the equipment or machinery, which is locked out.

20.5 Multiple Company Procedures

- When more than one person or company is working on the same equipment, a multiple LOTO procedure is required.
- All LOTO procedures will be initiated by site's LOTO Officer (Electrical Subcontractor).
- The Subcontractor's LOTO Officer will place a separate lock on each isolation point along with the appropriate lock and warning tag.
- Each employee working on the equipment has the option to affix their personal lockout device to the equipment.
- When the work to be performed is completed, the Subcontractor's LOTO Officer is to be notified. NO ONE OTHER THAN THE JMW LOCK-OUT/TAG-OUT OFFICER IS TO REMOVE THE PRIMARY LOCK AND RETURN POWER TO THE EAUIPMENT.
- All personal locks are to be removed after work is completed, or at the end of a shift.
- Upon completion of work the Energy Control Permit, the JMW LOTO Officer shall file the original copy of the Permit and ensure it is filled out completely. The LOTO Officer shall be responsible for posting the Energy Control Permit at the location of the equipment or machinery, which is locked out.

20.6 Shift Change Procedures

- LOTO communication between shifts is **MANDATORY**.
- The JMW LOTO Officer shall verify that LOTO procedures are still enforce by the Subcontractor's LOTO Officer at the start of his/her shift.
- Advise all employees of LOTO switch.

20.7 Sequence for Restoring Energy Source

- The Subcontractor's LOTO Officer shall notify the JMW LOTO Officer.
- The Subcontractor's LOTO Officer shall notify all affected employees.
- All personal locks shall be removed.
- The Subcontractor's LOTO Officer shall verify that all employees are clear from the equipment to be re-energized and post a safety watch to prevent uniformed employees from entering the area.
- After verifying that all affected employees are safe, the Subcontractor's LOTO Officer will remove the primary lock and restore power to equipment.

20.8 Removal of Personal Lock

- In the event a personal lock needs to be removed, and that employee is not present, the Subcontractor's LOTO Officer will coordinate with the JMW LOTO Officer to verify that the employee is not on site.
- Once it is determined that the employee is off site and not in any danger, the lock can be removed.
- In the event an employee's lock is removed by someone other than the employee, that employee must be notified immediately upon returning to the site.

20.9 Disciplinary Action

Any person who operates a valve, switch, or device to which "Danger" tags are attached or removes such a tag without authorization will be subject to immediate termination.

Section 21 - Powered Industrial Equipment

21.1 General

This section covers project site equipment that is not licensed for operation on highways or other public roadways. Examples of this equipment are forklift trucks such as Lulls, scrapers, end loaders, hi-lifts, back hoes, skid steers, and off-road trucks.

Only authorized employees shall operate this type of equipment. Authorized employees are those who have received operator's training for their specific mobile equipment and have been assigned to operate a unit.

21.2 Safety Guidelines

All Machines and Vehicles:

- The Superintendent is responsible for ensuring that operators or others who operate equipment are properly trained.
- All mobile equipment used by JMW or subcontractors on our project sites, whether rented, owned, leased or borrowed, will be equipped with an operating audible reverse-signal alarm that is audible above other noises in the immediate area.
- Seat belts are required for all machines that are designed for sit-down operation and are equipped with a rollover protection structure (ROPS).

21.3 Pre-Start Inspection

Prior to the use of any mobile equipment each day, or at the beginning of each shift, the operator shall visually inspect and/or perform a functional test of the following:

- Operating and emergency controls, brakes, air/hydraulic connections,
- Safety and warning devices, lights, mirrors, back up alarms,
- Personal protective devices, seat belts,
- Hydraulic and fuel system leaks,
- Cable and loose wiring harnesses, Loose or missing parts,
- Wire rope, cable and sheaves
- Placards on rated load capacity, operating speeds, hazard warnings and other essential information,
- Outrigger and stabilizers
- Fuel, water, oil levels, battery charge
- Gauges, horns and lights
- Vehicle damage

21.4 Problems & Malfunctions

The operator shall promptly report all problems or malfunctions on any piece of mobile equipment to the Site Superintendent or a Site Foreman. The Site Superintendent or Site Foreman will determine the effect(s) of any mobile equipment problem or malfunction on the safety of operations of such equipment.

If correction or repair of an unsafe item cannot be made immediately, the unit shall be tagged “Danger-Do Not Operate” and removed from service until the corrective action has been taken.

21.5 Equipment Maintenance Inspections

Frequent inspections of all mobile equipment shall be performed by qualified persons to ensure that all mobile equipment is maintained in safe and proper working order in accordance with the manufacturer’s operating and maintenance specifications.

21.6 Work Area Inspections

Prior to start of shift operators shall inspect the work areas for any hazards.

21.7 General Safety Practices

- Routine maintenance, fueling or repairs must not be performed while the equipment is in use, the engine is running, or the power is on.
- A fire extinguisher rated at least 5 lb. ABC shall be located on all mobile equipment.
- Stunt driving or horseplay on any mobile equipment is strictly prohibited.
- The use of planks, ladders or any other device on any aerial platform lift for the purpose of achieving additional height is strictly prohibited.
- Powered industrial trucks will not be used to elevate employees.
- When a forklift is parked, the forks are to be grounded, brakes set, and engine is off.
- The use of a personal fall arrest system with lanyard attached to the anchor rings on aerial lift equipment is mandatory.

21.8 Operator Training & Authorization

Only properly trained employees shall be authorized to operate mobile equipment. Training for each specific type of mobile equipment is mandatory prior to authorization being given to the employee to operate that specific type of equipment.

Training for all mobile equipment shall include the following:

- A review of the Safety and Operations Manual for operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate.
- Differences between the truck and an automobile.
- Equipment controls and instrumentation: where instruments are located, what they do, how they work, etc.
- Steering, maneuvering, and visibility (including restriction)

- Vehicle capacity, stability, and limitations
- Vehicle inspection and maintenance
- Refueling and/or recharging batteries
- Personal Protective Equipment required when operating the truck.
- An Operator's performance test to demonstrate the employee's ability to operate the specific type of mobile equipment.

Refresher Training:

- The operator is assigned to operate a different type of truck or conditions in the workplace have changed in a manner that affects the safe operation of the truck.
- The operator has been observed operating the truck unsafely.
- The operator has been involved in an accident or a near miss incident.
- The operator has received an evaluation that reveals the operator is not operating the truck safely.

Re-Evaluation of Operators:

- Operators will be re-evaluated at least once every three years.

21.9 Certification of Operators

Operators who have received training and passed the evaluation will be certified. The written certification will include: the name of the operator, the identity of the person performing the training and evaluation, the date of the training, date of the evaluation, signature of the operator and the type of equipment the person is certified to operate.

Training and certification records will be maintained by the Safety and Risk Management Department and will be available to the Project Management or the operator or the operator on a need-to-know basis.

Section 22 - Respiratory Protection

22.1 General

This procedure establishes the Respiratory Protection Program for protecting employees from hazards while working on the job site. These hazards include particulates and vapors, and in some cases represent immediately dangerous to life or health situations. The purpose of this program is to ensure that all JMW employees are protected from exposure to these respiratory hazards. It is essential all employees are consistent with their respiratory protection procedures to ensure the safety of all other employees.

This Respiratory Protection Program procedure is designed to reduce the opportunity for exposure to hazards in the workplace. Engineering controls, such as ventilation and substitution of less toxic materials, are the first line of defense. However, engineering controls are not always feasible for some operations, or have not always completely controlled the identified hazards. In these situations, respirators and other protective equipment must be used. Respirators are also needed to protect employees' health during emergencies.

22.2 Scope and Application

This program applies to all JMW employees and subcontractors who are required to wear respirators during normal; work operations, and during some non-routine or emergency operations such as a spill of a hazardous substance. All employees working in the condensation pit area and engaged in certain processes or tasks (as outlined in the table below) must be enrolled in the JMW respiratory protection program.

In addition, any employee who wears a respirator when a respirator is required is subject to a medical evaluation, cleaning, maintenance, and storage elements of this program, and must be provided with certain information specified in this section of the program.

Employees participating in the respiratory protection program do so at no cost to them. The expense associated with training, medical evaluations and respiratory protection equipment will be borne by the company.

Table 1: Suggested Respiratory Use

Respirator	Department / Process
N-95	
Half-face piece APR	
PAPR	

22.3 Responsibilities

Safety Coordinator

- The Safety Coordinator is responsible for administering the respiratory protection program. Duties of the Safety Coordinator include:
- Identifying work areas, processes or tasks that require workers to wear respirators, and evaluating hazards.
- Selection of respiratory protection options.

- Monitoring respirator use to ensure that respirators are used in accordance with their certifications.
- Arranging for and/or conducting training and qualitative fit testing.
- Ensuring proper storage and maintenance of respiratory protection equipment.
- Administering the medical surveillance program.
- Maintaining records required by the program.
- Evaluating and updating the written program, as needed.

Superintendent

The Superintendent is responsible for ensuring that the respiratory protection program is implemented in their areas, being knowledgeable about the program requirements for their own protection, ensuring that the program is understood and followed by JMW employees and subcontractors under their charge. Duties of the Superintendent shall include:

- Ensuring that employees under their supervision (including new hires) have received appropriate training, fit testing, and annual medical evaluation.
- Ensuring the availability of appropriate respirators and accessories.
- Being aware of tasks requiring the use of respiratory protection.
- Enforcing the proper use of respiratory protection when necessary.
- Ensuring that respirators are properly cleaned, maintained, and stored according to the respiratory protection plan.
- Coordinating with the Safety Coordinator on how to address respiratory hazards or other concerns regarding the program.

Employees

Each employee has the responsibility to wear his/her respirator when and where required and in the way they were trained. Employees must also:

- Inform their Superintendent if the respirator no longer fits well and request a new one that fits properly.
- Inform their Superintendent or Safety Coordinator of any respiratory hazards that they feel are not adequately addressed in the workplace and of any other concerns that they have regarding the program.
- Maintain their respirators as instructed and store them in a clean sanitary location.

22.4 Program Elements

The Safety Coordinator will select respirators to be used on site, based on the hazards to which workers are exposed and in accordance with all OSHA standards. The Safety Coordinator will conduct a hazard evaluation for each operation, process, or work area where airborne contaminants may be present in routine operations or during an emergency.

The hazard evaluation will include:

- Identification and development of a list of hazardous substances used in the workplace, by department, or work process.

- Review of work processes to determine where potential exposures to these hazardous substances may occur. This review shall be conducted by surveying the workplace, reviewing process records, and talking with employees and supervisors.
- Exposure monitoring to quantify potential hazardous exposures. Monitoring will be conducted by the Safety Coordinator.

22.5 Updating the Hazard Assessment

The Safety Coordinator must revise and update the hazard assessment as needed (i.e., anytime work process changes may potentially affect exposure). If an employee feels that respiratory protection is needed during a particular activity, he/she is to contact his/her Superintendent or Safety Coordinator.

The Safety Coordinator will evaluate the potential hazard, arranging for outside assistance, as necessary. The Safety Coordinator will then communicate the results of that assessment back to the employees. If it is determined that respiratory protection is necessary, all other employees of this program will be in effect for those tasks and this program will be updated accordingly.

22.6 NIOSH Certification

All respirators must be certified by the National Institute for Occupational Safety and Health (NIOSH) and shall be used in accordance with the terms of that certification. Also, all filters, cartridges, and canisters must be labeled with the appropriate NIOSH label. The label must not be removed or defaced while it is in use.

22.7 Medical Evaluation

Employees who are either required to wear respirators must pass a medical exam before permitted to wear a respirator on the job. Employees are not permitted to wear respirators until a physician has determined that they are medically able to do so. Any employee refusing the medical evaluation will not be allowed to work in an are requiring respirator use.

A licensed physician at, where all medical services are to be provided, will provide medical evaluations. Medical evaluation procedures are as follows:

- The medical evaluation will be conducted using the questionnaire provided in Appendix C of the respiratory protection standard. The Safety Coordinator will provide a copy of this questionnaire to all employees requiring medical evaluations.
- To the extent feasible, the company will assist employees who are unable to read the questionnaire (by providing help in reading the questionnaire). When this is not possible, the employee will be sent directly to the physician for the medical evaluation.
- All affected employees will be given a copy of the medical questionnaire to fill out, along with a stamped and addressed envelope for mailing the questionnaire to the company physician. Employees will be permitted to fill out the questionnaire on company time.
- Follow-up medical exams will be granted to employees as required by the standard, and/or as deemed necessary by a physician.
- All employees will be granted the opportunity to speak with the physician about their medical evaluation if they so request.
- The Safety Coordinator has provided a physician with a copy of this program, a copy of the Respiratory Protection standard, the list of hazardous substances by work area, and for each employee requiring evaluation: his or her work area or job title, proposed respirator type and weight, length of time required to wear respirator, expected physical workload, (light, moderate,

or heavy), potential temperature and humidity extremes, and any additional protective clothing required.

After an employee has received clearance and begun to wear his/her respirator, additional medical evaluations will be provided under the following circumstances:

- Employee reports signs and/or symptoms related to their ability to use a respirator, such as shortness of breath, dizziness, chest pains, or wheezing.
- The physician or JMW Superintendent informs the Safety Coordinator that the employee needs to be reevaluated.
- Information from this program, including observations made during fit testing and program evaluation, indicates a need for reevaluation.
- A change occurs in workplace conditions that may result in an increased physiological burden on the employee.

All examinations and questionnaires are to remain confidential between the employee and the physician. A list of all JMW employees and subcontractors currently in medical surveillance is provided in Table 2 of this program.

22.8 Fit Testing

Fit testing is required for employees wearing half-face piece APR's for exposure to fumes in the condensation pit work area. The Safety Coordinator will conduct fit tests following the OSHA approved Bitrex Solution Aerosol QLFT Protocol in Appendix B (B4) of the respiratory protection standard. Employees who are required to wear half-face piece APR's will be fit tested:

- Prior to being allowed to wear any respirator with a tight-fitting face-piece.
- Annually.
- When there are changes in the employee's physical condition that could affect respiratory fit (i.e., obvious changes in body weight, facial scarring, etc.).
- Employees will be fit tested with the make, model, and size of respirator that they will wear. Employees will be provided with several models and sizes of respirators so that they may find an optimal fit. Fit testing of PAPR's is to be conducted in the negative pressure mode.

22.9 Respirator Use

Respiratory protection is required for the following personnel:

JMW Personnel in the Respiratory Protection Program

Name	Department	Work procedure	Respirator

General use Procedures:

- Employees will use their respirators under conditions specified by this program, and in accordance with the training they receive on the use of each model. In addition, the respirator shall not be used in a manner for which it is not certified by NIOSH or by the manufacturer.
- All employees shall conduct user seal checks each time they wear their respirator. Employees shall use either the positive or negative pressure check (depending on which test works best for them) specified in Appendix B-1 of the Respiratory protection Standard.
- All employees shall be permitted to leave the work area to go to the office trailer to maintain their respirator for the following reasons: to clean their respirator if the respirator is impeding their ability to work, change filters or cartridges, replace parts, or inspect respirator if it stops functioning as intended. Employees should notify their Superintendent before leaving the area.
- Employees are not permitted to wear tight-fitting respirators if they have any condition, such as facial scars, facial hair, or missing dentures, that prevents them from achieving a good seal.

Emergency Procedures:

The following work areas have been identified as having foreseeable emergencies (NOTE - Each jobsite has different potential emergency situations):

Area	Hazard

When the detector alarm sounds, employees in the affected area must immediately shut down their equipment and exit the work area. All other employees must remain away from the area. JMW's Emergency Action Plan describes these procedures (including the proper evacuation routes and rally points) in greater detail.

22.10 Respirator Malfunction

APR Respirator Malfunction:

For any malfunction of an APR (i.e., such as breakthrough, face piece leakage, or improperly working valve), the respirator wearer should inform his/her supervisor that the respirator no longer functions as intended and go to the designated safe area to maintain the respirator. The Superintendent must ensure that the employee receives the needed parts to repair the respirator or is provided with a new respirator.

22.11 Respirator Care

Cleaning:

Respirators are to be regularly cleaned and disinfected at the designated respirator cleaning station in the employee locker room. Respirators issued for the exclusive use of an employee shall be cleaned as often as necessary, but at least once a day for workers in the prep and Assembly departments. The following procedure is to be used when cleaning and disinfecting respirators:

- Disassemble respirator, removing and filters, canisters, or cartridges.
- Wash the face piece and associated parts in a mild detergent with warm water. Do not use organic solvents.
- Rinse completely in clean warm water.
- Wipe the respirator with disinfected wipes (70% Isopropyl Alcohol) to kill germs.
- Air dry in a clean area.

- Reassemble the respirator and replace any defective parts.
- Place in a clean, dry plastic bag or other airtight container.

The Safety Coordinator will ensure an adequate supply of appropriate cleaning and disinfection material at the cleaning station. If supplies are low, employees should contact their Superintendent, who will inform the Safety Coordinator.

Maintenance:

Respirators are to be properly always maintained in order to ensure that they function properly and adequately protect the employee. Maintenance involves a thorough visual inspection for cleanliness and defects. Worn or deteriorated parts will be replaced prior to use. No components will be replaced, or repairs made beyond those recommended by the manufacturer. Repairs to regulators or atmospheric alarms will be conducted by the manufacturer.

The following checklist will be used when inspecting respirators:

- Face piece: Cracks, tears, holes, Facemask distortion, Cracked or loose lenses/face shield.
- Head strap: Break or tears, Broken Buckles
- Valves: Residue or dirt, Cracks or tears in valve material
- Filters/Cartridges: Approval designation, Gaskets in good condition, Cracks or dents in housing, Proper cartridge for hazard
- Air Supply Systems: Breathing air quality / grade, Condition of supply hoses, Hose connections, Settings on regulators and valves.

Employees are permitted to leave their work area to perform limited maintenance on their respirator in a designated area that is free of respiratory hazards. Situations when this is permitted include: to wash their face and respirator face piece to prevent any eye or skin irritation, to replace the filter, cartridge or canister, and if they detect vapor or gas breakthrough or leakage in the face piece or if they detect other damage to the respirator or its components.

Change Schedules:

Employees wearing APRs for protection against vapors and other particulates shall change respirators when they first begin to have trouble in breathing (i.e., resistance) while wearing their masks.

Storage:

Respirators must be stored in a clean, dry area, and in accordance with the manufacturer's recommendations. Each employee will clean and inspect their own air-purifying respirator in accordance with the provisions of this program and will store their respirator in a plastic bag in the connex box. Each employee will have his/her name on the bag and that bag will only be used to store that employee's respirator.

The Safety Coordinator will store JMW's supply of respirators and components in their original manufacturer's packaging in the office trailer.

Defective Respirators:

Respirators that are defective or have defective parts shall be taken out of service immediately. If, during an inspection, an employee discovers a defect he/she is to bring it to the attention of his/her Superintendent. Superintendents will give all defective respirators to the Safety Coordinator. The Safety Coordinator will decide whether to:

- Temporarily take the respirator out of service until it can be repaired.
- Perform a simple fix on the spot such as replacing a head strap.
- Dispose of the respirator due to an irreparable problem or defect.

When a respirator is taken out of service for an extended period, the respirator will be tagged out of service, and the employee will be given a replacement of similar make, model, and size. All tagged out respirators will be kept in the storage cabinet inside the Safety Coordinator's office.

22.12 Training

The Safety Coordinator will provide training to respirator users and their Superintendents on the contents of the JMW Respiratory Protection Program and their responsibilities under it, and on the OSHA Respiratory Protection Standard. Workers will be trained prior to using a respirator in the work place. Superintendents will also be trained prior to using a respirator in the work place or prior to supervising employees that must wear respirators.

The training course will cover the following topics:

- The JMW Respiratory Protection Program
- The OSHA Respiratory Protection Standard
- Respiratory hazards encountered at LMCO and their effects.
- Proper selection and use of respirators.
- Limitations of respirators
- Respirator donning and user seal (fit) checks.
- Fit Testing
- Emergency use procedures
- Maintenance and storage
- Medical signs and symptoms limiting the effective use of respirators.

Employees will be retrained annually or as needed (i.e., if they change departments and need to use a different respirator). Employees must demonstrate their understanding of the topics covered in the training through hands-on exercises and a written test. Respirator training will be documented by the Safety Coordinator and the documentation will include the type, model, and size of respirator for which each employee has been trained and fit tested.

22.13 Program Evaluation

The Safety Director will conduct periodic evaluations of the workplace to ensure that the provisions of this program are being implemented the evaluations will include regular consultations with employees who use respirators and their supervisors, site inspections, air monitoring and a review of records.

Problems identified will be noted in an inspection log and addressed by the Safety Coordinator. These findings will be reported to the JMW management, and the report will list plans to correct deficiencies in the respirator program and target dates for the implementation of those corrections.

22.14 Documentation and Record Keeping

A written copy of this program and the OSHA standard is kept in the Safety Coordinator's office and is available to all employees who wish to review it.

Also maintained in the Safety Coordinator's office are copies of training and fit test records. These records will be updated as new employees are trained, as existing employees receive refresher training, and as new fit tests are conducted.

The Safety Coordinator will also maintain records for all employees covered ender the respirator program. The completed medical questionnaire and the physician's documented findings are confidential and will remain at JMW's medical care provider. The company will only retain physician's written recommendation regarding each employee's ability to wear a respirator.

Section 23 - Scaffolding

23.1 General

OSHA standards 1926.450 and 1926.454 apply to the use of scaffolds. The standards contain much useful information and are the minimal standards for the use of scaffolds in JMW construction work.

Scaffolds and other elevated work platforms can expose workers to falls objects if appropriate safety measures are not implemented. Scaffolds should be designed by a qualified person and built and inspected by competent persons.

There are several types of scaffold that are addressed specifically in the OSHA standards. All working levels of scaffolds are to be fully planked or decked between the front uprights and the guardrail supports in the back.

23.2 Hazards

- Falling from scaffold
- Collapse of scaffold
- Deck failure

23.3 Control of Hazards

The following general rules are suggested for maintaining all types of scaffolds in safe working condition.

- A competent person should inspect scaffolds daily.
- The structure should be cleared of all rubbish daily.
- No access materials should be stockpiled on scaffolding.
- Scaffold structures should be protected from trucks and other vehicles.
- Working platforms should be free from ice, snow, oil and other elements.
- No open fires are permitted on or near scaffolds.
- Guardrails are required on all sides and at the ends of scaffolds.
- Fall arrest systems may be required whenever conditions indicate they are required.

23.4 Aerial Lifts

Pre-Delivery Inspection

Prior to arrival onsite, all man lift equipment shall be thoroughly inspected by a qualified person. A record of the dates and results of all inspections for each man lift device shall be documented, maintained and furnished to the Safety and Risk Management Department upon request.

Daily Inspection

Prior to use of any man lift equipment on the project, daily equipment inspections shall be conducted to ensure the lift meets the manufacturers' and Occupational Safety and Health Act standards. These inspections shall be documented, and original copies kept on site for review.

All Daily Equipment Inspections shall be documented on the appropriate forms provided.

Annual Inspection

A competent person shall make an annual inspection of all man lift equipment. A record of the dates and results of all annual inspections shall be documented, maintained and furnished to the Safety and Risk Management Department upon request.

Operating Procedures

A man lift device shall only be operated by a worker who has been instructed in the safe operation of the machine, the conducting of the Daily Equipment Inspections, maintenance required by the manufacturer, types of working surface on which the machine is designed to be used, maximum rated workload capacity, special conditions or limitations of the machine, significance of alarms and the location of emergency controls. Copies of training documentation shall be maintained and furnished to the Safety and Risk Management Department upon request.

- A safety harness, with a shock-absorbing lanyard connected to an appropriate anchorage point, shall be always worn when inside a man lift.
- A man lift device which is not working properly, or which has sustained damage to critical components should not be used until repaired by a qualified mechanic.
- A man lift device should only be used on surfaces specified by the manufacturer.
- A man lift device should not be driven in a raised position, close to floor holes, trenches, depressions or similar hazards.
- A man lift device should not bear more than its rated working load capacity and where possible, the load should be distributed over the platform.
- When man lift platforms are used to lift materials, ensure the materials are in a rack or stand which is firmly secured to the platform. At no time are you to lift, set in place or steady materials with the lift's handrails.
- Do not place makeshift platforms such as boxes or ladders/scaffolds on a man lift platform to gain access to areas above.
- A man lift platform, or any other part of a man lift device shall not be closer than ten (10) feet to overhead power lines, unless the device is equipped for live electrical line work and the workers on the platform are qualified for such work.
- A man lift device should not be used for pulling, pushing or dragging materials.
- The platform of a man lift device should not be extended by using cantilevered planks or similar platform materials.
- Only manufacturer's platform extension devices shall be used.
- Planks or similar platform materials should not be used to bridge a gap between a man lift platform and other work areas.
- If needing to egress the confines of a man lift, 100% fall protection shall be used, utilizing a double lanyard style system.

Section 24 - Welding and Hot Work

24.1 General

The following is the procedure each contractor shall follow for all hot work activities. The protection of employees and equipment from injury and damage from fire, which could occur from hot work operations, is detailed within this section. Additional requirements may be stipulated, as deemed necessary, by the Safety Department.

- All contractors engaged in hot work operations are required to have a valid Hot Work Permit. These permits must be obtained every day, every shift and for every operation. Hot Work Permits are only valid for the duration stated on the permit.
- Prior to the start-up of any hot work operation, the employee or subcontractor shall contact the LM Fire Department to request a Hot Work Permit for the location of their hot work.
- Each contractor is required to provide fire-fighting equipment for standby during hot work operations. Permanent fire fighting equipment furnished by LM are for emergencies only and do not alleviate the contractor of its responsibility for providing standby fire fighting equipment.
- After permits have been filled out and have appropriate signatures and approvals, the permit must be conspicuously displayed on the welding or burning equipment in use.
- Fire blankets shall be used in all areas as needed.
- Each contractor is responsible to protect equipment, electrical cables and personnel from falling sparks or molten metal. This can be accomplished by moving the equipment or by protecting the equipment with fire resistant blankets and having a fire watch present. Any time there is overhead burning or welding operations, a fire watch will be present, or signage posted to keep personnel from walking underneath the hot work.

24.2 Welding and Cutting

When possible, all welding, cutting or burning operations shall be performed away from potentially hazardous areas.

Gas cylinders shall be properly protected and used in a safe manner. Mandatory procedures shall include, and are not limited to the following:

- All compressed gas cylinders must be stored in a ventilated area, located away from traffic and free from falling material.
- Full cylinders shall be stored separately from empty cylinders. All empty cylinders shall be marked as such.
- Oxygen and fuel gas cylinders shall be segregated in storage at a minimum distance of twenty (20) feet apart or separated by a non-combustible firewall. All cylinders shall be stored outside the plant at a minimum distance of fifty (50) feet, in a well-ventilated area away from heat sources.
- Storage areas for flammable gas cylinders shall be posted with **"NO SMOKING"** signs.
- A suitable cylinder truck, chain or other secure fastening shall be used to keep cylinders from being knocked over while in use. Securing the bottles to each other will not meet this requirement.
- All cylinders being transported must be fastened securely in an upright position on an approved cart. Under no circumstances should gas cylinders be transported in a horizontal position, as on the forks of a lift truck or a dock cart.
- Gas cylinders shall be secured in an upright position. When not in use, the valves shall be closed, and the valve protection cap shall be in place unless connected to a regulator.

- Oxygen cylinders, valves, couplings, regulators and hose apparatuses shall be kept free from oil, grease or other flammable liquids. Petroleum products in the presence of oxygen under pressure may ignite violently.
- Cylinders shall be protected from sources of heat, open flame or sparks.
- Suitable fire extinguishing equipment shall be immediately available.
- Flash-back arresters should be used for oxyfuel gas welding and cutting operations. These devices shall be used and maintained in accordance with the manufacturer's instructions.
- All acetylene welding units must have a "T" shut-off wrench chained to the cart.

Where cutting or welding is to be conducted overhead, the contractor shall have arranged for a security person with an approved fire extinguisher to be stationed below. Any cutting or welding done five (5) feet above the floor shall have the area around the work roped off.

Welding in the vicinity of flammable liquids is not permitted.

Proper ventilation is required for all welding activities. The use of fans shall be utilized when natural airflow is not present.

Where practical, all welding activities shall be 100% shielded with welding shields.

24.3 Propane

- Propane cylinders must be kept in an upright position, unless designated for horizontal use.
- Oxygen and propane cylinders shall be segregated in storage with a non-combustible firewall or at a minimum distance of twenty (20) feet apart. All cylinders shall be stored outside the plant at a minimum distance of fifty (50) feet, in a well-ventilated area away from heat sources.
- Full cylinders shall be stored separately from empty cylinders. All empty cylinders shall be marked as such.

Section 25 - Environmental

25.1 Statement of Purpose

It is the responsibility of the General Contractor / Controlling Contractor to assure installation and maintenance of all erosion control and storm water methods that meet the federal, state and local EPA laws. All hazardous materials such as asbestos, lead base paint, silica, paint, fertilizers, pesticides and insecticides shall be stored and disposed of in such a manner so that no runoff will occur to any state waters by what means are necessary.

There will be no on-site dump pits nor will there be any open air burning without permits obtained from the local Fire Marshall, prior to the activity.

25.2 Lead Exposure Protection Policy

Purpose

The following pages describe the procedures and precautions to be adopted on all jobsites in which employees could receive significant exposures to lead dust or fumes. Lead fumes are generated from welding or cutting on steel, girders, or other metals coated with lead-based paint, soldering to join copper pipe, radiator repair, construction activities with fume exposures in aluminum, brass, or bronze foundries, electronics or battery plants, and glass and ceramic facilities. Lead dusts are commonly associated with the disturbance of contaminated ground, sandblasting or abrasive action on surfaces with lead paint, demolition of interior walls painted with lead paint, and decontamination of certain manufacturing operations.

Policy

1. Prior to any demolition or retrofit, all work areas will be surveyed by a competent person to determine existing and predictable lead hazards. It is the responsibility of the overall superintendent of each jobsite to ensure that the survey is conducted.

2. Appropriate material samples will be taken and sent to an approved laboratory to determine the lead content in each material under question. Paints, coatings, and alloys with lead in concentration of 0.4% or more shall be considered a lead source.

3. Where a potential exposure to lead dust exists, spray-misting equipment shall be used for dust control.

4. In an enclosed area, during welding or cutting on surfaces with lead containing paints, local exhaust ventilation will be used to remove the fumes. The ventilation shall be evaluated periodically to maintain its effectiveness. If local exhaust is not possible, then the paint will be stripped away from the surface to be welded or cut a distance of 12" on each side.

5. In an open-air setting, for welding and cutting on lead-contaminated surfaces, respiratory protection is mandatory with respirators approved by NIOSH.

Initial Determination

For potential lead exposures that cannot be eliminated through engineering means, personal air samples shall be conducted to determine the extent of exposure. The samples shall be for a complete shift and represent each potentially exposed job classification in each work area for the shift with the highest potential exposure. Until sample results are available, workers in the immediate area shall be required to wear respirators according to each established exposure or activity below:

Moderate	High	Extreme
Manual demolition structures / drywall	Lead in mortar: burning	Abrasive blasting.
Manual scraping	Lead in paint: rivet busting power tool cleaning	Welding.
Manual sanding	Cleanup spent abrasives	Cutting
Heat gun applications	Abrasive blasting enclosure: move or remove.	Torch burning.
Power tool clean with dust collector		
Spray painting		
Half mask air purifying respirators	Powered air purifying respirators	Supplied air. respirators

Until sampling results are available, employees shall be provided with appropriate protective clothing, suitable change areas, handwashing facilities, and blood sampling for analysis of blood lead and zinc protoporphyrin (ZPP) levels.

Negative Results

If the initial personnel samples on each exposed job category show that the airborne lead concentrations are below 30 micrograms per cubic meter (Ug/M3), the result is negative. A written record must be documented that shows:

- Date
- Location
- Job activity
- Name
- Social security number

The name of the person who made this determination should also be included.

No further testing is required unless the nature of the activity changes.

All surfaces shall be kept free of accumulations of lead dust or fumes. Vacuums with HEPA filters shall be used for cleanup. Compressed air cleaning is prohibited.

Handwashing facilities will be provided. Where showers are not available, employees will be required to wash their hands and face at the end of a work shift, and before taking breaks, eating, smoking, etc. If disposable coveralls and foot protectors are provided, they will be disposed of in approved containers before the employee leaves the work area.

Action Level

1. Within five days, each employee will be notified in writing of the test results that represent that employee's exposure. Records of air monitoring and medical evaluation tests shall be kept for five years.

2. If any samples show job categories above the 30 ug/m³ action level but below the 50 ug/m³ permissible exposure limit (PEL), follow-up samples must be taken at least every six months on each employee classification which has a potential lead exposure.

3. Initial medical examinations, including lead and zinc ZPP blood level tests, are required for anyone who must work in an area or activity in which the airborne concentration of lead exceeds the 30 ug/m³ action limit. If the test results show blood lead concentrations greater than 40 ug/dL, additional blood tests shall be conducted every two months. For employees with exposures above the action level for any thirty days in a twelve-month period, tests for lead and ZPP levels in the blood will also be conducted at two-month intervals. Samples will be taken under the direction of a licensed physician and analyzed by an approved laboratory. Follow-up blood tests must be conducted within two weeks of notification for employees with blood concentrations greater than 50 ug/dL, and the employee will be removed from any workplaces with potential lead exposures.

4. Training in addition to that described in Section 4 under "Negative Results" will be provided and will include:

    - The contents of the lead standard
    - Specific nature of operations that could lead to lead overexposures.
    - Proper use of respirators
    - Medical surveillance program Engineering controls
    - Lead exposure control program
    - Employees' right of access to records
    - Suitable work practices

Exceeding the Permissible Exposure Limit (PEL)

1. If initial air test results show that employee exposure concentrations exceed the PEL, a written notice shall be provided to the employee advising him or her that the exposure was above the PEL and giving a description of the corrective action to be taken to bring concentrations within acceptable limits. Additional air test must be conducted on at least a quarterly basis.

2. Engineering and work practice controls will be used to bring employee exposure concentrations below the PEL. When mechanical ventilation is used, the performance of the system shall be evaluated and documented daily.

3. For locations or activities for which respiratory protection is mandatory, the use of respirators will conform to the company's respiratory protection program, including the provisions for selection, medical evaluation, fit testing, maintenance, and training.

4. Where employees are subject to airborne lead concentrations in excess of the PEL or where they may meet lead compounds that could cause skin or eye irritation, employees will be required to wear protective clothing such as coveralls, hats, protective footwear, and/or face shields or goggles. Protective clothing shall be cleaned and provided on at least a weekly basis.

5. Food, beverage, and tobacco products are not allowed in areas where airborne lead exposures exceed the PEL. Clean change areas are to be provided, including separate lockers for work clothing and street clothing, shower facilities, and lead-free eating facilities. Employees are required to wash both hands and face prior to eating, drinking, smoking, or applying cosmetics. No employees from high lead concentration areas may enter an eating facility unless, surface lead dust has been removed by vacuuming or other cleaning method that collects lead dust. Adequate hand-washing facilities will be provided.

6. The requirements for blood tests and ZPP are the same as in Section 3 under "Action Level".

7. The training requirements are the same as those in Section 4 under “Action Level".

8. Warning signs must be posted in areas where the PEL is being exceeded. The signs will read:

WARNING!
LEAD WORK AREA
POISON
NO SMOKING OR EATING
NO ADMITTANCE WITHOUT AUTHORIZATION

Regulated areas will be established and roped off. Non-essential workers will be routed around these areas.

Exposure Control

1. The following controls will be used to keep airborne lead concentrations below the action level of 30 ug/m^{3}3:

Activity	Control
Soft demolition / interior walls (lead based paint)	Mist drywall prior to sawing or breaking.
Area cleanup lead contaminated dust	HEPA vacuum
Welding or cutting – coatings with lead (enclosed space)	Local exhaust ventilation. or clean metal for four inches
Welding or cutting - coatings with lead (open air)	Respiratory protection. or clean metal for four inches
Abrasive blasting/lead coatings	Supplied air respirators.
Spray painting/lead content	Use paint with no lead content

2. For each activity in which lead is emitted, a description will be provided including:

   - The activity
   - The nature of the lead source
   - Equipment in use
   - Engineering and other controls
   - Crew size
   - Work practices and procedures
   - Maintenance practices

Any engineering plans or studies used to select the controls should also be documented.

3. Frequent and regular inspections will be provided at the jobsites by a competent person.

4. Copies of all air monitoring tests, which identify airborne lead concentrations will be attached to this program.

A detailed schedule of equipment procurement, construction contracts, and other plans for implementation of the protection program will also be attached.

25.3 Asbestos Safety Policy

It is the intent of J.M. Wilkerson Construction Co., Inc. to provide a safe working environment for all J.M. Wilkerson Construction Co., Inc. employees and subcontractor / vendor employees, on all J.M. Wilkerson Construction Co., Inc. jobsites.

Asbestos is not as common of a construction material as it was years ago. Therefore, contact with asbestos containing materials will be generally during renovations of buildings that were built before 1975.

The typical areas where asbestos containing materials are found are:

- Plumbing and mechanical pipe insulation
- Floor and ceiling tile
- Floor and ceiling tile glues and adhesives
- Asbestos lined pipes typically used in underground situations.

These areas require special attention and demolition by authorized personnel only. The superintendent of each jobsite should contact J.M. Wilkerson Construction Co., Inc. if asbestos containing materials are detected or thought to be detected in a building under construction, demolition, or renovation.

A survey of the jobsite for asbestos containing materials must be performed by an approved testing company prior to any work being performed on the jobsite. This is typically performed by the owner of the property, and a copy of the results are forwarded to J.M. Wilkerson Construction Co., Inc.

The following is a list of precautions that should be followed when asbestos containing materials are found. An abatement contractor who is fully licensed and insured for asbestos removal shall remove asbestos.

1. A negative pressure environment must be placed around the asbestos containing material to prevent loose particles of asbestos from entering the atmosphere.

2. No sawing, cutting, chipping, grinding, or any other procedure that will cause loose particles of asbestos to enter the atmosphere is permitted.

3. Air purifying respirators, gloves, and disposable coveralls will be required for employees who are required to work with and remove asbestos containing materials.

4. When a quantity of asbestos containing material is to be removed, trash bags that are capable of being sealed airtight and marked **ASBESTOS CONTAINING MATERIAL** must be used. The trash bags must be taken to an approved landfill.

5. Employees are to be provided a hand washing station and an area to change clothes before entering the work area. An area must be provided for breaks. There shall be **NO SMOKING OR EATING** in work areas.

6. Proper training of employees that are to work with asbestos containing material is to be performed by the superintendent or a competent person before the work begins.

7. Negative pressure fans containing HEPA filters shall be used in large areas to ensure that there are no asbestos particles leaving the containment area.

8. HEPA filters shall be used in all vacuum cleaners that are used to collect loose materials, and the contents of the vacuum cleaners are to be disposed of in sealed and clearly marked trash bags.

25.4 Silica Policy

Silica is a sand-based product that is found in most concrete based products.

Silica is normally introduced into the atmosphere by grinding, chipping, brushing and demolition of concrete.

Respirators designed for silica use and safety glasses are required when working with silica-based products.

Workers are required to wash their hands thoroughly before taking breaks and using tobacco.

When working within an environment where other workers are present, all precautions should be taken to control the silica dust within the construction area by means of negative pressure fans with HEPA filters or HEPA vacuums.

25.5 Nuisance Dust Policy

Nuisance dust is generally created by normal construction activities and should be controlled or contained within the construction area.

- When working within an office / public environment, special precautions need to be taken to protect the quality of air by all possible means, which are necessary. Some examples are increasing the outside air flow to the Air Handlers, adding additional filters on return air diffusers, creating negative pressure environments, using HEPA vacuums and negative pressure fans to filter the environment.

- When working with cleaners and solvents needed for cleanup, always read all SDS before using in a controlled air environment, which could affect surrounding personnel.

- Always contact the employer of surrounding employees with a schedule of work activities and coordinate any special activities that may affect the quality of air near them.

- Always ask surrounding employers if any of their employees have medical conditions, which may be triggered by nuisance dust, fumes, mist, etc. from construction activity. These employees need to be relocated as far away from construction activities as possible. Asthma,

allergies or bronchitis type medical conditions may be affected with even the smallest amount of dust or fumes entered the environment.

- Always contact J.M. Wilkerson Construction Co., Inc. when nuisance dust conditions may occur around the general public, prior to beginning construction.

- Workers required to work around nuisance dust environments may be required to wear proper respirators.

25.6 Erosion and Sediment Control Plan

It is the intent of J.M. Wilkerson Construction Co., Inc. to protect the environment and state waterways through proper erosion and sediment control methods set forth by the governing federal, state, or local authority of the Environmental Protection Division Department of Natural Resources.

Each jobsite that involves land disturbance of any amount requires a land disturbance permit from the governing authority which has jurisdiction over the state waterways and streams for the area in which the jobsite is located.

The following is a list of definitions that will help clarify terms used by the Environmental Protection Agency:

- "Erosion and Sediment Control Plan" means a plan for the control of soil and sediment erosion resulting from a land disturbing activity.

- "Land-Disturbing Activity" means any activity which, may result in soil erosion from water or wind movement of sediment into state waterways or onto lands within the state including, but not limited to, clearing, dredging, grading, excavating, transporting, and filling of land.

- "State Waters" includes all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, and other bodies of surface and subsurface waters which are not entirely confined and retained completely upon the property of a single individual, partnership, or corporation.

All erosion and sediment practices shall be of proper design, installation, and maintenance that allows for all rainfall events up to and including a 25-year rainfall event. A 25-year rainfall event is when 6.7" of rain occurs within a 24-hour period. Failure to maintain proper erosion and sediment control methods may result in a minimum fine of $2,500.00 per day, the land disturbance permit may be **REVOKED,** and/or a **STOP WORK ORDER** may be issued until all violations are corrected.

The following is a list of activities, which will help maintain erosion and sediment control:

1. All excavations shall be conducted in such a manner to maintain erosion sediment onto the jobsite.

2. Whenever feasible, natural vegetation shall be retained, protected, and/or supplemented.

3. The disturbed area shall be kept to a minimum whenever possible and shall be stabilized as quickly as possible.

***Note: Slopes, grades, banks, etc. within 26-0" of any state waterway must be. temporary seeded if left unprotected for more than 14 days.

4. No land disturbance shall endanger or encroach adjoining properties.

5. Grading equipment shall not cross state waterways without means of adequate bridges or culverts.

6. Permanent vegetation and structural erosion control methods must be installed as soon as practical.

7. All construction entrances/exits will have soil underlayment - stabilization fabric installed with a minimum cover of 6" to 8" of stone. As a minimum, the area should be at least 10'-0" in width and 30'-0" in length or whatever is acceptable to the local governing authority.

8. Entrances / Exits used for heavy trucks may require a truck wash-down station to remove dirt, mud, and loose debris from vehicles or equipment before they can enter public streets.

9. All surrounding streets and roads surrounding the jobsite, including entrances and exits onto the jobsite, will require a street cleaning / wash truck or a street sweeper to keep all streets free of construction debris. This should be used on an as needed basis or in accordance with the erosion control specifications that pertain to the jobsite.

10. All storm water inlets, whether on the jobsite or located in the surrounding street's curb and gutter system, will require some type of filtration device in place to remove sediment from rain run-off water before it enters the storm water system. This may be done with silt fence, sandbags, straw bales, or a combination of all.

11. The perimeter boundaries of the jobsite shall have silt fence installed per the jobsite erosion and sediment control methods set forth in the jobsite specifications or in accordance with the local EPD authority.

12. All-natural storm water run-off from the jobsite shall have swells installed that are lined with rip-rap stone, straw bales, silt fence, stone berms, or a combination of any or all that meets the jobsite specifications for soil and sediment erosion control methods.

13. All erosion and sediment control methods shall be ALWAYS maintained in good working condition, especially during rainstorms.

14. Tree protection fence shall be coordinated with the soil and erosion control plan.

Whenever there are any questions pertaining to the installation and/or maintenance of erosion and sediment control methods for a jobsite, the jobsite superintendent of J.M. Wilkerson Construction Co., Inc. should be contacted immediately.

25.7 Inorganic Arsenic

Purpose

This procedure establishes the guidelines to follow when there is a possibility of exposure to inorganic arsenic.

Scope

This procedure shall be followed when an AMEC employee performs work in one of the following work areas where fly ash is present.

- Inside and out of any coal fired boiler.
- Cutting or welding on any boiler tube scale
- All associated ducts work.
- ID and FD fans.
- Precipitators.
- Air Preheaters
- Any associated equipment where fly ash is present.

Definitions

Inorganic Arsenic – A highly toxic heavy metal that is found in fly ash. Arsenic and most of its compounds are poisonous to the body. When exposed to the skin, arsenic has caused dermatitis and skin lesions. Chronic exposure has been linked to lung cancer.

Action Level (AL) – Concentrations of inorganic arsenic of 5 µg/m3 averaged over an eight-hour period.

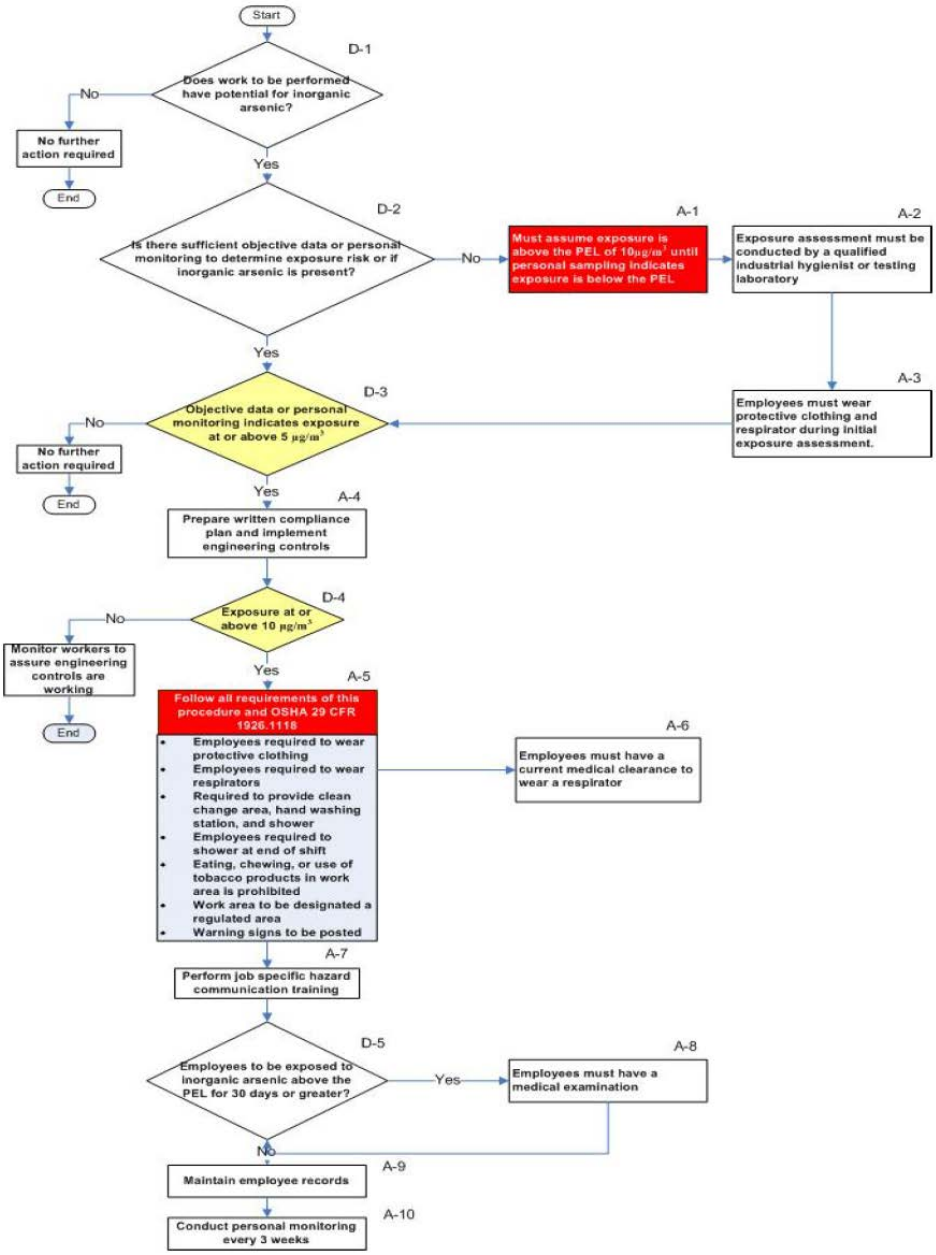
Permissible Exposure Limit (PEL) – Concentration of inorganic arsenic greater than 10 µg/m3 averaged over an eight-hour period.

Time Weighted Average (TWA) – Average concentration for a normal 8-hour workday to which nearly all workers may be repeatedly exposed day after day, without adverse effect.

Flow Chart

The process flow chart for Silica follows the text of the procedure.

See chart on next page.



General

Exposure Assessment (D-1, D-2, A-1, A-2, A-3, D-3, A-4, D-4, A-10):
When work involves any of the above-described tasks and fly ash is present, the Site Manager must assume inorganic arsenic is present and above the action level of 5 µg/m3. Hot work involving boiler tube scale must also be assumed above the action level.

When fly ash is present in the work area, a pre-work exposure assessment must be performed to determine if inorganic arsenic is present and the level of concentration.

Site Manager when performing an Exposure Assessment should do the following:

- Obtain from the client/owner any objective evidence such as bulk analysis of the fly ash and coal to determine what heavy metals are present, specifically inorganic arsenic and at what concentration.

Work Practices (A-5):
Employees exposed to arsenic levels of 10 µg/m3 or greater are required to wear protective clothing at the minimum coveralls, gloves, boot coverlets, and head cover. Additional protective equipment such as face shields or mono goggles may be required.

Site Managers will provide a clean change area adjacent to the work area for employees to change their clothes. Clean protective clothing shall be provided daily.

Site Managers must provide adequate washing facilities near the work area for employee use. If Inorganic Arsenic levels are at or above the PEL of 10µg/m3, shower facilities are required, and employees must shower at the end of their work shift. Consult the AMEC Corporate Safety Department or an Industrial Hygienist for further requirements when the PEL has been exceeded.

Employees are prohibited from eating, chewing gum or using tobacco products in the work areas where inorganic arsenic exceeds 5µg/m3 Employees are required to wash their hands and face prior to putting anything in their mouth.

Work areas where exposure to inorganic arsenic is at or above the PEL of 10 µg/m3 shall be designated as a regulated area and access in and out is to be controlled. Site Managers must initiate controls to prevent dust contaminated with inorganic arsenic from escaping the regulated area.

The regulated area must be clearly marked with warning signs to warn other employees of exposure to inorganic arsenic. The warning sign should read:

Medical Monitoring (D-5, A-8, A-6):
Employees exposed to inorganic arsenic levels at or greater than 10µg/m3 for thirty (30) days or longer may be required to submit to a medical examination as described in OSHA 20 CFR 1926.1118. Contact the AMEC Corporate Safety Department if any employee meets this requirement.
All employees working in a regulated area must have a current medical clearance for wearing a respirator.

Training (A-7):
Any employee that will be exposed to inorganic arsenic levels at or greater that 5 µg/m3 shall receive specific hazard communication training prior to start of work. Refer to Section 7.1 Employee Information and Training for Inorganic Arsenic.

As a minimum the specific hazard communication training must consist of:

- Contents of this procedure

- Description of the work to be performed.
- The hazards associated with exposure to inorganic arsenic and its effects on the employee's health.
- The contents of the written compliance plan
- The engineering controls implemented, and safe work practices developed.
- Respirator selection and proper use of.
- Medical surveillance program as described in OSHA 29 CFR 1926.1118

Employees will be advised where a copy of OSHA 29 CFR 1926.1118 is available for their review.

Recordkeeping (A-10):
Site Managers must assure all employees personal exposure monitoring results and medical records involving an employee exposure to inorganic arsenic are properly stored in accordance with OSHA 29 CFR 1926.33 regulations. Contact the AMEC Corporate Safety Department for assistance.

OSHA regulations require AMEC to maintain all records for forty (40) years or the duration of employment plus twenty (20) years, whichever is longer.

Site Managers must send employee exposure monitoring results and medical records to the AMEC Corporate Safety Department at the conclusion of work for proper record retention.

If heavy metals are present, then determine if the client/owner has recent (within 6 months) personal monitoring results of their employees that may have performed similar work in the work area that the AMEC employees will be working.

Historic data used for an exposure assessment should be less than six months old. Area monitoring data cannot be used to determine employee arsenic exposure.

If the client/owner does not have current analysis or historical data, the Site Manager must:

a. Collect a bulk sample of fly ash in the work area and send to a certified laboratory for analysis to determine presence and concentration of heavy metals.

b. If Inorganic Arsenic is found to be present in the fly ash, the Site Manager must:

1. Contact a reputable Industrial Hygiene firm to conduct personal air monitoring of a representative sample of the work force.

2. Workers during the initial exposure assessment must wear protective clothing, boot booties, ½ face HEPA respirator, and gloves. Workers must continue to wear protective clothing and equipment until the monitoring results indicate exposure is below the OSHA PEL.

3. If personal sampling and objective data indicates:

- **Below 5 µg/m3 arsenic** – No further sampling is required; no protective measures required.
- **At or above 5 µg/m3 arsenic but below 10 µg/m3** – Employee monitoring continues a minimum of once a month or until new engineering controls reduce the concentration to below5 µg/m3. A written compliance plan must be written, and work practices followed.

- Greater than 10 µg/m3 arsenic – Employee exposure monitoring is required as a minimum every three weeks. The full requirements of this procedure and OSHA 29 CFR 1926.1118 must be followed.

Each worker who was monitored must be notified in writing of their exposure results within five (5) working days after receipt of sampling results. Area monitoring results shall be posted in a prominent location in the work area, so all employees have access to the sampling results.

Engineering Controls (A-4):
When sampling results indicate inorganic arsenic exposure limits above 5 µg/m3, the Site Manager will implement engineering controls to reduce or lower employee exposure.

Examples of acceptable engineering controls are:

- Full boilers wash down with high pressure water wash.
- Continue to run the FD fan while the boiler is cooling to pull as much fly ash accumulation out of the boiler and duct areas.
- Remove the scale from boiler tube where cuts will be made using high pressure water.
- Local exhaust ventilation that is filtered and vented to an outside location.
- Vacuum or hydro wash of fly ash deposits in duct work and around associated equipment.

Written Compliance Plan (A-4):
A written compliance plan is required for all work where employees may be exposed to inorganic arsenic levels at or above the action level of 5 µg/m3. The written compliance plan shall be prepared prior to commencement of work or within twenty-four (24) hours after the exposure assessment determined exposures at or above the action level.

As a minimum, the written compliance plan shall contain the following:

- Description of each work activity where exposure is likely to occur. This will include location, size of work crew, work to be accomplished, and method work will be executed.
- Air monitoring data that determined employees may be exposed to inorganic arsenic greater than 5 µg/m3.
- Description of the engineering controls implemented to reduce employee exposure. Examples would be boiler wash down or local exhaust. If engineering controls cannot be achieved, the reason(s) must be stated and what other steps are being taken to prevent employee over exposure.
- Detail schedule for the implementation of the engineering controls and work practices plan.
- Describe the method used to notify other employees or subcontractors of possible exposure to inorganic arsenic when there is the possibility they may be working in the immediate area.

The written compliance plan shall be reviewed by the AMEC Corporate Safety Department or an Industrial Hygienist prior to implementation.

Respiratory Protection (A-5):
Employees exposed to inorganic arsenic at or above the action level of 5 µg/m3 but below the PEL of 10 µg/m3 are not required to wear respiratory protection.

Employees exposed to inorganic arsenic at or above the PEL of 10 µg/m3 are required to wear respiratory protection.

The level of respiratory protection shall be determined from the data obtained during the exposure assessment. Respirators shall be selected from the below chart:

Section 26 – Lead Compliance Safety Plan

26.1 PURPOSE AND SCOPE

Purpose: The Lead Exposure Control Plan has been developed to control employee exposure to fumes and/or dust from lead-containing products in compliance with the OSHA Construction Industry Standard (29 CFR 1926.62) and the General Industry Standard (29 CFR 1910.1025).

Scope: This policy applies to all areas of the corporation when work is being performed that may result in exposure to lead.

26.2 DEFINITIONS AND ABBREVIATIONS

Definitions:

Action Level – An airborne exposure level set by Occupational Safety and Health

Administration (OSHA) regulation that initiates certain requirements of a standard such as regulated areas, air monitoring and medical surveillance. For lead, this level is 30 µg/m^3.

Competent Person - One who can identify existing and predictable lead hazards in the surroundings and who has authorization to take prompt corrective measures to eliminate them.

Facility Manager (Appointed Management Representative) – The individual who is charged with the duties and responsibilities of providing and ensuring the overall management, operation, and maintenance of the physical worksite or business unit. (i.e., plant manager, terminal manager, etc.)

Permissible Exposure Limit (PEL) **–** An airborne exposure limit set by Occupational Safety and Health Administration (OSHA) regulation. Employee's 8-hour time-weighted average exposure may not exceed the PEL in any 8-hour work shift of a 40-hour work week. For lead, this limit is 50 µg/m^3.

Abbreviations:

AIHA **–** American Industrial Hygiene Association.

AL **–** Action Level.

APF **–** Assigned protection factor.

APR **–** Air-purifying respirator.

HEPA – High efficiency particulate air.

NIOSH – National Institute for Occupational Safety and Health.

OSHA – Occupational Safety and Health Administration.

PAPR – Powered air-purifying respirator.

PEL – Permissible Exposure Limit.

PPE – Personal protective equipment.

JM WILKERSON– San Juan Construction, Inc.

TWA **–** Time-weighted average.

26.3 ROLES AND RESPONSIBILITIES

Facility Manager shall:

- Ensure that all affected employees are educated on the hazards of lead exposure and the contents of this policy.
- Ensure proper personal protective equipment is available.
- Designate a competent person to determine proper control procedures and /or protective equipment for jobs with potential lead exposure.

Competent Person shall:

- Determine proper control procedures and/or personal protective equipment for projects involving lead exposure.
- Determine when sufficient current or historical air monitoring is available to deregulate a regulated area.

Persons working for or on behalf of J.M. Wilkerson Construction shall:

- Be trained in accordance with this procedure to understand the hazards of lead exposure and shall abide by the prevention methods defined herein to avoid exposure.
- Wear proper respiratory protection and protective equipment when working in regulated areas and maintain qualifications to wear this equipment.
- Stop any job or operation and report to their supervisor or site responsible person if the scope of the job has changed from the original job briefing.

Supervisors shall:

- Conduct quality job briefings covering lead exposure hazards and proper protective equipment needed for the job.
- Ensure employees utilize proper protective equipment when working in regulated areas.

Managers or other Contractor Liaisons shall:

- Ensure contractors are aware of lead exposure hazards and control procedures and protective equipment required.
- Ensure contractors receive copies of SDSs or sampling reports that indicate presence of lead in a coating or other material.
- Ensure contractors who may have exposure to lead have their own lead policy as well as respiratory protection and medical surveillance.
- Ensure that the plant competent person receives copies of contractor air monitoring.

Facility Safety & Health Professionals shall:

- Assist Competent Person by providing necessary data to make decisions on control procedures and protective equipment.
- Arrange for necessary air monitoring.

- Arrange for necessary training / education.
- Ensure proper records are maintained.

Corporate Industrial Hygiene shall:

- Review this policy annually.
- Assist with interpretations of this policy and the OSHA standard.
- Assist the Competent Person with decisions regarding the adequacy of air monitoring data.

26.4 ADMINISTRATION

The Lead Exposure Control Policy has been developed to control employee exposure to fumes and/or dust from lead-containing products in compliance with the OSHA Construction Industry Standard (29 CFR 1926.62) and the General Industry Standard (29 CFR 1910.1025). Air monitoring has shown that some employees may be exposed to airborne lead fumes/dust during routine and non-routine operations. Hot work, such as welding or torch cutting on lead-based paint generally has the highest exposure potential, but other exposure situations cannot be ignored.

Lead is a systemic poison capable of damaging several body systems. Health effects of lead include memory loss, muscle and joint pain, seizures, kidney damage, and others. Employee exposure to lead will be controlled below Occupational Safety and Health Administration (OSHA) limits using engineering controls, work practices, or administrative controls. If controls fail to reduce exposure below the OSHA Permissible Exposure Limits (PELs), or when other controls are not feasible, respirators and other personal protective equipment will be provided and required to be used.

A competent person (one who can identify existing and predictable lead hazards in the surroundings and who has authorization to take prompt corrective measures to eliminate them), will determine proper control procedures and/or personal protective equipment for projects involving lead exposure. The facility's competent person shall consult with an Industrial Hygienist or other Safety and Health professional if needed.

26.5 EXPOSURE STANDARDS AND MONITORING

Initial Determination of Lead Exposure

A determination must be made whether the original coatings or materials contain lead. This may be done by:

- Submitting paint chips or pieces of the material to an outside laboratory for analysis. Be certain that the paint sample contains all layers of paint. A minimum sample size of about 0.5 to 1.0 gram (or about a teaspoon) is required for analysis.
- Examining any engineering specifications or SDS that may indicate what types of coatings or materials were used. If a clear determination cannot be made from this method, samples shall be taken.
- Using Lead Check® swabs, which give an immediate indication of lead content. This method is only appropriate for making a positive determination of lead. If

Lead Check® results are negative, the material shall be sent to the Dolan or Shreveport Laboratories or an outside laboratory for further analysis and confirmation of the negative result.

Materials containing 0.05% (500 ppm) lead or more will be considered lead containing for the purposes of this policy. For materials with less than 0.05% lead, contact an industrial hygienist or other Safety and Health professional for assistance in determining what portions of this policy apply for the planned work.

Typical equipment and materials potentially containing lead include:

- Valve Assemblies
- Above ground piping and supports
- Hydro Powerhouse buildings and equipment
- Spill gates and spillway decks
- Substation structures and equipment
- Transmission towers and supportive equipment
- Structural components such as I-Beams
- Paint on any buildings or equipment, especially red primer
- Metal solders
- Welding materials
- Underground cable splicing
- Leaded bearings
- Chlorine Service washers or gaskets

Initial exposure determinations shall be based on exposure monitoring and such information as calculations or observations indicating lead exposure, previous monitoring results, and employee complaints of symptoms of lead exposure. Exposure monitoring, representative of the current project, conducted within the past 12 months or appropriate objective data that demonstrates that there is no chance for overexposure may be used to satisfy the initial exposure determination requirement. Contact an Industrial Hygienist or other Safety and Health professional to determine if previous monitoring or existing data meets these requirements.

Exposure Standards

OSHA has set the Permissible Exposure Limit for lead at fifty micrograms per cubic meter of air (50 mg/m^3) as an eight-hour time-weighted average (TWA). If an employee is exposed for more than eight hours in any workday, the employee's allowable exposure, as a TWA for that day, shall be reduced according to the following formula:

$$\text{Allowable employee exposure (in } mg/m^3) = \frac{400}{\text{Hours Worked}}$$

The OSHA Lead Standard applies to all workers in general industries, shipyards, and in construction industries where an employee may be occupationally exposed to lead [OSHA 2012a OSHA 2012b OSHA 2012c].

Action level means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 $\mu g/m^3$) calculated as an 8-hour time-weighted average (TWA).

- OSHA set a Permissible Exposure Limit (PEL) for lead in workplace air of 50 µg/m^3 (8-hour time weighted average).
- OSHA mandates periodic determination of BLL for those exposed to air concentrations at or above the action level of 30 µg/m^3 for more than 30 days per year.
- The worker must be notified in writing within 15 days after the receipt of the results or any monitoring performed and provided with a medical examination if a BLL is found to be greater than 40 µg/dL.

The employer is obligated to remove the employee from excessive exposure, with maintenance of seniority and pay, until the employee's BLL falls below 40 µg/dL. If a worker's one-time BLL reaches 60 µg/dL (or averages 50 µg/dL or more on three or more tests) in general industries or shipyards, or 50 µg/dL in construction. Under these standards, lead is considered a hazard when equal to or exceeding 40 micrograms of lead in dust per square foot on floors, 250 micrograms of lead in dust per square foot on interior windowsills, and 400 parts per million (ppm) of lead in bare soil in children's play areas or 1200 ppm average for bare soil in the rest of the yard. In addition, paint in deteriorating condition, on a friction or impact surface, or on certain chewable surfaces is also defined as a hazard.

Air Monitoring

The facility competent person and/or Industrial Hygienist or other Safety and Health professional will conduct air monitoring to determine the employee exposure to airborne lead. Monitoring frequency will be based on the following:

- Air monitoring is performed at the beginning of each project (and type of work in each project) where exposure to airborne lead is possible to initially determine if employees may be exposed to lead at or above the AL. Employees engaged in work falling under the OSHA General Industry Standard, such as soldering or work with molten lead, shall also follow these air monitoring requirements. It is important that air monitoring be representative of each task that will be conducted (i.e., monitoring conducted while setting up the work area cannot be used to represent exposures during hot work). For short term jobs, historical data may be used to select proper respiratory protection and protective equipment. Air monitoring must be repeated periodically for short-term jobs to determine if exposure levels have changed.
- If sampling indicates that the exposures are below the AL, the sampling may be discontinued.
- If the exposures are between the AL and the PEL, sampling must be repeated at least every six months or until two samples collected at least seven days apart show the exposures to be less than the AL.
- If the exposure is above the PEL, sampling must be repeated quarterly or until two samples collected at least seven days apart show the exposures to be less than the PEL. If results are above the AL, sampling must continue at least every six months.

If sampling is discontinued and procedures, equipment, or materials involving lead related activities change in such a way as to possibly increase the lead exposure, then sampling will be reinstated.

If a negative initial determination is made showing no employees are exposed above the AL, a written record shall be maintained which includes the date of the determination, location within the worksite, type of work performed, and the name and ID number of each employee monitored.

26.6 CONTROLLING EXPOSURE

Lead Compliance Plan

A written lead compliance plan, or plans, is required for any facility/project where lead exposure is possible. For routine activities, such as removing paint before welding on an area, individual compliance plans such as job hazard analyses (AHAs) may be used.

For non-routine projects, a project compliance plan should be completed before each project, unless the facility plan adequately addresses all issues. The competent person may prepare these compliance plans with assistance of an industrial hygienist or other safety and health personnel.

This compliance plans shall be reviewed at least annually.

Interim Protection Requirements

The OSHA Construction Standard for lead at 29 CFR 1926.62(d) (2) spells out specific assumptions that must be made when performing certain tasks involving lead. Until an exposure assessment (initial determination of exposure) is conducted to determine exposure levels, lead exposure at the concentration indicated must be assumed for the tasks below. Appropriate respiratory protection, personal protective equipment, and hygiene facilities must be provided based on the assumed exposure level.

Exposure levels between the PEL and 10 times the PEL (500 mg/m3) are assumed for manual demolition, dry scraping, dry sanding, heat gun applications, power tool cleaning with dust collection systems, and spray-painting with lead paint.

Exposure levels between 10 times the PEL (500 mg/m3) and 50 times the PEL (2500 mg/m3) are assumed for power tool cleaning without dust collection systems, abrasive blast clean-up or enclosure movement, rivet busting where lead is present, lead burning, or using lead containing mortar.

Exposure levels above 50 times the PEL (2500 mg/m^3) are assumed for abrasive blasting, welding, cutting, and torch burning.

Engineering and Work Practice Controls

Engineering and work practice controls to minimize the potential for generating airborne lead are essential for controlling employee exposure. The following procedures are used to control airborne lead dust:

- Local exhaust ventilation (vacuum systems, hoods, paint spray booths, etc.) may be used to control lead exposure. The system shall be evaluated as necessary to ensure that effectiveness is maintained. Equipment used to collect lead containing dust will be equipped with a High Efficiency Particulate Air (HEPA) filtered exhaust.

- Several methods are available for bulk paint removal such as wet sandblasting, and vacuum blasting. It is important to note that using Blastox® **does not** eliminate airborne lead or the need for protective equipment. It is primarily used to reduce the levels of lead in waste analysis.

- Use wet methods when manually sanding or scraping painted surfaces. Chemical strippers may be used, but strippers that contain methylene chloride should be avoided because of methylene chloride's low PEL and potential cancer-causing effects. When methylene chloride products are used, representative exposure monitoring results should be below the PEL to justify the continued use of the product. When removing a section of lead paint prior to cutting or other hot work, sufficient paint shall be removed to prevent remaining paint from bubbling or vaporizing when hot work is performed.

- Vacuum work surfaces with a HEPA vacuum as needed during the work shift and at the end of the day to remove lead dust that may have accumulated. Shoveling, wet and dry sweeping and brushing may only be used where HEPA vacuuming has been found to be ineffective.
- Compressed air may not be used to remove lead dust from surfaces, equipment, or containers.

Restricted Access Areas

Areas in which lead-related work is being performed shall be marked off with barriers or barricades, accident prevention signs, etc., as appropriate, to minimize access and potential exposure. The signs shall read:

WARNING

LEAD WORK AREA

POISON

NO SMOKING OR EATING

26.7 RESPIRATORY PROTECTION

When working with lead, respirators will be required for the following:

- When exposures exceed the PEL.
- When engineering or administrative controls do not reduce exposure below the PEL.
- As interim protection during exposure assessments or during installation of controls.

Employees already in the J.M. Wilkerson Construction Respiratory Protection Program may use a respirator when working with lead, even when the above conditions do not apply, provided:

- They have HEPA filter cartridges (if an APR).
- The use does not increase other hazards; and
- All aspects of the Respiratory Protection Policy are followed (no facial hair, current fit test, etc.).
- For voluntary respirator use by individuals not in the Respiratory Protection Program, please see the J.M. Wilkerson Construction Respiratory Protection Policy.

The following chart lists the most common acceptable respirators and their use concentrations. Additional respirators can be found in the J.M. Wilkerson Construction Respiratory Protection Policy:

Airborne Concentration	Required Respirator Type
10 x PEL or less	Half-face air-purifying respirator with P-100/HEPA filters
25 x PEL or less	Powered air-purifying respirator (PAPR) with loose-fitting hood or helmet equipped with P-100/HEPA filters, PAPR with hood or helmet and tight-fitting face piece unless manufacturer has test results with higher APF (then 1000). Supplied-air respirator with a loose-fitting hood or helmet face piece operated in the continuous-flow mode.
50 x PEL or less	Full face piece air-purifying respirator equipped with P100/HEPA filters, or a PAPR with a tight-fitting half mask equipped with P-100/HEPA filters, or a supplied-air respirator with a tight-fitting half mask operated in continuous-flow or pressure demand mode.
1000 x PEL or less	PAPR with a tight-fitting full-face piece equipped with P- 100/HEPA filters or a supplied-air respirator with a tight-fitting full-face piece operated in the continuous-flow pressure demand or other positive pressure mode.
10,000 x PEL or unknown	Self-contained breathing apparatus with a full-face piece operated in the pressure-demand or other positive-pressure mode

Respirator selection may be based on previous air monitoring data. The OSHA Construction Standard for Lead, 29 CFR 1926.62(d) (2), assumes exposure levels for certain tasks when air monitoring data is not available. See section II. (C) for more information. If respirator requirements are not clear, an Industrial Hygienist or other Safety and Health professional can provide the necessary guidance.

All respirator use shall be in accordance with the J.M. Wilkerson Construction Respiratory Protection Policy.

26.8 PERSONAL PROTECTIVE EQUIPMENT

When employee exposures to lead exceed exposure limits, without regard to the use of respirators, personal protective equipment must be issued and worn. Personal protective equipment (PPE) used for exposure to lead includes:

- Coveralls or similar full-body work clothing.
- Head covers.
- Foot covers.
- Gloves.
- Eye / Face protection.

When working on ladders, during hot work, or when they otherwise create a greater hazard, the use of shoe coverlets may be discontinued provided that the employees' footwear is decontaminated when exiting the work area by HEPA vacuum and/or wet washing. Employees are encouraged to change their shoes before leaving work even if their shoes have been decontaminated.

PPE supplied may be disposable or reusable. Reusable PPE would include cloth coveralls, shoes or boots worn only at work, cloth or leather gloves, and cloth hoods. Disposable clothing includes paper or synthetic clothing, shoe covers, and head covers. Cloth coveralls shall be used when performing hot work. Disposable coveralls are not suitable for hot work.

Protective clothing and equipment shall be cleaned, laundered, repaired, or replaced as necessary to maintain their effectiveness. Disposable clothing may be used more than once if the integrity of the clothing is not impaired. Clean clothing must be provided at least weekly and must be provided daily when exposure levels are > 200 mg/m^3.

When laundering reusable clothing, the release of lead dusts must be controlled below the PELs.

Commercial laundry services must be notified of the presence of lead contamination.

26.9 HYGIENE FACILITIES AND PRACTICES

Every effort shall be made to prevent employees from spreading contamination to other areas of the workplace, and from spreading contamination to their homes. The following facilities and practices shall be provided and used:

Change Rooms

When feasible, clean change rooms should be provided for storing personal clothing and other personal items. Provisions shall be available in change rooms for separately storing clean and contaminated clothing. If a change room is not feasible, non-contaminated personal clothing may be stored in containers, vehicles, or other areas outside of the regulated area. Personal protective equipment shall be donned before entering the work area.

When leaving the work area during the work shift, all personal protective equipment shall be HEPA vacuumed, removed, and left outside of the entrance to the regulated area (in the change room if available.) Employees shall wash their hands and face before eating, drinking, or smoking.

Showers

All employees working in areas where exposure is above the PELs shall shower at the end of the work shift. If the shower facility is not immediately outside of the regulated area, HEPA vacuums or wet washing shall be

used to clean protective clothing prior to removal. After removing protective clothing, employees shall proceed to the shower facility, and shower and wash their hair.

When working in remote locations without shower facilities, protective equipment shall be HEPA vacuumed or wet washed before removal. Employees should wash their hands and face before entering vehicles to prevent contamination. Employees shall shower and wash their hair at their reporting locations as soon as possible.

General

- Protective gear, respirators, and tools shall be decontaminated according to standard procedures.
- There shall be no eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics when working with lead.
- Compressed air may not be used as a decontamination method.
- Contaminated clothing must be stored in appropriate containers labeled with the proper warning labels.

26.10 WASTE DISPOSAL

All waste disposal procedures for any given project must be developed and coordinated with the local Plant Environmental Coordinator or Region Environmental Coordinator.

26.11 MEDICAL SURVEILLANCE

Initial biological monitoring, consisting of tests for blood lead and zinc protoporphyrin levels, shall be made available to employees performing work covered under the lead construction standard who have been or will be exposed to lead above the AL on any day. Continuing biological monitoring shall be made available to employees covered by the lead general industry or construction standards who are, or will be, exposed at or above the AL for thirty or more days per year. Exposures are without regard to the use of respiratory protection. More extensive medical surveillance may be required depending on the results of the biological monitoring. Medical surveillance programs shall meet all requirements of 29 CFR 1910.1025 and/or 1926.62. Industrial Hygiene personnel or other Safety and Health professionals can assist with determining the need for a medical surveillance program.

26.12 TRAINING

A lead training program shall be established for employees who are or could be exposed at or above the AL on any given day or for employees who are exposed to lead compounds that may cause skin irritation (lead arsenate, lead azide). The training program shall be repeated annually and shall consist of the following:

- The content of the appropriate lead standard(s) and appendices.
- The specific nature of the operations which could result in exposure to lead above the action level.
- The purpose, proper selection, fitting, use, and limitations of respirators.
- The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health.

effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant).

- The engineering controls and work practices associated with the employee's job assignment including training of employees to follow relevant good work practices.
- The contents of any compliance plan in effect.
- Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies sand should not be used at all except under the direction of a licensed physician; and
- The employee's right of access to records under 29 CFR 1910.1020.

26.13 CONTRACTORS

Contractors performing maintenance activities in areas where the possibility for exposure to lead exists shall be informed concerning the compliance aspects of this policy. Contractors shall comply with the safety and health provisions as stated within the terms and conditions for contracts or service agreements. Contractors shall also be required to have their own lead policy, as well as respiratory protection, medical surveillance, and any other applicable policies. Copies of applicable J.M. Wilkerson Construction SDS or test results shall be provided to contractors along with any other data needed to make a hazard determination. The plant will receive copies of monitoring data collected by the contractor.

26.14 RECORDKEEPING AND NOTIFICATION

Exposure Monitoring Records

Lead exposure monitoring records must be kept for the duration of employment plus thirty years.

Medical Surveillance Records

Lead medical surveillance records, including biological monitoring records, must be kept for the duration of employment plus thirty years.

Training Records

OSHA requires that training records shall be kept at least until the next refresher is completed. Using electronic record storage (i.e., On-Track) effectively retains these records forever. Individual locations may want to save paper records such as sign-in sheets for 5 years or longer.

Negative Exposure Assessment Information

Any objective data used to determine exemptions from initial monitoring, or any other data used to show negative exposure assessments must be kept for thirty years.

Notification

When HR or any other group responsible for notification receives results of air monitoring, biological monitoring, or medical findings or opinions, the employee shall be notified of the results within 5 working days.

TRIGGER TASKS AND REQUIRED PROTECTION

Tasks	Protection Measures
Manual demolition, manual scraping, manual sanding, heat gun applications, power tool cleaning with dust collection systems, spray painting with lead paint: Assume exposure level of permissible exposure limit (50 mg/M3) to 500 mg/M3.	1/2 mask respirator with HEPA filters; 1/2 mask supplied air. (demand mode); coveralls, gloves, head covers, shoe covers, face shields or goggles (if respirator does not provide face protection); clean change area; shower facilities (if feasible); hand and face washing facilities; lunchroom facilities; blood lead, ZPP; HazCom training for lead; and other regulations that apply including respirator protection, medical surveillance, recordkeeping and access to records.
Using lead containing mortar, lead burning, power tool cleaning without dust collection systems, clean-up activities where dry expendable abrasives were used, abrasive blasting enclosure movement or removal, and rivet busting where lead containing coatings are present. Assume exposure levels between 500 mg/M3 and 2500 mg/M3.	Full face PAPR with HEPA filters; hood or helmet supplied air (continuous flow); full-face respirator with HEPA filters; full-face supplied air (demand mode); 1/2 face supplied air. (continuous mode); SCBA (demand mode); coveralls, gloves, head covers, shoe covers, face shield or goggles (if respirator does not provide face protection); clean change area; shower facilities (if feasible); hand and face washing facilities; lunchroom facilities; blood lead, ZPP; HazCom training for lead; and other regulations that apply including respirator protection, medical surveillance, record keeping and access to records.
Abrasive blasting, welding, cutting and torch burning. Assume exposure levels above 2500 mg/M3.	1/2 mask supplied air (pressure demand); full face supplied air (pressure demand); SCBA (pressure demand) coveralls, gloves, head covers, shoe covers, face shield or goggles (if respirator does not provide face protection); clean change area; shower facilities (if feasible); hand and face washing facilities; lunchroom facilities; blood lead, ZPP; HazCom training for lead; and other regulations that apply including respirator protection, medical surveillance, recordkeeping and access to records

26.15 REFERENCES

OSHA General Industry Lead Standard – 29 CFR 1910.1025

OSHA Construction Lead Standard – 29 CFR 1926.62

OSHA Respiratory Protection Standard – 29 CFR 1910.134

Medical Surveillance Policy

26.16 APPENDICES

Appendix A – Sample Lead Compliance Plan

Appendix B – Sample Laundry Notification Letter Appendix F – Lead Compliance Checklist

APPENDIX A – LEAD COMPLIANCE PLAN

Lead Compliance Plan

Facility Name: _____ Date: _____

Competent Person for Lead: _____

Project Description (include tasks with potential for lead exposure) _____

_____

_____

_____

_____

Prior to Project:

- ☐ Paint Tested for Lead
- ☐ Wipe Test
- ☐ Scraping
- ☐ Other _____

Location(s):	Results:
_____	_____
_____	_____
_____	_____
_____	_____

Surface Preparation Method:

- ☐ High Pressure Water
- ☐ Manual Removal
- ☐ Power Tool Removal
- ☐ Blasting

Type of Respirator Required:

- ☐ None
- ☐ Half Mask APR w/HEPA

- ☐ Full Face APR w/HEPA
- ☐ Powered APR w/HEPA
- ☐ Blasting Helmet
- ☐ Supplied Air ½ Mask, Continuous.
- ☐ Supplied Air Full Face, Continuous

Additional PPE Required:

- ☐ None
- ☐ Gloves
- ☐ Gloves for Chemical Stripping
- ☐ Face Shield
- ☐ Cover All's
- ☐ Tyvek Suit
- ☐ Boots
- ☐ Other _____

Equipment Available:

4-gas Detector	Yes / No
Charged	Yes / No
Calibrated	Yes / No
Filters	Yes / No
Labeled Respirators	Yes / No
Hepa Cartridges	Yes / No
Protective Clothing	Yes / No
Change Room	Yes / No
Showers	Yes / No
Lunch Area	Yes / No
Signage posted	Yes / No

Medical Surveillance:

Expected lead exposure on any day at or above the action level? Yes / No

Initial blood lead & ZPP tests taken in last 12 months? Yes / No

Blood lead ZPP tests taken prior to start of this task? Yes / No

APPENDIX B – SAMPLE LAUNDRY NOTIFICATION LETTER

Laundry Facility

Address

City, State Zip

Dear Sir or Madame:

Facility Name is notifying you as manager of the Laundry Facility that all clothing that we will be sending to your facility for laundering should be considered as potentially contaminated with lead. Exposure to high concentrations of airborne lead may cause damage to the central nervous system, reproduction system, and kidneys.

A warning label will be attached to containers containing clothing potentially contaminated with lead. This label will read as follows:

"Caution: Clothing contaminated with lead. Do not remove dust by blowing or shaking.

Dispose of lead-contaminated wash water in accordance with applicable local, state or federal regulations."

Your facility must adhere to the conditions listed in this label. A copy of the lead standard 29 CFR 1910.1025 is enclosed for your convenience.

If you have any questions concerning the above, please do not hesitate to call.

Sincerely,

Facility Manager

APPENDIX C – COMPLIANCE CHECKLIST LEAD EXPOSURE CONTROL POLICY

ROLES AND RESPONSIBILITIES (SECTION26.3)

1. Has the facility designated a facility competent person for lead?

EXPOSURE STANDARDS AND MONITORING (SECTION 26.5)

1. Does the facility conduct proper initial determinations of lead exposures?
2. Does the facility conduct proper initial and periodic exposure monitoring when negative exposure assessments have not been developed?

CONTROLLING EXPOSURE (SECTION 26.6)

1. Are lead paint removal AHAs or other AHAs used for small jobs involving lead?
2. Are lead compliance plans completed for large lead jobs conducted by JM Wilkerson employees or contractors?
3. Are interim protection requirements followed for jobs involving lead?
4. Are engineering and work practice controls such as local exhaust ventilation, HEPA equipped tools, wet methods, etc. used or considered for lead jobs?
5. Are proper signs posted for restricted areas where lead work is being performed?

RESPIRATORY PROTECTION (SECTION 26.7)

1. Are proper respirators worn for lead jobs based on exposure assessments?

PERSONAL PROTECTIVE EQUIPMENT (SECTION 26.8)

1. Is proper PPE used for lead jobs (cloth coveralls, head covers, foot covers, gloves and eye / face protection)?
2. Are decontamination procedures communicated for leather boots or leather protective equipment?
3. Is clean protective clothing provided according to the policy (at least weekly for most lead jobs and daily if levels exceed 200 mg/m^3)?
4. Are commercial laundry services notified of the presence of lead contamination?

HYGIENE FACILITIES AND PRACTICES (SECTION 26.9)

1. Are change rooms provided when feasible (if not are containers or some other means of storing personal clothing provided)?
2. Is protective clothing HEPA vacuumed and removed at the entrance to the regulated area?
3. Are shower facilities available and are employees required to shower at the end of their shifts when working in lead regulated areas?
4. Is contaminated clothing stored in appropriate labeled containers?

MEDICAL SURVEILLANCE (SECTION 26.11)

1. Is initial biological monitoring, consisting of tests for blood lead and zinc protoporphyrin levels, made available to employees performing work covered under the lead construction standard who have been or will be exposed to lead above the AL on any day?
2. Is continuing biological monitoring made available to employees covered by the lead general industry or construction standards who are, or will be, exposed at or above the AL for thirty or more days per year.

TRAINING (SECTION 26.12)

1. Are employees who may be exposed above the action level on any given day given training on lead hazards?

Section 27- Respirable Crystalline Silica Program

27.1 Statement of Purpose

This Respirable Crystalline Silica Program was developed to prevent employee exposure to hazardous levels of Respirable Crystalline Silica that could result through construction activities or nearby construction activities occurring on worksites. Respirable Crystalline Silica exposure at hazardous levels can lead to lung cancer, silicosis, chronic obstructive pulmonary disease, and kidney disease. It is intended to meet the requirements of the Respirable Crystalline Silica Construction Standard (29 CFR 1926.1153) established by the Occupational Safety and Health Administration (OSHA).

All work involving chipping, cutting, drilling, grinding, or similar activities on materials containing Crystalline Silica can lead to the release of respirable-sized particles of Crystalline Silica (i.e., Respirable Crystalline Silica). Crystalline Silica is a basic component of soil, sand, granite and many other minerals. Quartz is the most common form of Crystalline Silica. Many materials found on constructions sites include Crystalline Silica; including but not limited to – cement, concrete, asphalt, pre-formed structures (inlets, pipe, etc.) and others. Consequently, this program has been developed to address and control these potential exposures to prevent our employees from experiencing the effects of occupational illnesses related to Respirable Crystalline Silica exposure.

SCOPE

This Respirable Crystalline Silica Program applies to all employees who have the potential to be exposed to Respirable Crystalline Silica when covered by the OSHA Standard. The OSHA Respirable Crystalline Silica Construction Standard applies to all occupational exposures to Respirable Crystalline Silica in construction work, except where employee exposure will remain below 25 micrograms of Respirable Crystalline Silica per cubic meter of air (25 µg/m^3) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.

27.2 RESPONSIBILITIES

JMW firmly believes protecting the health and safety of our employees is everyone's responsibility. This responsibility begins with upper management providing the necessary support to properly implement this program. However, all levels of the organization assume some level of responsibility for this program including the following positions.

Safety Manager:

- Conduct job site assessments for Silica containing materials and perform employee Respirable Crystalline Silica hazard assessments in order to determine if an employee's exposure will be above 25 µg/m^3 as an 8-hour TWA under any foreseeable conditions.

- Select and implement into the project's ECP the appropriate control measures in accordance with the Construction Tasks identified in OSHA's Construction Standard Table 1; and potentially including (but not limited to) - a written Exposure Control Plan (ECP), exposure monitoring, Hazard Communication training, medical surveillance, housekeeping and others.

  NOTE: OSHA's Construction Standard Table 1 is a list of 18 common construction tasks along with acceptable exposure control methods and work practices that limit exposure for those tasks.

- Ensure that the materials, tools, equipment, personal protective equipment (PPE), and other resources (such as worker training) required to fully implement and maintain this Respirable Crystalline Silica Program are in place and readily available if needed.

- Ensure that Site Managers, Competent Persons, and employees are educated in the hazards of Silica exposure and trained to work safely with Silica in accordance with OSHA's Respirable Crystalline Silica Construction Standard and OSHA's Hazard Communication Standard. Managers and Competent Persons may receive more advanced training than other employees.

- Maintain written records of training (for example, proper use of respirators), ECPs, inspections (for equipment, PPE, and work methods/practices), medical surveillance (under lock and key), respirator medical clearances (under lock and key) and fit-test results.

- Conduct an annual review (or more often if conditions change) of the effectiveness of this program and any active project ECP's that extend beyond a year. This includes a review of available dust control technologies to ensure these are selected and used when practical.

- Coordinate work with other employers and contractors to ensure a safe work environment relative to Silica exposure.

Project Manager:

- Ensure all applicable elements of this Respirable Crystalline Silica Program are implemented on the project including the selection of a Competent Person.

- Assist the Safety Manager in conducting job site assessments for Silica containing materials and perform employee Respirable Crystalline Silica hazard assessments in order to determine if an ECP, exposure monitoring, and medical surveillance is necessary.

- Assist in the selection and implementation of the appropriate control measures in accordance with the Construction Tasks identified in OSHA's Construction Standard Table 1; and potentially including (but not limited to) - a written Exposure Control Plan (ECP), exposure monitoring, Hazard Communication training, medical surveillance, housekeeping and others.

- Ensure that employees using respirators have been properly trained, medically cleared, and fit-tested in accordance with the company's Respiratory Protection Program. This process will be documented.

- Ensure that work is conducted in a manner that minimizes and adequately controls the risk to workers and others. This includes ensuring that workers use appropriate engineering controls, work practices, and wear the necessary PPE.

- Where there is risk of exposure to Silica dust, verify employees are properly trained on the applicable contents of this program, the project specific ECP, and the applicable OSHA Standards (such as Hazard Communication). Ensure employees are provided appropriate PPE when conducting such work.

Competent Person and/or Site Manager

- Make frequent and regular inspections of job sites, materials, and equipment to implement the written ECP.

- Identify existing and foreseeable Respirable Crystalline Silica hazards in the workplace and take prompt corrective measures to eliminate or minimize them.

- Notify the Safety Manager of any deficiencies identified during inspections in order to coordinate and facilitate prompt corrective action.

- Assist the Safety Manager in conducting job site assessments for Silica containing materials and perform employee Respirable Crystalline Silica hazard assessments in order to determine if an ECP, exposure monitoring, and medical surveillance is necessary.

Employees:

- Follow recognized work procedures (such as the Construction Tasks identified in OSHA's Construction Standard Table 1) as established in the project's ECP and this program.

- Use the assigned PPE in an effective and safe manner.

- Participate in Respirable Crystalline Silica exposure monitoring and the medical surveillance program.

- Report any unsafe conditions or acts to the Site Manager and/or Competent Person.

- Report any exposure incidents or any signs or symptoms of Silica illness.

DEFINITIONS

If a definition is not listed in this section, please contact your supervisor. If your supervisor is unaware of what the term means, please contact the Competent Person or your Safety Department.

- Action Level means a concentration of airborne Respirable Crystalline Silica of 25 $\mu g/m^3$, calculated as an 8-hour TWA.

- Competent Person means an individual who can identify existing and foreseeable Respirable Crystalline Silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them.

- Employee Exposure means the exposure to airborne Respirable Crystalline Silica that would occur if the employee were not using a respirator.

- High-Efficiency Particulate Air (HEPA) Filter means a filter that is at least 99.97 percent efficient in removing monodispersed particles of 0.3 micrometers in diameter.

- Objective Data means information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating employee exposure to Respirable Crystalline Silica associated with a particular product or material or a specific process, task, or activity. The data must reflect workplace conditions closely resembling or with a higher exposure potential than

the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

- Permissible Exposure Limit (PEL) means the employer shall ensure that no employee is exposed to an airborne concentration of Respirable Crystalline Silica in excess of 50 µg/m^3, calculated as an 8-hour TWA.

- Physician or Other Licensed Health Care Professional (PLHCP) means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all the health care services required by the Medical Surveillance Section of the OSHA Respirable Crystalline Silica Standard.

- Respirable Crystalline Silica means Quartz, Cristobalite, and/or Tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle size- selective samplers specified in the International Organization for Standardization (ISO) 7708:1995: Air Quality-Particle Size Fraction Definitions for Health-Related Sampling.

- Specialist means an American Board-Certified Specialist in Pulmonary Disease or an American Board-Certified Specialist in Occupational Medicine.

27.3 REQUIREMENTS

Specified Exposure Control Methods

When possible and applicable, JMW will conduct activities with potential Silica exposure to be consistent with OSHA's Construction Standard Table 1. Supervisors will ensure each employee under their supervision and engaged in a task identified on OSHA's Construction Standard Table 1 have fully and properly implemented the engineering controls, work practices, and respiratory protection specified for the task on Table 1 (unless JMW has assessed and limited the exposure of the employee to Respirable Crystalline Silica in accordance with the Alternative Exposure Control Methods Section of this program).

Table 1: Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
1	Stationary masonry saws	• Use saw equipped with integrated water delivery system that continuously feeds water to the blade. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
2a	Handheld power saws (any blade diameter) when used outdoors	• Use saw equipped with integrated water delivery system that continuously feeds water to the blade. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
2b	Handheld power saws (any blade diameter) when used indoors or in an enclosed area	• Use saw equipped with integrated water delivery system that continuously feeds water to the blade. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
3	Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less) for tasks performed outdoors only	• Use saw equipped with commercially available dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	None	None
4a	Walk-behind saws when used outdoors	• Use saw equipped with integrated water delivery system that continuously feeds water to the blade. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
4b	Walk-behind saws when used indoors or in an enclosed area	• Use saw equipped with integrated water delivery system that continuously feeds water to the blade. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
5	Drivable saws for tasks performed outdoors only	• Use saw equipped with integrated water delivery system that continuously feeds water to the blade. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
6	Rig-mounted core saws or drills	• Use tool equipped with integrated water delivery system that supplies water to cutting surface. • Operate and maintain tool in accordance with manufacturer's instructions to minimize	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		dust emissions.		
7	Handheld and stand-mounted drills (including impact and rotary hammer drills)	• Use drill equipped with commercially available shroud or cowling with dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. • Use a HEPA-filtered vacuum when cleaning holes.	None	None
8	Dowel drilling rigs for concrete for tasks performed outdoors only	• Use shroud around drill bit with a dust collection system. • Dust collector must have a filter with 99% or greater efficiency and a filter cleaning mechanism. • Use a HEPA-filtered vacuum when cleaning holes.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
9a	Vehicle-mounted drilling rigs for rock and concrete	• Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector.	None	None
9b	Vehicle-mounted drilling rigs for rock and concrete	• Operate from within an enclosed cab and use water for dust suppression on drill bit.	None	None
10a	Jackhammers and handheld powered chipping tools when used outdoors	• Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10b	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	• Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10c	Jackhammers and handheld powered chipping tools when used outdoors	• Use tool equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		mechanism.		
10d	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	• Use tool equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
11	Handheld grinders for mortar removal (i.e., tuckpointing)	• Use grinder equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	Powered Air-Purifying Respirator (PAPR) with P100 Filters
12a	Handheld grinders for uses other than mortar removal for tasks performed outdoors only	• Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
12b	Handheld grinders for uses other than mortar removal when used outdoors	• Use grinder equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	None	None
12c	Handheld grinders for uses other than mortar removal when used indoors or in an enclosed area	• Use grinder equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.		
13a	Walk-behind milling machines and floor grinders	• Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
13b	Walk-behind milling machines and floor grinders	• Use machine equipped with dust collection system recommended by the manufacturer. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. • When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.	None	None
14	Small drivable milling machines (less than half-lane)	• Use a machine equipped with supplemental water sprays designed to suppress dust. • Water must be combined with a surfactant. • Operate and maintain machine to minimize dust emissions.	None	None
15a	Large drivable milling machines (half-lane and larger) for cuts of any depth on asphalt only	• Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. • Operate and maintain machine to minimize dust emissions.	None	None
15b	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	• Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. • Operate and maintain machine to minimize dust emissions.	None	None
15c	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	• Use a machine equipped with supplemental water spray designed to suppress dust. • Water must be combined with a surfactant. • Operate and maintain machine to minimize dust emissions.	None	None
16	Crushing machines	• Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points).	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		• Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. • Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote-control station.		
17a	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	• Operate equipment from within an enclosed cab.	None	None
17b	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	• When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None
18a	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials.	• Apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None
18b	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	• When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.	None	None

When implementing the control measures specified in Table 1, JMW shall:

- For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust.

- For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust.

- For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:

  - Is maintained as free as practicable from settled dust.

  - Has door seals and closing mechanisms that work properly.

  - Has gaskets and seals that are in good condition and working properly.

  - Is under positive pressure maintained through continuous delivery of fresh air.

  - Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 μm range (e.g., MERV-16 or better); and

  - Has heating and cooling capabilities.

- Where an employee performs more than one task included on OSHA's Construction Standard Table 1 during a shift, and the total duration of all tasks combined is more than four hours, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift. If the total duration of all tasks on Table 1 combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.

27.4 Alternative Exposure Control Methods

Alternative Exposure Control Methods apply for tasks not listed in OSHA's Construction Standard Table 1, or where JMW cannot not fully and properly implement the engineering controls, work practices, and respiratory protection described in Table 1.

First, JMW will assess the exposure of each employee who is or may reasonably be expected to be exposed to Respirable Crystalline Silica at or above the Action Level in accordance with either the Performance Option or the Scheduled Monitoring Option.

- **Performance Option** – JMW will assess the 8-hour TWA exposure for each employee based on any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures to Respirable Crystalline Silica.

- **Scheduled Monitoring Option:**

  - JMW will perform initial monitoring to assess the 8-hour TWA exposure for each employee based on one or more personal breathing zone air samples that reflect the exposures of employees on each shift, for each job classification, and in each work area. Where several employees perform the same tasks on the same shift and in the same work area, JMW will plan to monitor a representative fraction of these employees. When using representative

monitoring, JMW will sample the employee(s) who are expected to have the highest exposure to Respirable Crystalline Silica.

- If initial monitoring indicates that employee exposures are below the Action Level, JMW will probably discontinue monitoring for those employees whose exposures are represented by such monitoring.

- Where the most recent exposure monitoring indicates that employee exposures are at or above the Action Level but at or below the PEL, JMW will repeat such monitoring within six months of the most recent monitoring.

- Where the most recent exposure monitoring indicates that employee exposures are above the PEL, JMW will repeat such monitoring within three months of the most recent monitoring.

- Where the most recent (non-initial) exposure monitoring indicates that employee exposures are below the Action Level, JMW will repeat such monitoring within six months of the most recent monitoring until two consecutive measurements, taken seven or more days apart, are below the Action Level, at which time JMW will probably discontinue monitoring for those employees whose exposures are represented by such monitoring, except when a reassessment is required. JMW will reassess exposures whenever a change in the production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or additional exposures at or above the Action Level, or when JMW has any reason to believe that new or additional exposures at or above the Action Level have occurred.

JMW will ensure that all Respirable Crystalline Silica samples taken to satisfy the monitoring requirements of this program and OSHA are collected by a qualified individual (i.e., a Certified Industrial Hygienist) and the samples are evaluated by a qualified laboratory (i.e., accredited to ANS/ISO/IEC Standard 17025:2005 with respect to Crystalline Silica analyses by a body that is compliant with ISO/IEC Standard 17011:2004 for implementation of quality assessment programs).

Within five working days after completing an exposure assessment, JMW will individually notify each affected employee in writing of the results of that assessment or post the results in an appropriate location accessible to all affected employees.

Whenever an exposure assessment indicates that employee exposure is above the PEL, JMW will describe in the written notification the corrective action being taken to reduce employee exposure to or below the PEL.

Where air monitoring is performed, JMW will provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to Respirable Crystalline Silica. When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required for any workplace hazard, JMW will provide the observer with protective clothing and equipment at no cost and shall ensure that the observer uses such clothing and equipment.

Once air monitoring has been performed, JMW will determine its method of compliance based on the monitoring data and the hierarchy of controls. JMW will use engineering and work practice controls to reduce and maintain employee exposure to Respirable Crystalline Silica to or below the PEL, unless JMW can demonstrate that such controls are not feasible. Wherever such feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the PEL, JMW will nonetheless use them to reduce employee exposure to the lowest feasible level and shall supplement them with the use of respiratory protection.

In addition to the requirements of this program, JMW will comply with other programs and OSHA standards (such as 29 CFR 1926.57 [Ventilation]), when applicable where abrasive blasting is conducted using Crystalline Silica-containing blasting agents, or where abrasive blasting is conducted on substrates that contain Crystalline Silica.

Control Methods

JMW will provide control methods that are either consistent with Table 1 or otherwise minimize worker exposures to Silica. These exposure control methods can include engineering controls, work practices, and respiratory protection. Listed below are control methods to be used when Table 1 is not followed:

27.5 Respiratory Protection

Where respiratory protection is required by this program, JMW will provide each employee an appropriate respirator that complies with the requirements of the company's Respiratory Protection Program and the OSHA Respiratory Protection Standard (29 CFR 1910.134).

Respiratory protection is required where specified by the OSHA Construction Standard Table 1, for tasks not listed in Table 1, or where the company has not fully and properly implemented the engineering controls, work practices, and respiratory protection described in Table 1. Situations requiring respiratory protection include:

- Where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work practice controls.
- Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering, and work practice controls are not feasible; and
- During tasks for which an employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL.

27.6 Housekeeping

JMW does not allow dry sweeping or dry brushing where such activity could contribute to employee exposure to Respirable Crystalline Silica unless wet sweeping, HEPA-filtered vacuuming, or other methods that minimize the likelihood of exposure are not feasible.

JMW does not allow compressed air to be used to clean clothing or surfaces where such activity could contribute to employee exposure to Respirable Crystalline Silica unless:

- The compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air; or
- No alternative method is feasible.

27.7 Written Exposure Control Plan

When employee exposure on a construction project is expected to be at or above the Action Level, a Written Exposure Control Plan (ECP) will be established and implemented. This ECP will contain at least the following elements:

- A description of the tasks in the workplace that involve exposure to Respirable Crystalline Silica.
- A description of the engineering controls, work practices, and respiratory protection used to limit employee exposure to Respirable Crystalline Silica for each task.
- A description of the housekeeping measures used to limit employee exposure to Respirable Crystalline Silica; and
- A description of the procedures used to restrict access to work areas, when necessary, to minimize the number of employees exposed to Respirable Crystalline Silica and their level of exposure, including exposures generated by other employers or sole proprietors.

The written ECP will designate a Competent Person to make frequent and regular inspections of job sites, materials, and equipment to ensure the ECP is implemented.

The written ECP will be reviewed at least annually to evaluate the effectiveness of it and update it, as necessary. Having said this, ECP's are project specific and most project durations do not exceed a year. The written ECP will be readily available for examination and copying, upon request, to each employee covered by this program and/or ECP, their designated representatives, and OSHA.

Site Specific Silica Exposure Control Plan

Project Overview	
JMW:	
Project Name:	
Project Address:	
Project Competent Person(s):	
Person Completing Plan:	
Date:	
Project Description/Scope:	

Silica Generating Tasks				
1.	☐ < 4 Hours	☐ >4 Hours	☐ Indoors	☐ Outdoors
2.	☐ < 4 Hours	☐ >4 Hours	☐ Indoors	☐ Outdoors
3.	☐ < 4 Hours	☐ >4 Hours	☐ Indoors	☐ Outdoors
4.	☐ < 4 Hours	☐ >4 Hours	☐ Indoors	☐ Outdoors
5.	☐ < 4 Hours	☐ >4 Hours	☐ Indoors	☐ Outdoors
6.	☐ < 4 Hours	☐ >4 Hours	☐ Indoors	☐ Outdoors
7.	☐ < 4 Hours	☐ >4 Hours	☐ Indoors	☐ Outdoors
8.	☐ < 4 Hours	☐ >4 Hours	☐ Indoors	☐ Outdoors

Exposure/Compliance Data Source			
1.	☐ Table 1 (1926.1153)	☐ Performance or Objective Data	☐ Self-Monitoring
2.	☐ Table 1 (1926.1153)	☐ Performance or Objective Data	☐ Self-Monitoring
3.	☐ Table 1 (1926.1153)	☐ Performance or Objective Data	☐ Self-Monitoring
4.	☐ Table 1 (1926.1153)	☐ Performance or Objective Data	☐ Self-Monitoring
5.	☐ Table 1 (1926.1153)	☐ Performance or Objective Data	☐ Self-Monitoring
6.	☐ Table 1 (1926.1153)	☐ Performance or Objective Data	☐ Self-Monitoring
7.	☐ Table 1 (1926.1153)	☐ Performance or Objective Data	☐ Self-Monitoring

8.	☐ Table 1 (1926.1153)	☐ Performance or Objective Data	☐ Self-Monitoring

Engineering Controls
1.
2.
3.
4.
5.
6.
7.
8.

Respiratory Protection					
1.	☐ N/A	☐ Disposable Filtering Facepiece	☐ Half Mask	☐ Full Face	☐ Powered Air Purify Respirator
2.	☐ N/A	☐ Disposable Filtering Facepiece	☐ Half Mask	☐ Full Face	☐ Powered Air Purify Respirator
3.	☐ N/A	☐ Disposable Filtering Facepiece	☐ Half Mask	☐ Full Face	☐ Powered Air Purify Respirator
4.	☐ N/A	☐ Disposable Filtering Facepiece	☐ Half Mask	☐ Full Face	☐ Powered Air Purify Respirator
5.	☐ N/A	☐ Disposable Filtering Facepiece	☐ Half Mask	☐ Full Face	☐ Powered Air Purify Respirator
6.	☐ N/A	☐ Disposable Filtering Facepiece	☐ Half Mask	☐ Full Face	☐ Powered Air Purify Respirator
7.	☐ N/A	☐ Disposable Filtering Facepiece	☐ Half Mask	☐ Full Face	☐ Powered Air Purify Respirator
8.	☐ N/A	☐ Disposable Filtering Facepiece	☐ Half Mask	☐ Full Face	☐ Powered Air Purify Respirator

Housekeeping Procedures	
☐ Wet Sweeping	☐ HEPA-Filtered Vacuuming
☐ Other (Please Describe):	
(Dry sweeping, dry brushing, compressed air, or forced air are not permissible for housekeeping practices)	

Procedures Used to Restrict Access to Work Area

27.8 Medical Surveillance

Medical surveillance will be made available for each employee who will be required to use a respirator for 30 or more days per year due to their Respirable Crystalline Silica exposure. Medical surveillance (i.e., medical examinations and procedures) will be performed by a PLHCP and provided at no cost to the employee at a reasonable time and place.

JMW will make available an initial (baseline) medical examination within 30 days after initial assignment, unless the employee has received a medical examination that meets the requirements of the OSHA Respirable Crystalline Silica Construction Standard within the last three years. The examination shall consist of:

- A medical and work history, with emphasis on past, present, and anticipated exposure to Respirable Crystalline Silica, dust, and other agents affecting the respiratory system in addition to any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (e.g., shortness of breath, cough, wheezing), history of tuberculosis, and smoking status and history.

- A physical examination with special emphasis on the respiratory system.

- A chest X-ray (a single postero-anterior radiographic projection or radiograph of the chest at full inspiration recorded on either film [no less than 14 x 17 inches and no more than 16 x 17 inches] or digital radiography systems) interpreted and classified according to the International Labour Office (ILO) International Classification of Radiographs of Pneumoconiosis by a NIOSH-certified B Reader.

- A pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) and FEV1/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course.

- Testing for latent tuberculosis infection; and

- Any other tests deemed appropriate by the PLHCP.

JMW will make available medical examinations that include the procedures (except testing for latent tuberculosis infection) at least every three years. If recommended by the PLHCP, periodic examinations can be more frequently than every three years.

JMW will ensure that the examining PLHCP has a copy of the OSHA Respirable Crystalline Silica Construction Standard, this program, and the following information:

- A description of the employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to Respirable Crystalline Silica.

- The employee's former, current, and anticipated levels of occupational exposure to Respirable Crystalline Silica.

- A description of any personal protective equipment (PPE) used or to be used by the employee, including when and for how long the employee has used or will use that equipment; and

- Information from records of employment-related medical examinations previously provided to the employee and currently within the control of JMW.

JMW will ensure that the PLHCP explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of each medical examination performed. The written report shall contain:

- A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to Respirable Crystalline Silica and any medical conditions that require further evaluation or treatment.

- Any recommended limitations on the employee's use of respirators.

- Any recommended limitations on the employee's exposure to Respirable Crystalline Silica; and.

- A statement that the employee should be examined by a Specialist if the chest X-ray is classified as 1/0 or higher by the B Reader, or if referral to a Specialist is otherwise deemed appropriate by the PLHCP.

JMW will also obtain a written medical opinion from the PLHCP within 30 days of the medical examination. The written opinion shall contain only the following in order to protect the employee's privacy:

- The date of the examination.

- A statement that the examination has met the requirements of the OSHA Respirable Crystalline Silica Construction Standard; and

- Any recommended limitations on the employee's use of respirators.

If the employee provides written authorization, the written opinion shall also contain either or both of the following:

- Any recommended limitations on the employee's exposure to Respirable Crystalline Silica; and/or

- A statement that the employee should be examined by a Specialist if the chest X-ray is classified as 1/0 or higher by the B Reader, or if referral to a Specialist is otherwise deemed appropriate by the PLHCP.

If the PLHCP's written medical opinion indicates that an employee should be examined by a Specialist, JMW will make available a medical examination by a Specialist within 30 days after receiving the PLHCP's written opinion. JMW will ensure that the examining Specialist is provided with all the information that the employer is obligated to provide to the PLHCP.

JMW will ensure that the Specialist explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of the examination. The written report will contain:

- A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to Respirable Crystalline Silica and any medical conditions that require further evaluation or treatment.
- Any recommended limitations on the employee's use of respirators; and
- Any recommended limitations on the employee's exposure to respirable crystalline Silica.

In addition, JMW will obtain a written opinion from the Specialist within 30 days of the medical examination. The written opinion shall contain the following:

- The date of the examination.
- Any recommended limitations on the employee's use of respirators; and
- If the employee provides written authorization, the written opinion shall also contain any recommended limitations on the employee's exposure to Respirable Crystalline Silica.

27.9 Hazard Communication

JMW will include Respirable Crystalline Silica in the company's Hazard Communication Program established to comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200).

JMW will ensure that each employee has access to labels on containers of Crystalline Silica and those containers respective Safety Data Sheets (SDS's).

All employees will be trained in accordance with the provisions of the OSHA Hazard Communication Standard and the Training Section of this program. This training will cover concerns relating to cancer, lung effects, immune system effects, and kidney effects.

JMW will ensure that each employee with the potential to be exposed at or above the Action Level for Respirable Crystalline Silica can demonstrate knowledge and understanding of at least the following:

- The health hazards associated with exposure to Respirable Crystalline Silica.
- Specific tasks in the workplace that could result in exposure to Respirable Crystalline Silica.
- Specific measures JMW has implemented to protect employees from exposure to Respirable Crystalline Silica, including engineering controls, work practices, and respirators to be used.
- The contents of the OSHA Respirable Crystalline Silica Construction Standard.
- The identity of the Competent Person designated by JMW; and

- The purpose and a description of the company's Medical Surveillance Program.

JMW will make a copy of the OSHA Respirable Crystalline Silica Construction Standard readily available without cost to any employee who requests it.

27.10 Recordkeeping

JMW will make and maintain an accurate record of all exposure measurements taken to assess employee exposure to Respirable Crystalline Silica. This record will include at least the following information:

- The date of measurement for each sample taken.
- The task monitored.
- Sampling and analytical methods used.
- Number, duration, and results of samples taken.
- Identity of the laboratory that performed the analysis.
- Type of personal protective equipment (PPE), such as respirators, worn by the employees monitored; and
- Name, social security number, and job classification of all employees represented by the monitoring, indicating which employees were monitored.

JMW will ensure that exposure records are maintained and made available in accordance with 29 CFR 1910.1020. Exposure records will be kept for at least 30 years.

The employer shall make and maintain an accurate record of all objective data relied upon to comply with the requirements of the OSHA Respirable Crystalline Silica Construction Standard. This record shall include at least the following information:

- The Crystalline Silica-containing material in question.
- The source of the objective data.
- The testing protocol and results of testing.
- A description of the process, task, or activity on which the objective data were based; and
- Other data relevant to the process, task, activity, material, or exposures on which the objective data were based.

JMW will ensure that objective data are maintained and made available in accordance with 29 CFR 1910.1020. Objective data records will be kept for at least 30 years.

JMW will make and maintain an accurate record for each employee enrolled in the Medical Surveillance portion of this program. The record shall include the following information about the employee:

- Name and social security number.
- A copy of the PLHCPs' and/or Specialists' written medical opinions; and
- A copy of the information provided to the PLHCPs and Specialists.

JMW will ensure that medical records are maintained and made available in accordance with 29 CFR 1910.1020. Medical records will be kept under lock and key for at least the duration of employment plus 30 years. It is necessary to keep these records for extended periods because Silica-related diseases such as cancer often cannot be detected until several decades after exposure. However, if an employee works for an employer for less than one year, the employer does not have to keep the medical records after employment ends if the employer gives those records to the employee.

Section 28 – Concrete & Masonry

28.1 Statement of Purpose

Each contractor working on a JMW project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart Q - Concrete and Masonry Construction, in addition to the following guidelines.

General Requirements

- Unless otherwise stated in their contract, the concrete or masonry contractor must provide at least two covered entrances into each building or structure during perimeter work. They must also cordon off other means of access/egress.
- No load may be placed on a concrete structure unless a qualified person, knowledgeable in structural design, determines that the structure can support the load.
- Protruding reinforced steel, onto which employees could fall, must be protected to eliminate the hazard of impalement.
- Subcontractors must submit a formal Fall Prevention Plan to Turner, including the name and resume of their designated competent person.

28.2 Equipment and Tool Requirements

- Powered and rotating concrete troweling machines must have a "dead man" switch that automatically shuts off power whenever the hands of the operator are removed from the machine.
- Masonry saws must be provided with a semi-circular guard.
- Machines must be locked and tagged out of service, per Subpart K, of OSHA 29 CFR 1926, Construction Industry Regulations, before employees can perform any maintenance or repair work.

28.3 General Shoring and Formwork Requirements Per ANSI

This written Vertical Shoring and Formwork Plan describes methods and practices to be implemented when working with Vertical Shoring and Formwork and that can be read and understood by all managers, supervisors, and employees at JMW OSHA states that:

> *"Formwork which has been designed, fabricated, erected, braced, supported and maintained in accordance with Sections 6 and 7 of the American National Standard for Construction and Demolition Operations for Concrete and Masonry Work, ANSI A10.9-1983, shall be deemed to be in compliance with the provision of 1926.703(a)(1)."*
> *1926.703(a)(1) Formwork shall be designed, fabricated, erected, supported, braced and maintained so that it will be capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork. Formwork which is designed, fabricated, erected, supported, braced and maintained in conformance with the Appendix to this section will be deemed to meet the requirements of this paragraph.*

These rules follow ANSI / ASSE A10.9-1997 requirements. This written plan is intended to be used to:

- Create an awareness of the hazards when working with concrete and formwork among our workforce,
- Standardize procedures for working with concrete and formwork.
- Provide a consistent format for training employees on the proper procedures to be used,
- Minimize the possibility of injury or harm to our employees, and
- Demonstrate JMW compliance with OSHA's Concrete and Formwork requirements

28.4 Vertical Shoring and Formwork Requirements OSHA and ANSI

The requirements of this section apply to all vertical shoring and reshoring:

- The shoring and reshoring drawings and/or specifications may include details of unusual conditions such as heavy beams, sloping areas, ramps, and cantilevered slabs, as well as elevation views.
- JMW must have a copy of the shoring and reshoring drawings and/or specifications at the jobsite while the pertinent areas are in progress.
- Baseplates, shoreheads, extension devices, or adjustment screws must be in firm contact with the footing sill and the form material and be snug against the legs of the frames.

Load and Design

- The total vertical service load shall consist of dead load plus an allowance for live load. (Weight of formwork and freshly placed concrete is dead load). The minimum allowance for formwork dead load must not be less than 10 lbs per square foot.
- Live loads include the weight of personnel, equipment, material storage, runways, mounding of concrete, and impact of concrete equipment, and shall be computed in pounds per square foot. Additional allowances for live loads must be added for special conditions that may occur when placing concrete.
- The total vertical service load shall not be less than 100 pounds per square foot.
- The allowable loads on components must be based on a factor of safety consistent with the type of shoring used.
- When fabricated shoring units are used, manufacturers' and/or suppliers' recommendations for allowable loads must be used.
- The specifications to be used for all form lumber and timber shall be shown on all shoring and reshoring drawing and specifications.
- The sills for shoring and reshoring must be capable of supporting the maximum intended load.
- When shoring or reshoring from soil, engineer shall determine the type and size of mudsills, spread footings, or pile footings that must be used to support the loads to be placed on them. Precautions must be taken so that weather and job conditions do not change the load carrying capacity of the soil below the minimum requirements.
- If temporary storage of reinforcing steel, material, or equipment becomes necessary, upon notification by the general contractor, the shoring shall be redesigned and strengthened to meet the intended loads.

Field Practices

- Shoring and reshoring equipment must be inspected by a qualified person prior to erection to determine that it is as specified and shown in the drawings and or specifications.
- Equipment found to be damaged must not be used for shoring unless repaired to design specifications under the supervision of a qualified person.
- Erected shoring equipment must be inspected by a qualified person prior to, during, and immediately after the placement of concrete.
- If stability bracing is required for the shoring, it must be installed as erection progresses at the locations shown on the shoring layout drawings.
- Deviations from the shoring plan and or specifications because of field conditions must meet the approval of an engineer before concrete is placed.
- Erected shoring shall be checked by a qualified person to ensure that details of the drawing and/or specifications have been met.
- All vertical shoring equipment shall be reasonably plumb in both directions, unless otherwise specified in layout. The maximum allowable deviation for scaffold shoring from the vertical centerline of the leg is 1/8 inches in 3 feet, but the maximum deviation in the completed structure shall not exceed the dimension of the vertical member. If this tolerance is exceeded, the shoring equipment must not be used until properly readjusted.
- Upon inspection, if the shoring or reshoring equipment is found to be damaged, the system shall be reinforced to fully compensate for the damaged members prior to concrete placement.

Shoring Removal

- Shoring and reshoring equipment must not be removed until written approval by the general contractor confirms the specified required tests indicate that the specified concrete strength has been reached as established by an engineer.
- Removal of shoring and reshoring equipment must be planned as shown on the shoring and reshoring drawings and/or specifications so that the equipment that is still in place is not over loaded.
- Slabs and beams that are to be reshored must be allowed to take their dead load deflection before installation of reshoring equipment is made unless the shoring has been adequately designed to support multiple levels.
- While the reshoring is underway, no placement of fresh concrete or storage of reinforcing steel on slab forming above shall be permitted; and no construction loads shall be permitted on the partially cured concrete unless accounted for in the shoring and reshoring design.
- The unfactored service load of the supporting slab must not be exceeded when reshoring.
- The reshoring must be checked by a competent person to determine that it is properly installed as specified in the formwork drawings and/or specifications.

Tubular Welded Frame Shoring

- All tubular frame shoring equipment shall be inspected by a competent person before erection.

- Metal tubular frame shoring equipment and accessories shall not be used if heavily corroded, bent, dented, or if they have broken weldments or other defects. Repairs shall be made under the supervision of a qualified person.
- Locking devices on frames and braces must be in good working order, coupling pins must align the frame or panel legs, pivoted cross braces shall have their center pivot, and all components shall be in a condition like that of original manufacture.

- When checking the erected shoring forms with the shoring drawings and or specifications, the spacing between towers and cross-brace spacing must not exceed that shown by the drawings and/or specifications, and all locking devices must be in the closed position.
- Devices for attaching the external lateral stability bracing or lacing shall be securely fastened to the legs of the shoring frames.
- Eccentric loads on shore heads and similar members are prohibited unless designed for such loads.
- Adjustment screws shall not be adjusted beyond their recommended safe thread extension nor adjusted to raise formwork during concrete placement.

Single Post Shores

- When checking erected single post shores with the shoring design drawings and/or specifications, the spacing between shores must not exceed that which is specified. All clamps, screws, pins, and other components must be in the closed or engaged position.
- Single post shores shall be erected plumb.
- Single post shores must have adequate bracing provided in both the longitudinal and transverse directions and adequate diagonal bracing must be provided for stability when needed.
- Single post shores must not be stacked vertically.
- Devices that attach to the external lateral stability bracing must be securely fastened to the single post shores.
- Eccentric loads on the shore heads are prohibited unless the shore heads are designed for such loading.
- Adjustment of single post shores to raise the formwork may be made during placement of concrete. However, adjustment must not be made after the initial set of the concrete.

Adjustable Single Post Shores

- Must be inspected and not used if they:
    - Have splits in excess of recognized lumber grading rules.
    - Are cut.
    - Have sections removed.
    - Are rotten.
    - Are otherwise structurally damaged.

- Clamps, screws, pins, threads, and other components must be in a condition equal to that of the original manufacture.

Fabricated metal single post shores

- Design of the shoring shall be prepared by an engineer using working loads that keep a safety factor of at least 3:1.
- Fabricated single post shores must be inspected by a competent person before being used.
- Fabricated single post shores must not be used if heavily corroded, bent, dented, or they have broken weldments or other defects. Repairs must be made under the supervision of a qualified person.
- Clamps, screws, pins, threads, and other components must be in a condition equal to that of the original manufacture.

Formwork for Cast-in-Place Concrete

- Formwork must be designed, fabricated, erected, supported, braced and maintained so that it will be capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork.
- Formwork must be inspected by a competent person prior to, during, and immediately after the placement of concrete. A competent person performing these inspections shall be approved, in writing, by an engineer. A written report of the inspections is required. Concrete shall not be placed until the report on the erected formwork indicates approval for placement. Completion of JMW's pre-pour inspection sheet is required.
- Stripped lumber and materials intended for re-use shall have nails removed or bent over and all wire removed. All lumber and material shall be removed from the work area or properly stockpiled.
- Lumber, concrete, form hardware, and other materials should not be allowed to accumulate on walers, scaffolds, walkways, and form decks.
- Fire protection is required when combustible formwork and oils are used.

Loads

- Total vertical service load shall consist of dead load plus allowance for live load. The weight of the formwork together with the weight of the freshly poured concrete is the dead load. The minimum allowance for formwork deadload shall not be less than 10 pounds per square foot. Live loads include the weight of the personnel, equipment, materials stored, mounding of concrete, and impact of concrete and equipment, and shall be computed in pounds per square foot of horizontal projection. It is recognized that not all live loads are imposed simultaneously with the total dead load; therefore, only that portion of the live load that is present need be considered.
- Material should not be stored on the formwork unless the formwork is specifically designed to support the imposed loads.
- The minimum service load for combined dead and live loads shall be 100 pounds per square foot, or 125 pounds per square foot if motorized carts are used.

- Pressures exerted by the concrete on vertical forms shall be determined as set forth in ACI 347. If retarders, super plasticizers, fly ash, or other admixtures are used in the concrete mix, special provisions must be made for the increased pressures.
- Braces, shores, and vertical formwork shall be designed to resist all foreseeable lateral loads such as wind, cable tensions, inclined supports, impact of placement, and starting and stopping of equipment.
- Formwork shall be designed for all special conditions of construction, such as unsymmetrical placement of concrete, impact of machine delivered concrete, uplift, and concentric loads.
- Imposition of any construction loads on the formwork shall not be permitted unless such loading has been included in the design of the formwork and shown on the design drawings and/or specifications.
- Where mobile equipment, vehicles or trains will or may pass through false-work, suitable protective devices shall be provided, or traffic shall be excluded. Where protective devices are used, they shall be designed by an engineer.

Formwork Design

- In the design of forms, provisions shall be made, not only for the known concrete pressures and weights, but also for additional form pressures that may result. The design shall include impact during concrete placement, low temperatures, or other factors that would retard the set and increase the pressures, vibration of the form or the concrete during placing, uneven stressing, or impact from placing equipment.
- Unit stresses for use in the diagram of formwork, allowable loads on accessories, and factors of safety shall be set forth in ACI 347. When fabricated formwork units are used, the manufacturer's recommendations for allowable loads shall be followed providing the recommended allowable loads are supported by test results.

Placing and Removal of Forms

- When forms are placed or removed by cranes, cableway, A-frame, or similar equipment, the rigging and lifting attachments must meet ANSI B30.9
- Tag lines shall be used when moving panels or other large sections of forms.
- When the forming and stripping operations cannot be performed from the ground, floor, or other solid construction, ladders, scaffolds, or other approved means of access shall be used.
- Forms being raised or removed in sections shall not be released until braced or secured. Personnel shall be prohibited from riding forms being moved or suspended from hoisting devices, except slipforms designed for that purpose.
- Employees or others at lower levels shall be protected from falling materials by approved warning lines, signs, barricades, or overhead protection along walkways provided by the general contractor. Personal protective equipment, particularly hard hats, shall be worn by all employees.
- No construction loads shall be supported on, nor any formwork and shoring system be removed from, any part of the structure except where the portion of the structure, in combination with the remaining forming and shoring system, has sufficient strength to support its weight and total live loads involved. The strength of the partially cured concrete and / or reshoring necessary to

carry the proposed loads shall be specified by an engineer if not contained in the job drawings and specifications.

- The determination of adequate strength for formwork and shoring removal is made by the general contractor or structural engineer in writing.
- Copies of formwork drawings shall be available at the job site.

Flying Deck Forms

- All flying deck forms shall be designed, and drawings made by or under the supervision of an engineer.
- Field assembly of the equipment shall be in accordance with the manufacturer's and/or suppliers recommended procedures. A copy of these procedures shall be available at the jobsite.
- Any movement of the deck forms must be in strict accordance with manufacturer's and/or supplier's recommended procedures. A copy of these procedures shall be available at the jobsite.
- Field operations shall be under the supervision of a competent person.
- A competent person shall inspect the formwork prior to the placement of concrete to ensure that all components are properly placed and adjusted.
- A competent person shall inspect the formwork prior to any movement to ensure that all components are properly placed and adjusted.
- A safety line shall be attached to each form during the roll out operation. Movement of the forms shall be such that allowable impact loads are not exceeded.
- No one other than the rigger shall be permitted be permitted on top of the deck form after rollout operations has been completed. Rigging of the deck form shall be completed prior to the line from the crane taking on a load. The rigger shall use fall prevention procedures.
- A tag line shall be attached to the form during flying operations.
- No one shall be permitted on the form during any movement, either horizontal or vertical. Nothing shall be allowed on top of the forms during any movement of the forms, other than integral parts of the deck forms that have been securely fastened to the deck prior to movement. Cribbing, jacks, heaters, and weatherproofing may be attached to the forms and moved with the decks in compliance with the flying forms manufacturer's recommended procedures.
- Slings and rigging shall be in good condition. Sling and rigging shall be inspected by a competent person prior to use.
- Flying deck forms shall be inspected by a competent person before being used.
- The area directly underneath the flying deck forms shall be barricaded to prevent individuals from being under flying deck forms.

Horizontal Shoring Beams

- Horizontal shoring beams shall have allowable loads based on results of tests conducted by manufacture, according to the test procedures established in the scaffolding, shoring and

forming institutes “recommended procedures for compressive testing of scaffolds and shores” or its equivalent. A minimum safety factor of 2 shall be used in establishing allowable loads.

- All horizontal shoring beams shall be inspected by a qualified person before use by JMW.
- Horizontal shoring beams shall not be used if heavily corroded, have broken weldments, missing locking devices, missing bearing prongs or other defects.
- Erected horizontal shoring beams shall be inspected by a competent person.
- Supports for the horizontal shoring beams shall be designed to properly distribute the loads from the horizontal shoring beams to the supports during use.
- When supporting horizontal shoring beams on steel hangers, bearing ends of the horizontal shoring beams shall be designed to conform to the bearing end, and to support the shoring loads imposed. The hanger manufacturer’s recommendations shall be followed, providing the recommended allowable loads are supported by test results.
- Precautions shall be taken in the design and the installation of horizontal shoring beams for the following conditions:
    - Sloped or supported by sloping ledgers (stringers)
    - Ledger (stringer) height/width ratios exceed 2.5 to 1. Under no circumstances shall horizontal shoring beams bear on a single nominal 2-inch ledger (stringer).
    - Eccentric loading conditions exist.
    - Ledger (stringer) consists of multiple members (i.e., double 2-inch x 6-inch board, 1-inch x 8-inch board, etc.)
- Bearing ends of horizontal shoring beams shall be supported and locking devices, if required, properly engaged before placing any load on beams.
- Horizontal shoring beams shall not be supported other than at the bearing prongs unless approved by an engineer or manufacturer/suppler. Beam bearing prongs shall not be nailed to ledger.
- Adjustable horizontal shoring beams shall not be used as part of a reshoring system.

28.5 Masonry Requirements

1. A limited access zone must be established prior to the start of any masonry work.
2. The zone must be equal to the height of the wall, plus four feet.
3. Employees reaching more than 10 inches below the level of the walking/working surface on which they are working, must be protected from falling by guardrail systems, safety net systems or personal fall arrest systems.
4. For overhand bricklaying from a scaffold, fall protection is required if the working side of the scaffold has a gap greater than 12" between the scaffold and structure.

28.6 Rebar Protection Requirements

During the construction of reinforced concrete buildings, Contractors erect forms or perform other duties over exposed vertical or upturned reinforcing bars, bolts, or other protrusions (i.e., conduits/pipes/metal stakes/posts) that is 2" or smaller in diameter and 2" in height or taller is to be protected. Serious injuries and

deaths have resulted from falls on these protrusions. Also, floor slab reinforcing that extends beyond a section of slab in place can be an Incident hazard.

Contractors are not permitted to work above vertical protruding objects unless it has been protected to eliminate the hazard of impalement. Several approved methods to protect against this hazard are:

- Empty steel drums placed over the dowels until the column reinforcing is placed. The drums are then moved forward as the work progresses.
- Shallow boxes made from scrap lumber used in the same manner as No. 1 above.
- Plank covers for rows of bond bars.
- Approved, reinforced rebar caps, designed for impalement protection. Mushroom caps are not permitted on JMW projects.
- 4" x 4" x 4" wood blocks drilled to bar size and used as No. 4 above.
- Continuous 2"x4" wood rail secured to avoid displacement.
- Wire mesh or reinforcing bars extending beyond a section of slab in place shall be bent down and secured to eliminate a tripping hazard. Otherwise, Contractors shall be prohibited from walking over the area.

Section 29 - Ladders

29.1 General

OSHA standards 1926.851,.951,.1050,.1051,.1053,.1060, and .1060 apply to the use of ladder on this job site. The Standards contain much useful information and are the minimal standards for JMW construction work.

29.2 Training

JMW employees shall be trained by a competent person in the following areas:

- The nature of potential fall hazards in the work area.
- The proper construction, use, placement and care in handling of all ladders and scaffolding.
- The maximum intended load-carrying capacities of ladders and scaffolds used.

Training records shall be documented, maintained on-site and furnished to the Safety and Risk Management Department upon request.

29.3 Rules of Use

- Three points of contact shall be always maintained when working from a ladder.
- The top step of a stepladder should not be used as a step.
- When ascending or descending a ladder, the worker should face the ladder.
- Ladders should not be moved, shifted or extended while in use.
- The area around the top and bottom of the ladders should be kept clear.

29.4 Rules of Application

- Ladders should be inspected by a competent person for visible defects on a periodic basis and after any incident that could affect its safe use.
- Only approved fiberglass or wooden ladders are permitted on the project. The use of aluminum ladders is strictly prohibited.
- Painted wooden ladders shall not be permitted on the project.
- When portable ladders are used, the side rails should extend at least three (3) feet above the upper landing surface and shall be secured.
- Ladders that can be displaced by job site activities or traffic should be secured to prevent accidental movement, be barricaded and have a ground person to keep traffic or site activities away from the ladder.
- Ladders should not be placed in front of doors that open toward the ladder unless the door is safely locked or otherwise guarded with a ground person.
- Ladders with broken or missing rungs, broken or split side rails or other faulty or defective construction shall not be used. Defective ladders must be tagged and taken out of service.
- Scaffolds shall be designed by a qualified person, constructed and loaded in accordance with its design, and erected, moved, dismantled, and altered only under the supervision and direction of a competent person qualified in scaffold erection.

29.5 Stairways

All temporary and permanent stairways on our jobsites will meet the following requirements before our employees are permitted to use them:

- Stairways that will not be a permanent part of the structure on which construction work is being performed will have landings of not less than 30 inches in the direction of travel and extend at least 22 inches in width at every 12 feet or less of vertical rise.
- Riser height and tread depth will be uniform within each flight of stairs, including any foundation structure used as one or more treads of the stairs. Variations in riser height or tread depth will not be over 1/4-inch in any stairway system.
- Metal pan landings and metal pan treads, when used, will be secured in place before filling with concrete or other material.
- All parts of stairways will be free of hazardous projections, such as protruding nails.
- Slippery conditions on stairways must be eliminated before the stairways are used to reach other levels.
- Except during stairway construction, foot traffic is prohibited on stairways with pan stairs where the treads and/or landings are to be filled in with concrete or other material later, unless the stairs are temporarily fitted with wood or other solid material at least to the top edge of each pan. Such temporary treads and landings must be replaced when worn below the level of the top edge of the pan.
- Except during stairway construction, foot traffic is prohibited on skeleton metal stairs where permanent treads and/or landings are to be installed later, unless the stairs are fitted with secured temporary treads and landings long enough to cover the entire tread and/or landing area.
- Treads for temporary service must be made of wood or other solid material and must be installed the full width and depth of the stair.
- Stairways having four or more risers or rising more than 30 inches, whichever is less, must be equipped with at least one handrail and one stair rail system along each unprotected side or edge.
- Stair rails installed after March 15, 1991, must be not less than 36 inches from the upper surface of the stair rail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.
- Midrails, when used, must be located at a height midway between the top edge of the stair rail system and the stairway steps.
- When intermediate vertical members, such as balusters, are used between posts, they must be not more than 19 inches apart.
- The height of handrails must be not more than 37 inches nor less than 30 inches from the upper surface of the handrail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

- When the top edge of a stair rail system also serves as a handrail, the height of the top edge must be not more than 37 inches nor less than 36 inches from the upper surface of the stair rail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.
- Stair rail systems and handrails must be so surfaced as to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing.
- Handrails that will not be a permanent part of the structure being built must have a minimum clearance of 3 inches between the handrail and walls, stair rail systems, and other objects.
- Unprotected sides and edges of stairway landings must be provided with guardrail systems.

Section 30 – Traffic Control

30.1 Statement of Purpose

When operations are such that signs, signals, and barricades do not provide the necessary protection on or adjacent to a highway or street, flagmen, or other appropriate traffic controls shall be provided by the Contractor completing the operation.

Signaling directions by flagmen shall conform to American National Institute D6.1-1971. Hand signaling by flagmen shall be by use of red flags at least 18 inches square or sign paddles, and in periods of darkness, red lights. Flagmen shall be provided with and shall wear a red or orange warning garment while flagging. Warning garments worn at night shall be reflectorized material.

All Contractors receiving materials are solely responsible for the traffic control during the unloading processes and shall provide the necessary personnel to complete such tasks. All efforts shall be made to ensure trucks with materials are unloaded on site.

30.2 Worker Safety

TTC zones present temporary and constantly changing conditions that are unexpected by the road user which creates an even higher degree of vulnerability for workers on or near the roadway.

The following are key elements of worker safety and TTC management that should be considered to improve worker safety:

- All workers should be trained on how to work next to motor vehicle traffic in a way that minimizes their vulnerability. Workers having specific TTC responsibilities should be trained in TTC techniques, device usage, and placement.
- All workers exposed to the risks of moving roadway traffic or construction equipment should wear high-visibility safety apparel.
- Temporary traffic barriers should be placed along the workspace depending on factors such as lateral clearance of workers from adjacent traffic, speed of traffic, duration and type of operations, time of day, and volume of traffic.
- Reducing the speed of vehicular traffic, mainly through regulatory speed zoning, funneling, lane reduction, or the use of uniformed law enforcement officers, or flaggers should be considered.
- Planning the internal work activity area to minimize backing-up maneuvers of construction vehicles should be considered to minimize the exposure to risk.

A competent person designated by the employer should conduct a basic hazard assessment for the work site and job classifications required in the activity area.

30.3 Rules and Regulations

1. Employees working in or around a work zone or traffic work zone must be provided with, and required to wear, approved high-visibility apparel.

2. High visibility clothing is required when working on or near a roadway, and during flagging operations and should meet the following criteria:

Class 1 High Visibility Apparel:
- May be suitable for workers not directly in vehicle traffic paths.
- When vehicle speeds are less than 25 mph.

Class 2 High Visibility Apparel:
- For use in inclement weather.
- Workers closer to traffic than in Class 1.
- Near traffic above 25 mph, but less than 50 mph.

Class 3 High Visibility Apparel:
- Covers high risk work environments where weather, work or other factors impair visibility.
- Where traffic speeds exceed 50 mph.

Flagging:
- Strong yellow green (SYG) reflective vests are required.
- SYG reflective pants are recommended in low-visibility conditions.
- SYG reflective soft caps or white DOT reflective hard hats are required dependent on conditions and operations.
- DOT's SYG reflective apparel is the only apparel approved for flagging.
- SYG reflective vests, pants and soft caps are required during night work.
- White DOT reflective hard hats shall be substituted for SYG reflective soft caps if warranted during night work.

Other Daytime Operations:
- Orange or SYG shirts or jackets may be worn for other daytime operations.
- Orange or SYG shirts or jackets not obtained from inventory must be comparable in color to inventoried clothing.
- Orange or SYG reflective vests shall be worn over personal clothing of any color other than orange or SYG.

3. The Traffic Control Officer or competent person will ensure that the appropriate personal protective equipment (PPE) has been selected, issued to employees, worn by employees and employee training regarding the PPE.

4. All Site Workers Will Wear:

    - High-visibility apparel in accordance with ANSI/ISEA
    - Other PPE as required

30.4 Flagging Procedures

Flaggers are responsible for public safety and make the greatest number of contacts with the public of all highway workers; they should be trained in safe traffic control practices and public contact techniques.

1. Flaggers must be trained in accordance with state and local requirements. Training programs are available through either the American Traffic Safety Services Association or National Safety Council.

2. Flaggers should be able to demonstrate the following abilities:

- Ability to receive and communicate specific instructions clearly, firmly, and courteously.
- Ability to move and maneuver quickly in order to avoid danger from errant vehicles.
- Ability to control signaling devices (such as paddles and flags) in order to provide clear and positive guidance to drivers approaching a TTC zone in frequently changing situations.
- Ability to understand and apply safe traffic control practices, sometimes in stressful or emergency situations.
- Ability to recognize dangerous traffic situations and warn workers in sufficient time to avoid injury.

3. Hand signaling devices used by flaggers shall meet the following criteria:

    - The STOP/SLOW paddle shall have an octagonal shape on a rigid handle. STOP/SLOW paddles shall be at least 18 in wide with letters at least 6 in high and should be fabricated from light semi-rigid material.
    - The STOP/SLOW paddle should have a 5' staff.
    - The background of the STOP face shall be red with white letters and border. The background of the SLOW face shall be orange with black letters and border.
    - When used at night, the STOP/SLOW paddle shall be retro-reflective.
    - Use of flags should be limited to emergency situations.
    - Flags, when used, shall be a minimum of 24" square, made of a good grade of red material and securely fastened to a staff about 36" long. When used at nighttime, flags shall be retro-reflective red.

4. Flagger stations shall be located such that approaching road users will have sufficient distance to stop at an intended stopping point.

5. Except in emergency situations, flagger stations shall be preceded by an advance warning sign or signs. Except in emergency situations, flagger stations shall be illuminated at night.

6. Flagger stations should be located such that an errant vehicle has additional space to stop without entering the workspace.

7. Flaggers should do the following:

    - Stand either on the shoulder adjacent to the road user being controlled or in the closed lane prior to stopping road users.
    - Only stand in the lane being used by moving road users after road users have stopped.
    - Be always clearly visible to the first approaching road user.
    - Be visible to other road users.
    - Be stationed sufficiently in advance of the workers to warn them (for example, with audible warning devices such as horns or whistles) of approaching danger by out-of-control vehicles.
    - Stand alone, never permitting a group of workers to congregate around the flagger station.

The needs and control of all road users through a TTC zone shall be an essential part of highway construction as well as any jobsite.

Advance notification of sidewalk closures shall be provided to the maintaining agency. Where pedestrians with visual disabilities normally use the closed sidewalk, a barrier that is detectable by a person with visual disability traveling with the aid of a long cane shall be placed across the full width of a closed sidewalk.

The following three items should be considered when planning for pedestrians in TTC zones:

- Pedestrians should not be led into conflicts with work site vehicles, equipment, and operations.
- Pedestrians should not be led into conflicts with vehicles moving through or around the work site.
- Pedestrians should be provided with a reasonably safe, convenient, accessible path that replicates as nearly as practical the most desirable characteristics of the existing sidewalk.

A pedestrian route should not be severed and/or moved for non-construction activities such as parking for vehicles and equipment.

If a significant potential exists for vehicle incursions into the pedestrian path, pedestrians should be rerouted, or temporary traffic barriers should be installed.

Section 31 - Demolition

31.1 Statement of Purpose

The purpose of this document is to establish guidelines to protect the employees of J.M. Wilkerson Construction Co., Inc. (JMW) and its subcontractors form the hazards of demolition operations.

31.2 Identification of Hazards

Prior to beginning demolition operations, an engineering survey will be made by a qualified person designated by the owner or the general contractor. Documentation shall be submitted to owner/GC prior to starting any work. the This survey shall determine:

- The condition of the framing, floors, and walls.
- The possibility of an unplanned collapse of any part of the structure.
- Adjacent structures shall be checked for structural integrity as well.

31.3 Control of Hazards

- Prior to beginning demolition operations, JMW will obtain from the owner a site survey identifying the locations of asbestos and lead containing materials. If the owner is unable to provide JMW this information, then JMW shall employ a testing agency that can identify and/or verify areas of suspected of containing these materials prior to their disturbance during the demolition operation.
- All utilities (gas, electric, water, steam, sewer, etc) shall be cut or capped or otherwise controlled outside the building/demolition area before demolition work is started. If any utility is necessary to remain in service during the demolition work, then their lines shall be temporarily relocated and protected.
- Before demolition begins the building/work area will be checked for any hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in pipes, tanks, or other equipment. If found, they shall be removed before starting any demolition work.

31.4 Procedures

- All floor and wall openings, which pose a fall exposure shall be protected by guardrails.
- If debris is dropped through holes in the floor without the use of chutes, the area onto which the materials is dropped onto will be completely enclosed by barricades not less than 42 inches high and 6 feet back from the floor openings.
- Floor openings not used as material drops will be covered with material that can withstand the weight of any potential load. The floor opening cover will be secured to prevent it from being accidently moved.

Section 32 – Line Breaking

32.1 Purpose

To establish safe standard work practices and procedures for initial safe opening of flanges, pipes and equipment, which contained hazardous material or may have been under pressure.

32.2 Scope

The provisions of this safety and health guide will apply to all Valero and contractor personnel within this facility.

Routine production operation activities (e.g., filter cleaning, hose connection or disconnection, process sampling, etc.) may be performed by trained operations personnel outside the scope of this procedure provided there are operating procedures that cover the work that is to be performed.

Safe work practices for utility and slop hoses are addressed in SHG#49 Process and Utility Hose Use Guideline.

32.3 Definitions

Line Breaking - The initial opening of process and utility lines, hoses, fittings and vessels to the atmosphere.

Stray Currents - Electrical currents caused by power line induction, cathodic protection, and galvanic potentials (i.e., “battery action” due to dissimilar metals, soils, etc.).

Vessel - An enclosed container designed to hold liquid, solids, vapor, etc., (i.e., process towers, surge drums, LPG tanks, etc.)

32.4 Responsibilities

Personnel/Department	Responsibilities
Owning Area Lead Tech	• Assure compliance with Safe Line Breaking Guidelines. • Assure that SHG #33 Unplugging Bleeders Guideline is followed if plugged bleeders, drain valves or pressure taps are encountered.

Operations Personnel	• Assure, to the extent possible, that the lines or equipment have been walked down, emptied, purged, flushed, drained, vented, isolated (including flow and pressure) and tested to ensure the system is free from recognized hazards. • Assure that Lock, Tag, Try Guideline has been used to isolate equipment that may have contained hazardous material or may have been used under pressure prior to line breaking activities.
Maintenance/Contractor Personnel	• Assure the lines or equipment has been properly prepared. • Assure all applicable procedures such as Lock, Tag, and Try, Confined Space Entry, Hot Work, etc., are in use and properly completed. • Assure that all permit requirements have been met.
Training Department	• Ensure affected personnel are trained initially and periodically in safe line breaking procedures.

32.5 Procedure

Prior to approving work that falls within the scope of this procedure, Operations personnel shall:

- Ensure that, to the extent possible, the lines or equipment has been walked down, emptied, purged, flushed, drained, vented, isolated (including flow and pressure) and tested to ensure the system is free from recognized hazards.

- Assure that any flange(s) that will be opened is properly tagged to identify the line break points.

- Ensure that Lock, Tag, Try Guideline has been used to isolate equipment that may have contained hazardous material or may have been used under pressure prior to line breaking activities.

- When possible, verify de-pressurization of lines or equipment and absence of material has been accomplished by opening vents and/or drains and ensure they are cleared. Where present, pressure gauges will be checked for pressure reading and bleeders will be opened and cleared.

- Ensure that when work is performed on elevated piping or equipment and there is potential for liquids to fall, the area below the work is barricaded and posted, as needed, with suitable containment when applicable.

- Issue proper Safe Work Permits as required per SHG #3 Safe Work Permit Guidelines.

- As appropriate, shut down and lock out the cathodic protection rectifiers affecting the piping to be worked on, as per SHG #39 Piping Stray Current Guideline.

- Issue a Hot Work Permit before placing bonding cables.

NOTE: When pipe is disconnected or separated, a spark may occur due to stray currents present in the pipe. These sparks may have sufficient energy to be an ignition source for flammable mixtures that may be present in the area of separation in the pipe or the area where the pipe is located.

Prior to performing work that falls within the scope of this procedure, Maintenance/Contractor personnel shall:

- Ensure that the lines or equipment have been properly prepared.
- Ensure that when work is performed on elevated piping or equipment and there is potential for liquids to fall, the area below the work is barricaded and posted, as needed.
- Ensure that all applicable permits have been obtained and that all the requirements have been met.
- Ensure that the appropriate level of personal protective equipment is clearly defined and available for use.
- Ensure that personnel are in a defensive position to avoid a spray or release when attempting the initial opening. (Flanges will be cracked open on the opposite side of the line from the employee.)
- Consider means of egress and location of eyewash/safety shower before commencing work.

32.6 Personal Protective Equipment

- The appropriate type of personal protective equipment employed in a given line-breaking situation will vary with the hazards associated with the material, equipment, location and ability to verify that the equipment/line is clear.
- The minimum protective equipment in any line-breaking situation shall be:
  - Hardhat
  - Gloves
  - Face shield
  - Goggles or safety glasses as determined by Owning Area.
  - Appropriate chemical protective clothing as needed.
- Additional PPE, including respiratory protection, shall be used as defined in the Personal Protective Equipment Hazard Assessment in SHG #3 Safe Work Permit Guidelines.
- After the line break is completed and hazards have been identified, PPE may be downgraded per job requirements.

32.7 Additional Safety Procedures

- All piping systems will be considered pressurized until line breaking is complete.

- When opening a flanged pipe, maintain a safe position, loosen bolts farthest away from yourself (to avoid a spray) then loosen bolts on either side and pry open side farthest away from yourself cautiously until there is obviously no pressure in the line.

- In breaking a union joint, loosen cautiously and flex the joint away from yourself (to avoid spray) making certain all pressure is relieved.

- Be aware of pinch points due to spring back, shrinkage or expansion.

- Be aware of the potential for flow to resume when working on systems that contain highly viscous or frozen liquids.

- Use a box wrench instead of an open-end wrench whenever possible.

32.8 Training

- Operations, Maintenance and Contractor personnel who engage in line breaking activities must be trained in safe line breaking procedures prior to participating in line breaking activities.

- Refresher training must be provided a minimum of every three years.